Making Energy Saving Normal: An Energy-Saving Intervention Based on the Focus
Theory of Normative Conduct

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Abstract

This thesis is an exploration of a norm-based energy-saving intervention for possible implementation at Reed College. According to the Focus Theory of Normative Conduct, there are two distinct types of social norms that influence behavior: information about what ought to be done and information about what others typically do. In addition, these norms only impact behavior to the extent that each is salient. Previous research has shown that making both of these kinds of normative information salient can encourage pro-environmental behavior, but few studies have attempted to use them in conjunction in order to create maximal behavior change. The present study tested the effectiveness of simple injunctive and descriptive norm salience manipulations at getting people to turn a bathroom light off after washing their hands. The descriptive norm manipulation – whether the light was on or off initially – influenced participants' energy-saving behavior, but the injunctive norm manipulation – a posted sign – did not. Secondary variables of theoretical interest such as self-monitoring, and individuals' beliefs, attitudes, and behavioral habits were assessed, but results were inconclusive. Based on the present study, it seems that getting others to turn the bathroom light off when they leave is simply a matter turning them off before they arrive.

This thesis is dedicated to my old-guy triumvirate: Chuck Moshontz, Ron Moshontz, and Cary Joseph.

Introduction

Reed College is a socially liberal community in Portland, Oregon, a city regularly ranked as the nation's most environmentally friendly¹. Most students at Reed probably believe that global climate change is happening, is caused by humans, and that action should be taken to minimize it. But pro-environmental beliefs do not necessarily translate into pro-environmental behaviors. Lights get left on in common rooms and dorm bathrooms, students drive to school daily from less than one mile away.

A recent study divided the population of the United States into six categories based on attitudes, beliefs, and behaviors related to global climate change (see Leiserowitz, Maibach, & Roser-Renouf, 2009; Leiserowitz, Maibach, Roser-Renouf, & Smith, 2010)². The student body of Reed College, as described above, would likely be best categorized as "The Concerned". "The Concerned" are quite certain that global warming is happening and that it is a serious and urgent social problem, but they are unlikely to take personal actions as a result of these beliefs. As evidenced by the recent student-led push for an Environmental Studies Program, some of the student body might not fit this characterization. This group would likely be characterized as "The Alarmed". "The Alarmed" are the most actively engaged in the issue of global warming. They too are convinced that it is happening and that it is a serious and urgent social problem, but unlike "The Concerned", they make significant changes in their own lives. To summarize, though "The Concerned" are theoretically motivated to take action to help reduce the impact of global climate change, they are unlikely to do so. If a hypothetical desire to act isn't enough to motivate "The Concerned" to make behavioral changes, what methods can be used to help them actualize their concern?

¹ For example, SustainLane Government- an online community of government professionals whose focus is sustainable living - named Portland, OR the number one sustainable US City in the SustainLane 2008 US City Rankings. Many different criteria were used, and the data came from public data, research done by NGOs (for example, the US Green Building Council), and primary research done alone and in conjunction with NGOs. The 50 most populous US cities (according to the 2004 census) were ranked on 16 criteria, which were then weighted and averaged. The criteria were: Commute to Work, Metro Transportation, Metro Congestion, Air Quality, Tap Water Quality, LEED Building, Local Food & Agriculture, Planning & Land Use, Housing Affordability, Natural Disaster Risk, Green Economy, Energy and Climate Change Policy, City Innovation, Knowledge Base/Communications, and Water Supply. For more information about the methodology of the study, see SustainLane Government (2008).

² Names of the "6 Americas" and estimated percentage of national population (as of June 2010) are, ranging from lowest to highest in belief in Global Warming, concern, and motivation: "The Dismissive" (12%), "The Doubtful" (12%), "The Disengaged" (10%), "The Cautious" (24%), "The Concerned" (28%) and "The Alarmed" (13%). For more information about the demographics of each group and their identifying features, see Leiserowitz et al. (2010).

The present study seeks to find an effective pro-environmental intervention targeted at the students of Reed College who would like to take actions to help reduce the effects of global warming but do not consistently do so. In the present study, I have focused on one so-called "low-hanging fruit behavior" (an easily obtainable goal): turning off lights in public restrooms. I employ a simple norm salience manipulation based on the Focus Theory of Normative Conduct. My goal is straightforward: to get the highest percentage of Reed students to turn the light off in a single-stall bathroom after washing their hands.

Psychology and Environmentalism

The application of psychology to questions of environmental significance began in the 1970's, in the historical context of an emerging national concern about environmental degradation best represented by the first Earth Day in 1970. The era of abundant oil had suddenly ended; rising oil costs gave the U.S. public its first awareness of the inequality between the demand for energy and the dwindling global oil supply. The energy crisis - which lasted throughout the 1970's - created a need for widespread energy conservation. As Americans tried to make behavioral changes to limit energy consumption and promote environmental conservation more generally, psychologists began to study ways to encourage them to do so.

Most early "environmental" psychological studies focused on energy conservation behaviors. In 1973, Maloney & Ward designed the first scale to measure environmental concern. Around the same time, behaviorists began applying principles of operant conditioning to household energy use – training people to conserve energy by using types of rewards and punishments (for a review, see Lehman & Geller, 2004). A multitude of studies demonstrated the ability of psychological theory to reduce destructive behaviors like littering, wasteful consumption of electricity and gas (for a review, see Cone & Hayes, 1980) and increase conservation behaviors like carpooling, recycling, and public transportation (for a review, see Geller, Winett & Everett, 1982).

But psychology's interest in pro-environmental behaviors faded in the early 1990's after peaking in the early 1980's (Geller, 1990). But since the late 1990's, interest has been growing as evidence of the urgency and scope of the environmental problems we are facing grows. Today there is an abundance of psychological research that applies a broad range of psychological theories to the tasks of preventing Global Climate Change and understanding the implications of Global Climate Change (Oskamp, 2000; Swim, 2010; Kazdin, 2009).

Using Psychology to Increase Environmentally Significant Behaviors

Attempts to change long-term behaviors and lifestyle are often met with resistance. Instead, interventions that target specific behaviors are generally more successful (for reviews see, Kazdin, 2009, Oskamp, 2000). It might seem that the best way to encourage behavioral change is through education. However, interventions that solely provide education only increase knowledge, and do not increase environmentally significant behavior (Geller, 1992). Anecdotally, this is evidenced by the existence of “The Concerned” - a highly environmentally educated group whose beliefs and knowledge about Global Climate Change do not necessarily correlate with conservation behaviors (Leiserowitz et al., 2010). Indeed, a meta-analysis of 128 studies focusing on pro-environmental behaviors and relevant social variables found a small correlation (about .30) between knowledge of environmental problems and engagement in environmentally significant behaviors (Bamberg & Moser, 2007).

In order to be successful, educational interventions need some kind of motivational piece (Gardner & Stern, 2008). For example, having people make a personal commitment – particularly when the commitment is active, public, and perceived as voluntary – makes them more likely to follow through (Cialdini, 2001). In addition, how information is presented can also make educational campaigns more effective. When information about energy use in the home was provided in vivid, personalized terms rather than technical ones, more people made the recommended changes (Gonzales, Aronson, & Costanzo, 1988). Finally, some general principles of the psychology of persuasion can be used to boost educational campaigns. For example, when information comes from a respected or prestigious figure, it is more likely to produce changes in the desired direction (Miller & Ford, 1985).

Certain types of information – such as feedback - are more motivating than other types. Interventions that provide people with frequent (daily) and relevant information (in understandable terms like dollars or percentages) about energy-use decrease energy-use in the home. Similar feedback techniques have been used to increase curbside recycling, increase gas mileage, and reduce littering (Schultz, 1998; Darby, 2006; Fischer, 2007; Nickerson, 2003; Dixon, Knott, Roswell, & Sheldon, 1992).

