

A Light Bulb Goes On: Values, Attitudes, Social Norms, and Personal Energy Consumption

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Abstract:

When do people take political action? What roles do values, elite rhetoric, and social norms play in motivating action? These questions are of obvious importance for those interested in political behavior; however, little work – other than research on participation – explores the impact of these various factors. This study offers a framework that generates hypotheses about the role of values, rhetoric, and norms in shaping political behavior. Predictions are tested in an experiment that focuses on a particularly important behavior – actions regarding the consumption of energy. I find that social norms play a key role in shaping individuals' attitudes about energy consumption, behavioral intentions to conserve energy, and actual behavior on a purchasing decision. Values, beliefs, and rhetoric also shape actions; however, social norms consistently exert the strongest impact. This accentuates the importance of incorporating social forces, in addition to psychological determinants, in the study of political behaviors. Additionally, the findings offer insight into ways to promote energy conservation.

Introduction

When do people take political action? What roles do values, elite rhetoric, and social norms play in motivating action? These questions are of obvious importance for those interested in political behavior; however, little work – other than research on participation (e.g. voting, financial contributions) – examines the impact of these various factors. In this paper, I explore how values, rhetoric, and norms affect private actions that have clear political consequences: actions regarding the consumption of energy.¹

I begin by offering a theory that identifies the factors that contribute to individuals' decisions to take action. The theory brings together a host of factors treated as distinct in past work. This includes internal factors such as values (Schwartz, 1992; 2006) and attitudes (Fazio, 1986; Ajzen & Fishbein, 1980), and external forces including elite rhetoric (Druckman, 2004; 2005; Levin, Schneider, & Gaeth, 1998) and social norms (Tetlock, 1985; Cialdini, 1990; Gerber, Green, and Larimer, 2008). I then test the theory's predictions with an experiment that explores the impact of these factors on behavioral intentions and observed actions. I find that social norms play a key role in shaping individuals' attitudes about energy consumption, behavioral intentions to conserve energy, and actual behavior on a purchasing decision. Values, attitudes, and elite rhetoric matter too, but social norms consistently exert the strongest

¹ Other private behaviors with public consequences include various choices affecting public health (e.g. smoking, exercise and diet, etc) and environmentally-significant actions (e.g. carbon emissions). While a dearth of studies in political science examine this class of actions (but see Lubell et al., 2007), social psychologists have explored the causes of *environmentally-significant behavior*, i.e., any action that changes “the availability of materials or energy from the environment or alters the structure and dynamics of ecosystems or the biosphere itself” (Stern, 2000, p. 408) Stern defines one specific class of environmentally significant behavior - i.e. *private-sphere environmentalism* – that includes personal decisions about energy usage and recreational travel. Thus, the actions I explore are politically and environmentally consequential (Dietz, Stern, & Guagnano, 1998; Stern et al, 1999, Stern, 2000).

influence on behavior. This accentuates the importance of incorporating social forces, in addition to psychological determinants, in the study of political behaviors.

A Social and Psychological Theory of Political Behavior

I focus on the determinants of behavior taken to secure a public good. A public good is defined as any good that cannot feasibly be withheld from others in a group if it is provided for any other member of that group (Olson, 1965). Thus, a nation's energy supply is a public good that the government plays a central role in providing for its citizens. While the government generally takes the lead in formulating and implementing energy policies, citizens are primary users of energy, and individuals' actions ultimately shape collective outcomes. Importantly, taking steps to reduce energy consumption may result in private economic benefits (e.g. money saved from reduced consumption), but these actions may also entail personal sacrifices (e.g. purchasing and driving smaller vehicles, reducing travel, etc.) with benefits that accrue to the general population. Thus, reducing energy consumption, in part, may result from the desire to contribute to the provision of a public good (i.e. stable energy supply/ reduced demand).

