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Environmental Hypocrisy—or Environmental Quota?

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Environmental Hypocrisy...or Environmental Quota?

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A new form of environmentalism is shifting focus on the ecological behaviors of individuals. While environmental attitudes remain high, there is ample research and other indicators that it does not necessarily lead to ecological behavior. Cognitive dissonance has been shown to reduce this gap, especially when the self-concept is involved. A key component of cognitive dissonance is the realization of hypocrisy between attitudes and behaviors. The current study addresses two points, asking the following. First, is hypocrisy an agent in the environmental attitude-behavior gap? Second, can self-concept threat that is different from cognitive dissonance paradigms have a similar reduction in the environmental attitude-behavior gap?

Only one of three hypotheses, that of a weak attitude-behavior link, was supported. Hypotheses regarding environmental hypocrisy and the impact of self-concept threat on the attitude-behavior gap were not supported. While the researcher expected to find low ecological behavior and a way to increase it, instead, he found high ecological behavior and a way to decrease it. The results indicate that environmental attitude and situational factors did influence ecological behavior. The discussion addresses alternative explanations, such as an “environmental quota”, and directions for future research.
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There are bound to be many other people and events that contribute to the mosaic of our lives, which I could not possible list, but always acknowledge.
Introduction

With widespread agreement in the scientific community that human activity contributes to global warming, there is a new urgency in changing attitudes and behaviors to rein in greenhouse gas emission (Uzzell & Rathzel, 2009). While early environmental movement efforts dealt with conserving parks that may be thousands of miles away, current actions have shifted focus on individuals’ daily activities. Since 2006, the year when global warming took center-stage (MacDonald, 2008), new questions are hitting closer to home—do you recycle, how much trash do you generate, and what is your carbon footprint?

Environmental awareness and pro-environmental attitudes are gaining popular attention. Indirect indicators reflect a growing prevalence of the new form of environmentalism, focused on individuals. On June 4, 2008, the global media and entertainment company Discovery Communications replaced one of its 29 network brands, Discovery Home Channel, with a channel dedicated to environmental shows, Planet Green (Ashoka.org, 2008). Benz (2000) showed that the use of “eco-” in lexicon of select newspapers increased from 13 in 1988 to 240 in 1998. In 2008, EBSCOHost, a provider of searchable journal databases used by academics and scholars, added GreenFile, a database that “offers well-researched information covering all aspects of human impact to the environment” (GreenFile database description in http://web.ebscohost.com).

Consumer attitudes and self-reported behaviors also reflect a new environmentalism. Sixty percent of American consumers say they seeking out green products—those thought to have less harmful impact on the environment than traditional
products. Sixty-six percent said they have not reduced spending on green products in the 2009 economy—noted as the biggest economic recession since the Great Depression of the 1930’s (Pendery, 2009).

Dunlap, Van Liere, Mertig, and Jones (2000) highlight a modest increase in endorsement of their New Ecological Paradigm (NEP), a prominent scale of environmental attitudes, over a 14-year period. They posit that a “ceiling effect” reduced the size of the impact as compared to a period before a major shift in the 1960’s—the so-called environmental decade.

Despite the increase in environmental attitudes, research has shown a gap, or inconsistency, between environmental attitudes and ecological behavior. For example, Bickman (1972) showed that whereas 94% of participants were in favor of removing litter, only 1.4% picked up trash left by experimenters. Bird, Wüstehagen, and Aabakken (2002) reported that while 50-90% of participants say they support renewable energy and are willing to pay a small premium for it, less than 2% actually subscribe to renewable energy options. Whitmarsh (2009) reports an increase in energy usage in the United Kingdom in recent years. Although industrial energy usage declined, it increased in areas most directly linked to individual behaviors—transportation and domestic energy usage. The study goes on to claim that many European countries may not reach their voluntary Kyoto Protocol targets for reducing carbon emissions by 2010. Van Rijnssoever, Farla, and Dijst (2009) showed that while 66% of their Netherlands sample had positive attitudes toward environmental factors in an automobile, only 11% of them take action such as driving less or buying a more environmentally responsible car.
These examples point to a potential gap between attitudes and the behaviors related to those attitudes. Should policy efforts wish to address final behaviors, they must understand how to overcome this gap. Before continuing on to the attitude-behavior gap, a little definition is in order. First, the usage of attitudes for the purposes of this study will be reviewed, followed by comment on behaviors.

Attitudes

The meaning of attitudes in social psychology research has evolved over the years. Albarracin, Johnson, and Zanna’s *The Handbook of Attitudes* (2005) provide a succinct conceptualization of attitudes as “a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor” (p.4). Therefore, the term environmental attitude will refer to participants' range of positive to negative evaluations regarding the natural environment.

There is also some inconsistency between the usages of “environmental” and “ecological.” In this work, “environmental” will refer to attitudes, whereas “ecological” will refer to behavior. This is consistent with the PsycINFO database classification of these subject words (Kaiser, Ranney, Hartig, & Bowler, 1999). Therefore, ecological behavior will refer to actions thought to have less harmful impact on the environment than traditional actions used to achieve the same means.

Behaviors

One might think that actual behaviors are easier to define than attitudes. However, in the realm of environmental psychology, there remains substantial variation on what constitutes ecological behavior. Stern (2000) distinguishes impact-oriented and intent-oriented behavior, proposing to focus on impact-oriented as a way to make a true impact
on the environment. Among the several types of impact-oriented behaviors identified by Stern (2000), throughout this paper, ecological behaviors will refer to Stern’s “private-sphere environmentally significant behavior” (2000, p. 409). These are behaviors that the individual has control over, and have received the greatest amount of research. Though each private-sphere behavior has little impact, the aggregate across many individuals leads to significant impact. Examples of private-sphere environmentally significant behavior include purchase of major household goods and services that have a significant environmental impact (e.g., automobiles, energy for the home, recreational travel), the use and maintenance of goods that impact the environment (e.g., home heating and cooling systems), household waste disposal, and “green” consumption (e.g., recycled products and organic food) (Stern, 2000, p. 409-410).

A lack of empirical data leads to ambiguity about what constitutes ecological behavior. Often, individuals are only able to act based on intent, without a clear connection to impact. As an example, the purchase of locally grown foods has widely been presented as environmentally beneficial, in that it reduces the amount of transportation required to deliver the food to the end-user. Yet, in the book SuperFreakonomics (Levitt & Dubner, 2009), economist Steven Levitt uses actual data to show that there is little, and perhaps negative, impact as most of the energy required for our food goes to production. Saving on transportation may be offset if the local climate requires much more resources to produce the food than a fertile, but distant, production site.

A main challenge for environmental psychology research is the difficulty in measuring behaviors. Many studies rely on self-reports of behaviors, garnishing criticism
in social psychology in general (Aronson, 1992) and environmental psychology in particular (Corral-Verdugo, 1997). Biga (2006) has a specific critique that much of the ecological behavior research deals more with behavioral intent, rather than actual behaviors. There are examples of studies that address this point, and measure specific behaviors (Dickerson, Thibodeau, Aronson, & Miller, 1992). However, this often leads to tedious procedures, and is limited in scope and complexity. This researcher will attempt to measure actual behavior, though under the control of an experimental setting.

**Attitude-behavior Gap**

Social psychologists have long been aware that there can be a gap between attitude and behavior. In his review of over 30 studies from the 1930’s until 1969, Wicker (1969) found little correlation between attitudes and behavior. He concluded by warning against assumptions of behavior based solely on measured attitudes. Environmental attitudes are no safer from this gap than the topics reviewed by Wicker (1969) – work, minority treatment, cheating, and health.

A prominent theory addressing the attitude-behavior link in social psychology is the theory of planned behavior (Azjen, 1991). A key component of the model is the specificity between attitudes and the related behavior. Additionally, the theory proposes a structural model with latent variables beyond just specific attitudes and behavior. The model states that in addition to specific attitudes, perceived control and subjective norms determine behavioral intent. This behavioral intent then leads to the actual behavior. Kaiser, Hübner, & Bogner (2005) have applied the theory of planned behavior to environmental attitudes and behaviors.
Examples presented earlier have shown ecological behaviors not corresponding to seemingly high environmental attitudes. Other studies have shown a relationship between attitudes and behavior, though the effect is often weak. Van Liere and Dunlap (1978) found that both awareness of consequences and ascription of responsibility were necessary to impact yard burning behavior. Kurz, Linden, and Sheehy (2007) found that strength of community and socio-economic status had as much and more, respectively, impact on recycling as did attitudes toward recycling. Poortinga, Steg, and Vlek (2004) found that while attitudinal measures were significant with regard to acceptance of energy-saving measures (Stern’s intent-oriented behavior), contextual factors had more significant impact on measures of actual home and transportation energy use (Stern’s impact-oriented behavior). Schultz and Zelezny (1998) found that general environmental concern did not predict participation in a recycling program, but instead predicted the quantity recycled per participant. Scott and Willits (1994) showed weak correlation between the New Environmental Paradigm and ecological behavior, with other social characteristics providing more predictive value. Van Liere and Dunlap (1981) showed that three different measures of environmental concern were not equivalent, and neither was very strong. Vining and Ebreo (1992) found that while general environmental attitudes increased over time with a new recycling program, they were only moderately related to specific recycling attitudes.