Another kind of information that produces behavior change in a broad range of environmentally significant domains is normative information: information about what others do and think. Heath and Gifford (2002) demonstrated that people’s perceptions about others’ use of public transportation correlated with their own use. In a similar study conducted by Schultz et al. (2007), when homeowners were told the amount of energy

that most members of their community used, they tended to adjust their own behavior to fit that norm. Interestingly, though the aim of the study was to decrease energy use, homeowners who were using less energy than the norm actually increased their energy use to match the norm. This so-called “boomerang effect” was eliminated when additional, specific motivation to decrease energy use was provided.

Similar norm-adjustment procedures have been used to encourage other pro-environmental behaviors like recycling and littering (e.g., Nolan et al., 2008; Schultz, 1999; Cialdini, Kallgren, & Reno, 1991). Norm adjustment has also been used to reduce drinking on college campuses. Researchers found that when they corrected students’ misperceptions about drinking norms – establishing that heavy drinking was less common than it seemed - students’ behavior also shifted (Berkowitz, 2004; Perkins, 2002). This method has been implemented at many colleges with success (e.g., Agostinelli, Brown, & Miller, 1995; Haines & Spear, 1996; Neighbors, Larimer, & Lewis, 2004; Frauenfelder, 2001).³

Similar programs that seek to adjust widely held beliefs about the normative rates of disordered eating and gambling have also been successful (Donaldson, Graham, & Hensen, 1994; Larimer & Neighbors, 2003). Similarly, messages about the behavior and opinions of others have been used to encourage energy saving in hotels (Goldstein, Cialdini, & Griskevicius, 2008) and increase hand washing in public rest stops (Judah et al., 2009).

Social Norms

Though norm-based interventions have been used successfully to predict and change behaviors, the mechanisms are not well understood. The psychological study of social norms has had a long history marked by disagreement about using social norms to explain or predict behavior. The reason for this long-standing lack of consensus is simple: the evidence is mixed (for a review, see Cialdini & Trost, 1998). Norms exert a strong influence over behavior; merely witnessing the actions of others can shape behavior in surprising ways (Terry & Hogg, 2001). For example, the behavior of others can motivate

³ There is some controversy over the influence of social norms on drinking behavior (see Campo et al., 2003). Interventions using just descriptive norms sometimes have no impact or actually increase alcohol consumption, particularly in people who initially drank less than the normative amount (Werch, Pappas, DiClemente, Chally, & Sinder, 2000; Weschsler, Nelson, Lee, Seiberg, Lewis, & Keeling, 2003). This phenomenon – that people on either side of the norm adjust their behavior to match it – is essentially the same as the “boomerang effect” described above in the home energy saving intervention. It has also occurred for other behaviors like littering (Cialdini, 2003). These “boomerang” effects go away when motivating information or incentives are provided (Schultz et al., 2007).

people to say things that are obviously untrue (Asch, 1956) and cause people to fail to react to obvious danger (Darley & Latane, 1970). Other times, normative social influence seems less virulent. Though norms exist and exert influence over behavior, they do not necessarily predict or control it. It is therefore not surprising that researchers, hoping to understand the theoretical relationship between social norms and behavior, have arrived at opposing conclusions. Some argue that social norms are crucial to understanding and predicting human behavior (Berkowitz, 1972; Fishbein & Ajzen, 1975; Kerr, 1995), while others contend that the concept is too vague, and is of little or no predictive value (Krebs, 1970; Krebs & Miller, 1985).

The Focus Theory of Normative Conduct (FTNC)

To help bring order to the long but inconclusive history of social norms as a topic of psychological investigation, Cialdini, Reno, and Kallgren (1990) introduced the Focus Theory of Normative Conduct (FTNC). Cialdini et al. make two claims.

Their first claim resolves what they see as a main issue preventing theoretical headway: the multiple meanings of “social norm” (Schaffer, 1983). To address the ambiguity of the term, they provide definitional clarification. They distinguish between two motivationally different types of normative information, injunctive and descriptive norms. **Injunctive norms** communicate information directly about the validity or appropriateness of a behavior in a given situation, and they are often expressed as rules or beliefs (e.g., “When driving it is important to use your turning signal before turning.”). Injunctive norms motivate through the implicit threat of social sanctions. In contrast, **descriptive norms** indicate the validity of a behavior on the basis of what is commonly or actually done in a given situation (e.g., “People don’t always use their turning signals before turning”). Descriptive norms motivate through a desire to belong. To summarize, injunctive norms specify what *should* be done, and descriptive norms indicate what is *actually* done.

The second claim made by the Focus Theory of Normative Conduct is that either type of norm will influence behavior only to the extent to which an individual has that norm on his mind (consciously or not), in which case the target norm is said to be salient or focal.⁴

⁴ Although this theory is broadly accepted as valid, and has inspired subsequent successful research on social norms, there is still controversy over the mechanisms involved in the relationship between norm saliency and norm-consistent behavior (Keeling, 1999, 2000). Not enough research has focused in an organized fashion on the mechanisms of normative influence and the contextual factors responsible for the clear results of behavioral change. In addition, norm salience has not ever been concretely defined in the

Using the Focus Theory of Normative Conduct

The claims of the FTNC have been verified by subsequent research (Kallgren, Reno, & Cialdini, 1999; Reno, Cialdini, & Kallgren, 1993). Descriptive and injunctive norm salience manipulations were used successfully to influence behaviors in a series of studies conducted by the original authors. These studies were theory-driven, though they involved pro-environmental intervention. Their primary goal was not to produce the most pro-environmental behavior, but to provide evidence for a theoretical claim. A summary of the group's body of research and methodologies is presented in Table 1. The studies focused on reducing littering behavior in public spaces. Depending on the study's goals, the experimenters manipulated injunctive norm salience, descriptive norm salience, or some combination of the two, and then observed subsequent behavior.

Methods of norm salience were highly creative and variable. Though each study carefully defined the injunctive and descriptive norm salience manipulations, it was often the case that norm salience manipulations made both the injunctive and descriptive norms salient. Since descriptive and injunctive norms are not defined in much detail or with empirical guidelines, and since each experimental context has its own characteristics, how each was manipulated varied greatly from study to study.

Descriptive norms had to be both established and made salient by the experimenters. Many of the studies took place in a parking garage, where participants were given a flier. To establish the descriptive norm (which varied by randomly assigned condition) the parking garage was either clean, or fliers were scattered near the trashcan on the floor of the parking garage. In order to make the descriptive norm focal, participants witnessed a confederate researcher litter, thus drawing the participants' attention to the fact that others had or had not littered. In other studies with different target behaviors or designs, the descriptive norm is both established and made salient with a simple statement (e.g., "75% of households in your neighborhood take advantage of the household recycling program").

Manipulation of injunctive norm salience is somewhat more complicated. Unlike the descriptive norm, the injunctive norm does not need to be established. Often it is known that one shouldn't litter. Manipulation procedures vary from a posted sign (or having a message printed on the fliers distributed to participants), to a similar procedure

context of behavioral interventions, so that each study uses slightly different norm salience manipulations, ostensibly resulting in different degrees of salience. To complicate things further, it is often not possible to standardize norm salience manipulations across contexts, since the norms and the manipulations are highly context-specific. Although some of the secondary questions that I seek to answer in the present study have to do with the mechanisms of norm-based intervention, addressing these theoretical questions and methodological complications is beyond the reach of the present study.

to that of the descriptive norm, where the participant witnesses the confederate's behavior. In Reno et al.'s (1993) studies, the injunctive norm was made salient by the actions of a confederate, who picked up a piece of litter as he walked by the participant. This manipulation is somewhat counter-intuitive. Although the manipulation involved the observation of another's behavior, the authors explain that the act emphasized societal disapproval of littering, and therefore made the injunctive and not the descriptive norm salient. Similarly, Cialdini et al. (1990) argued that when one piece of litter stands alone, the conspicuousness of the act (or the evidence of the act) stands in contrast to the cleanliness around it - and the implicit actions of others - and so serves as an example of what ought not to be done. Other experiments used very different tactics. For example, in Kallgren et al. (1999), norm salience was increased by physiological arousal: the study was designed so that participants encountered an injunctive norm sign ("do not litter") after having gone up a flight of stairs (Interestingly, this manipulation worked! Arousal led to less littering!).