I explain variation in three primary measures of individual behavior: behavioral intentions related to energy consumption, willingness to pay (WTP) for an energy-saving product, and actual behavior on a purchasing decision. First, reported intentions are widely used throughout political science to study actions such as turning out to vote (Rosenstone and Hanson, 1993; Lau and Pomper, 2001), vote choice (Berelson, Lazarsfeld, McPhee, 1954; Campbell, Converse, Miller, and Stokes, 1960; Krosnick, 1988; Ansolabehere, Rodden, & Snyder Jr., 2008), and other participatory behaviors (Brady, Verba & Scholzman, 1995; Goidel & Nisbet, 2006). Intentions are also commonly used to measure private-sphere-environmentally-significant behavior (Stern, 2000; Dietz, Stern, & Guagnano, 1998; Lubell et al., 2007). Thus, I account for intentions to reduce energy usage through energy conservation (e.g. adjusting ambient home temperature, switching to energy efficient bulbs, taking public transportation instead of driving, etc) and capital investments in energy efficiency (e.g. purchasing a vehicle with better fuel efficiency, insulating a home or apartment, etc). Second, to evaluate the extent to which a person values a non-market good (i.e. a public good), I rely on method of *contingent valuation* (Ciriacy-Wanthurp,

1947; Davis, 1963; Green et al., 1998; McFadden, 1994). This method involves asking the maximum monetary amount an individual is willing to pay (WTP) to obtain a good as a measure of support, or demand, for the public good. Therefore, I measure the maximum amount individuals are WTP for light bulbs that cost more but save energy. Third, I move beyond what is typical in political science to assess actual behavior on a purchasing decision (i.e. a package of standard light bulbs or energy-efficient bulbs). While there are exceptions (e.g., Green and Gerber, 2000; Lau & Redlawsk, 2001; Green, Gerber, and Larimer, 2008), most research on political behavior focuses exclusively on measures of attitudes and intentions and does not assess WTP or actual behavior.²

Internal Dimensions of Influence: Attitudes and Values

Having specified the dependent variables, I now turn to the determinants of political action. One criticism of psychological approaches to understanding the antecedents of behavior is that they do not adequately account for influences stemming from the social context in which decisions are executed (Druckman & Lupia, 2000; Stern, 2000; Druckman, 2004). For instance, Stern (2000, p. 418) bemoans the “large number of single variable studies of environmentally significant behavior” and calls for research “[synthesizing] theories or models that incorporate variables” known to shape behavior. Therefore, I focus on the relationships between two internal forces (attitudes and values) and two external forces (elite rhetoric and social norms) posited to influence observed behavior, WTP, and intentions. While I account for factors well known to influence behavior, this is one of the first studies in political science to bring social norms into the framework and examine their influence relative to other factors (i.e. values, attitudes, and rhetoric) in determining behavior.

² Even among social psychologists, measures of actual behavior are relatively uncommon. In a meta-review of 185 independent studies testing the *theory of planned behavior* (Ajzen, 1991), Armitage and Conner (2001) find that only 19 studies contain overt measures of behavior. In addition, the few studies that examine energy consumption almost exclusively use households as the unit of analysis rather than individuals (but see Stern, 2000).

The Impact of Attitudes on Behavior

A person's attitude toward a behavior is a proximate determinant of whether he or she will take action (Ajzen & Fishbein, 1980; Ajzen, 1991). An attitude refers to an evaluation toward an object (e.g. candidate, policy, or behavior), and objects are usually evaluated on multiple dimensions (e.g. economic effects, environmental effects, etc).³ For instance, a person's attitude toward using public transit may stem from personal values or past experiences (e.g. better for the environment, cheaper than driving, etc.). An attitude toward a behavior is affected primarily by beliefs about its likely consequences (e.g. its impacts), and can be an accurate predictor of action when measures are specific about the target, action, context, and time (Ajzen & Fishbein, 2005, pg. 199; see also, Albarracin et al., 2001; Armitage & Conner, 2001). Thus, *I predict that an attitude toward a behavior will be a strong predictor of behavioral intentions, WTP, and actual behavior (hypothesis 1, H1).*

Aside from the direct attitude toward a behavior, there are two other attitudes that derive from the public goods aspects of energy conservation that are likely to influence action taken to secure a public good: attitude about the *importance* of the action; and, attitude about the *efficacy* of the action. First, importance refers to the perceived significance of the attitude. Researchers have long distinguished between attitudes in terms of the importance people attach to them (e.g. Festiner, 1954; Newcomb, 1956; Converse, 1964). Boninger, Krosnick, and Berent (1995) explain that "perceiving an attitude to be personally important leads people to use it in processing information, making decisions, and taking action" (p. 62).⁴ For example, members of issue publics – who care deeply about specific policies - are more likely to take action on behalf of these issues (Krosnick, 1990; Krosnick and Sowmya, 2003). Similarly, the personal importance associated with a policy issue has been shown to affect people's vote choice (Aldrich and McKelvey, 1977; Aldrich et. al, 1989; Krosnick, 1988; Krosnick and Sowmya,

³ For instance, see Fazio, 2007; O'Keefe, 2002.