Different research approaches have tried to address the gap between environmental attitudes and behavior. Some include moderating factors such as difficulty of the behavior (Schultz, Oskamp, & Mainieri, 1995), others address more specificity between attitude and behavior (Vining & Ebreo, 2002), and several include linear
modeling based on the theory of planned behavior (Kaiser, Hubner, & Bogner, 2005) or value-belief-norm theory (Kaiser et al., 2005; Slimak & Dietz, 2006; Stern, 2000). However, one area of study has shown an ability to influence the relationship between attitude and behavior, by relying on recognition of hypocrisy. This is the use of cognitive dissonance.

**Cognitive Dissonance**

Leon Festinger originally proposed Cognitive Dissonance Theory in 1957 (Festinger, 1957). This theory relies on inconsistencies leading to arousal of dissonance. By holding two contradictory ideas (e.g., that we need to conserve water, yet we use a lot of water), an uncomfortable feeling arises. People have a motivational drive to reduce this resulting uncomfortable feeling, or dissonance, by changing their attitudes (e.g., concluding that conserving water really is not that important) or behaviors (e.g., taking shorter showers). However, other researchers found that all inconsistencies are not equally disturbing and therefore equally likely to produce cognitive dissonance. Festinger (1957) did not precisely state the possible sources of variation in the dissonance produced. Later research has attempted to strengthen the theory on this point. Aronson (1992; Aronson & Carlsmith, 1962) suggests that the feeling of cognitive dissonance depends on whether important elements of one’s self-concept (i.e., being consistent, competent, or morally good) are threatened.

By building his approach off Aronson’s version of dissonance theory, with concern for self-concept, Thøgersen (2004) showed that many ecological behaviors are in fact correlated once several conditions, among them participants’ recognition of inconsistencies, are controlled for. Participants identified as recognizing low similarity
between recycling and buying organic food had smaller correlations between such behaviors than those identified as recognizing a high similarity. Therefore, it is the individual's recognition of similarity that influenced behavioral correlation, and not what may seem a behavioral inconsistency to an outsider. Other studies have used cognitive dissonance to underscore similarity of attitude and behavior, thereby increasing ecological behaviors (Aitken, McMahon, Wearing, & Finlayson, 1994; Dickerson et al., 1992; Kantola, Syme, & Campbell, 1984).

A brief summary of the Dickerson and colleagues (1992) study will serve as an example. This study was a field experiment performed at a pool and shower room to measure the impact of arousing dissonance on water conservation. In a 2x2 factorial design, the researchers included a mindfulness factor—where some were reminded that they sometimes waste water—and a commitment factor—where some were asked to make a public argument to taking shorter showers. The results showed that those in the dissonance condition—making a public argument and being reminded that they sometimes waste water—but not in the other conditions, reduced their shower times. This study showed a method for actually increasing the prevalence of ecological behavior.

That same year, one of the authors, Elliott Aronson, wrote an article on the return of cognitive dissonance (Aronson, 1992). Key in Aronson’s position is the notion that at that time social psychology research was trying to revive motivational aspects to explain behavior. Motivation may be a concept that helps to explain parts of the attitude-behavior gap. Aronson (1992) also restated his version of cognitive dissonance; noting that individuals strive for three things related to their self-concept—to be consistent, competent, and morally good.
Two main points are of note in these two Aronson articles from 1992 (Aronson, 1992; Dickerson et al., 1992). These are the notion of invoking a sense of hypocrisy and Aronson’s long-standing notion that self-concept is a key component to cognitive dissonance. These two concepts are foundational to the current study. However, instead of invoking them to promote ecological behavior, I will try to uncover whether these two concepts can provide new insight into the attitude-behavior gap. If revealing hypocrisy can invoke more ecological behavior, could some of the attitude-behavior gap be explained by hidden hypocrisy?

**Hypocrisy**

The Encarta Dictionary (1999) defines hypocrisy as: (noun) the false claim to or pretense of having admirable principles, beliefs, or feelings. In the framework of Aronson’s cognitive dissonance, hypocrisy would violate the desire for one to be consistent, as well as to be morally good. Another view of hypocrisy is demonstrated by Goffman (1959); who presents the notion of appearance management in terms of staging. People present a certain self to the public, or front stage, while reserving a separate self for closer others, or back stage. With regard to environmental presentation, our changing social norms may be driving people to a more environmental presentation. However, while some truly embrace that perspective, others may merely present it in public, while internally they take a much less environmental stance. Uzzell and Rathzel (2009) propose a similar approach of considering people as “social actors”, in their work on “transformative environmental psychology.” In fact, Webster’s Dictionary (1989) attributes the etymology of the word hypocrisy to the Greek work hypokrisis—act of playing a part on the stage.
For an example of research that deals with the concepts of hypocrisy and morality, we now turn to the work of Batson and colleagues. These studies show how hypocrisy can be uncovered when some try to appear moral without having to act that way.

*Batson's work on moral hypocrisy.*

In a series of studies, Batson, Kobrynowicz, Dinnerstein, Kampf, and Wilson (1997), tried to “unmask” hypocrisy relating to moral action. They presented participants with a choice of two tasks; one was more desirable and offered a chance for a reward (raffle tickets) while the other was neutral and boring, with no chance for reward. What instigated the moral dilemma was that the actual participants were told that a second participant (fictitious) would be assigned the task opposite what they selected, without the second participant (fictitious) knowing that the actual participant was responsible for the assignments. The results showed that 80% of participants assigned themselves to the more desirable task, even though less than 10% said that doing so was moral. This result parallels the environmental attitude-behavior gaps presented earlier.

When the morality of the choice was underscored by telling participants that most people think that both should be given a chance by flipping a coin. Half of these participants chose to flip a coin. Of those that did not flip the coin, 90% assigned themselves to the desirable task. Flipping the coin seemed to make no difference, as 90% of those that flipped the coin still assigned themselves to the desirable task (as opposed to the expected chance outcome of 50%). Batson and colleagues termed this tendency to want to appear moral but failing to do so if there is a personal cost as moral hypocrisy. Of note is that Batson and Thompson (2001) point out that the attitude-behavior gap is not
due to thinking about it—experiments where the attitude-behavior “link” was obvious differed little from unidentified cases. They point to it being motivational in nature, which ties in well with Aronson’s 1992 stance on the significance of cognitive dissonance in combining cognitive and motivational perspectives of social psychology.

Batson and colleagues followed up their study to better understand the mechanisms of moral hypocrisy. This included inducing self-awareness by sitting in front of a mirror (Batson, Thompson, Seuferling, Whitney, & Strongman, 1999), allowing the experimenter to flip a coin (Batson, Tsang, & Thompson, 2000 as cited in Batson & Thompson, 2001), and two forms of perspective taking (Batson, Lishner, Carpenter, Dulin, Harjusola-Webb, Stocks, et al., 2003). The findings reveal that focusing on self-concept (i.e., sitting in front of a mirror, letting another flip the coin, and perspective taking) led to a reduction in hypocritical behavior.

**Self-concept**

Brehm, Kassin, and Finn (2002) define self-concept as: (noun) the sum total of an individual’s beliefs about his or her own personal attributes. Though referring to a “sum total”, the self-concept nonetheless is a conglomerate of many attributes, circumstances, and time.

As noted previously, Aronson believes that self-concept—specifically being consistent, competent, and morally good—is a crucial part of cognitive dissonance theory (Aronson, 1992). He proclaims that violation of one’s self-concept drives feelings of dissonance in cognitive dissonance paradigms. If hypocrisy might be a hidden component to the attitude-behavior gap, could self-concept be a key to attitude-behavior consistency? Cognitive dissonance experiments, in particular the Dickerson and colleagues (1992)
water conservation study, as well as the Batson studies that invoked self-concept (Batson et al., 1999; Batson et al., 2000 as cited in Batson & Thompson, 2001; Batson et al., 2003) seem to justify that.

Sociology research has begun to probe the role of self-concept, through the lens of identity theory, on ecological behavior. Stets and Biga (2003) bring an interesting perspective on the attitude-behavior gap in environmental research. Taking a sociological view, they propose that identity theory (similar to psychology’s self-concept) is the missing component linking attitudes and behavior. By measuring environmental attitudes and environmental identity—“the set of environmentally relevant self-meanings that one projects and sustains” (p. 417)—their study showed that environmental attitudes lost significance once controlling for environmental identity. They argue that identity theory’s power lies in considering the person’s multifaceted identity, embedded within social structures, as a guide to choices. This addresses Uzzell and Rathzel’s (2009) criticism of other environmental research for being too linear and ignoring other social circumstances. Identity theory is able to address how multiple identities interact in a hierarchy, leading to better correspondence between attitudes and behavior. The Batson studies and Dickerson et al. show that invoking or threatening self-concept does influence attitude-behavior consistency.

Self-concept threat.

Cognitive dissonance, as proposed by Aronson, relies on self-concept threat to increase the target behavior. One view of reacting to such threat is self-completion theory. Wicklund and Gollwitzer (1981) proposed that individuals use socially recognized symbols to communicate their identities to others. To that end, individuals will seek out
symbols that are consistent with whatever identity they wish to be associated. Later research has looked into how individuals react to a threat to an identity they find important. The results indicate that individuals will increase their efforts to seek out symbols that are consistent with the threatened identity (Braun & Wicklund, 1989; Wicklund & Gollwitzer, 1981). Aronson (1992) would argue that self-completion theory is one of the “minitheories” (p. 307) that can better be explained by the more encompassing cognitive dissonance theory.