Later studies conducted by the group branched out to other pro-environmental behaviors like taking artifacts from natural parks (Cialdini, 2003), increasing in-home recycling (Schultz, 1998), home energy-saving (Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008), and reducing energy waste caused by excess laundering in hotels (Goldstein, Cialdini, & Griskevicius, 2008).

Table 1. Target behavior, Dependent variable, Setting, and Findings of Cialdini et al. (1990) and Reno et al. (1993).

Study	Target behavior	Dependent Variable	Setting	Findings
Cialdini et al., 1990 Study 1	littering	Littering of handbill	University hospital parking garage	Injunctive and descriptive norms distinct, validation of the Focus Theory of Normative Conduct.
Cialdini et al., 1990 Study 2	littering	Littering of handbill	Amusement park	Descriptive norm influences behavior; more litter in an environment increases littering behavior.
Cialdini et al., 1990 Study 3	littering	Littering of handbill	University mail room	One conspicuous piece of litter draws attention to the otherwise clean environment, acts as an injunctive norm salience manipulation against littering.
Cialdini et al., 1990 Study 4	littering	Littering of handbill	University hospital parking garage	When there is evidence of an injunctive norm that contradicts the descriptive norm, descriptive norm less powerful determinant of behavior.
Cialdini et al., 1990 Study 5	Littering	Littering of handbill	Library parking lot	The closer a message is to the injunctive norm, the less likely the counter-normative behavior.
Reno et al., 1993 Study 1	littering	Littering of handbill	Library parking lot and nearby grassy area	Injunctive norm more effective than descriptive norm when behavior is prevalent.
Reno et al., 1993 Study 2 & Study 3	littering	Littering of handbill	Library parking lot and nearby grassy area	Injunctive norm effective beyond immediate environment.

Table 2. Descriptive norm, Injunctive norm, Norm alignment, Salience manipulation, and Most behavior change of Cialdini et al. (1990) & Reno et al. (1993).

Study	Descriptive norm	Injunctive norm	Norms aligned?	Salience manipulation	Most behavior change
Cialdini et al., 1990 Study 1	Environment clean or littered with handbills	-	-	Confederate litters.	Confederate litters in clean environment.
Cialdini et al., 1990 Study 2	Environment littered with varying amount of handbills	-	-	-	One piece of litter in an otherwise clean environment.
Cialdini et al., 1990 Study 3	Environment clean or littered with handbills	One conspicuous piece of litter.	Varies by condition.	Conspicuous piece of litter.	One piece of litter in an otherwise clean environment.
Cialdini et al., 1990 Study 4	Environment littered with handbills	Littering swept in a line/not.	Conflicting.	Confederate litters.	When litter is neatly swept.
Cialdini et al., 1990 Study 5	Not manipulated, a small amount of non-relevant litter (i.e. not fliers).	Messages on handbill in windshield 1 of 5 more or less relevant injunctive messages, (Do Not Litter; Recycle; Turn out lights; Vote; Arts Month)	-	-	When the injunctive norm was closest (handbill said "Do Not Litter")
Reno et al., 1993 Study 1	Clean environment	When confederate picks up litter.	Varies by condition.	Confederate litters fast food bag or picks up littered fast food bag.	When confederate picks up litter.
Reno et al., 1993 Study 2 & Study 3	Clean environment	When confederate picks up litter.	Aligned.	Confederate litters fast food bag or picks up littered fast food bag.	When confederate picks up litter in otherwise clean environment.

Secondary Psychological Variables

My main analysis focuses on the situational influences most likely to produce changes in behavior. Beyond the situational influence of normative focus that is predicted by the Focus Theory of Normative Conduct, it is likely that a variety of both internal and external situational factors also influence a particular behavior (Kallgren et al., 1999). A variety of individual differences in behaviors, beliefs, and dispositions may make people more or less sensitive to the kind of norm-based intervention proposed here (Kallgren et al., 1999; Schwartz, 1973, 1977; Schwartz & Howard, 1982). In order to control for some of these factors, and explore the theory-based predictive value of others, I examine the behaviors, beliefs, and dispositions of participants.

First, people's behavioral habits are likely to come into play. Particularly for a behavior like turning the light off - which people do countless times daily - personal habits with respect to that behavior may well dictate whether an individual does the behavior, perhaps above and beyond the normative messages in a situation. Therefore, my study examines participant's self-reported personal energy-saving habits.

In addition, participants' self-reported beliefs about Global Warming are likely to influence the outcome variable. Most simply, people tend not to engage in behaviors (e.g., household recycling) if they do not believe these behaviors are environmentally meaningful (Nickerson, 2003; Leiserowitz, 2009).

Self Monitoring

Kallgren et al. (1999) showed that norm-focus, and thus compliance with a salient norm, can be influenced by internal factors by experimentally manipulating physiological arousal and whether the participants were internally or externally focused. Self-monitoring, a measure of an individuals' tendency to focus internally or externally, may be an individual difference measure that relates to norm focus and compliance with a salient norm, an idea that was suggested by Cialdini et al. (1991). According to the original construct of self-monitoring, described in Snyder (1979), a high self-monitor is "particularly sensitive to the expression and self-presentation of relevant others" (p.89), someone guided more heavily by social cues than internal factors. Because high self-monitors are more perceptive, they are more likely to recognize norms in their social environment, thus increasing norm salience just like the external focus manipulation in Cialdini et al. (1991). In previous studies, people with lower self-monitoring scores were likely to act in congruence with personal habits and values despite situational influences (Prislin & Kovrlija, 1992; DeBono & Omoto, 1993). Therefore, I expect that people with lower self-monitoring scores will be more likely to act in accordance with personal habits

and beliefs while people with higher self-monitoring scores will be more likely to act in accordance with the salient norms.

Energy-Saving in Public Restrooms

Energy saving in households has been a popular topic of psychological study (for a review, see Abrahamese, Steg, Vlek, & Rothengatter, 2005). Not as much attention has been paid to energy-saving interventions outside of the home, even though the majority of energy - about 2/3 - is consumed by non-household entities such as business, industry, and military (Gardner & Stern, 2002). Energy saving is an issue that institutions like Reed College care about. Though it can be discouraging to consider that one-time decisions such as installing energy-efficient equipment have a larger effect on net energy use than repetitive actions like turning lights off (Stern & Gardner, 1981), small energy-saving behaviors are relevant and make a larger impact in CO₂ savings than is generally assumed (Hawkes, 2010). Turning off unnecessary lights is a simple but meaningful action. Many educational institutions and businesses looking to reduce their carbon footprint already implement energy-saving interventions. At Reed bright stickers adorn all bathroom light switches, reminding people to "Save a fish, douse the lights". These stickers, however, might not be a psychologically effective way to encourage energy-conservation.

Overview of Current Research

This study uses the FTNC to increase energy saving in a single-stall bathroom, using injunctive and descriptive norm salience manipulations to get people to turn the light off as they leave the bathroom. By applying this well-researched theory to a novel setting, the present study provides opportunities for both applied and theoretical gains.

This behavior is well suited for an intervention. People (at Reed, at least) are presumably already motivated to turn off the lights, so there are no attitudinal barriers to overcome. In addition, it is a simple behavior, requiring little effort. The intervention proposed is also logistically simple. It is easy to adjust the appearance of the descriptive norm. Finally, because the status of the light can only indicate the behavior of one other individual, if many people do not turn the light off, there is no "legacy" of that true descriptive norm and therefore nothing to challenge an artificially established descriptive norm.

