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Effects of Persuasive Communication on Intention to Save Energy: Punishing and Rewarding Messages

Michell Patricia Garcia Mera
mpg4570@rit.edu

The Rochester Institute of Technology

School of Communication

College of Liberal Arts

Effects of Persuasive Communication on Intention to Save Energy:

Punishing and Rewarding Messages

by

Michell Patricia García Mera

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The members of the Committee approve the thesis of

Michell Patricia García Mera presented on

December 09, 2015.

_____

Patrick Scanlon, Ph.D.
Director and Professor of Communication
School of Communication

_____

Tracy R. Worell, Ph.D.
Associate Professor of Communication
School of Communication
Thesis Advisor

_____

Eric Hittinger, Ph.D.
Associate Professor
Department of Public Policy
Thesis Advisor

_____

Grant Cos, Ph.D.
Director of Graduate Programs and
Associate Professor of Communication
School of Communication

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EFFECTS OF PERSUASIVE COMMUNICATION ON INTENTION TO SAVE ENERGY:

PUNISHING AND REWARDING MESSAGES

Michell Patricia García Mera

School of Communication

College of Liberal Arts

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Abstract

Communication can be used to persuade individuals to change their intentions. This study analyzes the use of rewarding and punishing messages for the purpose of changing intention towards energy saving. It also analyzes the use of social and individual rewards and punishments and their effects in motivating behavioral change positively towards energy saving. Results show that while reward and punishment are both effective in manipulating intention positively towards energy saving behaviors, overall there is no significant difference between the two. However, when individual reward was compared to individual punishment, individual punishment was found to be more effective than reward in affecting intention to save energy. This study also found that while social motivations are as effective as individual motivations in saving energy when used in rewarding messages, individual motivations in punishing messages were more effective than social ones.

Keywords: persuasion, reward, punishment, sustainable consumption

Effects of Persuasive Communication on Intention to Save Energy:

Punishing and Rewarding Messages

The unsustainable consumption and production of energy is one of the larger forces responsible for the erosion of the environment (Akenji & Bengtsson, 2014). For example, the use of coal or oil as fuel causes emissions that affect the environment, and are costly to maintain, but are necessary in order to fulfill the existing demand for energy (Alliance To Save Energy, 2012). In addition, current methods of energy production employ non-renewable materials almost in their entirety. This means that eventually these resources will be depleted, and the system that was built upon the dependence of these materials will crumble, unless other viable alternatives to energy production are found (Alliance To Save Energy, 2012).

The method of energy production can play a large role in diminishing the costs of electricity and its effects on the planet. However, consumer behavior is the factor responsible for how much energy is produced in the first place, and thus how much this production affects the environment. Part of the solution to unsustainable energy consumption may lie in changing methods of energy production to ones that limit the damages on nature (such as the use of solar energy and wind power), but it is not enough. Obtaining the technology and changing the industrial processes to reduce or eradicate the negative impact towards the environment would only be sustainable if consumers' demand allows it. The key to the other half of the solution to the problem lies in changing consumer behavior (OECD, 2008), and this behavioral change can only go so far by itself as well; a reduced demand for processes that endanger the environment will still produce negative effects on it, except at a slower pace than before (Lorek & Fuchs, 2013; 2011).

Both methods of achieving sustainable consumption present their own difficulties in being accomplished. Changing industrial processes for a greener planet can be achieved through monetary resources and governmental or managerial decisions. However, accomplishing sustainable consumption of energy through the change of behavior in consumers could pose a greater challenge (Farber, n.d.). While sustainable production of energy can be achieved through the efforts and decisions of key individuals in political positions with the power to make those changes, the steps to accomplishing sustainable consumption are more complicated. For it to be achieved, consumers have to make the individual decision to change their behaviors in order to create a mass sustainable consumption. Mass persuasion of consumer attitudes towards saving energy has to be achieved. This study reviews methods of persuasion that can be used for this purpose.

Individuals engaging in behaviors that encourage sustainable consumption benefits society as a whole, and these behaviors are seen as positive and encouraged, however "What is good for society in the long run is not necessarily the best option for the individual in the short term" (Van & Hans, 2013, p. 3). That may be the reason why, despite being both aware and concerned about the environmental impact behind their consumption choices, there is a gap between consumers' values of sustainable behaviors and their actions towards accomplishing them (Van & Hans, 2013; Young et al., 2010).

One way to achieve the desired behavioral change is through the use of persuasive messages. Persuasion strategies can be used to seek behavioral change, and in the world of mass persuasion, these strategies are applied in the shape of campaigns, be it of social, health, or environmental nature. This study takes special interest in communication that uses the promise of reward or punishment for the purpose of persuading individuals in

changing intentions positively towards energy saving. While research has previously looked at the effectiveness of both of these methods separately (e.g., Janis & Feshbach, 1953; Porter & Lawler, 1968; Rogers, 1975; Staples, Hulland, & Higgings, 1998; Vroom, 1964) this study looks to compare both rewarding and punishing messages in order to determine if one is more likely to change behavioral intention for the purpose of saving energy. This study also looks at the likelihood of changing intention from the perspective of individual and social punishment or reward. For a governmental entity interested in achieving sustainable consumption of energy through a shift in consumer behavior, it would be key to learn how to communicate with its audience in order to persuade them to support sustainable energy consumption, and which methods prove more likely to achieve their proposed goal.

Review of Literature

Persuasion as a topic of study has been discussed for decades. Scientific discourse on persuasive communication can be dated back to the 1940s (Gass & Seiter, 2011). Scholars have given persuasion several definitions since then. For example, Gass and Seiter (2011) broadly describe persuasion as any attempt at changing the attitudes, motivations, beliefs, and behaviors of one or many individuals. Perloff (2003) combines this and other definitions by stating that: "Persuasion is a symbolic process in which communicators try to convince other people to change their attitudes or behavior regarding an issue through the transmission of a message, in an atmosphere of free choice" (p.7).

As social beings, humans are exposed to messages that influence attitudes (Perloff, 2003). We can find examples of these messages in books, movies, songs, and certain interactions with other human beings (Perloff, 2003). For example, a parent who wants

their child to behave might offer a reward later on if the child complies, or threaten with a punishment if they don't; a person listing the positive attributes of a movie to their friend is trying to persuade them into watching it, or someone flirting with another person in an attempt to convince them to go out on a date.

But persuasion pervades the lives of the average human being in other ways. These other types of persuasive messages come in the shape of advertisement and publicity campaigns. Many pieces of advertisement are, after all, a company's attempt at making consumers buy their product. These forms of persuasive communication can be found everywhere around us: in the daily mail, in the newspaper, outside on billboards visible from every street, and cluttering many social media outlets, to mention just a few. According to Media Matters (2007), the average person is exposed to advertising messages 600 times a day.