**Conceptualization**

A new form of environmentalism is shifting focus on the ecological behaviors of individuals. While environmental attitudes remain high, there is ample research and other indicators that it does not necessarily lead to ecological behavior (Dunlap & Van Liere, 1978; Kurz et al., 2007; Poortinga et al., 2004; Schultz & Zelezny, 1998; Scott & Willits, 1994; Van Liere & Dunlap, 1981; Vining & Ebreo, 1992). The researcher will test the first hypothesis to determine the strength of relationship between a general attitudinal measure and a specific ecological behavior. The first hypothesis states:

**H₁:** The correlation between environmental attitude and ecological behavior will be significant, but weak.

Cognitive dissonance has been shown to reduce the gap between environmental attitude and ecological behavior, especially when the self-concept is involved. A key component of cognitive dissonance is the realization of hypocrisy between attitudes and behaviors. The current study addresses two points, asking the following. First, is hypocrisy an agent in the environmental attitude-behavior gap? Second, can self-concept
threat that is different from cognitive dissonance paradigms have a similar reduction in
the environmental attitude-behavior gap?

Making one aware of hypocrisy, the false claim to having admirable principles, with regard to environmentalism, has been shown to be increase ecological behavior (Aitken et al., 1994; Dickerson et al., 1992; Kantola et al., 1984). The researcher will test the second hypothesis to determine whether hypocrisy is an agent in the environmental attitude-behavior gap. The second hypothesis states:

\[ H_2: \] Environmental hypocrisy will be revealed in that participants will take an opportunity to appear environmentally responsible without having to act that way.

The researcher will utilize Batson and colleagues' (Batson et al., 1997) methodology for exposing moral hypocrisy, but apply it to the environmental attitude-behavior gap. Therefore, this study will explore the potential of an “environmental hypocrisy.”

Consistent with Batson's work, the focus will be on situational, instead of dispositional, factors.

Aronson’s stance on cognitive dissonance (1992) is that it works best when the self-concept is involved. Other research has shown self-concept (identity) to have predictive power above environmental attitudes. The researcher will induce self-concept threat (Braun & Wicklund, 1989; Wicklund & Gollwitzer, 1981) in a manner different from traditional cognitive dissonance studies, to see if it reduces the environmental attitude-behavior gap. The third hypothesis states:

\[ H_3: \] Threatening self-concept will lead to greater instances of ecological behavior.
Methods

Participants completed an online survey to gather attitudinal measures. A week later, participants took part in a laboratory experiment. The experiment involved deciding to take one of two surveys, either an environmental survey or one about fun campus activities with a chance to win a raffle prize. The methodology to uncover hypocrisy was similar to Batson and colleagues (Batson et al., 1997; Batson et al., 1999; Batson et al., 2003; Batson & Thompson, 2001). Participants were randomly assigned to one of three experimental conditions: Control, Identified, and Threat. The impact of threat to self-concept on expression of hypocrisy was tested in the Threat condition.

Recall from above, that in a series of studies, Batson and colleagues created situations that revealed moral hypocrisy. Participants utilized opportunities to appear moral without having to act so. Batson et al. (1997) write that “the simplicity of our dilemma made it relatively easy for us to unmask the nature of the moral motivation by introducing ambiguity into the link between moral action and moral outcome, permitting individuals to pursue self-interest without having to look selfish” (p. 1344). They called it the moral action-outcome link, but this study will apply similar methodology to address the environmental attitude-behavior gap. In the 1997 version of the study, Batson et al. included moral responsibility measures. The current study will replace these with a measure of environmental attitudes. One major difference between the Batson studies and the present is that each participant will not be put in a dilemma that pits them against another (fictitious) participant, but instead, the dilemma will pit a given participant’s interests against each other.
Participants

Participants were students from the College of William and Mary research pool. These are students enrolled in introductory psychology classes, who are required to fulfill research participation as part of their class grade. A total of 167 participants signed up for the study using the school's Internet-based research participant management software (SONA systems). Of these, 27 were dropped from the study when they failed to complete the online portion a week before the laboratory portion, eight did not show up for the laboratory section, and one declined to participate after hearing the cover story, leaving 131 participants. Of these, two were dropped due to suspicious data patterns (inconsistent answers to related measures). All data analysis was limited to the remaining 129 participants. Of these participants, 78 were female, 41 were male, and demographics were not available for 10 participants. The average age was in the late teens ($M = 18.9$, $SD = 1.08$) with a range of 18 to 23 years of age.

Materials

Samples of measures can be found in Appendix A.

Independent measures.

Environmental attitude was measured with the New Ecological Paradigm (NEP) scale (Dunlap et al., 2000). The NEP measures a respondent’s “ecological worldview”, thereby avoiding issues of specificity between the attitude measure and later behavior measures. The NEP is a 15-item general attitude scale, measuring a respondent’s agreement / disagreement with certain environmental statements (e.g., “Humans are severely abusing the environment”). Responses were scored on a five-point scale ranging from Strongly Agree, to Unsure, to Strongly Disagree (refer to Appendix A).
Dependent measures.

Dependent measures included which survey participants chose and whether a coin flip was used. The survey choice was a self-report measure measured in two ways. One was with a dichotomous variable. The other way was a continuous variable. The use of a coin flip was measured by two self-report measures, as well as experimenter observation. One self-report measure asked if a coin was flipped, while the other probed whether the coin flip was used to make the decision of surveys. The observation involved the experimenter noting whether participants moved a precisely situated coin. A United States quarter coin was placed next to the keyboard used by participants, with the head of George Washington pointed up to the wall.

Manipulation checks.

The primary manipulation check was the preference for each of the surveys. This was a self-report measure to the question of “how much of a sacrifice would it have been to NOT choose Survey 1?” on a 7-point scale from 1 (no sacrifice at all) to 7 (large sacrifice). This question was presented for each of the two surveys, in a randomized order.

The final manipulation checks involved self-report measures and debriefing questioning by the experimenter about the amount of disappointment participants felt about their performance on the online survey, and questions probing for suspicion about the experiment.

Procedure

The study was carried out in two sections, an initial online survey followed by a laboratory session a week later. Participants signed up for the study through the school’s research participant management software (SONA Systems). They were informed that
the study would take part in two sections, and that they would receive separate credits upon completing each section. Participants selected a lab section from those posted. Eight days before a participant’s scheduled laboratory section, they received an email with the password to the online portion of the study. They had until midnight of the following day, for a total window of 48 hours, to complete the online surveys. Those that did not complete the online portion by the deadline were dropped from the study \( (n = 27) \).

The online survey wording led participants to believe that they were receiving a random set of surveys from a pool of available surveys. This was in an effort to bolster deception during the laboratory portion. In reality, all participants received the same set of surveys. This included the New Ecological Paradigm (NEP) along with filler surveys. Participants read and signed informed consent forms before doing the surveys. The 140 participants that completed the online portion of the study received the first part of the research credit.

Approximately a week after completing the online portion, participants came into the lab during their scheduled time. Sessions were scheduled at 15-minute intervals, one participant per session. Participants were escorted to the research room, were presented with a cover story, and filled out the questionnaires. One of two male researchers, one of whom was the author, conducted the laboratory sessions. No experimenter effects were found in data analyses that used experimenter as a factor.

A representative script of the interaction is provided in Appendix B. Upon entering the research room, the experimenter told the participant that the original experiment was cancelled. The experimenter explained that the data collected during the online portion of the study was not producing the expected results, so the second portion
would not be run. The experimenter offered the participant another study to complete their research requirement.

The experimenter explained that of several campus organizations, two were eager to collect survey data. Upon consulting the Psychology Department, the researchers were told that they could give participants credit for completing one of the surveys. Participants were asked if they wanted to do this for their research credit. All but one participant agreed to do a survey to receive research credit.

Participants were randomly assigned to either the Control, Identified, or Threat condition. The division was 18.6% in the Control condition, 18.6% in the Identified condition, and 62.8% in the Threat condition. This division was determined due to the expectation that most of the data analysis would occur within the Threat condition. The other conditions were expected to serve as manipulation checks.

For the Control condition, the experimenter did not refer to the surveys completed a week earlier. For the Identified condition, the experimenter mentioned he was trying to figure out why the online survey from a week ago produced such unexpected results. He said that everyone had a different mix of surveys, and asked if the participant remembered which surveys they took. Whether or not the participant remembered (most did not), the researcher glanced at a clipboard and mentioned that the participant most likely completed a “general social battery” followed by mention of a “survey on environmental attitudes.” He then told the participant that neither of these led to the unexpected results from a week before, so he could not find out from the participant why another of the surveys from a week ago produced such unexpected results. This was just a
cover story for the Identified condition manipulation of knowing what surveys the participant took a week prior.

For the Threat condition, the researcher followed a similar procedure as the Identified condition, except for one change. After a brief glance at his clipboard, the researcher said he had the participant’s scores available. He told the participant that his or her environmental score was in the bottom 10% compared to other students that also took the survey, suggesting that he or she “must not care too much about issues about the environment.” He then told the participant that the score does not matter, as neither of these surveys led to the unexpected results from a week before, so he could not find out from the participant why another of the surveys from a week ago produced such unexpected results. This was just a cover story for the Threat condition manipulation of the low environmental attitudes score.

