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INVESTIGATING SELF-AFFIRMATION, SELF-EFFICACY AND RESPONSE-
EFFICACY IN RELATION TO PRO-ENVIRONMENTAL BEHAVIOR

by

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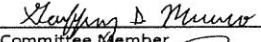
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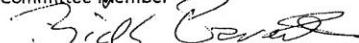
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RE: Application for Approval of Research Involving the Use of Human Participants



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Thank you for submitting an Application for Approval of Research Involving the Use of Human Participants to the Institutional Review Board for the Protection of Human Participants (IRB) at Towson University. The IRB hereby approves your proposal titled:

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We wish you every success in your research project. If you have any questions, please call me at (410) 704-2236.

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PREDICTORS OF PRO-ENVIRONMENTAL BEHAVIOR

Abstract

INVESTIGATING SELF-AFFIRMATION, SELF-EFFICACY AND RESPONSE-EFFICACY IN RELATION TO PRO-ENVIRONMENTAL BEHAVIOR

Danielle Emery

This study examined the effect of self-affirmation on self-efficacy and response-efficacy in relation to pro-environmental behavior. Self-affirmation was manipulated by having participants rank important values and write a paragraph about the value they ranked as most important. Outcome measures were self-reported intentions to engage in pro-environmental behavior, levels of self-efficacy, response efficacy and whether or not participants signed an environmental pledge or volunteered to help with an earth day event. Results indicated no significant main effects of self-affirmation on any of these dependent measures. However, results do indicate significant correlations between self-efficacy, response-efficacy and pro-environmental outcome measures. Participants with higher levels of self-efficacy and response-efficacy were more likely to engage in pro-environmental behavior and reported greater future intentions to engage in pro-environmental behavior.

Keywords: self-affirmation, pro-environmental behavior, self-efficacy, response-efficacy

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A major concern in the world today is human influence on the environment.

Human use of energy results in greenhouse gas emissions that influence climate change.

Motor vehicles, heating and air conditioning, food production, TV, computer use, lights and showers all affect the environment. When people attempt to engage in behavior to reduce or prevent harmful effects on the environment they are engaging in pro-environmental behavior (PEB). Recent research on pro-environmental behavior has gained psychological perspectives by addressing factors such as situational context, existing beliefs, and personal motivational factors in an attempt to understand why people may or may not engage in pro-environmental behavior (Clayton & Brook, 2005).

Accepting the fact that our behavior is negatively impacting the environment is not easy. Most people want to retain a positive self-image and are therefore likely to avoid negative information about how their everyday behavior is harmful to the environment. A possible way to overcome this need for defensiveness is to induce positive feelings about the self. Boosting one's self-image makes it less necessary to defend it from negative information (Steele 1988). Self-affirmation, affirming the self by identifying one's positive qualities, can result in greater acceptance of threatening information as well as positive behavior changes (Jessop, Simmonds, & Sparks, 2009; Sparks, Jessop, Chapman, & Holmes, 2010; Steele, 1988).

Self-affirmation can lead to changes in attitudes, intentions, and behaviors (Sparks et al., 2010). Understanding these factors could help promote positive changes for environmental behavior. This thesis will cover past research on self-affirmation in

general, assess potential mediational factors for self-affirmation effects, then focus on how self-affirmation and mediators such as self-efficacy may influence not only intentions to engage in pro-environmental behavior but actual behavior as well.

Self-Affirmation

There have been multiple studies showing that self-affirmation can lead to beneficial cognitive and behavioral changes (Sherman & Cohen, 2002; Harris, Mayle, Mabbott & Napper, 2007; Epton & Harris, 2008). This has been shown mostly with health related behaviors although a recent study proved this to be true for environmental behaviors as well (Sparks et al., 2010). Usually people are inclined to avoid negative self-related information in order to preserve a positive self-concept. Self-affirmations cause a boost in self-concept making it less necessary to avoid the negative information (Steele, 1988). Researchers in this area usually manipulate self-affirmation by asking participants to reflect on their own positive qualities. For example participants may be asked to recall previous acts of kindness. It is assumed that this boosts their self-concept, which allows them to be more receptive and less defensive to information that may have otherwise threatened their self-concept. When people are able to accept threatening information they are able to gain new knowledge about an issue and may subsequently change their attitudes and or behavior in a way that supports this newly acquired information (Armitage & Rowe, 2011).