Scholars have looked at persuasion from different angles. Studies have looked at persuasion from the side of persuaders, exploring the techniques often used by them to convince and persuade (Lee, Levine, & Cambra, 1997). Studies have also focused on the effects these and many other tactics have on their audiences. For example, these studies have focused on the effect of different methods of persuasive communication on the attitudes of smokers (Hackleman, 1973); how source credibility affects persuasion (Kumkale, Albarracín, & Seignourel, 2010); as well as the use of humor on information processing and persuasion (Moyer-Gusé, Bryne, & Nabi, 2007). In addition, another duality in the work of the study of persuasion comes as the distinction between persuasion achieved through rational thought versus persuasion achieved through emotion (Briñol & Petty, 2012).

As a result of this body of research, there are a large number of theories on how to persuade an audience into changing their attitudes and behaviors, such as social judgment theory, the narrative paradigm, or the elaboration likelihood model (Dainton & Zelley, 2005). These theories, along with many others, can help to better understand how persuasive communication works, which is a necessity in today's world, where we are so exposed to persuasive media (Dainton & Zelley, 2005).

Persuasion tactics can also be used to change attitudes and behaviors for the benefit of social and ecological causes. Such is the case when social and environmental campaigns are put into action. The use and study of persuasive communication is not only important because it allows the persuader to gain something, but because of how it can be used to help and guide groups of people into engaging in healthy behaviors or avoiding harmful ones by being incorporated into communication campaigns (Mendelsohn, 1973). The benefits sought by these campaigns are not restricted to those where the messages are more individualized, as would be the case with smokers and drinkers, but can also be extended to behaviors that seek a more general audience. Such is the case with environmental causes and campaigns crafted to persuade their audiences to change behavior for the greater good. In the case of energy saving, persuasion requires convincing the audience to make an effort and alter their use of energy for the purpose of achieving sustainable consumption of energy. It is in the best interest of the institutions behind these environmental campaigns to know and understand what types of messages are more effective in persuading the audience towards this goal (Mendelsohn, 1973).

Expectancy Theory

Expectancy theory was first developed in 1964 by Victor Vroom, who centered his studies on motivations behind decision making, with direct applications to work settings. Vroom's (1964) theory consists of three important variables. The first one is expectancy, which is the individual's belief that their efforts will result in achieving desirable performance. This variable is influenced by the individual's belief about their own ability to perform successfully, the difficulty of the goal presented, and their perceived control over the expected outcome. The second variable is instrumentality. This is the individual's belief that they will be rewarded if they perform as expected. Instrumentality is affected by the trust the individual has in those deciding their reward, in control over how the decision is made, and in the standing policies concerning performance and outcome. The third variable in expectancy theory is valence, which is the value the individual places on the expected reward. Valence is affected by the individual's needs, goals, and values, as well as sources of motivation.

Motivations affect attitude and behavioral change, and persuaders may use someone else's motivations as a tool to persuade them. One way to motivate others is by offering a reward; something desired being accomplished or gained as a result of compliance (Marr, 2009). It comes natural to assume that by offering an individual something desirable, they will agree to perform a task. This very thought is the basis behind labor. People get up early and go to work for most of their day in order to be rewarded a payment.

According to expectancy theory, behavior in individuals is motivated due to what they believe the result of that behavior will be, and they put forth effort accordingly. Traditionally, this theory has been applied to management settings in order to explain how

if employees believe that putting effort into their work will be rewarded, then they will work harder in order to achieve the reward (Vroom, 1964).

Other researchers worked on expanding this theory, arguing that Vroom's model was too simplistic, and proceeded to perfect it. Among the most notable contributions are Graen (1969), Lawler (1971), Lawler and Porter (1967), and Porter and Lawler (1968). Their criticism addressed the fact that Vroom's model did not account for the distinction between actions and outcomes, or the types of expectancies associated with each of them, and how they affect motivation. (Campbell, Dunnette, Lawler, & Weick, 1970).

Taking into account the developments made since Vroom's model, expectancy theory states that individuals will choose to engage in a behavior if their perceived reward for it is valuable enough to justify their effort, and if they believe they can perform the task successfully (Lawler, Porter, & Vroom, 2009).

While expectancy theory has been mainly applied to managerial purposes (Porter & Lawler, 1968; Staples, Hulland, & Higgins, 1998; Vroom, 1964), the theory has also been applied to issues outside the workplace. Research has been applied to topics such as analyzing the association between alcohol outcome expectancies and consumption (Jones, Corbin, & Fromme, 2001); analyzing expectancy motivations for dieting in patients with eating disorders (Hohlstein, Smith, & Atlas, 1998); the study of motivations in building refurbishing for the purpose of energy saving on the owner occupied housing stock (Organ, Proverbs, & Squires, 2013), and examination of the interaction between the internal and external factors that influence pro-environmental behavior inside a business setting (Halsell, 2014).

For the purpose of energy saving, Vroom's expectancy theory translates into whether individuals perceive themselves as capable of performing the actions to save energy, whether the outcome of said actions is valuable for them (lowers carbon emissions, cheaper bills, gaining an eco-friendly image), and whether obtaining these outcomes does not come into conflict with more relevant priorities. In other words, individuals can be motivated to change behavior towards saving energy by offering either monetary (lower bills) or social rewards (being perceived as ecologically conscious) if the task is perceived to be within their capabilities and does not conflict with more important interests.

While previous studies on expectancy theory show that rewards do work as a motivational tool, even possibly for the purpose of energy saving, there are clear limitations to how far rewards can go. The theory states that the limitations of a reward can be found in whether the individual one is trying to motivate views the reward as desirable or not (Lawler & Suttle, 1973). When thinking of rewards, it is easy to conjure the image of material gain, which in energy saving could take the shape of cheaper bills, or an added material bonus offered by the motivator, which affects them positively as an individual (for example, offering discount coupons for food, entertainment, clothes, etc.). However, there is also the option of offering intangible rewards. These aim to catch the individual's interest with the promise of social rewards, which do not involve any sort of material gain (such as the promise of greater acceptance and praise from their surrounding community; Marr, 2009). That is to say, that while the expectancy of reward can certainly work to motivate change in behavior, the reward in itself is a very important factor in the effectiveness of such a promise (Lawler & Suttle, 1973).

As such, different types of motivations can be used to persuade individuals. For example, research has found that the human brain processes social rewards in the same manner as monetary rewards (Fliessbach et al., 2007). Additionally, other research has found that individuals with pro-social values are more likely to engage in environmentally conscious behavior than those with egoistic interests (Martiskainen, 2007). Taking this into account, it is of interest to evaluate which type of reward offered works more effectively towards reaching the proposed goal, so that it can be applied accordingly. While individual material gain seems to be the most obvious option, could the lure of social status and acceptance be used to motivate individuals into changing their behaviors positively towards energy saving? On the other hand, could the loss of such things serve to motivate for the same purpose?