⁴ One way important attitudes influence behavior is by increasing the cognitive accessibility of positive considerations about performing an action (Krosnick, 1989).

2003). Important attitudes also have been shown to guide actions such as voting, writing letters to public officials, and making contributions to political organizations (Krosnick, 1990; Boninger, Krosnick, & Berent, 1995).⁵ *Thus, I predict a direct effect of attitude importance on intentions, WTP, and observed behavior whereby individuals take action in areas of their lives that are important to them* (hypothesis 2, H2).

Second, I posit that *attitudes about the collective efficacy* (CE) of taking action will be an important determinant of engaging in collective behaviors. CE refers to the extent to which individuals believe that their actions have an influence on the collective outcome (e.g. by encouraging others to take action). Research on protest behavior and environmental activism indicates that individuals consider not only the personal costs and benefits resulting from an action (as in traditional expected-utility models of action), but also one's perceived personal influence over collective outcomes, whether the group is likely to succeed, and the expected reciprocity of others (Finkel, Muller & Opp, 1989; Lubell et al., 2007). Individuals tend to systematically overestimate their personal influence on outcomes when determining whether to engage in a collective action. Other research shows that individuals sometimes perform collective actions because they perceive their behavior as diagnostic of how similar others will act (Quattrone & Tversky, 1984). The end result of these psychological "miscalculations" is that individuals engage in collective actions at a much higher rate than predicted by traditional expected-utility models of behavior. *Thus, I posit that attitudes about collective efficacy will shape intentions to perform a collective action, WTP for a public good and actual behavior to provide the good* (hypothesis 3, H3).

The Impact of Values on Attitudes

⁵ The importance associated with an attitude has been shown to vary as a function of material interests, reference group identifications, and personal values (Boninger, Krosnick, Berent, 1995).

Psychologists define values as deeply rooted, abstract motivations that guide, justify, and explain attitudes and actions (Davidov, Schmidt, & Schwartz, 2008; Schwartz, 1992).⁶ Schwartz refers to values as a “vocabulary” expressing distinct human motivations (Schwartz, 2006, pg. 5). Values have characteristics that distinguish them from attitudes and norms (e.g., values transcend specific situations and are ordered in their importance); however, the distinguishing characteristic between values is the type of motivation it expresses. The Schwartz Values Theory (SVS, Schwartz, 1992) specifies 10 *basic values* that individuals in all cultures recognize.⁷ Individuals pursue important values by performing actions that express those values (Bardi & Schwartz, 2003). According to Schwartz (2006, pg. 29), “The higher the priority given to a value, the more likely people will form action plans that can lead to its expression in behavior.” Values serve as *internalized guides* that motivate and coordinate individual and group interactions by shaping behavior across decision contexts.

Because collective actions often require assuming personal costs for the public good, one might expect values promoting self-transcendence to motivate these behaviors. For instance, reducing energy consumption may entail assuming personal losses or costs for the benefit of the collective interest.⁸ The Schwartz Values Theory posits that one primary dimension by which values are structured is between those that promote self-transcendence, or self-sacrifice (e.g. universalism, benevolence), and those that

⁶ For instance, egalitarianism and individualism have been shown to shape preference for the development of various energy sources (Smith, 2002; see also Ansolabehere, 2007).

⁷ Values are presumed universal because they are grounded in three universal requisites of human existence: biological needs as an organism, need for social coordination, and need for the survival and welfare of groups. The ten motivationally distinct values Schwartz (1992) identifies include: self-direction, stimulation, hedonism, achievement, power, security, conformity, tradition, benevolence, and universalism. The theory has been tested with data from over 70 countries (Schwartz, 2006).