The benefits of self-affirmations for responses to health related information have been shown in previous research. For example, Reed and Aspinwall (1998) found that women who were self-affirmed were more likely to accept health risk information about the link between caffeine and breast disease. The women also indicated more perceived

control over reducing their own caffeine intake. In addition, Harris and Napper (2005) found that women who were self-affirmed were more likely to have intentions to decrease alcohol consumption after being informed that alcohol increases risk of breast cancer. Also, cigarette smokers who were self-affirmed had higher intentions of cutting down their smoking after reading information on smoking health risks than those who were not affirmed (Harris, Mayle, Mabbott, & Napper, 2007). These results support the theory that self-affirmations lead to greater acceptance of threatening health related information and cause increased intentions for positive behavior. Recent research has shown that self-affirmations can lead to changes in actual behavior as well.

Epton and Harris (2008) examined the effect of self-affirmations on health behavior, specifically fruit and vegetable intake. They found that self-affirmation (SA), prior to a message about the benefits of eating fruits and vegetables, led to increased fruit and vegetable intake over a seven day period and that SA also led to increased self-efficacy and response efficacy. They recruited female participants in the United Kingdom, measured their baseline fruit and vegetable consumption, and then randomly assigned participants to either the SA condition or the control condition. Experimenters asked participants in the SA condition to recall and give examples of past acts of kindness. Participants in the control condition were asked to give opinions on unrelated issues. All participants then received a message emphasizing the health benefits of fruit and vegetables recommending at least five servings of fruit and vegetables each day and giving examples of how to add fruits and vegetables to their diet. Fruit and vegetable consumption was measured using a seven day diary in which participants recorded their fruit and vegetable intake. The researchers measured self-efficacy using four items

assessing participants' confidence in their ability to adhere to the five per day recommendation. Response efficacy was measured using six items assessing participants' confidence in the benefits of consuming fruits and vegetables. The results show that self-affirmed participants consumed significantly more fruits and vegetables than participants in the control condition and this was consistent across a seven day period (Epton & Harris, 2008). The results also reveal that self-affirmed participants reported significantly higher levels of self-efficacy and response-efficacy and that the main effect of SA on fruit and vegetable intake was mediated by response efficacy but not self-efficacy (Epton & Harris, 2008). These results suggest that self-affirmation can lead to positive changes in behavior as well as positive changes for self-efficacy and response-efficacy. Furthermore it reveals that response-efficacy can mediate self-affirmation effects. Examining possible mediating factors can help explain how and why self-affirmation leads to changes in motivation and behavior which could then help identify more effective ways to use self-affirmation as a technique to help change maladaptive behavior.

Mediators of Self-Affirmation

Research has found that self-affirmation influences numerous self-related concepts and ways of thinking, all of which may be possible mediators of self-affirmation effects. It is reasonable to assume that affirming one's self may boost one's self-concept or self-esteem and that this could explain self-affirmation effects. Although research has found self-affirmation can lead to increases in positive self-appraisals (Napper, Harris & Epton, 2009), less negative self-esteem (Derks, van Laar & Ellemers, 2009), and higher self-concept clarity (Cerully, 2012), most researchers in this field do not view these variables as probable mediators for self-affirmation effects. Furthermore, some studies

have found that self-esteem does not mediate self-affirmation effects (Koole et al., 1999; Napper et al., 2009) and Cerully (2012) did not find self-concept clarity to mediate self-affirmation effects.

Researchers have also examined self-efficacy and found that self-affirmation leads to increases in self-efficacy (Harris & Napper, 2005; Epton & Harris, 2008; Jessop, Simmonds, & Sparks, 2009). In their study on self-affirmation and healthy eating habits, Epton and Harris (2008) found that although self-efficacy did increase with self-affirmation it did not mediate self-affirmation effects whereas response efficacy did. Response efficacy is the belief that certain behaviors are actually helpful. For example, the belief that eating fruits and vegetables is important and beneficial to your health. Self-efficacy is the belief that one is capable of engaging in the behavior (-e.g., how confident someone is that they can and will eat more fruits and vegetables).

Self-affirmation has been found to have physiological effects as well. Creswell et al. (2005) exposed participants to a stressful situation by making them create and deliver a 5 minute speech in front of two confederates who were pretending to evaluate the speech performance. Participants then had to count aloud backwards from 2,083 by 13s while being told to go faster at one minute intervals. After stress exposure, participants who self-affirmed on personal values had lower cortisol levels than participants in the control condition (Creswell et al., 2005). Sherman, Bunyan, Creswell and Jaremka (2009) also found that self-affirmation can help alleviate physiological responses to stress. In their study participants in the control condition showed increased epinephrine levels in response to stress while epinephrine levels of participants who were self-affirmed did not change (Sherman et al., 2009).