The setting for this norm-based intervention also provides some promising theoretical novelties. Unlike parking lots or hotel rooms, a public restroom is neither

totally public nor totally private, but a combination of the two. Similarly, this particular public restroom is neither completely familiar nor completely unfamiliar; though bathrooms are all quite similar, the particular restroom in my study is one that most of my participants have never used, in an area of the school (inside the Developmental Psychology Lab), they have probably never been.

In addition, the design of my study provides opportunities for theoretical broadening. Few studies that use norm salience manipulations have manipulation checks; often participants do not even realize that they have been in a study since the research is done in public spaces. Because of the design of this study, it is possible to give manipulation checks to participants, which can provide valuable information about my own study, as well as information about how consciously this normative information is registered.

Design

The present study has a 2 (injunctive norm: salience manipulation, control) x 2 (descriptive norm: light on, light off) between-subjects design. The two injunctive norm conditions were a straightforward salience manipulation, an injunctive sign about turning the light off in the bathroom, and a control sign about hand washing. The two conditions of the descriptive norm variable were simply the initial state of the bathroom light; participants found either that the light had been left on or that it had been turned off. The dependent variable was whether the participant turned the light off in the bathroom.

Hypotheses

There are several primary hypotheses regarding the effectiveness of the norm salience intervention. First, it is predicted that both the injunctive and descriptive norm salience manipulations will impact energy-saving behavior. In addition, there will be an interaction effect such that when descriptive and injunctive norms conflict, less people will act in compliance with these norms than when they agree. There are also some secondary hypotheses. It is hypothesized that self-monitoring scores will predict pro-normative behavior. In addition it is hypothesized that people's responses to the survey questions will predict their behavior in ways consistent with previous research. I expect that peoples perception of the injunctive norm will predict their energy saving behavior, as will personal behavioral habits and beliefs about global warming.

Methods

Participants

Participants were 62 undergraduate students (18 male) at Reed College. Participants were recruited by posters around campus, postings on Facebook, and in the campus-wide student body e-mail, and in person, and asked to participate in a study of 'behaviors and attitudes about important political issues.' Participants were compensated for their time with candy and a psychology department lottery ticket (a chance to win up to \$150). Six additional participants were excluded from the final analysis. Four participants in the light-off condition did not turn the lights on in the bathroom when they washed their hands. One participant specifically asked if he was to turn the light off or not, and one participant correctly guessed the hypothesis of the study.

Procedure

Participants were met in the psychology department lounge and led to a waiting room by the experimenter (a female college student) where they were given a consent form. The form explained that the study was looking at behaviors and attitudes about important political issues and that, if they consented, participants would be asked to complete some tasks including making some judgments about children's toys and filling out a survey asking questions about "yourself, your attitudes, and your behaviors."

After participants gave written consent, the experimenter explained the first task involving the children's toys, noting that participants would be rating toys that were being considered for use as research materials in a later, related study involving children. The conspicuous political nature of these toys and their packaging, which were both sitting on a central table in the common room, made the task's connection to the study obvious. Specifically, the toys were all obviously "environmentally" themed; either superficially (one toy was a photo-realistic inflated plastic globe), conceptually (another toy was a deck of cards with endangered animals, whose packaging emphasized that all materials were recycled from waste), or both (the last toy was a "root viewer" which provided the tools and seeds grow and observe the growth of a radish, a beet, and a carrot). Before the toy-rating task, the experimenter asked participants to wash their hands in the adjacent one-stall bathroom, explaining that because the toy task would involve hands-on assessment of the toys, keeping everything as hygienic and germ-free as possible was very important. The hand-washing task was actually the main experimental procedure.

Participants were shown the bathroom and asked to follow the hand-washing instructions by the sink. They were also shown where the experimenter would be sitting doing some reading, in an adjacent room with the door open (to establish a sense of partial, but not absolute privacy). On the outside of the bathroom door, clearly visible from any place in the waiting room, participants encountered a sign whose message varied by injunctive norm condition to read either "Don't forget to turn off the light!" or "Wash your hands with soap!" depending on random assignment. Although the messages were quite straightforward, two factors made them less commanding and less clearly targeted at the participant, and also less obvious. First, the signs were in a distinctly "kid" font, a bolded blue Comic Sans. Second, the signs were placed slightly lower than signs are typically placed, in other words, the signs were placed at kid eye-level. Upon entering the bathroom, participants found either that the light had been left on or that it had been turned off, depending on their randomly assigned descriptive norm condition. Participants washed their hands for approximately 20 seconds, according to the posted hand-washing instructions, written in simple language and printed in the same font as the injunctive manipulation signs on the door.

After they finished washing their hands, participants were given instructions for the toy-testing task and encouraged to ask the experimenter, who would again be reading in the adjacent room, any questions that arose. The instructions told the participant to play with, examine, and evaluate three children's toys using short provided response forms. In addition to the toys themselves, relevant packaging was provided (for example, the box for the cards and a booklet that came with the inflatable globe). The toy survey included 5 items, all with 7-point Likert scales. Participants gave an overall rating (dislike to like) and rated the toys on various factors which implied that the focus of the study was both the quality of the toys themselves (how fun? how straightforward?) and the consumer appeal of the toys to eco-conscious parents (how educational? how eco-friendly?). Again, the cover task was intended to deflect suspicion about the necessity of the hand washing and to explain the environmental theme of questions on the final survey.

After they completed the toy-rating task, participants alerted the experimenter who gave them the final task: a survey consisting of the Revised Self-Monitoring Scale (Lennox & Wolfe, 1984), and some questions about attitudes, beliefs, and behaviors regarding the environment, global warming, and energy conservation adapted from the survey used in Leiserowitz et al. (2010). Participants completed the survey and brought it to the experimenter as instructed.

Finally participants were given a 3-item manipulation check. The manipulation check contained a question about whether the participant had developed any ideas about what the study was about, whether they had noticed a sign on the bathroom door and what the sign said, and whether the light was on or off when they first entered the bathroom. Before the participant began the manipulation check, the experimenter surreptitiously removed the sign on the bathroom door. The experimenter retrieved the participant's compensation and a debriefing script, and then sat with the participant as he or she completed the manipulation check. When the participant completed the manipulation check, the experimenter went over the answers with the participant –taking note of anything unusual and ranking the participant's suspicion level on a scale from 0 (no suspicion) to 2 (correctly guessed the hypothesis). Finally, participants were fully debriefed and thanked for their participation.

Materials

The final survey was constructed to measure the effect of variables besides the norm manipulations on the dependent variable. There were 16 behavior, belief, and attitude items, including questions about their own beliefs about global warming (e.g., "Do you think global warming is happening? How sure are you that global warming is happening?"), their own behaviors related to global warming including a specific question about personal norms regarding energy-saving (e.g., "I always turn unused lights off in public restrooms."), and some questions about perceptions of the normative attitudes and behaviors of others at Reed. The survey also included the 13-item Revised Self-Monitoring Scale (Lennox & Wolfe, 1984). Participants were asked to indicate their gender, but no other demographic information.

Results

Primary Analysis: Norm Manipulations on Energy Saving

Although gender is not a variable of theoretical interest, and major differences in the norm literature have not typically been found between males and females, it seemed wise to explore any differences in behavior caused by gender. Gender was included in the main analysis and had no impact on the dependent variable, $\chi^2(1, N = 62) = 1.43$, $p = .231$). Since gender did not make a difference in the main analyses, it was not considered further.

Regardless of randomly assigned condition, the majority (69%) of participants in my study turned the light off when they left the bathroom. Of the 62 participants, 43 turned the light off and 19 left the light on. As shown in Table 1, at least 50% of participants turned the light off in each of the four experimental conditions.

The impact of the two main predictor variables - the injunctive norm salience manipulation and the descriptive norm salience manipulation - on whether participants turned the light out in the bathroom was assessed with a binary logistic regression. A logistic regression allows for the prediction of dichotomous dependent variables by multiple independent variables. A multinomial logistic regression in SPSS revealed a main effect of the descriptive norm salience manipulation (whether the light was on or off when participants entered the bathroom), $\chi^2(1, N = 62) = 5.03$, $p < .05$) but no interaction effect or effect of the injunctive norm salience manipulation (the sign on the door), $\chi^2(1, N = 62) < .94$, $p > .33$).