After the experimental manipulation, participants were told that the surveys were placed on the computer in an effort to reduce the hassle of dealing with the paper versions. They were instructed to follow the directions on the computer. The experimenter told participants that he assured the campus organizations that he would provide a coin to all participants in case the participant could not decide between the surveys.

The researcher then left the room. The participants read a brief description of the two surveys (refer to Appendix A). One was titled as the “WM Social Activities Project.” This was intended to be the preferred survey, and included a raffle ticket to win a $25 gift card. It will be referred to as the FUN survey in the remainder of the paper. The other survey was titles as the “Environmental Task Force.” This was intended to be the less preferable survey, with mention of “monotonous” questions. However, the description for
this survey also mentioned, “this is your opportunity to help us build a foundation that will lead to environmentally responsible changes on campus” (refer to Appendix A). This will be referred to as the ECO survey in the remainder of the paper. Participants were then to decide which one they preferred, and reminded that, “[they] only need to complete one to get research credit today.”

The participants made their choice on the computer. Then, the computer administered a questionnaire about the decision-making process, which included the dependent measures and manipulation checks. The experimenter then returned to the room, checked whether the precisely placed coin had been moved, and informed participants the experiment was complete. After probing for suspicion, the experimenter debriefed them about the real purpose of the study.

Results

Analysis Strategy

As two versions of the dependent variable were collected, one dichotomous and one continuous, two types of regression analyses were utilized. The dichotomous variable was analyzed with Logistic regression, while the continuous variable was analyzed with a Generalized Linear model. As both yielded similar results, this section will focus on the Logistic Regression. There was insufficient use of coin flip to perform the anticipated logistic regression and chi-square analyses for this variable. Several manipulation check variables were also analyzed. These include level of threat, which survey was more alluring, and level of suspicion.

A two-tailed alpha level of .05 was used for all statistical tests. Planned contrasts were performed on hypothesized relationships, while post-hoc Tukey HSD and Tukey
LD were used to explore further relationships. Of the 129 participants used, 24 were in
the Control condition, 24 were in the Identified condition, and 81 were in the Threat
condition. This unbalanced design was chosen to provide additional power in the single
condition expected to have major effects, the Threat condition.

Table 1 presents the variables used in the analysis. Dependent variables analyzed
were: dichotomous survey choice, continuous survey choice preference, coin flip choice.
Independent variables included: New Ecological Paradigm scores, and treatment
condition. Manipulation checks include: sacrifice to NOT do the ECO survey, sacrifice to
NOT do the FUN survey, a computed difference between the two sacrifice ratings, how
upset participants were with feedback, and how related participants thought the lab was to
the online survey.

One general manipulation check involved probing for suspicion. Many of the
participants showed genuine sympathy upon hearing the cover story intended to make
participants think that the lab and online portions of the study were not related. While the
averages for self-report of suspicion that the two portions were related ranged from 3 to 4
on a 7-point scale—increasing from Control ($M = 3.0$, $SD = 1.8$), to Identified ($M = 3.4,$
$SD = 2.0$), to the Threat ($M = 4.0$, $SD = 2.0$) conditions—the difference did not prove to
be significant, $F(2,126) = 2.67$ $p = .072$. Post-Hoc testing using Tukey HSD showed the
contrast between the Control condition and Threat condition approaching significance, $p$
$= .079$. However, many participants noted little suspicion when debriefed about the true
nature of the study.
First Hypothesis

The first hypothesis stated that the correlation between environmental attitude and ecological behavior will be significant, but weak. This was evaluated primarily with a Pearson’s correlation. The Pearson’s correlation between New Ecological Paradigm (NEP) and the dichotomous survey choice was $r(129) = .25, p = .004$. The Pearson’s correlation between NEP and the continuous survey preference was $r(129) = .37, p < .001$. This hypothesis also received support with significant predictors in the Logistic regression and Generalized Linear Model analysis presented with the results for the third hypothesis.

Second Hypothesis

The second hypothesis stated that environmental hypocrisy would be revealed in that participants would take an opportunity to appear environmentally responsible without having to act that way. The main test for this hypothesis was the comparison of coin flip and resulting survey choice. Whether the participant flipped the coin was measured by self-report early in the battery of decision-making process questions. Only eight participants reported that they flipped the coin—one of 24 in the Control condition (4%), two of 24 participants in the Identified condition (8%), and five of 81 in the Threat condition (6%). In addition to the percentages being similar across conditions, this was an insufficient number to warrant statistical analysis between conditions, with cells having expected values below five. Therefore, the second hypothesis could not be tested.

All but one of the participants that flipped the coin were in the Identified or Threat condition. The continuous variable for survey preference, a measure taken after the participants recorded which survey they would take, were within two points in favor for
the chosen survey, except for that one participant. This could indicate that the
participants were reacting to reduce cognitive dissonance by adjusting their preference
based on the coin flip. Only the participant in the Control condition seemed to prefer the
FUN survey, yet chose the ECO survey based on a coin flip.

Third Hypothesis

The third hypothesis stated that threatening self-concept would lead to greater
instances of ecological behavior. The main test for this hypothesis was the choice
between the two surveys. Refer to Table 2 for survey choice counts for each condition.
To provide for more meaningful beta-values, all continuous predictor variables were
converted to z-scores. These z-scores were used as predictors in the regression analyses.
Refer to Table 3 for a summary of the Logistic regression results. Binary Logistic
regression showed NEP and Condition to be significant when entered into the model
(Step chi-square = 21.2, \( p < .001 \)). Contrasts across conditions show that participants in
both the Identified condition (\( B = -1.59, \ p = .015 \)) and the Threat condition (\( B = -1.82, \ p = .001 \)) had a significant tendency toward the FUN survey, as compared to participants in
the Control condition (set as the reference condition).

The results were confirmed with the continuous variable analyzed with a
Generalized Linear Model for scale response. NEP and Condition were significant
predictors (\( p < .001 \) and \( p = .005 \), respectively). When pair-wise comparison was done,
the Control condition differed significantly from the Identified condition, \( t(1) = 2.43, p = .003 \), and Threat condition, \( t(1) = 1.98, p = .003 \). The Identified condition did not differ
significantly from the Threat condition \( t(1) = 0.45, p = .501 \).
Two manipulation checks provided additional information relating to the third hypothesis. These are the measure of sacrifice of NOT doing each survey and the level of threat participants felt.

The manipulation check comparing ratings of how much of a sacrifice it was NOT do each of the survey choices is available in Table 4. Due to computer data collection issues, these data were not available for five participants (Control $n = 22$, Identified $n = 23$, Threat $n = 79$). As individual differences were not as important as within subject differences, a difference score was computed. A positive difference means that participants thought that it was more of a sacrifice NOT to do the ECO survey than the FUN survey, while a negative score meant the opposite. The means were: Control $M = 0.95$, Identified $M = -0.48$, and Threat $M = -0.42$. ANOVA analysis indicated a significant sacrifice difference across conditions, $F(2,121) = 5.92, p = .004$. Planned contrasts showed Threat to differ from the other two $t(121) = 2.05, p = .043$. However, the Control condition had the largest difference from the other two with $t(121) = 3.35, p = .001$. Post Hoc Tukey Homogeneous Subsets showed the Control condition in one subset while the Identified and Threat conditions were in the other. This result parallels the survey preference dependent variable with a high correlation ($r(124) = .53, p < .001$) between survey preference and sacrifice rating.

Performing an analysis on the individual survey ratings led to sacrifice of NOT doing the ECO survey mirroring the difference measure above, while the sacrifice of NOT doing the FUN survey providing non-significant results. A between conditions ANOVA of NOT doing the ECO survey yielded a significant result, $F(2,121) = 5.72, p = .004$. Refer to Table 4 for the values for each condition. Planned contrasts showed the
Threat condition to differ from the other two $t(121) = 2.59, p = .011$. However, the Control condition had the largest difference from the other two, $t(121) = 3.03, p = .003$. Post Hoc Tukey Homogeneous Subsets showed the Control condition in one subset while the Identified and Threat conditions were in the other. A between conditions comparison of NOT doing the FUN survey yielded non-significant results, $F(2,121) = 0.67, p = .51$.

A check was also done to see if those in the Threat condition were more disappointed about the results of the previous survey then those in the other conditions (refer to Table 5). ANOVA results showed a between groups difference $F(2,126) = 29.5, p < .001$. A Priori planned contrast analysis confirmed that the Threat condition differed significantly from the other two, $t(126) = 7.76, p < .001$, while the Control and Identified conditions did not differ significantly, $t(126) = 0.58, p = .56$.

Discussion

Only one hypothesis, that of a weak attitude-behavior link, was supported. Hypotheses regarding environmental hypocrisy and the impact of self-concept threat on the attitude-behavior gap were not supported. While the researcher expected to find low ecological behavior and a way to increase it, instead, he found high ecological behavior and a way to decrease it. The results indicate that environmental attitude and situational factors did influence ecological behavior. Of note is the result that the ratings of sacrifice of not doing each survey followed survey choice preference, instead of remaining relatively consistent.