It is clear that self-affirmation affects the self and in turn can result in positive cognitive and behavioral changes yet the variation in mediational findings do not identify the exact reason for this effect. Furthermore, most of the research on self-affirmation has focused on health related behaviors. It is possible that self-affirmation effects in other domains could have different mediators (Emery, 2012).

Self-Affirmation and Environmental Behavior

Although most research on self-affirmation effects have focused on health related messages and behaviors, it is logical to assume that these effects could be repeated in other domains. Research on self-affirmation as it relates to environmental attitudes and behavior is scarce, yet the few studies on this topic have found effects analogous to the health related findings. Recently Sparks, Jessup, Chapman and Holmes (2010) examined the effect of self-affirmation on environmental attitudes and behavior. In their first study, Sparks et al. (2010) manipulated self-affirmation by having participants in the self-affirmation conditions recall times when they had engaged in compassionate behavior. Order was also manipulated so that participants either received the threat first or the affirmation first. Participants in the control condition were asked to agree or disagree with personal opinion statements (e.g., chocolate is the best flavor of ice cream). The threatening information, given to all participants, was ominous passages from newspapers and books about climate change. The researchers also asked participants to report their own beliefs about climate change. They measured participants' denial of the severity of climate change as well as denial of self-involvement. Results show that participants who were self-affirmed had less denial of self-involvement than those who were not affirmed.

There were no significant effects for order but a main effect for gender was found such that females had less denial than male participants.

In their second study Sparks et al. (2010) examined the effect of self-affirmation on intentions to engage in pro-environmental behaviors. Past recycling behavior was assessed with a six item questionnaire. Self-affirmation was manipulated by asking participants to indicate their most important moral value. Participants in the control condition were not given any task. Next, experimenters had participants read an information sheet highlighting the importance of recycling and then asked them about their intentions to recycle in the upcoming month. Results indicated that for participants who reported low past recycling behavior, self-affirmation led to increased intentions to recycle in the upcoming month (Sparks et al., 2010). This suggests that self-affirmation increases individuals' motivation, indicated by their increased intentions, and this could lead to changes in actual behavior. The theory of planned behavior states that there is a strong relationship between intentions and behavior (Ajzen, 1991). According to this theory, attitudes, subjective norms and perceived behavioral control all influence one's intentions and this then leads to changes in behavior (Ajzen, 1991). It is possible that self-affirmation can influence one's attitude and perceived behavioral control, while also allowing people to be more receptive to subjective norms that may be self-threatening (e.g., environmental concern). It is reasonable to assume that self-affirmation will lead to better intentions which could then lead to beneficial changes in actual behavior not only for health related issues as proven in past research but also in other domains such as environmental behavior.

Identifying mediators in domains other than health related behavior can help shed light on how and why self-affirmation effects occur in these specific domains. As mentioned previously, Epton and Harris (2008) examined self-efficacy and response efficacy as potential mediators and found that although both were influenced by self-affirmation, only response-efficacy was a significant mediator. In the domain of environmental behavior a recent study found that self-efficacy plays an important role in self-affirmation effects on pro-environmental behavior (PEB) intentions (Emery, 2012).

Self-Efficacy

Self-efficacy refers to how competent one feels about their own abilities. Stronger perceived self-efficacy leads to increased proactive behavior (Bandura, 1982). A recent study examined the role of self-efficacy in relation to environmental attitude and behavior. Tabernero and Hernández (2011) found that people with higher levels of recycling self-efficacy were more likely to engage in recycling behaviors, set bigger goals, and felt more satisfied with their actions. Research has also found that, like self-affirmation, positive feedback can also increase self-efficacy. Elliot, Faler, McGregor, Campbell, Sedikides and Harackiewicz (2000) found that positive feedback led to higher levels of perceived competence and competence valuation, which refers to how much one cares about being competent. Experimenters gave 97 university students a nina puzzle which required them to locate and circle the word nina that had been scattered throughout a series of drawings (Elliot et al., 2000). After completing three puzzles participants were either given positive or negative feedback about their performance. The results show that participants who received positive feedback reported higher levels of perceived competence and competence valuation (Elliot et al., 2000). This suggests that providing

positive feedback about performance should increase self-efficacy and possibly influence behavior. When people believe in their ability to do something they are more likely to engage in that behavior (Bandura, 1982).