Extended Parallel Process Model

Fear can also be used as a motivational tool to achieve persuasion. Contrary to rewards, which use the promise of gain to achieve behavioral change, individuals can be persuaded to change their behaviors out of fear of the outcome their current behavior can bring, or by failing to behave in a certain way. Communications that use these types of tactics in an attempt to achieve compliance are called fear appeals (Witte, 1994). Not to be confused with coercion, which uses threats and intimidation to force an individual to comply, fear appeal methods use the framing of information about the consequences of engaging in a certain behavior as a way to persuade the audience into changing this behavior or avoiding it altogether.

The extended parallel process model (EPPM) is one of these frameworks. Crafted by Kim Witte (1994), this model was based on both Leventhal's (1970) danger control

framework and Roger's (1975) protection motivation theory. The EPPM varies from other

approaches to fear appeals by taking into consideration both fear control and danger

control processes.

"The EPPM offers a more balanced view of how people process fear appeals because

it addresses both the cognitive and emotional factors associated with message processing

and relates these processes to a fear appeal's success or failure." (Witte, 1994, p. 114).

By developing this model, Witte addressed a gap in research of appeals, which up to

that moment focused on danger control processes and their persuasive success (Witte,

1994). Witte's model addressed this gap by taking into account fear control processes and

persuasive failure.

When applying fear as motivation towards behavioral change, EPPM uses four key

factors to predict the possible outcome. The first factor is self-efficacy, which is the

perceived competence of performance needed to control the risk. The second one is

response efficacy, which is the perceived effectiveness of risk control the action has. The

third factor is susceptibility, which is the perceived probability of impact the threat has on

the individual. The fourth one is severity, which is the perceived magnitude of the threat

(Witte, 1994).

By combining these four factors, the EPPM predicts three possible outcomes for

behavioral change as a result of using fear appeals. If the individual perceives that the

danger is severe enough and that they can be highly susceptible to it, they will change their

behavior and engage in danger control as long as they consider their self-efficacy to be high

as well. However, if the individual perceives that their ability to control the risk is low, then

they will engage in fear control instead, by changing their attitude instead of their behavior

in order to manage the resulting anxiety. Lastly, if both severity and susceptibility to the threat are perceived to be low by the individual, then the fear appeal will have no effect on them and no steps will be taken to control either fear or danger (Witte, 1994).

Fear appeal tactics are often used by public health organizations with the hope that stressing the consequences of unhealthy habits might persuade the masses to abandon certain behaviors (Hass, Bagley, & Rogers, 1975). Research on this common topic has been extensive (e.g., Janis & Feshbach, 1953; Rogers, 1975; Rogers & Thistlethwaite, 1970), and fear appeal has been found to facilitate persuasion in the case of health related topics (Higbee, 1969), such as cigarette or alcohol consumption. Studies on EPPM have tested the framework with a wide variety of research methods; from experiments and focus groups to surveys and content analysis (Roberto, 2013). It has been used to analyze such a wide variety of risk communications by virtue of being able to explain the factors that affect how fear appeals can succeed or fail in persuasion (So, 2013).

While the past examples show an abundance of research on fear appeals integrated into health campaigns, research on the topic of using fear appeals for the sake of energy saving has been scarce. One example that analyzed this topic was Hass, Bagley, and Rogers' (1975) research. Their research compared the effects of using the magnitude of noxiousness an energy shortage could possibly cause versus using the likelihood of an energy shortage happening as a fear appeal. While they found that increasing the likelihood of the shortage had no effect on strengthening intentions to save energy, the opposite happened when they increased the noxiousness caused by the shortage (Hass et al., 1975). The results of this research show that while fear can be used as an effective motivation, not all threats may work as effectively.

As with expectancy theory, EPPM considers specific factors important in determining whether individuals will be motivated to change behavior towards the expected goal. In this case, the severity of the punishment or threat factors in as one of them. In order to be affected by fear appeals, individuals must consider the threat (be it energy shortage, higher bills, or social rejection to their behaviors) to be of importance to them and a likely consequence of their current actions (Witte, 1994). They must also be aware of what type of behavior can help them avoid said consequences (in this case, which behaviors will help them save energy) and they must consider themselves capable of performing these behaviors satisfactorily enough to avoid the threat (for example, a household with low income would not be persuaded through fear appeal to make expensive modifications to their house in order to make it more energy efficient because they are not capable of doing so; Witte, 1994).

For the purpose of measuring the method's efficiency in changing intentions towards energy saving, it is important to determine what type of threat can more adequately cause behavioral change in individuals. There exists the punishment of material loss (higher bills to pay) as well as the punishment that can manifest in the form of guilt, fear of social rejection, or disappointment by causing troubles to the community (threats towards the community's well-being due to greenhouse gas emissions, or dwindling of the community's energy supply). If social acceptance and praise can be used as a reward, then it follows that the opposite can be used as punishment, which has been found to positively affect norm compliance in individuals (Spitzer, Fischbacher, Herrnberger, Grön, & Fehr, 2007). However, the question remains on which of these two punishments will carry more

severity in the individual's mind, and thus is more effective to use in changing intentions towards energy saving.

Research on EPPM and expectancy theory have shown that both reward and punishment are valid methods of motivation and affect likelihood of changing intention. By comparing the rate to which punishment and reward affect intention, this study looks to offer an idea of which method is more persuasive and how to better craft persuading messages for environmental campaigns. As will be discussed below, environmental campaigns can make use of communication and mass media to attempt to reach their goals, thus communication studies on persuasion can prove useful in the reaching of these goals.

Persuasion in Ecological Campaigns

Environmentalism is involved with various causes concerning the protection and improvement of the environment. While in the past there have been governmental regulations put in places to secure and promote the protection of the environment, such as the Kyoto protocol to reduce greenhouse gas emissions in 1997 (O'Neill & Nicholson-Cole, 2009), not every aspect of human behavior that is harmful to the environment can be regulated. For example, governments may be unwilling to tell their citizens when, where, how, and how much of their resources they can use (such as water, electricity, gasoline). Even if fines are added to the excessive use of these resources, such measures cannot ensure the resources are not wasted. For once, there may be individuals with both wealth and will to pay for the continued misuse of these resources, or those who while avoiding spending enough to reach such fines, still misuse these resources.

Although activism in favor of the environment includes lobbying for regulations to protect it, a large part of activism also has to do with persuading the masses to support its

causes. These attempts at persuasion take the shape of campaigns, aimed at educating the

population about the risks of human consumption towards the environment, and coaxing a

change in behavior towards sustainable practices (Gottlieb, 2005).