Table 3. Percentage (Frequency) of participants who turned off the light by injunctive and descriptive norm condition

	Injunctive sign	Control sign
Light on	65%, $n=11$	50%, $n=8$
Light off	79%, $n=11$	87%, $n=13$

Secondary Analyses: Psychological Variables

Self-Monitoring

The Revised Self-Monitoring scale consists of two sub-scales: the ability to modify self-presentation and sensitivity to expressive behavior of others (Lennox & Wolfe, 1984). Responses to items were averaged together (with items 9 and 12 reverse-scored) to create for each participant 3 different scores: one for the entire scale, and one for each sub-scale.

An independent samples t-test showed that there was no difference in total self-monitoring score between people who turned the light off ($M=3.19$, $SD = .55$), and those who didn't ($M=3.07$, $SD = .59$), $t(60)=.73$, $p=.47$. In addition, both the ability to modify self-presentation subscale $t(60)=.94$, $p=.35$ and the sensitivity to expressive behavior of others subscale $t(60) = .17$, $p=.87$, were also not predictive of whether the participant turned the light off.

A second analysis was performed to assess whether the self-monitoring scores predicted compliance with the descriptive norm. Participants were considered compliant with the descriptive norm if they left the bathroom light as they found it; turning the light off if it was off to begin with, or leaving it on if it was on to begin with. In other words, for compliant participants, the dependent variable (light off or on) was equal to the descriptive norm (light off or on). An independent samples t-test revealed no difference in total self-monitoring score between people who behaved in accordance with the descriptive norm ($M=3.12$, $SD = .55$), and those who didn't ($M=3.21$, $SD = .59$), $t(60)= -.56$, $p=.55$, and this pattern held for both the ability to modify self-presentation subscale $t(60)=-.88$, $p=.39$ and the sensitivity to expressive behavior of others subscale $t(60)= -.01$, $p=.99$.

Personal Attitudes and Beliefs

Items 7, 9, 11, 12, 13, and 14 on the survey measured participants' beliefs, knowledge, and self-reported behavior. A summary of participant responses and relevant analyses is presented in Table 4. As can be seen in Table 4, independent samples t-tests revealed no significant differences between people who turned the light off and those who didn't in knowledge and beliefs about global warming. Item 16 asked participants to select the statement which best matched their feelings about human agency and global warming. Participant responses are summarized in Table 5. A chi-square test for independence revealed that responses did not predict whether participants turned the light off, $\chi^2(3, N = 62) = 1.39$, $p=.22$).

Table 4. Summary of responses to survey items 7, 9, 11, 12, 13, and 14 and summary of results of independent samples t-tests comparing the responses of people who turned off the light and those who didn't for each item.

Construct	Content	Response	Mean	SD	<i>t</i>	<i>p</i>
Perception of agency	"The actions of a single individual won't make any difference in global warming."	Scale from 1 (strongly disagree) to 4 (strongly agree)	1.74	.68	-1.61	.11
Global warming, general belief	"Do you think that global warming is happening? How sure are you that global warming is happening?"	Scale from 1 (extremely sure) to 5 (don't know)	1.71	1.00	-1.54	.13
Global warming, personal importance	"How important is the issue of global warming to you personally?"	Scale from 1 (extremely) to 5 (not at all)	2.53	.88	-1.22	.23
Global warming, community importance	"How important is the issue of global warming to the Reed College community?"	Scale from 1 (extremely) to 5 (not at all)	2.90	.72	.44	.66
Perception of own knowledge (causes of GW)	"Personally, how well informed do you feel you are about the different causes of global warming?"	Scale from 1 (very well informed) to 5 (not at all)	2.00	.51	-1.08	.29
Perception of own knowledge (reducing GW)	"Personally, how well informed do you feel about the ways in which we can reduce global warming?"	Scale from 1 (extremely) to 5 (not at all)	2.11	.63	-.81	.42

Table 5. Summary of responses to Item 16, “Which of the following statements comes closest to your view?”

Statement	Frequency	%
Humans can reduce global warming, and will do so successfully.	1	1.6
Humans could reduce global warming, but it’s unclear whether we will.	45	72.6
Humans could reduce global warming, but people aren’t willing to change their behavior, so we’re not going to.	12	19.4
Humans can’t reduce global warming, even if it is happening.	4	6.5
Global Warming isn’t happening.	0	0.0

Perceived and Actual Norms

Several items on the survey measured perceived and actual norms regarding energy saving. A summary of participant responses to those items is presented in Table 5. Item 2 on the survey asked participants to select from seven statements about energy saving those that applied to them. This item served as a measure of personal norms regarding energy saving in general. An independent samples t-test revealed that participants who turned the light off did not select significantly more energy-saving statements as true of them ($M=4.19$, $SD=1.48$), than participants who left the light on ($M=3.79$, $SD=1.55$), $t(60)=.96$, $p=.34$.

One of the 7 statements specifically asked about turning lights off in public restrooms. Whether or not participants indicated that they “always turn unused lights off in public restrooms” served as a measure of participants personal behavioral norm. In order to test the hypothesis that personal norms would influence participant behavior, I ran a chi-square test for independence comparing personal behavioral norm to the dependent variable. Surprisingly, people who indicated that they always turn off the light in restrooms and people who did not were no different in turning the light off when they left the bathroom after washing their hands, $\chi^2(1, N=62) = .02$, $p=.88$.

In addition, there was no effect of perception of the relevant injunctive norm at Reed. An independent samples t-test showed that perceived expectation to turn the lights off was no different between participants who turned the lights off ($M=2.60$, $SD=.88$), and those who didn’t ($M=2.74$, $SD=.99$), $t(60)=-.53$, $p=.60$.

Table 6. Summary of responses to survey items 2(a and b), and 6.

Construct	Content	Response	Mean	SD
Personal norm, specific	"I always turn unused lights off in public restrooms"	Not true (0) or true (1)	.44	.50
Personal norm, energy-saving	List of seven statements regarding energy saving behavior.	Number selected as true.	4.06	1.50
Reed injunctive norm	"At Reed, it is expected that you turn the light off in an empty room."	Scale from 1 (strongly disagree) to 4 (strongly agree)	2.65	.91

Manipulation Checks

When asked if they noticed a sign on the bathroom door, 45.9% ($n=28$) of participants correctly recalled the message on the bathroom door while 42.6% ($n=26$) reported that they did not remember or did not notice⁵. An independent means t-test revealed no effect of injunctive condition (salience/control) on recall of the sign (correct/didn't notice or incorrect), $t(59)=.39$, $p=.70$, indicating that participants in the control condition were no more likely to correctly recall the content of the sign ($M = .48$, $SD = .51$) than those in the injunctive salience condition ($M = .43$, $SD = .50$). An independent-samples t-test showed no effect of recall of sign (correct/didn't notice or incorrect) on the dependent variable (light on/ light off), $t(59)=.15$, $p=.89$. Participants who correctly recalled the content of the sign were no more likely to turn off the lights ($M = 1.29$, $SD = .46$) than those who didn't recall the content of the sign ($M=1.30$, $SD = .47$). This held true when the participants given the hand washing sign were eliminated $t(28)=.38$, $p=.71$.

When asked if they noticed if the light was on or off to begin with, 55.7% ($n=34$) correctly recalled, 21.3% ($n=13$) did not notice and 23.0% ($n=14$) incorrectly answered. However, the response pattern differed between the two descriptive norm conditions (light on/light off) (see table 6). A chi-square test for independence revealed that participants in different descriptive norm salience conditions responded differently when asked if they remembered if the light in the bathroom was on or off, $\chi^2(2, N = 61) = 14.44$, $p<.01$), with the pattern suggesting more correct recall when the light was initially on.