The importance of self-efficacy and the ability of self-affirmations to influence PEB intentions was demonstrated in a recent study (Emery, 2012) in which participants were assigned to one of three conditions: self-affirmation with environmental information, environmental information without self-affirmation and control condition. Participants were self-affirmed by identifying important qualities and writing about specific times in which they exhibited those qualities. Participants in the other two conditions were asked to identify their least important qualities. Participants were then asked about their future intentions to engage in pro-environmental behavior. Levels of self-efficacy and response efficacy for pro-environmental behavior were also measured. Results indicated that participants in the self-affirmation condition had significantly higher PEB intentions than participants in the control condition whereas PEB intentions for the environmental information only condition did not significantly differ from the control condition. Results also show that self-affirmation led to increased self-efficacy. Participants in the self-affirmation condition reported significantly higher levels of self-efficacy than environmental information only and control conditions. Unlike previous research that has identified response-efficacy as a mediator for self-affirmation effects on health related behavior (Epton & Harris, 2008), this study found no significant effects for response-efficacy. Instead self-efficacy was found to significantly mediate the effect of self-affirmation on PEB intentions. This is interesting because no other study to my knowledge has identified self-efficacy as a mediator for self-affirmation effects. The

present study was designed to extend Emery's (2012) study by testing the effect of self-affirmation on actual pro-environmental behavior rather than using self-report measures.

Current Study

The goal of the present study was to examine how self-affirmation influences pro-environmental behavior and to determine if self-efficacy or response-efficacy would mediate any main effects of self-affirmation. An effective way to manipulate self-affirmation that has been used in past research is to have participants identify their important values and write about why those values are important to them (Steele, 1988; Steele & Lui, 1983; Cohen, Aronson & Steele, 2000; Sherman, Nelson & Steele, 2000). In a review of self-affirmation manipulations McQueen and Klein (2006) identified that the value scale, first used by Steele & Lui in 1983, was the most often used self-affirmation manipulation in succeeding research involving self-affirmation effects. The value scale manipulation requires participants to choose their most important value from a list of values that is provided to them. The present study also used this technique by having participants rank order a list of values from most important to least important. Those participants in the self-affirmation condition then wrote about the value they ranked as most important while participants in the other conditions wrote about the value they ranked as least important and why it may be important to someone else. As in the previous study (Emery, 2012) participants assigned to conditions with environmental information received information about climate change, why it is important to engage in PEB and suggestions for ways they can help the environment. Outcome measures included intentions for future PEB, levels of self-efficacy, response-efficacy and actual PEB. PEB was measured based on whether or not participants signed a pledge stating that

would do everything they can to support the environment including taking shorter showers, recycling, and carpooling whenever possible. Participants were also given the opportunity to sign up to volunteer their time in helping to organize a new Fall Earth Day event on campus. Based on prior research on self-affirmation, I hypothesized that participants who are self-affirmed would be significantly more likely to engage in actual PEB and would report greater intentions for future PEB than those who were not self-affirmed. In addition, I expected that participants who are self-affirmed would have higher levels of self-efficacy and response-efficacy. Also, because previous research has found that self-efficacy is a mediator of self-affirmation effects on PEB intentions, I hypothesized that self-efficacy would mediate any main effects of self-affirmation on pro-environmental behavior and intentions.

Method

Participants

176 undergraduate students at Towson University participated for extra credit. Of the 176 participants there were 142 females, 32 males, 1 unknown and 1 transgender. The average age reported was 21.33 years.

Procedure

Participants were told the purpose of the study was to examine the relationship between personality variables and environmental attitudes, informed consent is shown in appendix A. Participants were randomly assigned to one of the following conditions: 1) self-affirmation with environmental information; 2) environmental information only; and 3) control group. Participants completed the study in a classroom setting. Participants in the self-affirmation condition were asked to rank order a list of values from most

important to least important then write a paragraph about why that value is important to them. Participants in the other conditions were asked to rank order the same list of values but wrote a paragraph about the value they identified as least important and why it might be important to another Towson student.

Participants assigned to conditions including environmental information were given information taken from the United States Environmental Protection Agency website. This information included a definition of climate change, why it is imperative that people do something to help and examples of ways to help. For example, reduce reuse, recycle, use water efficiently, car pool etc. This page also informed participants that they were part of the climate change problem and it was imperative that they do something to help the environment. Participants assigned to the control condition did not receive this information.

All participants then completed a questionnaire, as shown in Appendix B, using six items to measure intentions for future pro-environmental behavior (e.g., I intend to increase the amount I recycle). Response options were on a scale ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). Demographic information of age and gender was also included in this questionnaire.

Self-efficacy was measured using three items assessing confidence in their ability to carry out increased pro-environmental behavior (e.g., “I am confident in my ability to engage in more environmentally responsible behaviors” and “I believe that I am capable of conserving more energy”). Response efficacy was measured using three items assessing participants’ belief that their own behavior can impact the environment (e.g., “I believe my actions impact the environment” and “I believe that my environmentally

friendly behavior will be effective in helping the environment"). Response scales for self-efficacy and response-efficacy measures were on a scale ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). See Appendix C for complete self-efficacy and response-efficacy measures.