⁸ Indeed the value-belief-norm model of behavior links private-sphere environmentalism to the moral-activation of altruism (Stern, 1999) and egalitarianism (see Douglas & Wildovsky, 1982).

promote self-enhancement, or self-interest (e.g. individualism, achievement). *Universalism* is a value defined by a motivational drives toward social justice, tolerance, and the concern and welfare of all of society. Thus, because self-sacrifice may be required to reduce energy consumption, I expect universalism to motivate intentions to reduce energy consumption, WTP, and purchasing behavior (hypothesis 4a, H4a). Similarly, *security* is a value (i.e. motivation) Schwartz (1992) defines as focused on conservation and the avoidance of risk both to self and to society (Davidov, Schmidt, & Schwartz, 2008). This value lies on the second primary dimension organizing and structuring values – i.e. openness to change versus conservation. Security emphasizes self-restriction, order, and resistance to change (as opposed to “openness” values that promote self-direction and hedonism). Because energy issues may be perceived as threatening (to self and society), I expect security to motivate action to reduce energy consumption (hypothesis 4b, H4b).

Values affect behavior by shaping proximate attitudes. For instance, Boninger, Krosnick, and Berent (1995) explain that “an attitude may become personally important to an individual if he or she comes to view the object as relevant to his or her basic social and personal values” (p.63). Thus, universalism should promote more positive attitudes about the importance and efficacy of taking action to reduce energy consumption. Consequently, I predict the impact of values on intentions, WTP and purchasing behavior will be mediated by their influence on attitudes (hypothesis 5, H5).

External Dimensions of Influence: Elite Rhetoric and Social Norms

A vast literature has clearly established that rhetoric can shape individuals’ attitudes and preferences (Hovland, Janis, & Kelley, 1953; Petty and Cacioppo, 1986; Zaller, 1992; Bartels, 1993; O’Keefe, 2002; Druckman & Holmes, 2004; Druckman & Parkin, 2005; Druckman, 2005; Chong and Druckman, 2007; Simon & Jerit, 2007). Much of this literature focuses on the processes by which persuasion occurs. O’Keefe (2002, p.5) defines persuasion as “human communication designed to influence others by modifying their beliefs, values, or attitudes.” One way to change how people act is to change what they think. Thus, persuasion fundamentally targets attitude change, which is seen as a

precursor to behavior change (e.g. altering beliefs about the importance and/or consequences of an action).

In the political science literature, research on persuasion often focuses on how rhetoric shapes behavior in election campaigns. Campaigns may shape voting behavior by highlighting certain aspects of issues or projecting an image of a candidate (Druckman, 2004a; Iyengar & Kinder, 1987). Thus, electoral campaigns are considered “events that can fundamentally alter election outcomes” by *priming* specific considerations that voters use to evaluate a candidate (Druckman and Miller, 2004, p. 503; see also, Miller and Krosnick, 2000; Druckman, 2004a; Chong and Druckman, 2007). Druckman and Parkin (2005) explain that “voters often base their candidate evaluations on the issues emphasized in the news (priming), and they form opinions about events in ways that correspond with how the news frame those events” (1030). Thus, I expect rhetoric (e.g. arguments for or against taking steps to reduce energy consumption) to affect attitudes about taking action to reduce energy consumption (e.g., *attitude toward a behavior, attitude importance, and beliefs about collective efficacy*, hypothesis 6, H6).

Rhetoric also has been linked to political behavior. For instance, Miller et al. (2002) found that individuals who perceived a hypothetical policy change as threatening increased financial contributions to favored interest groups. Similarly, Brader, Valentino, and Suhay (2008) found that a message focusing on the negative consequences of immigration, and including a Latino ethnic cue, significantly increased the tendency to seek more information about immigration policies and consent to an email message to Congress. Based on these studies, and from clear links between rhetoric and attitudes, I predict that rhetoric influences behavior through its influence on attitudes. In other words, I expect attitudes (*toward a behavior, importance, and efficacy*) to mediate the influence of rhetoric on behavior (hypothesis 7, H7).