First Hypothesis

The first hypothesis, that there would be a small but significant correlation between environmental attitude and ecological behavior, received support. The Pearson’s
correlation between environmental attitude and both survey choice measures was moderate. Logistic regression also showed environmental attitude to be a significant predictor of survey choice, with one standard deviation increase in New Ecological Paradigm (NEP) score increasing odds of choosing the ECO survey by 80%. Generalized Linear Model analysis of the continuous variable also showed environmental attitude to be a significant predictor of survey choice with one standard deviation increase in NEP score increasing the continuous survey choice measure by one point. These results are consistent with other studies that show a small correlation (Kurz et al., 2007; Poortinga et al., 2004; Schultz & Zelezny, 1998; Scott & Willits, 1994; Van Liere & Dunlap, 1978, 1981; Vining & Ebreo, 1992). Being that the general attitude measure lacked specificity to the target ecological behavior of survey choice, the results are counter to some studies that state the importance of attitude-behavior specificity (e.g., the General Ecological Behavior scale, Kaiser, 1998).

Second Hypothesis

The second hypothesis, that environmental hypocrisy would be revealed, did not receive support. The main test for this hypothesis was to be the comparison of coin flip and resulting survey choice. As in the Batson studies, should choice of any survey be significantly different from 50% for those that flipped a coin, hypocrisy would be revealed. However, only eight participants flipped a coin. Although the limited data show some trend in the predicted direction that the Threat condition would see a lower rate of coin flip than the Identified condition, there was insufficient data to rely on statistical tests. The miniscule flip rates (4-8%) led this measure to be of no practical significance. Therefore, the hypothesis was not supported.
Low instance of coin flip.

This result undermines the primary attempt of this study to research "environmental hypocrisy." As the coin flip was so infrequent, statistical analyses could not be run to determine survey choices beyond the expected probabilities provided by a coin flip. Pilot studies could have allowed the researcher to tailor the instructions to result in adequate variability in the instance of coin flip.

One interesting trend was that only one of the eight participants that flipped the coin noted a survey preference different from their actual survey choice. This was also the only participant that flipped a coin from Control condition. This may show a hint of environmental hypocrisy, though there are not enough data points to confirm this. Reading through the text entries for the participants, all noted using the coin for their decision. Yet, as in the Batson studies, we cannot control to see how accurate this self-report was. Similar to Batson et al.'s observation (1997), participants may have given themselves options for making their own choice. Another issue may be that the coin flip influenced how the participants later answered the question about preference between surveys. Perhaps they really had no preference until after the coin flip, and the forced choice answer merely reflects an answer consistent with the coin flip result.

Perhaps the hypocrisy paradigm was active, but not via the coin flip. As participants in the Control condition were not made aware that they had taken an "environmental attitudes survey" the week prior, their higher choice of the ECO survey may have been a primary way to appear environmentally aware. Alternatively, for participants in the Identified and Threat conditions, the mention of having done the environmental attitudes survey may have been all they needed to avoid being seen as
hypocritical. In these cases, a coin flip may not have been a sufficient or necessary mechanism for concealing hypocrisy.

*Third Hypothesis*

The third hypothesis, that threatening self-concept will lead to a greater instance of ecological behavior, failed to receive support. Based on the notion that self-concept threat would lead to a change in survey choice, the expectation was that participants’ survey choices would be similar across the Control and Identified conditions. Counter to this predictions, the Control condition stood apart from the other two with the highest proportion of participants choosing the ECO survey, and the Identified and Threat conditions had the similar levels. Of note is support for situational factors, in the form of experimental condition, having significant influence on ecological behavior; though not in the direction originally hypothesized. The manipulation check of sacrifice rating may provide some insight.

*Sacrifice ratings.*

The researcher intended to create a scenario where participants preferred the FUN survey to the ECO survey, across all conditions. However, the manipulation of making the FUN survey more attractive than the ECO survey might not have been effective. The difference score between ECO and FUN sacrifice ratings indicated that those in the Control condition \((M = 0.95)\) considered NOT doing the ECO survey as a larger sacrifice, while those in the Identified and Threat conditions \((M = -0.48, M = -0.42, \text{ respectively})\) considered NOT doing the FUN survey to be more of a sacrifice. When comparing differences between groups on each survey’s sacrifice rating, the difference was only significant for the ECO ratings and not the FUN ratings. Apparently, by having no
indication of having already taken a form of an environmental measure a week before, those in the Control condition rated the sacrifice of not doing the ECO survey higher than not doing the FUN survey.

The sacrifice rating trend mirrors the results of both the actual choice of surveys and continuous survey choice, discussed later. With the current design, it is not possible to determine causality of such responses; whether someone chose the ECO survey first and consequently rated the sacrifice as higher, or whether the sacrifice ratings drove the survey choices. The fact that the self-report of sacrifice was collected after participants chose the survey and gave their preference ratings, is not enough to detangle primacy. Independent preference ratings (outside of the experimental manipulation) may have provided more insight or allowed tailoring the survey presentation to reach the desired impact. However, as the Control condition received no experimental manipulation, it might be deemed the best reflection of actual survey preference. This lack of making the FUN survey substantially more appealing may be a major experimental flaw.

The lack of preference for the FUN survey may be a significant finding in its own right, underscoring the degree to which college students internalize the importance of environmental concern. Even a chance to win a $25 gift card was not enough to make the sacrifice rating for the FUN survey higher than that of the ECO survey. That the Identified and Threat conditions switched the relative ordering of sacrifice rating, for the FUN survey being more of a sacrifice, may be a sign that cognitive dissonance was invoked. In response to the knowledge that they had done an environmental measure the week before, these participants adjusted their preference to justify the FUN survey. Though not an original hypothesis, perhaps the action to justify the FUN survey is an
indicator of cognitive dissonance, if not hypocrisy. Should this be the case, it is in
contrast to typical cognitive dissonance experiments that rely on the counter-attitudinal
advocacy paradigm, and is more in-line with Dickerson et al.’s (1992) application to pro-
attitudinal situations.

However, if participants really preferred the ECO survey, why did those in the
Identified and Threat condition switch to the FUN survey? It would appear that
knowledge of having done an environmental measure a week earlier was enough to move
participants in the intended direction of preference for the FUN survey. The fact that the
effect was similar between the Identified and Threat conditions speaks to knowledge of
having done an environmental survey being more influential than invoking self-concept
threat. This finding will receive further consideration in the Future Research section,
relating to an environmental quota and real world parallels.

One note of caution is in the interpretation of this measure’s wording: “How
much of a sacrifice would it have been to NOT choose the ECO survey.” In addition to
potentially being confusing, awareness of social norms and expectations of ecological
behavior may have influenced self-report apart from actual desires. Unfortunately, the
wording was necessary because of trying to distinguish this measure from other similarly
worded measure that preceded it.

Another point of experimental execution may also be to blame. This concerns the
issue of unintentional environmental priming by telling participants that the surveys were
placed on the computer in an effort to reduce the hassle of dealing with the paper versions.
Though this statement does not directly address reduction of paper for environmental
reasons, participants could have interpreted that the researcher was concerned about the
environmental impact of the paper. Batson et al. (1997) addressed potential flaws similar to this by not setting off alarm bells and nullifying any “psychological space” for participants to move in. This potential priming may make the later environmental quota discussion more relevant.

Survey choice.

The ratio of survey choice was counter to expectations. The prediction was that participants in the Control and Identified conditions would show similar levels of preference, predominantly in favor of the FUN survey. Participants in the Threat condition were expected to have a higher preference for the ECO survey than the aforementioned two conditions. Instead, the result was that those in the Control condition stood apart from the other two by having the highest proportion of participants choosing the ECO survey. This may be in part due to a lack of impact of the self-concept threat manipulation, leaving the major difference between conditions up to whether participants were informed that they had taken an environmental attitudes survey a week prior to coming to the lab. Therefore, participants in the Control condition were uninformed (unaware or not mindful) of having done an environmental attitudes survey a week prior, while those in the Identified and Threat conditions were informed (aware or mindful).

Similar to reasoning presented concerning the sacrifice ratings, the impact of pro-attitudinal manipulation may have led to results different from those based on cognitive dissonance using the counter-attitudinal paradigm. By making participants in the Identified and Threat conditions informed about having done an environmental attitudes survey a week prior, the message was opposite that of counter-attitudinal messages that participants do NOT perform the behaviors. This message that the action was performed
may lead to the environmental quota concept discussed later. Instead of dissonance, participants may have experienced a suppression effect similar to the goal fulfillment effect of Forster, Liberman, and Higgins (2005) discussed later.

*Measure of self-concept threat.*

Although the manipulation check of disappointment with results was in the right direction, it was weaker than expected. The averages for the Control and Identified groups were 1.71 and 1.46, respectively (refer to Table 5). Although most should have answered with a value of zero for this question—that they did not get results or remember their performance—these values are low enough to indicate a lack of threat in these conditions. The average value for the Threat condition of 3.67 ($SD = 1.74$) reflected that many were somewhat disappointed (4 = “somewhat upset”) with the feedback that they had scored low on the environmental attitudes survey a week prior. The data reveal that some reached the upper end of the seven-point scale (7 = “very upset”), but overall the impact was lower than perhaps necessary to invoke the self-concept threat that Aronson deems so critical to cognitive dissonance (Aronson, 1992). The significant difference in threat ratings between those in the Identified and Threat condition, while having no significant difference on the survey choice, further supposes that the threat manipulation was not the main factor influencing survey choice.

*Future Research*

The results attained by this study may be better explained by alternative theory. Presented next is a notion of an “environmental quota”, presented under the theories of unpriming and goal achievement. Real world parallels to this study’s results will also be covered, along with general notes on modifying follow-up studies.
Environmental quota.