In the next part of the questionnaire packet participants were given the option to sign a pledge stating that they will do everything they can to support the environment including taking shorter showers, recycling, and carpooling whenever possible. Participants were also given the opportunity to sign up to volunteer their time in helping to organize a new Fall Earth Day event on campus. They were asked to provide their name, e-mail and how many hours/week they are willing to volunteer. It was explained that signing the pledge and volunteering are optional and will not affect participants' credit (Appendix D). Lastly participants were asked 3 questions to measure their level of belief in climate change (e.g., "Climate change is a problem that is affecting people and the environment.") Response options were on a scale from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*) (Appendix E). After participants completed the packet the experimenter explained the true purpose of the study and informed participants that there is no actual Fall Earth Day event.

Results

All dependent measure scales were internally consistent. Cronbach's alpha for the pro-environmental behavior, self-efficacy, and response-efficacy scales were .786, .731, and .919 respectively.

A multivariate analysis of variance was used to test the hypothesis that self-affirmation would increase pro-environmental behavior intentions. Results indicated no

significant main effects of condition on pro-environmental behavior intentions, $F(2,171) = 1.559 p > .05$, self-efficacy ratings, $F(2,171) = 1.943 p > .05$, response-efficacy ratings, $F(2,171) = 1.695 p > .05$, and climate change belief ratings, $F(2,171) = 1.088 p > .05$.

Binary logistic regression analysis was used to test the hypothesis that self-affirmation would increase the likelihood someone will sign the environmental pledge or volunteer. Results revealed no significant differences between conditions for the environmental pledge variable, $R^2 = .022$, $\chi^2 = 3.842$, $p = .050$ or volunteering variable, $R^2 = .001$, $\chi^2 = .172$, $p > .05$. Although the environmental pledge variable was approaching significance the trend was in the opposite direction. Descriptive statistics for these variables are shown in table 3.

Although the hypotheses were not supported, bivariate correlation analysis revealed significant correlations displayed in Table 1. For the environmental pledge and volunteer variables a value of 1 indicated yes and 2 no. The correlation analysis showed that self-efficacy and response-efficacy were positively correlated with PEB intentions and climate change belief indicating that participants with higher levels of either self-efficacy or response-efficacy reported greater intentions to engage in PEB and higher ratings of climate change belief. Self-efficacy was negatively correlated with the environmental pledge variable meaning participants with higher levels of self-efficacy were more likely to sign the environmental pledge. Response-efficacy was negatively correlated with signing the environmental pledge and volunteering for the earth day event, meaning that participants with higher levels of response-efficacy were more likely to have signed the environmental pledge or to have volunteered for the earth day event.

Table 1

Bivariate Correlations between Response Efficacy, Self-Efficacy and PEB Dependent Measures

Measure	Pro-Environmental Behavior	Climate Change Belief	Pledge	Volunteer
Response-Efficacy	.509**	.584**	-.302**	.194**
Self-Efficacy	.604**	.617**	-.265**	

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

Discussion

Although these results do not support the hypotheses, the findings do introduce new interpretations of how self-affirmation manipulations may work. A previous study shows that self-affirmation had a significant main effect on PEB intentions and this effect was mediated by self-efficacy (Emery, 2012). The main difference between the current study and the previous is the type of self-affirmation manipulation used. In the first study self-affirmation was manipulated by having participants identify the two characteristics most important to them from a list of 14 including: economical, kind, political, honest, etc. Participants were then asked to write 2 separate paragraphs, one for each characteristic, about a specific experience in which they exhibited the quality they chose. They were asked to include how they felt at the time of each event. In the current study participants in the self-affirmation condition were asked to rank six qualities from most important to least important and write one paragraph about the quality they ranked as most important by describing why it is important to them. The six qualities given to choose from in the current study were as follows: Aesthetics, economic, politics, religion, social and theoretical.