Environmental campaigns make the use of communication the same way that

commercial advertisements often do (Rice & Atkins, 2013). These methods range from

public demonstrations to more traditional media such as advertisement on televisions,

magazines, and billboards. Environmental advertisement often uses attention-catching

images and thought provoking messages to capture the public's attention and create

awareness on the topics addressed by the campaign in particular. Environmental campaign

communications differ from commercial advertisement in the fact that their purpose is not

to sell a product or raise awareness about a brand, but rather to create consciousness and

change on the topic addressed by the campaign (Cox, 2012).

Some of these environmental advertisements make use of written messages, which

are then reinforced through the use of images. An example of this is a climate change

awareness campaign made by the World Wide Fund for Nature (WWF). In the

advertisement, the message "Stop climate change before it changes you" is displayed over

an image of a human being that has mutated to look more like a fish than a person,

symbolizing a reverse-evolutionary world (Lytton, 2013). In this case while the message

alone is powerful, the image aids in creating a stronger impression on the viewer.

In other instances, both the written message and the image are linked to one

another, in the sense that one cannot be understood without the other. For example, a

campaign by the WWF made use of parallel images accompanied by text to create

awareness for animal species in danger of extinction. In one instance the image to the right

had a shark fin protruding from the water accompanied by the words "Horrifying." In an image next to it there is the same picture of the water, but without the shark fin, accompanied by the words "More horrifying" (Lina, 2014). In this case the message is divided half and half between words and images, and one makes no sense without the other. In all of these instances the strategy behind the message has been to use the fear of a threat to drive persuasion, by presenting the audience with an undesirable scenario as an outcome of a current situation.

But while the delivery might differ in medium and shape, the aim of these advertisements is the same: to use persuasive communication to cause awareness about environmental subjects either by informing about them or warning about their consequences and, consequentially, create a change in behavior that positively affects the cause (Rice & Atkins, 2013).

A common factor that rises amongst the campaigns previously discussed and many others directed towards the protection of the environment is the type of message displayed. Many advertisements aimed towards creating awareness of the environmental and social causes make use of language to reach their objectives. Their use of language seeks to coax compliance through causing guilt on the viewer for their actions, or fear of the dangers that lie in destroying the environment (Pfau, 2007). However, while all of these campaigns can be considered of persuasive nature if we take into account that they have been crafted to persuade and influence an audience towards change, not all of them make use of the principles that have resulted from mass media communication research. As a result, these attempts of persuasion tend to end in failure (Bator & Cialdini, 2000). On the other hand, research has shown that campaigns that make proper use of findings in social and

communication science tend to be successful (Mendelson, 1973). From here we can draw the importance of researching persuasive communication in order to best apply it for the purposes at hand. As stated before, ecological campaigns are made with the purpose to change something; it is only logical to ensure the use of effective tactics in their crafting. In this research, that means evaluating the effectiveness of reward and punishment in persuasive communication for the purpose of changing intentions positively towards energy saving, in order to determine which method proves to be more adequate for this topic.

Research Questions

The goal of this research is to analyze and compare the effectiveness of persuasive methods that use either rewarding or punishing language in achieving change in intention positively towards energy saving. Previous research has shown that there is a positive relation between intentions of performing and actual change in behavior (Webb & Sheeran, 2006), as such, this study measures reported intentions to change behavior positively towards energy saving. While research shows that both the use of fear appeal as a promise of punishment and the promise of rewards can work effectively towards changing behavior, this study looks to compare the effectiveness of both methods in changing likelihood of intention positively towards energy saving. In addition, this study also looks within each method to determine whether individual or social punishments and rewards are more effective as a motivation factor in changing intentions towards energy saving. Taking into account that both methods place importance on how the type of motivation offered affects the outcome, this research examines which type of either punishment or reward seems to be the more effective in changing intentions positively towards energy saving. Determining

the type of persuasive method will provide a useful tool of reference for the entities in need

of changing consumer behavior in the area of energy saving through the use of persuasive

messages, and potentially decrease the waste of such resources if used.

Taking this into account, the following research questions are proposed:

RQ1: Do individuals report higher likelihood of intention to engage in positive

energy saving methods when viewing a rewarding message or a punishing message?

RQ2: Do individuals report higher likelihood of intention to engage in positive

energy saving methods when viewing a socially rewarding message or an

individually rewarding message?

RQ3: Do individuals report higher likelihood of intention to engage in positive

energy saving methods when viewing a socially punishing message or an

individually punishing message?

Method

To answer these questions, this study makes use of an online experiment in which

both rewarding and punishing messages are measured for their effectiveness in changing

intentions positively towards energy saving. In addition, the experiment also examines the

compared effectiveness of the use of social and individual rewards and punishment

respectively.

To manipulate social punishment, individual punishment, social reward, and

individual reward, a message for each variable was crafted and put together with images

that simulate campaign advertisement. For the social punishment message, the image of a

neighborhood in the dark of night, with all lights out except for one, was used accompanied

by the message "Every time you waste energy, you are one step closer to leaving everyone

else in the dark" as shown in Figure 3 (all figures appear in Appendix B). For the individual

punishment message, a black and white image of a light switch and a coin inserter next to

one another was used, accompanied by the message "The more you waste energy, the more

you will PAY" as shown in Figure 4. For the social reward message, an image of a hand

holding a patch of green and environmentally clean land was used, accompanied by the

message "By saving energy whenever you can, you help make the world a cleaner and

brighter place for everyone else" as shown in Figure 2. Finally, for the individual reward

message, an image of a hand putting coins inside a light bulb was used, accompanied by the

message "When you save energy, you save yourself money" as shown in Figure 1.

These messages were divided into four individual surveys, which were completed by

different groups of individuals. The last and fifth group was used as a control group, where

no image or message was shown to participants. These surveys were administered online,

by posting the links to the surveys across different social media platforms (reddit,

Facebook, and Tumblr) and inviting users who were 18 years or older and were

citizens/residents of the United States to complete the questionnaire. As a result, a final

sample of 382 respondents was gathered in the month of October 2015. The sample is

divided as follows:

Table 1

Sample Per Message Type

Message Type	Sample
Social reward	116
Individual reward	70
Social punishment	61
Individual punishment	73
No message (control group)	62

Dependent Variables

Likelihood of intention towards energy saving. The likelihood of intention to save energy reported by respondents was measured by presenting seven statements that claimed intention to engage in energy saving such as "I will unplug appliances when I'm not using them" after being exposed to the persuasive message. Participants were asked to read these statements and then rate their intentions to engage in the proposed behavior on a scale of 1 to 7, where 1 = *Unlikely* and 7 = *Likely*. For the first statement, respondents were asked to state their likelihood to turn off the lights when unused. This question was then reverse coded as a fifth statement, where respondents were asked to state their likelihood of not turning off the lights when unused. These questions were the same across all five surveys.