The unexpectedly strong sacrifice rating for the ECO survey over the FUN survey in the Control condition may shed light on the strength of an ecological behavior prime. Even a chance to win a $25 gift card was not enough to make the sacrifice rating for the FUN survey higher than that of the ECO survey. However, given information that they may have previously accomplished the goal of ecological behavior, participants in the Identified and Threat conditions may have been “unprimed” of a cultural prime (Sparrow & Wegner, 2006).

Priming occurs when an earlier stimulus affects responses to a later stimulus. As mentioned before, there may have been unintentional environmental priming by telling participants that the surveys were placed on the computer in an effort to reduce the hassle of dealing with the paper versions. However, why would this lead to more ECO survey choice in one condition and not the other two? One notion may be that the participants were primed to personally perform an ecological behavior. Those in the Control condition had only one way to satisfy that prime, by choosing the ECO survey. However, those in the Identified and Threat conditions had evidence that they had already performed an ecological behavior a week prior, leaving them a reason to be released from the prime. The current results are insufficient to deduce whether this priming effect was due to this experiment or a general cultural prime. It is also unclear as to the role of a self-presentation effect of the experimenter knowing the status of the participants’ ecological behaviors.

Sparrow and Wegner’s (2006) introduction provides a succinct example of unprimint. They discuss someone being primed by the word “burrito” to eat at a Mexican
restaurant. However, being in the restaurant would further prime them with Mexican food, leaving them to spend days at the restaurant. Therefore, their research was geared to show that engaging in the primed behavior diminishes the prime. The methodology was based on instructing participants to answer simple yes/no questions in a random way. However, participants tended to answer in a manner biased toward the correct answers. The only way this tendency was reduced was to allow participants to indicate the correct answer before generating a random yes/no.

Sparrow and Wegner’s study included tests of other explanations for unpriming. This included repetition of random answering (experiment 2), supraliminal exposure to the correct and incorrect answer (experiment 3), a general acknowledgement to the experimenter that the answer was known (experiment 4), and correct answering of an unrelated question (experiment 5). None of these led to a reduction in the bias toward answering questions correctly. Only the part of experiment 4 that had participants express the answer to themselves, also yielded the unpriming effect consistent with the direct correct answering of experiment 1. Therefore, this study indicates that the participant must overtly and specifically answer a question correctly in order to unprime the correct answer bias.

Pertaining to the current work, the idea is that many people may have a cultural tendency to selecting ecological behaviors when available. However, similar to the findings of Sparrow and Wegner, once evidence is presented that the behavior has been performed, there may be a reduction in this cultural tendency. The literature on catharsis, completion, and updating suggests that psychological theorists have often recognized that behavior prompted by a stimulus can naturally reduce the propensity toward subsequent
stimulus-related behavior (Sparrow & Wegner, 2006). Participants of the current study were in a situation similar to those in experiments 1 and 4 of Sparrow and Wegner, in that they were informed that it was in fact they that had done the environmental attitudes survey a week earlier. Should this unpriming theory be pursued in future versions of this study, alternatives similar to those of Sparrow and Wegner’s should be used. It is my expectation that similar results would occur, in that the shift to the FUN study would only occur for those participants that gained information that they had actually performed an ecological behavior recently. Of interest would be to inform participants that others had performed the ecological behavior recently, or more in-line with cognitive dissonance paradigms, that they had not performed the ecological behavior recently. Perhaps mechanisms of social norms and cognitive dissonance would reinforce preference for the ECO survey. This would further illuminate the notion of whether there is a desire that the ECO survey be done—regardless of who does it—or is it important to the participant that they are the ones to do it. Future versions of this study should also address the influence of self-presentation to the experimenter.

Forster, Liberman, and Higgins (2005) found an effect similar to Sparrow and Wegner’s (2006) unpriming. However, they noted this effect to goal-influenced accessibility as being different from priming. They believe that priming is much shorter lived. Forster et al. (2005) performed experiments that involved lexical decision making and stroop effect measures. They found that participants with an unachieved goal (i.e., finding a picture of glasses followed by scissors) had better accessibility then those without that goal or those who had already achieved the goal. Further research based on this study could attempt to tease apart this nuance whether priming or goals led to the
current results. More intentional priming could be performed to see if priming
increases the preference for the ECOsurvey, and whether subsequent prime fulfillment
results in even lower levels of ECO preference. Alternatively, an overt goal could be used
instead of priming, and the results compared. Finally, the impact of the current
procedure—noting noting that a computer was used to reduce the hassle of paper—could
be evaluated to see if in fact it unwittingly primed participants.

One part of the Forster et al.’s (2005) discussion warrants further evaluation. The
authors mention that whilst some standards, such as being egalitarian, may be instantiated
but not fulfilled, goals, such as “showing a token of egalitarian behavior”, can be fulfilled.
The current study may reflect this focus on behavior that can be fulfilled—in having
performed an ecological behavior—apart from a more difficult standard of being an
environmentalist. Therefore, some of the concerns of reduced ecological behavior upon
being informed of a history of such, might not necessarily carry over into concerns of
lowering more global virtues of environmental concern. Participants may have
experienced ecological behavior suppression in the short term, without any impact on
their instantiated standard of environmental concern.

Ledgerwood, Liviatan, and Carnevale (2007), whose symbolic self-completion
approach would fall under those theories that Aronson (1992) argued to be a part of
cognitive dissonance, point to a similar mechanism. They found that once group
affirmation was achieved, a striving toward a group-identity goal was reduced or even
eliminated.

Recently emerging research indicates that upriming or quotas may apply to even
broader realms. Mazar and Zhong (2009) found that exposure to green products, seen as
socially responsible, actually led participants to higher levels of asocial and unethical behavior in other realms. The authors proposed that boosting self-image with the green products actually permitted a higher level of transgression of social norms, as if the net of behavior was significance. This research does an interesting job of combining the centrality of self-concept as proposed by Aronson, while also addressing the sense of morality that is key to the Batson studies (Batson et al., 1997). Perhaps participants that knew of their past week’s environmental survey gave themselves “environmental credits” to justify selecting the FUN survey. Other popular works also warn of effects similar to the environmental quota, in that “removing the guilt trip may lead to an overall increase in carbon emissions” (MacDonald, 2008, p. 233).

Dickerson et al. (1992) dismiss priming interpretations in their experiments. All but the Control condition were primed with the idea of water conservation, but those in the Hypocrisy condition still performed differently. There were equal turning off shower results across all treatment conditions (Mindful-only, Commitment-only, and Hypocrisy-both), but the length of shower was shortest in the Hypocrisy condition. The authors mention that participants in the Mindful and Commitment conditions took the first easy step, but only those in the Hypocrisy condition took meaningful action. Those in the Mindful and Commitment conditions acted in line with Batson’s work of appearing but not really acting a given way. Only those who were made to see their hypocrisy, those in the Hypocrisy condition, took meaningful action. I inadvertently setup a different scenario. Instead of highlighting a lack of action, participants in the Identified and Threat condition were informed that they had taken action a week prior. The informed state may have led to an effect similar to Sparrow and Wegner’s unpriming.
Real world parallels.

Real world analysis of energy efficiency gains seems to parallel this study’s results. Economists refer to the effect of reducing potential gains by altering other behaviors as “consuming the gains” (Gladwell, 2009). While Gladwell discusses how this plays out in areas such as automobile safety, others have applied it to environmental issues. For example, when low-income homes are made more energy efficient, some of the potential energy gains are “consumed” by residents turning up their heat (Boardman & Milne, 2000). Similarly, when drivers realize that they have a more fuel-efficient vehicle, they tend to “consume” their efficiency gains by driving more miles or driving faster (Small & Dender, 2005). Sorrell and Dimitropoulos (2008) give further examples of consuming gains by buying more cars, buying larger cars, and sharing them less. Pertaining to efficiency gains in washing machines, they point to buying more machines, buying larger machines, and using them more frequently and/or reducing the size of the average load. Perhaps the participants in this study revealed signs of a similar effect. Having been informed that they had achieved an ecological behavior the week prior, participants “consumed” the potential gains of again taking ecological action by choosing the FUN survey.

General future modifications.

In this study, neutral and negative feedback (Identified and Threat conditions, respectively) led to similar results. A follow-up study may consider the impact of a positive feedback condition. Would a similar mechanism of environmental quota hold for positive feedback, or would positive feedback increase ecological behavior? The role of accurate feedback, instead of feedback based on experimental condition, could also be
studied. Finally, follow-on study could address the influence of feedback regarding other participants’ actions. Would environmental quota occur if a participant was told that *others* took an environmental survey a week prior?

On a more general note, future research should delve even deeper to identify more contexts that shape actual behaviors. I agree with Uzzell and Rathzel (2009), that there is no linear progression from information to attitude to behavior, and that “behaviours need to be analysed in their specific social and environmental contexts and within the larger context of the consumer societies in which we live” (p.9). Less experimentally restricted methodologies may better reveal the mechanisms that lead to the current study’s results. However, the rigor of experimental control does limit the number of alternative explanations that need to be considered for the current results.

*Limitations*

Some of the speculation based on the current results needs further research. The experimental design may limit generalizability of such conclusions. Succinctly, while taking one environmental survey will be enough not to take another, would buying a hybrid vehicle prevent someone from then recycling? Surprisingly, the work of Mazar and Zhong (2009) indicates that even more distal results are possible. Symbolic self-completion theory relies on individuals seeking out “socially recognized indicators of the desired identity” (Braun & Wicklund, 1989). Perhaps the ECO survey was not salient enough to be a clear cut “socially recognized” symbol of ecological behavior.