An independent means t-test revealed no difference in compliance with the descriptive norm between participants who correctly recalled whether the light was on or off ($M = .38$, $SD = .49$) and those who didn't notice or recalled incorrectly ($M=.37$, $SD = .49$), $t(59)=-.09$, $p=.93$. Being able to correctly articulate at the end of the study whether the light was on did not predict participants' actual compliance behavior.

⁵ A manipulation check was not conducted on the first participant, so percentages were calculated for the 61 participants who completed a manipulation check. Four participants completed the manipulation check with the sign still on the bathroom door so their responses were eliminated from analyses regarding the sign manipulation question.

Table 7. Frequency of participant descriptive norm manipulation check response by descriptive norm condition

	Did not notice	Recalled incorrectly	Recalled correctly
Descriptive- light on	6	2	25
Descriptive - light off	7	12	9

Discussion

As expected, individuals who entered the bathroom with the light turned off were more likely to turn the light off than participants who entered the bathroom with the light left on. A subtle change to the environment resulted in major behavioral change. The manipulation check revealed some interesting patterns about the descriptive norm salience manipulation. Many participants who entered the bathroom with the light off didn't seem to remember turning it on; twelve participants reported that the light was on when they entered even though it was off. However, even participants who didn't remember that the light was on or off to begin with acted in accordance with the initial status of the light; there was no significant effect of correct recall on compliance with the descriptive norm. As in previous research, the descriptive norm impacted behavior without explicit awareness.

Contrary to the primary hypothesis, there was no effect of the injunctive norm salience manipulation on the dependent variable. Participants who encountered a sign reminding them to turn off the lights were no more likely to turn them off than those who had a sign reminding them to wash their hands. In addition, contrary to expectation, there was no interaction effect between the injunctive norm salience manipulation and the descriptive norm salience manipulation as expected. Overall, I found that participants looked to the initial status of the light – not to the injunctive message – to guide their behavior.

In addition to the main question regarding the differential impact of injunctive and descriptive norm salience manipulations, I also examined some individual difference measures that might have theoretical or applied significance. However, in part influenced by the small size of my sample, I found few meaningful relationships between participants' self-reported opinions, behavioral habits, and self-monitoring scores and their in-study behavior.

As is the case with all null results, there are a number of possible reasons why there was no main effect of the injunctive norm salience manipulation on the dependent variable. One possibility is that it is a true null result. It is counterintuitive – and certainly violates the logic behind those “Save a fish, douse the lights” messages – that a sign telling people to turn the light off is no more effective at getting people to turn the light off than a sign telling people to wash their hands with soap. Though this finding seems odd, it is not inconsistent with the literature. Direct messages about changing behavior are often not effective unless they are specifically about the descriptive norm (e.g., Nolan et al., 2008). This result is also consistent with an experiment recently conducted in Spain

by Ocejja and Berenguer (2009). They found that the initial status of the lights in a public multi-stall restroom (on/off) was a stronger predictor of energy saving a variety of injunctive-type messages. It could be the case that in public restrooms – where people may feel unfamiliar with the particular expectations of the setting - injunctive information is less valuable than descriptive information.

It is also important to keep in mind that the sign used in my study (“Don’t forget to turn off the lights!”) was designed as a norm salience manipulation. There is an abundance of research on message crafting and behavioral influence. There are also studies that provide guidelines and techniques for making messages most effective for specific behaviors (e.g., hand washing, Judah et al., 2009). For example, messages which invoke disgust (“Don’t take the loo with you – wash with soap”) were particularly effective in getting men to wash their hands (Judah et al., 2009). In addition, Bator and Cialdini (2000) published systematic guidelines for making effective pro-environmental public service announcements and doing pre-research on the effectiveness of behavior-targeting messages. They suggest that the message be as specific as possible, be stated in simple and vivid terms, that distracting extraneous information be avoided, and that messages make use of an encoding cue that connects the message to the brand or behavior, and makes recall of the message at the appropriate time more likely. These techniques were not used to create the injunctive message in my study.

Another possible explanation is that injunctive norm salience was operationalized unsuccessfully. In my attempt to minimize the authoritative power of a directive sign in a psychology study - an unfamiliar situation in which the participant is expecting specific behavioral instructions - I may have made the sign ineffective. The sign was at “child’s eye-level” so perhaps participants just did not see it. Results from the manipulation check can provide some indication of the effectiveness of the sign. A little less than half of participants correctly recalled the content of the sign ($n= 28$). The remainder of participants either incorrectly recalled the content of the sign ($n= 3$), or responded that they did not notice ($n= 26$)⁶.

However, it is important to carefully interpret the manipulation check results before coming to the conclusion that only 28 participants noticed the sign. Previous research suggests that normative influence happens without explicit awareness (Nolan et al., 2008). It follows that the manipulation check – which measures explicit awareness -

⁶ The three participants who incorrectly reported the content of the sign all had the sign reminding them to turn off the lights, but reported that the sign was about washing their hands. It is possible that these three misunderstood the question, which asked specifically about the sign on the bathroom door, and as a result they reported the content of the sign by the sink that provided directions about how to wash your hands properly.

does not necessarily reveal the effectiveness of the manipulation. Though the descriptive norm salience manipulation was effective, accuracy rates on the manipulation check were about the same as for the injunctive norm manipulation. In addition, for both types of norms, participants who correctly recalled the norm were not more likely to act in accordance with it. Therefore, the manipulation check does provide interesting information about normative influence, but doesn't conclusively establish the success of the injunctive norm salience manipulation.

Second, it is important to carefully consider what the injunctive manipulation check truly measures. Participants had the opportunity to see the sign after they had or had not turned off the light. It is possible that even people who correctly recalled the content of the sign did not notice it before entering the bathroom, but were able to recall the content of the sign because they glanced at it during the toy-rating task or while completing the survey.

With respect to the effectiveness of an injunctive norm salience manipulation, my study is inconclusive. However, it does seem clear that a descriptive norm salience manipulation effectively influenced participant behavior.

Strengths and Potential Limitations

The present study offers direct applied value, suggesting the implementation of a cheap campus-wide energy saving intervention perhaps by automatic light sensors. In addition the present study produced interesting evidence about the differential impact of injunctive and descriptive norm salience procedures. The basic fact that a directive sign changed participant behavior less than a subtle cue about the behavior of others is quite interesting, and attests to power of normative influence! Furthermore, the manipulation checks provided a unique opportunity to better understand the mechanisms of norm salience procedures.

The most obvious and problematic limitation of my study is the sample. Firstly, my sample was pretty small, and as a result, I was not able to explore my hypotheses fully. The participants in my study are not a representative random sample of the US population of college-age students demographically and with respect to attitudes and behaviors relevant to energy-saving and environmental action (see Table 7). As explained previously, these behavioral habits and related attitudes are believed to influence the effectiveness of norm-based behavioral interventions; it is likely that results would be different with a more diverse sample.

Similarly, the target behavior base rate was high to begin with, 50%, which might explain the failure of the injunctive salience manipulation – a simple message prompt – to impact participant behavior. Message-based environmental interventions have been successful, but many began with much lower base rates (Lehman & Geller, 2004).

There are several things that I did not measure which would have helped me interpret the null result for the injunctive norm salience manipulation. First, a more specific investigation into the strength of the injunctive norm against leaving lights on would have been helpful. As discussed earlier, since my study is unique in using an injunctive norm that is not necessarily widely held (unlike littering, Bickman, 1972). It is possible that the salience manipulation is not enough to motivate behavior. A more thorough analysis of people's ideas about the strength of the injunctive norm to save energy (or perhaps, the injunctive norm against leaving lights on in bathrooms) would have been useful. Though one question in my survey did address this issue, additional specific questions (for example, asking people if they feel they are "supposed to" turn the lights off when they leave the restroom) would have bolstered my understanding.