Manipulation check. In order to verify if respondents found the messages to be rewarding or punishing, four manipulation check questions were prepared. The purpose of the manipulation check was to ensure that the messages used were viewed as intended

(punishing and rewarding) by participants, so that the resulting intention could be correctly attributed to the method of motivation used. These four questions differed from survey to survey, and were entirely absent on the control group survey. Respondents were presented with sentences that matched the type of message by either stating a fear of the punishment or a desire for the reward offered related to their use of energy. They were then asked to rate them on a scale of 1 to 7, where 1 = *True* and 7 = *False*.

Independent Variables

Demographics. The demographic variables measured with this survey were gender, age, race, level of education, household income, city of residence, and contribution to the electricity bill. These questions were close-ended.

Individual perceived environmental consciousness. This variable was intended to measure participants' self-perceived environmental consciousness. To measure this variable, respondents were presented with the statements "I am environmentally conscious," "I believe it is important to save energy," and "How often do you consider engaging in energy saving behaviors," then asked to evaluate the truthfulness of those statements on a scale of 1 to 7 where 1 = *True* and 7 = *False*.

Social perceived environmental consciousness. This variable was intended to measure how participants perceived other individuals' environmental consciousness. To measure this variable, respondents were presented with the statement "Most people believe it is important to save energy," then asked to evaluate the truthfulness of that statement on a scale of 1 to 7 where 1 = *True* and 7 = *False*.

Previous energy consuming behavior. This variable was intended to measure participants' self-reported energy consumption previous to being exposed to the

persuasive message. To measure this variable, respondents were asked how often do they

engage in energy saving behaviors on a scale of 1 to 7, where 1 = *Never* and 7 = *Often*.

Respondents were also asked to rate the perceived consumption of energy in their

household on a scale of 1 to 7, where 1 = *Excessive* and 7 = *Limited*.

When gathering respondents, participants were asked to click on a link and fill out a

short anonymous survey. They were presented first with the individual environmental

consciousness, social environmental consciousness, and pre-behavior questions and told to

rate them on a scale of one to seven. Then they were asked to carefully look at the

presented image and accompanying message before answering the following statements.

The image was presented, followed by the manipulation check, and then the items intended

to measure intention. Finally, participants were asked several questions about their

demographic factors.

Results

The sample of this study consisted of citizens/residents of the United States varying

in ages from 18 to 75 years, with 61 percent of the sample varying in ages from 18 to 30

years old. The population of the sample consisted of 46.7% females and 53.3% males. The

majority of the sample reported to be White (61.7%), followed by Latinos/Hispanic

(27.5%). In addition, 93% of respondents reported to have received higher education past

high school, with 28.1% reporting having completed some college, 40.5% reporting having

finished college, and 24.4% reporting assistance to graduate school. When it came to

income, the samples were very evenly distributed, as seen on Table 2. In this sample, 72.2%

of respondents answered positively to contributing to the payment of the household

electricity bill, while 27.8% did not.

Table 2

Average Household Income

Income	Percent
Less than $25,000	15.1
$25,000 to $50,000	22.6
$50,000 to $75,000	17.9
$75,000 to $100,000	15.6
$100,000 to $125,000	12.2
$125,000 to 150,000	15.7

RQ1: Do individuals report higher likelihood of intention to engage in positive energy saving methods when viewing a rewarding message or a punishing message?

Seven scale items were prepared in the survey for the purpose of measuring "intention to save energy" after being exposed to either rewarding or punishing messages. Cronbach's Alpha was used to check internal consistency in measuring the "intention to save energy" variable. After finding that the fifth item was inconsistent with the rest, that item was dropped and the remaining six questions were found to be reliable ($\alpha = 0.76$). These six questions were then combined to form a single variable that measured "intention to save energy." An independent-samples *t*-test was conducted to compare the mean intention of participants who were exposed to punishing messages ($M = 5.05$, $SD = 1.14$) to the mean intention of participants who were exposed to rewarding messages ($M = 4.89$, $SD = 1.22$). No significant difference was found $t(317) = -1.191$, $p > .05$. These results indicate that while participants reported intention to save energy, there was not a significant

difference between the reported intention resulting from the use of rewarding and
punishing messages used.

When breaking down the analysis to examine rewarding versus punishing on an
individual level, an independent-samples *t*-test was run to compare the mean score of
participants who were exposed to an individual rewarding message (*M* = 4.87, *SD* = 1.09) to
the mean score of participants exposed to an individual punishing message (*M* = 5.39, *SD* =
1.08). A significant difference was found, *t*(140) = -2.841, *p* < .005. These results indicate
that while there is no significant difference between rewarding and punishing messages in
general, participants who were exposed to the punishing message were more likely to
report intentions to engage in positive energy saving behaviors than those viewing the
rewarding message. That seems to be an indicator that the individual factor is more
influential in causing motivation to save energy than the punishing factor.

An independent-samples *t*-test was run to compare the mean score of participants
who were exposed to a social rewarding message (*M* = 4.90, *SD* = 1.29) to the mean score of
participants exposed to a social punishing message (*M* = 4.64, *SD* = 1.09). No significant
difference was found, *t*(175) = 1.313, *p* > .05. These results indicate that participants
exposed to these messages did not report any differences in intention to engage in positive
energy saving behaviors.

An independent-samples *t*-test was run to compare the mean score of participants
who were exposed to an individual message (*M* = 5.13, *SD* = 1.11) to the mean score of
participants who were exposed to a social message (*M* = 4.81, *SD* = 1.23) A significant
difference was found, *t*(317) = 2.445, *p* < .015. These results show that participants exposed

to individual messages were more motivated to report likelihood of intention to engage in positive energy saving behaviors.

RQ2: Do individuals report higher likelihood of intention to engage in positive energy saving methods when viewing a socially rewarding message or an individually rewarding message?

An independent-samples *t*-test was run to compare the mean score of participants who were exposed to an individual rewarding message (*M* = 4.87, *SD* = 1.09) to the mean score of participants exposed to a social rewarding message (*M* = 4.90, *SD* = 1.29). No significant difference was found, *t*(183) = -.155, *p* > .05. These results indicate that there are no significant differences in viewing a socially or individually rewarding message and the reporting of behavioral intentions to engage in positive energy saving methods.

RQ3: Do individuals report higher likelihood of intention to engage in positive energy saving methods when viewing a socially punishing message or an individually punishing message?