This study also had limitations related to self-report. Although direct behavioral measurement avoids the self-report issue, it can limit the complexity and scope of a study. One way to reduce these limitations may be work in line with Rochester Interaction...
Record modeling (Nezlek, Schütz, & Sellin, 2007), in which a complex set of behaviors can be cataloged. Although this method still relies on self-report, the rigorous methodology helps ensure that reports are for actual behaviors recalled from a participant’s daily life. Electronic response monitoring may help boost the validity of Rochester Interaction Record modeling even further.

The other major limitation deals with the experimental design overly simplifying the results in terms of social context. Biga (2006) touts sociological perspectives’ advantage in “that humans are embedded in a social structure where behavior is chosen not on the basis of discrete, personal decisions, but on the basis of competing demands stemming from the many positions one assumes in society” (p.77). This study was limited in terms of addressing social context such as self-presentation and socially recognized indicators. The effect of self-presentation was not well controlled in the experiment, and cannot be accounted for. Goffman (1959) underscored the importance of “front stage” presentation as a means of meeting our social roles. One way that the impact of self-presentation could have been minimized would have been to tell participants that the experimenter would not see which survey they chose. The contrary may have happened with part of the script stating that enough participants had been choosing each survey; implying experimenter monitoring.

**Conclusion**

Only one of three hypotheses, that of a weak attitude-behavior link, was supported. Hypotheses regarding environmental hypocrisy and the impact of self-concept threat on the attitude-behavior gap were not supported. While the researcher expected to find low ecological behavior and a way to increase it, instead, he found high ecological behavior
and a way to decrease it. Finally, environmental attitude and situational factors did influence ecological behavior.

The possibility of an environmental quota may prove useful in both understanding and influencing ecological behavior. Such a response may serve a useful function, by limiting the amount of time devoted to any given social influence. Further research into this effect may improve efficacy of behavior change efforts. Although an environmental quota effect may limit some behavior, it may also point to a minimum expected social limit. As long as the current social norms move this expectation higher, ecological behavior is bound to increase. Such action is necessary to address concern about global climate change. Real world experience that energy efficiency gains may be “consumed” by a take back effect (Sorrell & Dimitropoulos, 2008) or environmental quota effect should help policy makers realize that standards on energy efficiency will not be sufficient to impact overall energy consumption. With large amounts of United States stimulus money going to energy efficiency efforts, such realizations may lead to more balanced efforts for reducing overall energy usage.
References


Appendix A: Measures

New Ecological Paradigm
{Dunlap et al. (2000) Measuring Endorsement of
the New Ecological Paradigm: A Revised NEP
Scale}

Circle your choice SA=Strongly Agree, MA=Mildly Agree, U=Unsure,
MD=Mildly Disagree, SD=Strongly Disagree

Do you agree or disagree that:

1. We are approaching the limit of the number of people
   the earth can support
   
2. Humans have the right to modify the natural
   environment to suit their needs
   
3. When humans interfere with nature it often produces
   disastrous consequences
   
4. Human ingenuity will insure that we do NOT make
   the earth unlivable
   
5. Humans are severely abusing the environment
   
6. The earth has plenty of natural resources if we just
   learn how to develop them
   
7. Plants and animals have as much right as humans to
   exist
   
8. The balance of nature is strong enough to cope with
   the impact of modern industrial nations
   
9. Despite our special abilities humans are still subject to
   the laws of nature
   
10. The so-called “ecological crisis” facing humankind
    has been greatly exaggerated
    
11. The earth is like a spaceship with very limited room
    and resources
    
12. Humans were meant to rule over the rest of nature
    
13. The balance of nature is very delicate and easily upset
    
14. Humans will eventually learn enough about how
    nature works to be able to control it
    
15. If things continue on their present course, we will soon
    experience a major ecological catastrophe
Survey Option Presentation
(Paper-based representation of MediaLab computer presentation)

Survey 1 and 2 were randomly assigned either the ECO (ETF) or FUN (WM-SAP) survey.

- The online portion of our original study did not give the results we were looking for, so we had to abandon it. However, in order to fulfill our obligation to get you research participation credit, we were able to get surveys from two campus organizations. Read the summary for each survey. You will then be asked to participate in ONE of them for your research credit.

- Survey choices (randomized)

Survey 1: WM Social Activities Project (WM-SAP)
Have you ever heard that, "a university experience is about more than just academics"? Social activities are a key component of a balanced education. In that effort, the William and Mary Social Activities Project sets out to gauge student insight on fun, social activities to make life at William and Mary a more pleasant experience. This survey provides you with the opportunity to give feedback on what social activities you have enjoyed, and what else you would recommend. The information is shared amongst the numerous student organizations. Past surveys have led to new organizations and events. In line with making students' experience a good one, the survey is fun and engaging (this is not your typical boring survey). PLUS, all survey participants for this session will be entered in a raffle for a $25 gift card to a merchant of your choice--within reason ;-).

Help make life at William and Mary even better. We want to hear from you.

Survey 2: Environmental Task Force (ETF)
We are a new group formed in the hopes of addressing environmental concerns on campus. You can participate in a survey to gauge what can be done on campus to reduce environmental impact. This is a preliminary survey, so we hope you see the value of answering what some may consider "monotonous" questions. This is your opportunity to help us build a foundation that will lead to environmentally responsible changes on campus.

- Now decide which survey you would like to participate in. You can only do one.
  If you do not want to make the decision yourself, use the coin provided to decide.
Survey Choice Questions
(Paper-based representation of MediaLab computer presentation)

Survey 1 and 2 were randomly assigned either the ECO or FUN survey. {Text} in brackets reflects variable name used.

- Which survey did you choose? {Survey}
  - Survey 1
  - Survey 2

- Did you flip the coin? (corroborated by experimenter) {CoinFlip}
  - Yes
  - No

- Did you use a coin flip to decide? {Coin}
  - Yes
  - No

- Indicate any comments about your decision (e.g. flipped several times, used other method to decide): {Decide}

- Indicate how strongly you leaned toward survey 1 or 2. {Lean}

<table>
<thead>
<tr>
<th>Survey 1 strongly</th>
<th>Survey 1 mildly / Survey 2 mildly</th>
<th>Survey 2 strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

- Indicate how difficult a decision it was to decide between survey 1 and 2. {Difficult}

<table>
<thead>
<tr>
<th>not at all difficult</th>
<th>somewhat difficult</th>
<th>very difficult</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- How much of a sacrifice would it have been to NOT choose Survey 1? (randomized with following) {Sur1}

<table>
<thead>
<tr>
<th>no sacrifice at all</th>
<th>somewhat a sacrifice</th>
<th>large sacrifice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- How much of a sacrifice would it have been to NOT choose Survey 2? (randomized with previous) {Sur2}

<table>
<thead>
<tr>
<th>no sacrifice at all</th>
<th>somewhat a sacrifice</th>
<th>large sacrifice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Debriefing Probing Questions
{ Paper-based representation of MediaLab computer presentation }

- Do you recall what the surveys you took online a week ago were about?
  {Recall}
  Yes  No
  o (If yes was selected) Try to identify what the surveys were about. Be
    brief, and do not think too hard about it if you cannot immediately
    remember. Use [GO BACK] and select NO if you realize you cannot
    recall: {Recall2}

- In general, how do you feel about the online surveys from a week ago?
  very negative  neutral  very positive
  1  2  3  4  5  6  7

- How upset or disappointed with the results from the online survey from a
  week ago? {Dispt}
  Did not
  get results  not at all upset  somewhat upset  very upset
  0  1  2  3  4  5  6  7

- BEFORE you made the decision on which survey to take, how related did you
  think today's surveys were to the online surveys from a week ago? {Related}
  Not at all related  somewhat related  part of the same study
  1  2  3  4  5  6  7

- BEFORE you made the decision on which survey to take, what did you think
  this experiment was about?

- NOW, what do you think this experiment was about?
Appendix B: Laboratory Scripts

Debriefing Script
{Non-verbatim presented by experimenter}

“This experiment was a bit different than how we presented it. The initial survey and your decision today were related. In particular, we were trying to learn more about the relationship between environmental attitude surveys and actual behavior. One of the questionnaires you filled out was the New Ecological Paradigm. It assesses general environmental attitudes. However, there has been numerous research showing that this measure does not predict actual behavior well. Some have researched how a more specific measure correlates with specific behaviors. For example, a question on “how likely are you to recycle” will better predict whether you actually do it than asking “is recycling important?”

In this experiment, we wanted to test something a bit different. Our theory is that the situation people are put in impacts how consistent they act with their general environmental attitudes. Everyone takes the same questionnaires, and is given the option of the same two “surveys”. The only difference is whether we reminded you of the online survey and whether you got feedback on your performance.

For those in the CONTROL condition, we never reminded them of the NEP questionnaire, and no results were given once you filled it out. For those in the IDENTIFIED condition, we reminded them that they took the NEP questionnaire on environmental attitudes. For those in the THREAT condition, we reminded them that they took the NEP questionnaire on environmental attitudes and false feedback was provided. Everyone in this condition was told they scores LOW on the NEP. This was entirely made up, and you could have scored anywhere from low to very high on the NEP. However, we wanted to see how people react when they are told that they score low on the NEP. Our belief is that those that consider themselves environmentalists will have that image of themselves threatened, hence the name THREAT condition. We think they will look for opportunities to reassert their environmental commitment. Therefore, we think these people will be more likely to choose the environmental survey over the survey that provided other rewards.