It would also be useful to know participants' opinions about the value of turning the lights off, or their understanding of how much energy can be saved from turning unused lights off. Much research indicates that these beliefs would correlate with the outcome variable. People do not engage in behaviors they believe are not environmentally meaningful (Nickerson, 2003; Leiserowitz, 2005). Furthermore, it has been suggested that the effectiveness of a normative intervention (such as the one proposed) is probably predicted by an individual's value-based opinions about the target behavior (Connor & Armitage, 1998; Kallgren et al., 1999). These value-based opinions, or norms (e.g., Schwartz, 1977), have to do with how an individual regards the behavior: if they themselves would approve or disapprove of it, separate from how society regards the behavior (the injunctive norm) and what others typically do (the descriptive norm). Though they use different terminology, Goldstein and Cialdini (2007) make a similar, more specific claim. They suggest that the effectiveness of an injunctive norm at regulating behavior is mediated by cognitions about the legitimacy of that norm. Although a few of my questions broach participants' personal norms about energy-saving, my research would have been strengthened by asking participants to specifically state their opinions about the importance of energy-saving and of turning the light off in a public bathroom. Appropriate questions would be "How effective do you feel turning off the light is at saving energy?" or "How important do you feel the act of turning lights off in public restrooms is?"

Table 8. Responses of my sample compared to the U.S. average (Leiserowitz et al., 2010) to survey items 7, 11, 13, and 16.

The actions of a single individual won't make any difference in global warming.	My Sample	U.S.
Strongly disagree	39%	17%
Somewhat disagree	48%	29%
Somewhat agree	13%	37%
Strongly agree	0%	17%
How important is the issue of global warming to you personally?	My Sample	U.S.
Extremely	11%	6%
Very	39%	18%
Somewhat	36%	38%
Not too much	15%	24%
Not at all	0%	14%
Personally, how well informed do you feel you are about the ways in which we can reduce global warming?	My Sample	U.S.
Very well informed	13%	13%
Fairly well informed	74%	49%
Not very well informed	13%	35%
Not at all informed	0%	3%
Which of the following statements comes closest to your view?	My Sample	U.S.
Humans can reduce global warming, and will do so successfully.	1.6%	6%
Humans could reduce global warming, but it's unclear whether we will.	72.6%	51%
Humans could reduce global warming, but people aren't willing to change their behavior, so we're not going to.	19.4%	22%
Humans can't reduce global warming, even if it is happening.	6.5%	16%
Global Warming isn't happening	0%	5%

Implications of my Findings

Norm-Based Energy-Saving Intervention

The descriptive norm salience manipulation had a powerful effect on behavior, over and above people's behavioral habits. Some participants who claimed to always turn the lights off left them on when the light was on to begin with.

The results of this study suggest that an effective energy-saving intervention should establish the perception that most people turn the light off. Installing motion sensors, which automatically turn the lights off, would be a good way of creating this perception. Not only would a motion sensor reduce the energy wasted when lights are left on, it would also decrease the likelihood that the lights get left on. It is important to consider that this study took place in an unfamiliar single-stall bathroom, a situation most comparable to bathrooms in places like restaurants, coffee shops, others' homes, and doctors' offices.

In my study, I found that participants were most likely to turn the light off if it seemed that others did. This evidence could be used to motivate people: reminding them that not only will turning the lights off save energy, it will make it more likely that others will too. Increasing the gains associated with the act of turning the light off could make it more meaningful and valuable, and increase motivation to do it.

Potential for Long-Term Behavior Change

Research suggests that descriptive norm-based interventions such as the one implemented in this study do not necessarily have influence beyond the immediate context (Reno et al., 1993). The most effective behavioral intervention would shift long-term behavior, so that effects would generalize beyond the specific situation. Though this intervention has a very short-term, specific objective, its implementation might have farther-reaching effects. It is possible that interventions causing changes in short-term and situation-specific behaviors can impact long-term behaviors. I will briefly discuss two of the ways that could happen.

First, it is possible that people in the Reed community would develop a context-specific perception of an injunctive and descriptive norm that would generalize to "all bathrooms at Reed" or maybe "all bathrooms." If normative messages are often present in the specific behavioral setting of a bathroom, when people encounter that behavioral setting - either in other bathrooms or even when exiting all rooms, perhaps upon seeing the light switch - it will act as a retrieval cue (Keller, 1987), thus bringing focus to that

normative information (as suggested by Kallgren et al., 1999). Indeed, research suggests that situation-specific behavioral norms can become associated with general environments (Aarts & Dijksterhuis, 2003).

Secondly, it is possible that this intervention could establish, over time, a strong behavioral norm that people turn the lights off in public spaces. The existence of this descriptive norm would likely, as discussed earlier, motivate people to change their behavior to match it. Recall that in reaction to descriptive norm interventions targeting drinking behavior, people initially drinking less sometimes increase the amount they drink to match the norm. There is no risk of a boomerang effect for the behavior of turning lights off in bathrooms because the target behavior is binary. There is no way to turn the light off “less” because people already meeting or “surpassing” the goal behavior in the desired direction (say, people who turn the light off all the time) will not have to move in a counter-productive direction in order to perform the target behavior.

Directions for Future Research

Applied

Before this study could be applied with confidence beyond the Reed community, it would need to be replicated with a broader sample and with some adjustments to the injunctive norm salience manipulation in order to determine if a different injunctive norm salience manipulation would be more effective. Future research should test this intervention out in other settings like public restrooms, multi-stall restrooms, and restrooms people are likely to frequent, such as those in work places.

Theoretical

The results of my study are consistent with prior research in suggesting that a descriptive norm does influence behavior, but people aren’t acutely aware of either the norm or the influence of the norm. Future research should seek to better understand how, why, and under what conditions this is the case. For example, little is known about the mechanism of normative influence. Is the descriptive norm – the behavior of others – taken as an indication of what behavior is “most” appropriate? Or is compliance with the descriptive norm motivated by a “need to belong”? Or do descriptive and injunctive norm cues simply “remind” people to behave as intended? Are some individuals more likely to comply with a salient descriptive norm than others? Do some situations – perhaps ones that are less familiar or more structured – make people particularly open to the influence of descriptive norms?

Before these interesting theoretical questions can be addressed empirically, there are some definitional issues that need attention. Descriptive and injunctive norms need to be defined with greater specificity so that they can be uniformly operationalized. For example, no research has attempted to measure or control for potentially relevant variables such as the “strength” of the norm, the “strength” of the norm salience manipulation, or the method of norm salience manipulation. Future research should seek to clarify some of the criteria of salience manipulations, and replicate past findings under new conditions where the norms and manipulations vary on these unstudied dimensions.

Conclusion

This study suggests that the kinds of energy-saving interventions used at institutions and businesses such as the “Save a fish, douse the lights” campaign implemented at Reed may not be the most effective way to increase energy-saving behavior. A more effective intervention would target the perception of the descriptive norm. Making it seem like everybody is turning off the lights may actually get everybody to turn off the lights!

Appendix A: Recruitment Ad

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Participate in a senior thesis exploring attitudes and behaviors about important political issues. All you'll need to do is come into the lab for about 10-15 minutes. In exchange you'll get candy or snacks, a psychology department lottery ticket, and, of course, a lot of karma. To sign up for a time, send an e-mail to moshonth@reed.edu.

Appendix B: Consent Form

Reed College Consent to Participate in Research

You are invited to participate in a thesis project conducted by Hannah Moshontz on behaviors and attitudes about important political issues. You will be asked to complete some tasks including making some judgments about children's toys and filling out a survey to report your feelings about yourself, your attitudes, and your behaviors.

Your participation will require 20 - 30 minutes. You will receive the immediate compensation of a candy bar or other yummy snack and a psychology lottery ticket (a chance to win up to \$150).

To protect the privacy of your data, your name will not be linked to your data. Reports of this study will not include individual data in a form by which you could be identified.

Your participation in this study is entirely voluntary. You may decline to answer any individual questions or to engage in any individual task. You may also withdraw from the study at any time without forfeiting either your snack or your lottery ticket.