Norms refer to socially shared agreement about what constitutes appropriate and inappropriate behavior, and have been shown to influence both attitudes and actions (Krupka & Weber, forthcoming;

Schultz et al., 2007; Cialdini et al, 1990).⁹ I explain normative influence as arising from both an internal process in which norms shape attitudes (e.g. generating considerations about the importance or efficacy of taking action), and from an external process in which norms motivate action (e.g. by promoting norm-compliant behavior). Experimental studies in which the salience of a norm is manipulated – e.g., by describing how most people behave in a situation - often induces conformity to the communicated behavior (Nolan et al, 2008; Schultz et al., 2007; Cialdini, 2005). Psychologists refer to this as a *focusing effect* because merely bringing attention to the norm influences cognition and subsequent action. For instance, Schultz (1999) conducted a field experiment in which households were given information about the average amount neighborhood homes recycled. This information increased the frequency of curbside recycling for treated households. Similarly, two recent field experiments analyzing energy consumption among California households found that messages about the normative desirability of energy conservation had a powerful impact in reducing actual consumption (Schultz et al., 2007; Nolan et al., 2008). Political scientists have also demonstrated the power of heightening the awareness of norms as a means to influence behavior. Gerber and Rogers (2009) find that messages emphasizing anticipated levels of voter turnout significantly influence intentions to vote. In another study, Gerber, Green, and Larimer (2008) manipulated social norms through different versions of a mailer to households. One treatment reminded households that it was their civic duty to vote. Drawing attention to the norm increased turnout 3% over a control group. Thus, I predict that a social norm that increases the desirability of reducing energy consumption will shape attitudes about personal energy consumption (i.e. *attitude toward a behavior, attitude importance, and attitude about collective efficacy*) (hypothesis 8, H8).

⁹ For instance, see Asch (1956); Cialdini et al. (1990); Schultz (1999); Kallgren et al. (2000); Cialdini & Goldstein (2004); Nolan et al., 2008; Krupka & Weber, forthcoming.

In addition to shaping attitudes, norms have an external dimension of influence as well – motivating or impeding the formation and execution of an intention.¹⁰ Behavior often occurs in a social context where people are held accountable for their publicly expressed attitudes and behaviors (Tetlock, 1985). Norm-compliant-behavior results from a fear of social isolation and leads people to consciously consider what *others* define as appropriate (Noelle-Neumann, 1989). For instance, Gerber, Green, and Larimer (2008) conducted a field experiment on the impact of various messages on voter turnout. One treatment (mailer) reminded households that voting was a matter of public record, and included the recent voting history for household members and neighbors. The results from this study showed that a message designed to create social pressure to vote significantly increased turnout above all other conditions (8% above the baseline). A key implication is that although behavior is affected by internal considerations (e.g. sense of civic duty, obligation, expressive act), external pressure (e.g. fear of isolation, social sanctions, etc.) also regulates thoughts and actions. Thus, I predict that a social norm that increases the desirability of energy conservation will affect behavioral intentions, WTP, and purchasing behavior; however, I predict that this influence will be mediated by more proximate influences on behavior – i.e. a person’s attitude toward a behavior, attitude about its importance, and attitudes about the CE of the action (hypothesis 9, H9).

Experiment: Participants, Design, Procedures

To test the predictions stated above, I implemented an experiment. The experiment involved measuring attitudes and values, and manipulating norms and information, to evaluate the relative influence of internal and external forces on participants’ intentions and actions. The purpose of the information manipulation was to provide alternative considerations about the *importance* and *efficacy* of reducing energy consumption (i.e. different directional arguments), and the normative manipulation was designed to promote personal energy conservation. To ensure the manipulations effectively

¹⁰ For instance, people generally regulate and monitor their behavior in public to a greater extent than when they are in private (Snyder, 1987; Berinsky, 2004).

communicated the intended messages, I pre-tested the articles on an undergraduate class at Northwestern University. I describe each manipulation below.

Participants

A total of 196 individuals participated in the study in exchange for a cash payment. I recruited participants by sending emails, advertising on a local news station, and by contacting local community organizations at four locations in Illinois.¹¹ I invited adults over the age of 21 to take part in a study about political learning, and explained that the study involved filling out a survey, reading two newspaper articles, and answering some questions about what they read. The experiment was conducted on one of fifteen portable laptop computers using *MediaLab* software and each session lasted about an hour. The sample consisted primarily of non-students (69%); however, two upper-level undergraduate classes were invited to participate in sessions scheduled in the Department of Political Science at Northwestern University (31%). Data were collected between August and October of 2008.