This is not to say that there is any better way to be, just that different circumstances influence individuals differently. We expect most people to choose the survey that is fun and offers a chance to win a gift card. Your choice did not impact your ability to be in the raffle for the gift card. Everyone will be in the raffle, and we will give out two $25 gift cards once
our experiment is over. We will send you an email if you should win the raffle drawing.

Does all of this make some sense now? Do you have any further questions?

As you can imagine, if you knew ahead of time what the experiment was about, you may have made different choices. We ask you to sign an agreement not to disclose the true nature of this experiment to anyone until the semester is over. You can just tell them it is about questionnaires’ influence on how you perform certain cognitive tasks.”
Laboratory Treatment Script

R is the researcher with scripted dialog

P is the participant with typical dialog.

(Check to see if participant is outside)

R: Hi, are you xxxx?

P: Yes.

R: Alright, come on in. We are going to be in the back room here. (Leads participant into research room) Well, unfortunately what I originally planned for the second part of this experiment will not work. You remember taking an online survey a week ago? Well, the data from that totally wasn’t doing what I had excepted, so it does not make sense to do the second part.

P: Oh, sorry to hear that.

R: However, as we had a commitment to you signed up for timeslots, we talked to some campus organizations\(^1\). Two said that they’d be thrilled to get some surveys filled out by students. I was told that I could let you take one of the surveys to receive research credit for coming in today. Would you like to do that?

P: Sure, that sounds great.

R: Alright, go ahead and read and sign this consent form. Even thought these are not our surveys, we still need to get your consent as we are the ones administering them to you. It basically says that I am not forcing you to take the surveys, and that you can quit at any time. (Enters participant ID into the computer)

(Once participant has finished signing the consent form one of three conditions is run)

**Condition 1 (Control)**

---

\(^1\) Some participants were told that student organizations were contacted, while others were told that these were campus organizations. There was some back and forth early in the experiment while the script was not well entrenched. Also, mention by one student in debriefing revealed that they know many student organizations, which led them to be suspicious of not having know these.
R: (Makes no mention about the surveys from a week prior)

**Condition 2 (Identified)**

R: (in a perplexed voice, eliciting help from participant) I am still trying to figure out what happened with the surveys from a week ago. Do you remember which ones you had in your set...everyone had a different mix.

P: I really do not recall, perhaps if you tell me I will remember.

R: That is fine, I actually have the codes for them here, and can probably figure it out from memory. Let’s see...23...that was a general social battery, everyone took that one...and 54...that was the survey on environmental attitudes. Does that sound familiar?

P: Yeah, I think I took that.

R: Well, neither of those were the ones that gave me trouble. Oh well, I still don’t know what happened. I guess William and Mary students are just different from what I expected.

**Condition 3 (Threat)**

R: (in a perplexed voice, eliciting help from participant) I am still trying to figure out what happened with the surveys from a week ago. Do you remember which ones you had in your set...everyone had a different mix.

P: I really do not recall, perhaps if you tell me I will remember.

R: That is fine, I actually have the codes for them here, and can probably figure it out from memory. Let’s see...23...that was a general social battery, everyone took that one...and 54...that was the survey on environmental attitudes. Does that sound familiar?

P: Yeah, I think I took that.

R: You scored in the bottom 10% of people that had that one. You must not care too much about issues about the environment. Well, neither of those were the ones that gave me trouble. Oh well, I still don’t know what happened. I guess William and Mary students are just different from what I expected.

**All conditions**

R: Anyhow, I put all the surveys on the computer so that I would not have to deal with a stack of paper afterwards (hand gesture to indicate expecting a large stack of paper). The instructions are on the computer, so just read them carefully.
Basically, there is a short description of each survey. Please read both of them carefully and decide which survey you would like to do, you only need to complete one to get research credit today. I also told the organizations that I would provide you with a coin to flip\(^2\). (most participants snickered at the idea of needing a coin to decide between surveys) (While exiting the room) Go ahead and open the door to let me know when you are done.

\(^2\) The wording was changed from, “I also told the organizations that I would provide you with a coin to flip in case you cannot decide on your own.”
Table 1

*Description of Variables Used in Analysis*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Type</th>
<th>range</th>
</tr>
</thead>
</table>
| CoinFlip | Whether a coin flip occurred | dichotomous | 1 = flip  
2 = no flip |
| Cond     | Which condition the participant was in | categorical | 1 = Control  
2 = Identified  
3 = Threat |
| Dispt    | How upset Participant was with feedback | likert | 0 = no feedback  
1 = not upset  
4 = somewhat upset  
7 = very upset |
| Lean     | Survey preference | likert | 1 = FUN strong  
6 = Fun weak  
7 = ECO weak  
12 = ECO strong |
| NEP      | New Environmental Paradigm score | continuous | 0 - 75 |
| Related  | Suspicion of online and lab portions of study being related | likert | 1 = not related  
4 = somewhat related  
7 = part same study |
| Sur1     | How much a sacrifice to NOT do the ECO survey | likert | 1 = no sacrifice  
4 = somewhat sacrifice  
7 = large sacrifice |
| Sur2     | How much a sacrifice to NOT do the FUN survey | likert | 1 = no sacrifice  
4 = somewhat sacrifice  
7 = large sacrifice |
<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Type</th>
<th>range</th>
</tr>
</thead>
</table>
| SurDiff  | A difference score of Sur1 and Sur2 | Continuous | -6 = FUN much higher sacrifice  
|          |             |          | 0 = same sacrifice         |
|          |             |          | 6 = ECO much higher sacrifice |
| Survey   | Choice between two surveys (FUN, ECO) | dichotomous | 1 = FUN                    |
|          |             |          | 2 = ECO                    |
Table 2

*Dichotomous Survey Choice by Condition*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Count for Survey</th>
<th>Control</th>
<th>Identified</th>
<th>Threat</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECO</td>
<td>18</td>
<td>9</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>FUN</td>
<td>6</td>
<td>15</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>% ECO</td>
<td>75%&lt;sup&gt;b&lt;/sup&gt;</td>
<td>38%&lt;sup&gt;a&lt;/sup&gt;</td>
<td>36%&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
</tbody>
</table>

*Note:* Tukey Homogeneous Subset 1 indicated with <sup>a</sup>. Tukey Homogeneous Subset 2 indicated with <sup>b</sup>. 
Table 3

Summary of Logistic Regression Analysis for Variables Predicting Survey Choice

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Exp(B)</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>zNEP</td>
<td>0.587</td>
<td>0.204</td>
<td>1.80</td>
<td>.004</td>
</tr>
<tr>
<td>Condition</td>
<td></td>
<td></td>
<td></td>
<td>.005</td>
</tr>
<tr>
<td>Condition (Identified)</td>
<td>-1.594</td>
<td>0.658</td>
<td>0.203</td>
<td>.015</td>
</tr>
<tr>
<td>Condition (Threat)</td>
<td>-1.820</td>
<td>0.556</td>
<td>0.162</td>
<td>.001</td>
</tr>
<tr>
<td>Constant</td>
<td>0.028</td>
<td>0.233</td>
<td>1.028</td>
<td>.905</td>
</tr>
</tbody>
</table>

*Note: Control condition was used as the reference for Condition.*
Table 4

*Sacrifice Scores for NOT Doing Each Survey Type*

<table>
<thead>
<tr>
<th>Survey</th>
<th>Control</th>
<th>Identified</th>
<th>Threat</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECO</td>
<td>3.09(^b)</td>
<td>2.17(^a)</td>
<td>1.96(^a)</td>
</tr>
<tr>
<td>FUN</td>
<td>2.14</td>
<td>2.65</td>
<td>2.38</td>
</tr>
<tr>
<td>Difference</td>
<td>0.95(^b)</td>
<td>-0.48(^a)</td>
<td>-0.42(^a)</td>
</tr>
</tbody>
</table>

*Note:* Tukey Homogeneous Subset 1 indicated with \(^a\). Tukey Homogeneous Subset 2 indicated with \(^b\).
Table 5

*Disappointment Rating for Each Condition*

<table>
<thead>
<tr>
<th>Condition</th>
<th>M (SD)</th>
<th>M (SD)</th>
<th>M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>1.71 (1.0)\textsuperscript{b}</td>
<td>1.46 (0.8)\textsuperscript{b}</td>
<td>3.67 (1.7)\textsuperscript{a}</td>
</tr>
<tr>
<td>Identified</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Threat</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note:* Planned contrast subset 1 indicated with \textsuperscript{a}.
Planned contrast subset 2 indicated with \textsuperscript{b}.
Vita

Education

Psychology, Bachelor of Science

University of Houston, Houston, TX 2003 - 2004

Chemical Engineering, Bachelor of Science – Chemistry Minor

University of Houston, Houston, TX 1993 - 1997

Work

Principal

Systemic Performance, LLC, Aurora, CO 2009 - Present

Human Performance Improvement Consultant


Graduate Teaching Assistant

The College of William and Mary, Williamsburg, VA 2005 - 2007

Process Engineer

Bechtel Corp., Houston, TX, 1998 - 2002