I will be glad to answer any questions about the procedures of this study. Concerns about any aspect of this study may be referred to Professor Kathryn Oleson, koleson@reed.edu, 503-517-7498 or to the Chair of the Reed College Human Subjects Research Committee, Professor Kambiz GhaneaBassiri, ghaneabk@reed.edu 503-517-7435.

I voluntarily consent to participate in this study. In signing this form, I certify that I am 18 years of age or older. I will be given a copy of this consent form if requested.

printed name

signature of participant

date

I certify that I have presented the above information to the participant.

signature

date

Appendix C: Toy Survey and Directions

Thank you for helping us with our research! We ask that you play with each of these three toys, and then tell us what you think. Please examine each toy for about 45 seconds to 1 minute before making your evaluations on the scales provided below. Please rate each toy before moving on to the next. You are encouraged to interact with these toys in whatever way makes sense to you. Feel free to look at packaging and instructions.

Name of toy: _____						
Overall, I _____ this toy:						
1	2	3	4	5	6	7
dislike						like
I find this toy:						
fun						
1	2	3	4	5	6	7
not at all						extremely
educational						
1	2	3	4	5	6	7
not at all						extremely
eco-friendly						
1	2	3	4	5	6	7
not at all						extremely
straightforward						
1	2	3	4	5	6	7
not at all						extremely

Appendix D: Survey

SURVEY

Part 1

For items 1-3, please **check all statements that apply** to you. We are interested in your actual behaviors, so please be as honest as possible.

1. Recycling

- ☐ I tend to recycle.
- ☐ I always recycle, even when I have to go out of my way to do it.
- ☐ I recycle at home.
- ☐ I recycle if I think to do it.
- ☐ If I see a recyclable item in a public trashcan, I will remove it and recycle it.
- ☐ I remind my friends to recycle.
- ☐ It upsets me when people don't recycle.

2. Energy-Saving

- ☐ If I am the last one out of a room, I always turn the light off.
- ☐ I always turn unused lights off, even if I'm leaving the room for just 5 minutes.
- ☐ I turn the light off in my home when I leave for the day.
- ☐ I always turn unused lights off in public restrooms.
- ☐ I turn unused lights off if I remember.
- ☐ If I see an unused light on in a common space or public area, I will turn it off.
- ☐ It upsets me when people leave unused lights on.

3. Consumer Activism

- ☐ I tend to think about the environmental impact of my purchases.
- ☐ I always choose the most environmentally friendly product available.
- ☐ I always consider the environmental impact of my purchases.
- ☐ I always make sure that my purchases are as environmentally friendly as possible.
- ☐ I purchase "green" household cleaning products when I can.
- ☐ I always purchase "green" household cleaning products, even if they are more expensive.
- ☐ I make my own natural household cleaning products.

For items 4-7, please indicate **how much you agree** with each statement by circling one response.

4. Products marketed as "green" are always good for the environment.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

5. At Reed, it is expected that you recycle.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

6. At Reed, it is expected that you turn the light off in an empty room.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

7. The actions of a single individual won't make any difference in global warming.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

For items 8-16, please **select one response**. We are interested in your actual attitudes and behaviors, so please be as honest as possible.

8. When determining the environmental impact of a product, I mostly consider:

1	2	3	4
what the label says (i.e. "organic" or "recycled")	where the product was made	what others have told me about the product	my knowledge about what is good for the environment

9. Do you think global warming is happening? How sure are you that global warming is happening?

1	2	3	4	5
extremely	very	somewhat	not sure	don't know

10. How sure are you that global warming is not happening?

1	2	3	4	5
extremely	very	somewhat	not sure	don't know

11. How important is the issue of global warming to you personally?

1	2	3	4	5
extremely	very	somewhat	not too much	not at all

12. How important is the issue of global warming to the Reed College community?

1	2	3	4	5
extremely	very	somewhat	not too much	not at all

13. Personally, how well informed do you feel you are about the different causes of global warming:

1	2	3	4
very well informed	fairly well informed	not very well informed	not at all informed

14. Personally, how well informed do you feel you are about the ways in which we can reduce global warming:

1	2	3	4
very well informed	fairly well informed	not very well informed	not at all informed

15. How often do you discuss global warming with your family and friends?

1	2	3	4	5
very often	somewhat often	occasionally	rarely	never

16. Which of the following statements comes closest to your view?

- ☐ Humans can reduce global warming, and will do so successfully.
- ☐ Humans could reduce global warming, but it's unclear whether we will.
- ☐ Humans could reduce global warming, but people aren't willing to change their behavior, so we're not going to.
- ☐ Humans can't reduce global warming, even if it is happening.
- ☐ Global Warming isn't happening.

Part 2

For items 1- 13, indicate the extent to which **each item is true of you** using the scale provided.

1. In social situations, I have the ability to alter my behavior if I feel that something else is called for.

0	1	2	3	4	5
always false	generally false	somewhat false but with exception	somewhat true but with exception	generally true	always true

2. I am often able to read people's true emotions correctly through their eyes.

0	1	2	3	4	5
always false	generally false	somewhat false but with exception	somewhat true but with exception	generally true	always true

3. I have the ability to control the way I come across to people, depending on the impression I wish to give them.

0	1	2	3	4	5
always false	generally false	somewhat false but with exception	somewhat true but with exception	generally true	always true

4. In conversations, I am sensitive to even the slightest change in the facial expression of the person I'm conversing with.

0	1	2	3	4	5
always false	generally false	somewhat false but with exception	somewhat true but with exception	generally true	always true

5. My powers of intuition are quite good when it comes to understanding others' emotions and motives.

0	1	2	3	4	5
always false	generally false	somewhat false but with exception	somewhat true but with exception	generally true	always true

6. I can usually tell when others consider a joke to be in bad taste, even though they may laugh convincingly.

0	1	2	3	4	5
always false	generally false	somewhat false but with exception	somewhat true but with exception	generally true	always true

7. When I feel that the image I am portraying isn't working, I can readily change it to something that does.

0	1	2	3	4	5
always false	generally false	somewhat false but with exception	somewhat true but with exception	generally true	always true

8. I can usually tell when I've said something inappropriate by reading it in the listener's eyes.

0	1	2	3	4	5
always false	generally false	somewhat false but with exception	somewhat true but with exception	generally true	always true

9. I have trouble changing my behavior to suit different people and different situations.

0	1	2	3	4	5
always false	generally false	somewhat false but with exception	somewhat true but with exception	generally true	always true

10. I have found that I can adjust my behavior to meet the requirements of any situation I find myself in.

0	1	2	3	4	5
always false	generally false	somewhat false but with exception	somewhat true but with exception	generally true	always true

11. If someone is lying to me, I usually know it at once from that person's manner of expression.

0	1	2	3	4	5
always false	generally false	somewhat false but with exception	somewhat true but with exception	generally true	always true

12. Even when it might be to my advantage, I have difficulty putting up a good front.

0	1	2	3	4	5
always false	generally false	somewhat false but with exception	somewhat true but with exception	generally true	always true

13. Once I know what the situation calls for, it's easy for me to regulate my actions accordingly.

0	1	2	3	4	5
always false	generally false	somewhat false but with exception	somewhat true but with exception	generally true	always true

Background Information

Gender: M F

Appendix E: Manipulation Check

Impressions of Today's Tasks

1. Sometimes people develop ideas about what it is that I am studying or what I am trying to find. It is important for us to know if people are doing this, so we like to stop and ask participants about this. If you have any thoughts about what we are studying please list them below.
2. Did you notice a sign on the door of the bathroom? What did it say?
3. Did you notice the light in the bathroom? Was it on or off?

Appendix F: Injunctive Salience Sign

Wash your hands
with soap!

Child Development Lab, Reed College

Appendix G: Injunctive Control Sign

Don't forget to
turn off the light!

Child Development Lab, Reed College

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