Experimental Design

The experiment contained two manipulations: (1) an information manipulation in which participants read one of two versions of a newspaper editorial promoting or discouraging taking steps to reduce personal energy consumption; (2) a manipulation altering the social context and inducing a pro-energy-conservation-norm, or no norm. The normative manipulation and the information manipulation resulted in a 2 X 2 experimental design in which participants were randomly assigned to one of four conditions. Figure 1 lists each experimental condition and the variable name assigned to that condition.

¹¹ The four locations were: Evanston, IL; Warrenville, IL; Mount Prospect, IL; and, Lovington, IL. Approximately half of the data was collected in an experimental laboratory located at Northwestern University. Data were collected at three other locations by transporting the laptops to businesses, libraries, and community centers that generously agreed to provide a conference room to conduct the experimental sessions.

In the analyses below, the conditions are represented by a dichotomous variable coded 1 if the participant was assigned to that condition and 0 otherwise.

[Insert Figure 1 here]

Information/Rhetoric Manipulation

I randomly assigned participants to read one of two versions of an editorial they were told had appeared recently in the *Chicago Tribune*. One version, entitled “Your Choices about Energy Consumption Matter,” emphasized the importance of consumers taking steps to reduce personal energy consumption as a way to contribute the national energy situation. The second version was entitled, “Government Must Take Action to Achieve Energy Independence,” and focused on the same problem, i.e. limitations to the nation’s energy supply; however, this version commented on the relatively small impact that consumer decisions (e.g. purchasing an energy-efficient light bulb) have on national energy consumption. Moreover, this version stated that asking consumers to pay for more energy-efficient technologies would do little to foster a transition away from a reliance on fossil fuels. The arguments were designed to influence considerations about the importance and the efficacy of reducing personal energy consumption – attitudes hypothesized to impact intentions, WTP, and observed action. The full text of each editorial is included in Appendix A.

Pro-Behavior Normative Manipulation

To implement the normative manipulation, prior to each session, I randomly determined whether the session would include a pro-energy conservation norm or whether the session would serve as a control group to assess any effects stemming from the treatment. For norms to influence attitudes and behavior, participants needed to be (1) aware of the attitudes of others (i.e. focusing attention on the norm), and (2) motivated to consider the attitudes of others (accountable for their actions).¹² To heighten awareness of

¹² In operationalizing norms, I bring in both their internal and external mechanisms of influence. Future work is necessary to unpack the unique influences of these factors on behavior (e.g. either focusing on the descriptive norm or providing external motivation to consider the appropriate norm).

the norm, participants attending a *pro-norms* session read a “press release” about the results from a recent survey of Illinois residents. The press release was entitled, “Illinois Residents Committed to Reducing Energy Consumption,” and stated that the “vast majority of Illinois residents support personal energy conservation” and “over 90%” agreed that it is important for “all Americans to make energy efficient consumption decisions.” In contrast, participants randomly assigned to *no-norms* sessions read a different press release about the attitudes of Illinois residents related to a different political issue. The full text of each press release is included in Appendix A.

To motivate participants in the pro-norms sessions to consider the pro-behavior norm, individuals attending these sessions received instructions that a short discussion about their responses and decisions would be held at the end of the study. I read these instructions aloud to ensure that everyone attending a pro-norms session was aware that there would be a group discussion at the conclusion. In addition, prior to answering important dependent measures, participants attending the pro-norms session were reminded that they might be asked to justify their responses and choices in the group discussion. Conversely, participants assigned to the no-norms (control) sessions were informed that their responses were confidential and they could leave upon completing the final set of questions. In sum, the normative manipulation merged two pieces of information: (1) the attitudes of local residents about a specific class of actions, and (2) the belief that participants would be asked to justify their responses to others attending that session.

Procedures & Measures

At the beginning of each session, all participants were given a written set of instructions detailing the activities in the study, and required to sign an IRB consent form. The instructions explained that the study focused on attitudes about U.S. energy policy and personal energy consumption, and that each participant would complete a background questionnaire, read a press release and a newspaper editorial, and answer a few questions about the articles they read. Further, the instructions explained that each participant would be given an envelope with \$20 in cash after completing all questions, and that a final

decision in the study involved using a portion of that cash to make a purchase.¹³ Participants were directed to a seat at one of the laptop stations where they received further instructions and began completing a background questionnaire measuring values, political preferences and other demographic characteristics.