Unlike in the previous study, the self-affirmation manipulation in the current study did not have an effect on self-efficacy. This may indicate that the self-affirmation manipulation in the current study was ineffective. One way to evaluate this is to compare the average self-efficacy and response-efficacy ratings for the self-affirmation conditions in both studies. In the previous study self-efficacy and response-efficacy in the self-affirmation condition were higher than self-efficacy and response-efficacy for the self-affirmation condition in the current study. This suggests that the self-affirmation manipulation in the current study did not increase self-efficacy, response-efficacy or pro-environmental intentions as it did in the previous one. Table 2 shows the means and standard deviations for the common dependent measures in each study. Table 3 shows the means and standard deviations for the dependent variables measured in the current study only. Given that self-efficacy was found to mediate the main effect of self-affirmation in the previous study (Emery, 2012) and response-efficacy was identified as a mediator of self-affirmation effects in another study (Epton & Harris, 2008) it is logical to assume that the lack of effect on self-efficacy and response-efficacy in the current study could explain the non-significant results on intentions and behavior.

Table 2*Means and Standard Deviations of Dependent Variables**Self-Efficacy*

<i>Condition</i>	<i>Study 1</i>	<i>Study 2</i>
<i>Self-Affirmation</i>	$M = 6.10, SD = .73$	$M = 5.45, SD = 1.08$
<i>Environmental Info Only</i>	$M = 5.56, SD = 1.05$	$M = 5.79, SD = .872$
<i>Control</i>	$M = 5.59, SD = .95$	$M = 5.55, SD = .92$

Response-Efficacy

<i>Condition</i>	<i>Study 1</i>	<i>Study 2</i>
<i>Self-Affirmation</i>	$M = 5.96, SD = 1.00$	$M = 5.34, SD = 1.46$
<i>Environmental Info Only</i>	$M = 5.30, SD = 1.29$	$M = 5.61, SD = 1.26$
<i>Control</i>	$M = 5.65, SD = 1.17$	$M = 5.55, SD = 1.18$

Pro-Environmental Intentions

<i>Condition</i>	<i>Study 1</i>	<i>Study 2</i>
<i>Self-Affirmation</i>	$M = 5.55, SD = 1.07$	$M = 4.80, SD = 1.03$
<i>Environmental Info Only</i>	$M = 5.03, SD = 1.02$	$M = 5.032, SD = 1.03$
<i>Control</i>	$M = 4.79, SD = 1.08$	$M = 4.70, SD = 1.02$

Table 3*Means and Standard Deviations of Additional Dependent Variables in the Current Study*

<i>Condition</i>	<i>Climate Change Belief</i>	<i>Pledge</i>	<i>Volunteer</i>
<i>Self-</i>			
<i>Affirmation</i>	<i>M = 5.53, SD= 1.34</i>	<i>M = 1.39, SD= .49</i>	<i>M = 1.81, SD= .40</i>
<i>Environmental</i>			
<i>Info Only</i>	<i>M = 5.88, SD= .76</i>	<i>M = 1.26, SD= .44</i>	<i>M = 1.91, SD= .28</i>
<i>Control</i>	<i>M = 5.70, SD= .95</i>	<i>M = 1.21, SD= .42</i>	<i>M = 1.78, SD= .42</i>

Note: for pledge and volunteer variables 1= yes and 2= no

The major differences that most likely explain why the manipulation in the first study had a significant effect on self-affirmation while the current one did not are the wider variety of qualities provided to choose from and the requirement to recall a specific experience in which they exhibited important qualities. It is likely that participants were able to identify more with the qualities from the list of 14 given in the previous study that included words like; honest, kind and intelligent, than the shorter list in the current study. In their study finding increased recycling intentions Sparks et al., (2010) also used values that were more identifiable (e.g. kindness, forgiveness, and altruism). Allowing participants to choose options that may have been more important to them might have led to a more pronounced effect of self-affirmation which may help explain why no effect was found in the current study.

The most noteworthy difference between the two self-affirmation manipulations is the requirement to recall a specific experience in which one exhibited an important quality. The act of recalling rather than simply identifying important positive self-characteristics may be an integral part of self-affirmation manipulation. Previous research in which the self-affirmation manipulation involved recall show that self-affirmation led to greater acceptance of health risk information (Reed & Aspinwall, 1998), increased intentions to quit smoking (Harris, Mayle, Mabbott, & Napper, 2007), healthier eating habits (Epton & Harris, 2008) and less denial of climate change (Sparks et al., 2010).

Not only did Sparks et al., (2010) find that self-affirmation led to less denial of climate change they also found that for people who reported low past recycling behavior self-affirmation led to increased intentions to recycle in the upcoming month. In both of these studies the control group was not required to do a task similar to the SA group. In their first study, Sparks et al., (2010) self-affirmed people by having them recall times when they had engaged in compassionate behavior. Participants in the control condition were asked to agree or disagree with personal opinion statements (e.g., chocolate is the best flavor of ice cream). In their second study they used a self-affirmation task similar to the one used in the current study and had participants identify their most important moral values. The control group was not given any task (Sparks et al., 2010). In these studies the control group was either given something completely unrelated to the SA task or nothing at all. It may be that task in the control condition used in the current study was too similar the SA condition which may have allowed participants in the control condition to self-affirm as well. Participants may have self-affirmed simply by ranking

the qualities given. Or perhaps the chance to write about why someone else would consider a value important served as a way to affirm oneself.