An independent-sample t test was run to compare the mean score of participants who were exposed to a social punishing message (*M* = 4.64, *SD* = 1.09) to the mean score of participants exposed to an individual punishing message (*M* = 5.39, *SD* = 1.08). A significant difference was found, *t*(132) = -3.951, *p* < .001. These results indicate that those exposed to the individual punishing message were significantly more likely to report intentions to engage in positive energy saving methods than those that viewed the socially punishing message.

Control Group

Without having a reference to compare these results, it would not be possible to show that participants reported higher level of intentions to save energy after being exposed to the manipulating messages. To show this, an independent-sample *t*-test was run

to compare the mean score of participants who were in the control group (M = 4.51, SD

=1.29) to the mean score of participants exposed to persuading messages (M = 4.95, SD =

1.19). A significant difference was found, $t(379)$ = 2.663, $p < .008$. These results show that

participants exposed to the manipulated messages were more likely to indicate intentions

to engage in positive energy saving behaviors than those that were not exposed to any

messages. If manipulation had not occurred, one would expect the experimental and

control groups to have no differences.

Manipulation Check

Four scale items were prepared in the survey for the purpose of measuring

"message manipulation" after being exposed to either rewarding or punishing messages.

These items show that respondents viewed the presented message as reward or

punishment respectively. Cronbach's Alpha was used to check their reliability in measuring

the "message manipulation" variable. All four questions were found to be reliable (α =

0.82). These four questions were then combined to form a single variable that measured

"message manipulation." The mean of the manipulation variable for individual rewarding

message is (M = 2.04, SD = 1.02). The mean of the manipulation variable for social

rewarding message is (M = 3.22, SD = 1.39). The mean of the manipulation variable for

social punishing message is (M = 3.25, SD = 1.37). The mean of the manipulation variable

for individual punishing message is (M = 1.81, SD = 1.07). Put together, the mean score of

the manipulation across all messages is (M =2.65, SD = 1.4). Assessment of manipulation

was not used to determine if the rewarding message was seen as more rewarding than the

punishment message, but to assess whether respondents found the message itself to be

rewarding (similarly, punishing). Findings showed that participants were more likely to

agree than disagree that each message was either individually or socially rewarding or

punishing within each of those conditions.

Table 3

Manipulation Results

Message type	M	SD
Individual reward	2.04	1.02
Social reward	3.22	1.39
Social punishment	32.25	1.37
Individual punishment	2.65	1.4

Note. 1 = *true* and 7 = *false*.

Pre-Behavior

Combining two scale items formed a "pre-behavior variable" that measured the

participants' behavior previous to exposure to the persuading message. An independent-

sample *t*-test was run to compare the mean score of participants' reported behavior

previous to exposure to the message (*M* = 2.79, *SD* =1.31) to the mean score of participants'

intention of behavior after exposure to the message (*M* = 4.95, *SD* = 1.19). A significant

difference was found, *t*(379) = 2.663, *p* < .001. These results show that there is a significant

difference such that individuals report higher intentions to engage in positive energy saving

behavior after viewing any of the persuasive messages than their reported pre-behaviors.

Energy Bill Payment and Intention to Save Energy

To show if the factor of contributing to the electricity bill influenced in any way the

responses of participants who were exposed to the individual rewarding message, an

independent-sample *t*-test was run to compare the mean score of intention to save energy

from participants who were exposed to individual rewarding messages and contribute to

paying the electricity bill (M = 4.81, SD = 1.17), to the mean score of intention to save

energy from participants who were exposed to individual rewarding messages and do not

contribute to paying the electricity bill (M = 4.98, SD = 0.90). No significant difference was

found, $t(67)$ = -.585, p > .05. To show if the factor of contributing to the electricity bill

influenced in any way the responses of participants who were exposed to the social

rewarding message, an independent-sample t-test was run to compare the mean score of

intention to save energy from participants who were exposed to social rewarding messages

and contribute to paying the electricity bill (M = 4.96, SD = 1.34), to the mean score of

intention to save energy from participants who were exposed to social rewarding messages

and do not contribute to paying the electricity bill (M = 4.77, SD = 01.19). No significant

difference was found, $t(114)$ = .739, p > .05. To show if the factor of contributing to the

electricity bill influenced in any way the responses of participants who were exposed to the

individual punishing message, an independent-sample t-test was run to compare the mean

score of intention to save energy from participants who were exposed to individual

punishing messages and contribute to paying the electricity bill (M = 5.46, SD = 1.05), to the

mean score of intention to save energy from participants who were exposed to individual

punishing messages and do not contribute to paying the electricity bill (M = 5.09, SD =

1.18). No significant difference was found, $t(71)$ = 1.137, p > .05. Finally, to show if the

factor of contributing to the electricity bill influenced in any way the responses of

participants who were exposed to the social punishing message, an independent-sample t-

test was run to compare the mean score of intention to save energy from participants who

were exposed to social punishing messages and contribute to paying the electricity bill (M =

4.66, *SD* = 1.11), to the mean score of intention to save energy from participants who were

exposed to social punishing messages and do not contribute to paying the electricity bill (*M*

= 4.55, *SD* = 1.006). No significant difference was found, *t*(59) = .263, *p* > .05. These results

show no evidence that contribution to the payment of the electricity bill has any effect on

the resulting intention of rewarding or persuasive messages, be it of social or individual

nature.

Discussion

This study analyzed rewarding and punishing messages to see if there was a

difference in the likelihood of changing intention positively towards energy saving between

the two methods. Additionally, it looked at social and individual types of messages inside

the rewarding and punishing variables to see if there was a difference in the likelihood of

changing intention positively towards energy saving for social and individual motivations.

When it came to how rewarding and punishing messages affected intention to save

energy, it was found that participants who reported that they did not previously engage in

energy saving behaviors also reported high intention to perform energy saving behaviors

after being exposed to both rewarding and punishing messages respectively. However,

when it came to comparing individual reward to individual punishment, results showed

that individual punishment was the more effective method in influencing likelihood of

changing behavior positively towards energy saving. Also, when comparing social and

individual methods of reward and punishment in their likelihood of affecting intention

positively towards energy saving, this study found that there was no significant difference

between using social or individual motivations for rewarding motivations. However, a

significant difference between the effectiveness of social and individual punishing messages

in positively changing likelihood of intention to save energy was found. These findings did

not extend to social reward and punishment, which had no significant difference in

resulting intention to save energy. In addition, when comparing the individual messages to

the social messages as a whole, the research showed that individual messages were more

effective in causing participants to report intention to save energy than social messages.