The background questionnaire included several items measuring values from the Schwartz Values Survey (SVS) hypothesized to influence attitudes and beliefs about personal energy consumption. In particular, I included three items measuring *universalism* (alpha = .63) and one item measuring *security*. In the analyses below, I combine responses to the three items measuring *universalism* and standardize each measure. The wording of these items is available upon request.¹⁴

Following completion of the initial battery of questions, participants read a press release (norm manipulation) followed by an editorial (information manipulation). Participants then responded to a battery of questions measuring attitude toward reducing energy consumption, the importance associated with this attitude, and attitude about CE. To measure overall *attitude toward a behavior*, participants responded to a question asking “do you think the benefits to the environment are enough to justify paying at least twice as much for a compact fluorescent light bulb as for a traditional bulb?” *Attitude toward CFLs* is a dichotomous measure coded 1 if participants answered “yes” to this question and 0 if they said “no.” The question asks for an evaluation toward a specific choice participants encounter later in the

¹³ Part of the normative manipulation involved inducing participants to believe that a group discussion would follow completion of the final battery of questions. Therefore, the instructions for participants in the pro-norms sessions stated that a group discussion would follow the final purchasing decision.

¹⁴ I also included questions measuring *egalitarianism* and *individualism* as these values have been associated with attitudes about energy alternatives (e.g. Smith, 2002; Stern, 2000). However, in the analyses, I focus on basic human motivations driving behavior (Schwartz, 1992; 2006). In all of the analyses reported below, the results are unchanged when I include controls for egalitarianism and individualism.

study (i.e. a decision about whether to pay more to purchase a package of energy-efficient bulbs). The measure is intentionally specific about target and action. I expect a person's *attitude toward CFLs* to influence intentions, WTP, and actual behavior (H1).

Participants also responded to several questions measuring the importance of their attitude about reducing personal energy consumption (1-7, unimportant/important scale): how critical is it for people in general to take personal steps to reduce energy consumption if we want to solve our nation's energy problems; how important are the economic effects of personal energy consumption; and, how important are the environmental effects of personal energy consumption? These items were averaged into a scaled measure of *attitude importance* ($\alpha = .66$). I expect higher scores associated with attitude importance to increase willingness to take action (H2).

To measure CE, I asked participants the degree to which they agreed or disagreed with the following statements (1-4 disagree/agree scale): (1) I believe my actions have an influence on the nation's energy situation; (2) My actions to help the nation achieve energy independence encourage others in my community to take actions that will lead to greater energy independence. The first item taps perceptions of one's own personal influence on collective outcomes and the second item focuses on the expected reciprocity of others. These items were averaged into a scaled measure of attitudes about *collective efficacy* ($\alpha = .76$) for each participant. I expect higher scores on this measure to increase intentions and actions to secure a public good (H3).

Participants also completed a battery of questions measuring their behavioral intentions related to personal energy consumption. The questions asked how likely it is that "you will perform [an action] in the forthcoming month or year" (1-7, likely/unlikely scale). Specific actions included: (1) reducing the number of miles you drive, (2) replacing an incandescent light bulb with an energy-efficient bulb, (3) adjusting the thermostat, (4) using alternatives other than driving (e.g. walking, carpooling, public transit), (5) turning off lights and appliances when not in use, (6) weatherizing or insulating your apartment or home before winter, (7) purchasing an energy efficient appliance, and (8) purchasing a more fuel-efficient vehicle. The first five actions were combined to create a scale measuring energy

curtailment intentions (alpha= .68), while the latter three intentions were combined to create a scale measuring intentions to make capital investments into energy-efficiency – i.e., *investment intentions* (alpha = .68). These terms (i.e. curtailment intentions and investments intentions) have been used previously by scholars to distinguish between these two distinct classes of actions related to energy consumption (Stern & Gardner, 1981; Black, Stern, & Elworth, 1985; Stern, 2000). I expect both classes of intentions to be directly shaped by attitudes (H1, H2, H3), as well as indirectly influenced by values, norms and elite rhetoric (H4-H9).