Another point of discussion for self-affirmation studies on environmental issues is the severity of the threatening information. Most research on self-affirmation focuses on health related information (Epton & Harris, 2008; Reed & Aspinwall, 1998; Harris, Mayle, Mabbott, & Napper, 2007). Using information directly related to one's health and well being may be a lot more personally threatening than information about climate change, especially if one is impartial to environmental concerns. When examining SA and pro-environmental behavior future research should increase the severity of the threatening information as much as possible in order to make it as equally threatening as personal health related information can be.

Although the value scale self-affirmation method used in the current study has been found to be effective in previous research (Steele & Lui, 1983; Cohen, Aronson & Steele, 2000), here it did not achieve the same results. This may be due to the environment in which the manipulation was given. Students were in a college classroom setting with the goal of achieving extra credit for completing a questionnaire packet. It is likely participants were more engaged with the thought of finishing their extra credit assignment than with thoughts about why a certain value is important to them. Asking participants to recall a specific experience about an important self-characteristic would have forced them to focus their attention more on the task rather than simply getting the extra credit. The act of recalling a memory requires more attention to oneself and may increase emotion involved in the writing, both of which would most likely enhance the effect of the self-affirmation manipulation.

Future research on self-affirmation and pro-environmental behavior should employ self-affirmation methods that include characteristics people can relate to, e.g. kindness, while also requiring participants to recall and write about specific experiences involving positive self-characteristics. It would also be beneficial to use decidedly threatening information and have participants in an environment where they can focus more on the task and less on others in the room and thoughts of extra credit.

Successful manipulation of self-affirmation could have far reaching implications for positive behavior change. The need to avoid negative situations or information in order to feel better about the self is alleviated by affirming one's self in other domains. This then allows people to deal with these situations in a more constructive ways. Self-affirmation can lead to positive changes in pro-environmental behavior however only if the self-affirmation manipulation is effective in influencing factors such as self-efficacy and response efficacy, both of which were shown here to be significantly correlated with pro-environmental intentions, and actual behavior.

Prior research has shown that self-efficacy promotes pro-social behavior (Caprara & Stecca, 2007). Tabernero & Hernandez (2011) examined self-efficacy and recycling and found that self-efficacy leads to increased recycling by promoting intrinsic motivation. Additionally, Homburg and Stolburg (2006) examined the role of different efficacy variables and appraisal processes in influencing pro-environmental behavior. They found that variables such as self-efficacy and collective efficacy as well as how people appraise environmental issues can activate coping strategies that are more problem solving oriented which then leads to increased pro-environmental behavior (Homburg & Stolburg, 2006).

The current study shows that self-efficacy and response-efficacy are correlated with pro-environmental behavior. Future research should focus on finding ways to manipulate these variables in attempt to influence behavior in positive ways. Doing so could influence behavior related to not only the environment but other important topics as well.

*Appendix A***Informed Consent**

Principal Investigator: Danielle Emery, Department of Psychology, Towson University

This is a study in which we are examining the relationship between personality variables and environmental attitudes for college students. In this study you will fill out questionnaires about your personality and your environmental attitudes and behavior.

There are no known risks associated with participating in this study. Should you become distressed or uncomfortable, we will terminate the session immediately. You will receive 1 credit on researchpool for participating. The study should take no longer than 30 minutes to complete.

Participants must be at least 18 years old.

Your participation is entirely voluntary. You do not have to participate in the study. If you choose to participate you may discontinue your participation at any time.

All information about your responses will remain confidential. We will not show your information to anyone outside of our research team. Your responses will never be linked to your name. If you have any questions you may ask them now or at any time during the study. If you should have questions after today, you can call 301-873-0571 and ask for Ms. Danielle Emery, call 410- 704-3214 and ask for Dr. Justin Buckingham or call (410) 704-2236 and ask for Dr. Deborah Gartland, Chairperson of the Institutional Review Board for the protection of Human Participants at Towson University.

I, _____ affirm that I have read and understand the above statements and have had all of my questions answered.

Date: _____

Signature: _____

Appendix B

Age: ____

Gender: M or F

Please rate the extent to which you will actually engage in these behaviors by circling your answer using the scale 1: Strongly Disagree to 7: Strongly Agree.