Taking into account that there was no significant difference between the comparison of

resulting intention by the use of reward and punishment, but that individual messages

were found more effective when comparing them to social messages, the results seem to

point towards the individual factor as the most effective in creating intention to save energy

from among the methods used in this study. The fact that a certain factor can affect the

effectiveness of either reward or punishment as motivation corroborates with expectancy

theory (Lawler et al., 2009) and the EPPM (Witte, 1994), as both theories clearly state that

reward and punishment respectively will be effective in changing behavior depending on

different factors. In the case of this study, results show that the most important factor to

affect intention was the individual characteristic of the message, and that using individual

types of motivational punishment in communication may result in being more persuasive

for individuals to behave in ways that save energy for the messages used in this study.

Overall, these results also corroborate with previous findings on rewarding messages'

(Halsell, 2014; Hohlstein et al., 1998; Jones et al., 2001; Organ et al., 2013) and punishing

messages' (Hass et al., 1975; Higbee, 1969) ability to persuade individuals positively

towards the desired outcome.

 In part, these findings relates to previous research that indicates social punishments

and rewards can be used as an effective motivational tool (Fliessbach et al., 2007; Spitzer et

al., 2007), but show that for punishment, it would be preferable to use individual

motivations to get better results in persuading the target audience. This research also

showed that when compared to individual reward, individual punishment may be more

effective in influencing likelihood of intention positively towards energy saving. However,

despite these conclusions, it is important to remember that no significant difference was

found between individual and social reward, which does not negate the assumption that the

individual factor is the most influencing in causing intention to save energy within this

study. The fact that no significant difference was found could be attributed to punishing

messages being slightly more influential than rewarding ones. Although no significant

difference was found between reward and punishment, coupled together with the

individual motivational factor, punishment was shown to be the most effective amongst

those methods. As a result, it may be that lacking the punishing factor in the rewarding

message eliminates the advantage that the individual rewarding message may have over

the social rewarding message, causing them to not be significantly different in causing

respondents to report higher levels of intention to save energy.

     The lack of a significant difference between the effects of social and individual

rewards for this study may also be due to respondents simply valuing both the individual

and social factors of the reward to the same extent. As expectancy theory states, one of the

factors involved in the effectiveness of a reward used as motivation to save energy lies in

the value that individuals place on the reward offered in the first place (Lawler et al., 2009).

     When examining the participants' answers about previous energy saving behaviors

the data shows a low frequency of engaging in these behaviors. Additionally, participants

answered positively to the manipulation check, which shows the messages were successful

in influencing the respondents. These results are further emphasized by findings that show

there was a significant difference between the mean score of the manipulated groups and

the mean score of the control group. Together, this data indicate that the messages crafted

for this study succeeded in persuading respondents into changing their intention positively

for the purpose of saving energy.

For individual rewarding and punishing messages, which offered motivations related

to personal finances as a result of energy saving behavior, it could be argued that

individuals who contribute towards paying the electricity bill could be more motivated to

save energy as a result of exposure to these messages. However, this study found no

evidence that contribution towards the payment of the household electricity bill has any

effect on the final intention to save energy with any of the four persuading messages used.

Limitations, Future Research, and Conclusions

This study's main purpose was to evaluate the differences in likelihood of success

between two persuasive communication methods in changing behaviors positively towards

energy saving. Results showed that both methods proved to be effective in influencing the

respondents' intentions to save energy after being exposed to the messages. Furthermore,

the results identified individual punishment as the more effective in changing likelihood of

intention across the four types of messages used. However, these results have several

limitations. Having used a convenience sample by reaching out to participants through

social media, there is the possibility that the results of this study are biased due to

underrepresenting or over representing of certain groups in the sample. Another limiting

factor for this study is the fact that it only measures self-reported intention of behavior

rather than measuring concrete behavioral change. This could also bias results, as there are

other implications beyond intention that may affect final behavior. The results of this study only measured self-reported intention of behavior immediate to exposure to a single persuading message, and thus cannot account for how these intentions may vary after time has passed from the moment of exposure to the message. In addition, by analyzing a very limited amount of examples, the results of this study could be biased by the wording of the questions and messages used. Future research on this topic can take these limitations into account by analyzing whether intention changes over time after message exposure in order to verify if resulting intention lasts enough to cause significant behavioral change.

Despite these limitations, the results of this study have theoretical implications relevant to the existent body of communication research. They serve to corroborate with previous research findings that assert that reward (Halsell, 2014; Hohlstein et al., 1998; Jones et al., 2001; Organ et al., 2013) and punishment (Hass et al., 1975; Higbee, 1969) can be used as motivation to influence behavioral change. Furthermore, the fact that individual punishing messages showed to be more effective in changing likelihood of intention in comparison to the other persuasive messages offers environmental activism a suggestion on what types of messages will render the best results when used for the purpose of persuasion.

As for results showing that both social and individual motivations are effective in affecting resulting intention, these show that social motivations such as guilt or social influence may be used as an effective motivational tool. Activists looking to craft communication campaigns that promote energy saving behaviors can take this into account and offer intangible rewards or punishments, rather than tangible ones. These tangible rewards might not be possible to achieve due to lack of sufficient budget or authority to

enforce punishments without lowering the rate of success in their campaign, in which case

the use of social motivations might be preferable. This point is further reinforced by the

lack of correlation found between contribution to payment of the electricity bill and

resulting intention to save energy. This shows that individuals can be equally motivated by

individual and punishing messages despite not being personally responsible for the

monetary implications of paying the bill. All of these findings can be used in the area of

activism for sustainable consumption of energy, and provide an insight in guiding the

process of message creation for communication campaigns of this nature and its likely

results.

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Appendix A

Survey with cover letter

PERSUASIVE COMMUNICATION ON INTENTION TO SAVE ENERGY

We invite you to take part in this research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time without penalty. The purpose of this research study is to gain a better understanding of persuasive communication for the purpose of positively changing behavior towards energy saving. You are not guaranteed any personal benefits from participating in this study.

If you agree to participate in this study, you will be asked a series of questions concerning energy usage and energy saving. There are no known risks to participants. Knowledge gained from this study may help participants in communication education. There are no direct benefits to the participants. The information in the study records will be kept strictly confidential. Data will be stored securely in an on-campus office. No reference will be made in oral or written reports that could link you to the study. You will be asked to NOT write your name on any study materials so that no one can match your identity to the answers that you provide. Participants will not receive compensation.

If you have questions at any time about the study or the procedures, you may contact the primary researcher at mpg4570@g.rit.edu. If you have questions about your rights as a research subject, please contact the Rochester Institute of Technology Human Subjects Research office at hmfsrs@rit.edu or (585) 475-7673.

By completing the survey, you indicate your willingness to participate in this study.

PLEASE FILL OUT THIS ANONYMOUS SURVEY IF YOU ARE 18+ YEARS OLD, AND ARE A CITIZEN/RESIDENT OF THE UNITED STATES.

Basic survey questions

Persuasive messages towards energy saving: punishing and rewarding communication. (Social punishment)

Read the following questions and rate your answers on a scale of 1 to 7

I am environmentally conscious

True   ☐1 ☐2   ☐3   ☐4   ☐5   ☐6   ☐7 False

I believe it is important to save energy

True   ☐1 ☐2   ☐3   ☐4   ☐5   ☐6   ☐7 False

Most people believe it is important to save energy

True   ☐1 ☐2   ☐3   ☐4   ☐5   ☐6   ☐7 False

How would you rate the level of energy consumption in your household?

Excessive   ☐1 ☐2   ☐3   ☐4   ☐5   ☐6   ☐7 Limited

How often do you consider engaging in energy saving behaviors? (such as turning off unused light, unplugging unused appliances, turning off unused appliances).

Never   ☐1 ☐2   ☐3   ☐4   ☐5   ☐6   ☐7 Often

How often do you engage in energy saving behaviors? (such as turning off unused light, unplugging unused appliances, turning off unused appliances).

Never   ☐1 ☐2   ☐3   ☐4   ☐5   ☐6   ☐7 Often

Please carefully look at this image and read the written message, answer the following questions based on your perceptions after viewing this advertisement.

Refer to Figure 1.

I would rather not deplete my community's energy resources through my excessive consumption of it.

True   ☐1 ☐2   ☐3   ☐4   ☐5   ☐6   ☐7 False

I am afraid that wasting energy will result in it becoming scarce

True   ☐1 ☐2   ☐3   ☐4   ☐5   ☐6   ☐7 False

I believe I will be punished if I waste energy

True   ⬜1 ⬜2 ⬜3 ⬜4 ⬜5 ⬜6 ⬜7 False

I believe saving energy will help me avoid negative consequences

True   ⬜1 ⬜2 ⬜3 ⬜4 ⬜5 ⬜6 ⬜7 False

Please read the following sentences and rate them according to your current intentions

I will turn off the lights in a room when I'm not using them.

Unlikely   ⬜1 ⬜2 ⬜3 ⬜4 ⬜5 ⬜6 ⬜7 Likely

I will shut down appliances when I'm not using them

Unlikely   ⬜1 ⬜2 ⬜3 ⬜4 ⬜5 ⬜6 ⬜7 Likely

I will unplug appliances when I'm not using them

Unlikely   ⬜1 ⬜2 ⬜3 ⬜4 ⬜5 ⬜6 ⬜7 Likely

I will only use compact fluorescent light bulbs (which are more energy efficient than other bulbs) in my household

Unlikely   ⬜1 ⬜2 ⬜3 ⬜4 ⬜5 ⬜6 ⬜7 Likely

I will not turn the lights off in a room when I'm not using them

Unlikely   ⬜1 ⬜2 ⬜3 ⬜4 ⬜5 ⬜6 ⬜7 Likely

I will unplug battery chargers when the batteries are fully charged or the chargers are not in use

Unlikely   ⬜1 ⬜2 ⬜3 ⬜4 ⬜5 ⬜6 ⬜7 Likely

I will use energy saving/economic mode when using my appliances (when applicable)

Unlikely   ⬜1 ⬜2 ⬜3 ⬜4 ⬜5 ⬜6 ⬜7 Likely

Please answer the following questions about yourself

City of Residence: _____

I am: _____ years old.

I am: ☐ Male   ☐ Female

Approximate yearly household income:
☐Less than $25,000
☐$25,000 to $50,000
☐$50,000 to $75,000
☐$75,000 to $100,000
☐$100,000 to $125,000
☐$125,000 to $150,000

Highest level of education
☐Did not attend school
☐Middle School
☐High School
☐Some College
☐College
☐Graduate School

Which race/ethnicity best describes you?
☐Native American or American Indian
☐Black or African American
☐Hispanic or Latino
☐White
☐Asian/ Pacific Islander
☐Other

Manipulation check questions
SOCIAL PUNISHMENT

1-I would rather not deplete my community's energy resources through my excessive consumption of it.

True   ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 False

2-I am afraid that wasting energy will result in it becoming scarce

True ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 False

3-I believe I will be punished if I waste energy

True ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 False

4-I believe trying to save energy will help me avoid punishment

True ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 False

INDIVIDUAL PUNISHMENT

1-I would like to avoid getting an expensive electricity bill

True ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 False

2-I am afraid that wasting energy will result in my electric bill rising up.

True ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 False

3-I believe I will be punished if I waste energy

True ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 False

4-I believe trying to save energy will help me avoid punishment

True ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 False

SOCIAL REWARD

1-It pleases me to be perceived as someone who helps keep the environment clean and makes good use of energy resources

True ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 False

2-I believe that by saving energy I will be perceived positively by others

True ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 False

3-I believe I will be rewarded if I save energy

True ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 False

4-I believe wasting energy will cause others to view me poorly (or negatively)

True ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 False

INDIVIDUAL REWARD

1-I would like to have cheap electricity bills

True ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 False

2-I believe that by saving energy I can lower my electricity bill

True ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 False

3-I believe I will be rewarded if I save energy

True ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 False

4-I believe saving energy will be beneficial to me

True ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 False

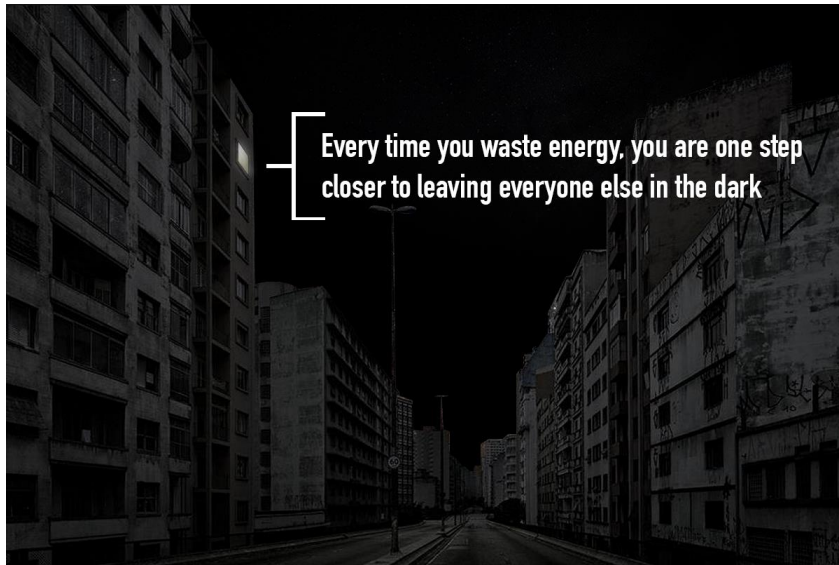Appendix B

Figures

Figure 1.

Figure 2.

Figure 3.

Figure 4.