I intend to increase the amount I recycle:

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

I intend to use water more efficiently by doing things like taking shorter showers:

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

I intend to use more energy efficient light bulbs:

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

I intend to conserve energy by doing things like turning off appliances and lights when they are not in use:

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

I intend to conserve materials by reducing and reusing things like beverage containers and other recyclable materials:

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

I intend to reduce my greenhouse gas emissions and air pollutants by doing things like checking tire pressure or using public transportation, walking, biking and carpooling when possible.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Appendix C

Please respond to each of the following statements by circling your answer using the scale 1: Strongly Disagree to 7: Strongly Agree.

I am confident in my ability to engage in more environmentally responsible behaviors.

I believe that I am capable of conserving more energy.

I know for sure that I could increase the amount I recycle.

I believe that my environmentally friendly behavior will be effective in helping the environment.

I believe that my actions impact the environment

I believe that I can make a difference to the environment by conserving energy and recycling

*Appendix D***Support the Environment Pledge**

By signing your name you are promising to support the environment by engaging in environmentally friendly behavior such as but not limited to: recycling, taking shorter showers, conserving energy, and carpooling whenever possible.

This is optional. Whether or not you sign will not affect your credit.

Name

Signature

X _____

Earth Day Event in the Fall

Students at Towson are in the process of planning a Fall Earth Day event to compliment the one in the spring. If you are interested in helping to organize the event and would like to volunteer some of your time to a good cause please provide your name, e-mail address and how many hours a week you are willing to volunteer. Volunteers are also needed to create posters to advertise the event.

Name

E-mail

Availability # hours/week _____

Appendix E

Please respond to each of the following statements by circling your answer using the scale 1: Strongly Disagree to 7: Strongly Agree.

Climate change is a problem that is affecting people and the environment.

You release greenhouse gases as a result of using energy to drive, using electricity to light and heat your home, and through other activities that support our quality of life like growing food, raising livestock and throwing away garbage.

We all need to be aware of our own individual impact, and start making some simple changes to help the environment.

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Curriculum Vita

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Education:

Masters of Arts, Experimental Psychology GPA 4.0
Towson University, Towson
May 2013

Bachelor of Science in Psychology
With Minor in Sociology GPA 3.9
Towson University, Towson, MD
December 2010

Associate of Arts General Studies GPA 3.6
Montgomery College, Rockville, MD
May 2009

Presentations:

Emery, D. (2012) Effects of Self-Affirmations, Self-Efficacy and Response-Efficacy on Intentions for Pro-Environmental Behavior. Poster presented at the Eastern Psychological Association Conference in NYC.

Buckingham, J., Sypher, A., Emery, D., & Navarro, E. (2011) Self-Esteem and Self-Perpetuating Effects of Appearance Threat on Contingencies of Self-Worth. Poster presented at Towson University Research Expo.

Coursework:

Behavioral Statistics
Research Methods
PSYC 491 (Independent Research)
Advanced Experimental Design I and II
Multivariate Statistics
Advanced Cognitive Psychology
Advanced Biological Psychology
Advanced Social Psychology

Career Experience:

July 2012 – Present

Research and Data Assistant at the Johns Hopkins Behavioral Pharmacology Research Unit. Responsible for recruiting participants with cancer diagnoses, screening volunteers for eligibility, managing data and regulatory documents, preparing study progress reports, developing recruiting strategies, collecting data through phone interviews, and running experimental sessions with psilocybin and cancer patients. Completed Johns Hopkins' research compliance training courses and HIPPA training courses.

September 2010 - Present

Research assistant for behavioral research studies involving human participants at Towson University. Responsible for performing literature reviews, obtaining IRB approval, setting up and conducting experiments, analyzing data and preparing manuscripts. Utilizing SPSS, MediaLab software, and Microsoft Excel.

September 2011 - Present

Graduate Assistantship for the Experimental Psychology Master's Program at Towson University. Responsibilities include: assisting with current research projects, evaluating applications and communicating with prospective students, facilitating communication between faculty, students and alumni, managing schedules for several research assistants.

May 2011 – July 2012

Externship at Copper Ridge Institute. Responsibilities included: facilitating current research studies, administering cognitive assessments, packaging phlebotomy and punch biopsy specimens, and conducting literature reviews.

August 2010 - January 2011

Mental health worker for the Children and Adolescent Day Program at Sheppard Pratt Health System. Responsibilities included: assisting patients in psychosocial and educational activities, assisting staff in monitoring patients' participation in activities, observing and reporting pertinent observations of patients' behavior to staff and co-leading therapeutic activity groups.

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