I also measured the maximum amount participants stated they were WTP for 1 energy efficient light bulb (*WTP for CFL*).¹⁵ After entering a response, participants received a final set of instructions stipulating that there was one task to complete. Participants were given an envelope with \$20 dollars cash. They were informed that a portion of the cash should be used to purchase a package of light bulbs that they could take home (in addition to the cash remaining in the envelope). The final instructions said, “You may choose a package with four standard light bulbs for a cost of \$1, OR you may choose a package with two energy efficient light bulbs at a cost of \$5.” After making the purchase, individuals attending a no-norms session (control group) signed a receipt and were allowed to leave; however, individuals assigned to the pro-norms sessions were asked to remain seated until others had finished so that the group discussion could take place.¹⁶ I recorded the purchase of each participant and created a

¹⁵ The question was worded as follows: “A standard light bulb costs about \$0.50. An energy efficient light bulb is more expensive. What is the maximum amount you would be willing to pay for 1 energy efficient light bulb? Please enter an amount ranging from \$0.50 to \$10.00 in the space provided below.”

This response protocol is an open-ended method of contingent valuation extensively used to value environmental goods (Green et al., 1998; McFadden, 1994).

¹⁶ After everyone in the pro-norms sessions had completed the study and made their purchase, I announced that there would not be time for the discussion, politely thanked the group, and allowed them to leave.

dichotomous variable, *light bulb purchase*, coded 1 if the CFL package was chosen and 0 if the standard package was selected.

Results

In presenting the results, I begin by providing details on the distributions for the primary dependent measures: *curtailment intentions*, *investment intentions*, *WTP for a CFL*, and *purchasing behavior*. Next, I evaluate the effects of the experimental conditions and values on key attitudes and dependent measures. This is a first step in evaluating any mediational influence stemming from the experimental manipulations (i.e. through attitudes). Subsequently, I include the attitude measures (*attitude importance*, *collective efficacy*, and *attitude toward CFLs*) as independent variables predicting intentions, WTP, and observed action.¹⁷ Last, I present the results from an analysis assessing the determinants of *purchasing behavior*.

Table 1 reports the distribution of responses on the main dependent variables. The mean score for curtailment intentions is 5.14 (st.d. = 1.24) on the seven-point measure. As one might expect the mean score for investment intentions was lower (mean=3.14; st.d.=1.71) than curtailment intentions due to greater constraints on making capital investments in energy efficiency. Across all conditions, the average amount participants were WTP for an energy-efficient bulb was \$2.97. In addition, 77% of the sample purchased the package of energy efficient bulbs (CFLs), and 23% purchased the standard package.

[Insert Table 1 here]

Table 2 reports the results from six ordinary least squares (OLS) regressions. Each column corresponds to a dependent measure and the rows represent dummy variables for three conditions and two

¹⁷ If mediation is present, I should find that any significant direct effects stemming from values, norms, and rhetoric on the main dependent variables disappear once the mediating variables are accounted for in the full model (Baron & Kenny, 1986).

values measures.¹⁸ The striking result in Table 1 is the powerful influence of norms on attitudes, curtailment intentions, and WTP. Across five of the six models, *NormPro* exerts a positive and significant effect on the outcome variable. The lone exception is the regression predicting investment intentions - likely stemming from fiscal constraints limiting the ability to undertake these actions.¹⁹ In contrast, the pro-action editorial appears to have very little impact on attitudes and actions. Although the coefficients for *ControlPro* are signed in the expected direction across all six regressions, statistical significance is only achieved in the model predicting *attitude about CFLs* (column 3). Comparing row 1 (*NormPro*) with row 3 (*ControlPro*) shows that norms are clearly the driving force in shaping attitudes, intentions, and WTP to reduce energy consumption. Remarkably, the pro-behavior norm causes participants to increase the importance they attach to their attitudes about personal energy consumption, view these actions as having a greater impact on the provision of the collective good, formulate more intentions to curtail energy usage, and express a greater WTP for a CFL bulb. Even when coupled with an editorial that emphasizes the *lack of importance and efficacy* of these actions (see *NormCon* condition in row 2), the pro-behavior norm overpowers the considerations made salient in the con-editorial to push these variables in a positive and significant direction. This result offers clear evidence of the power that norms possess to shape cognitions and actions.

[Insert Table 2 here]

¹⁸ *ControlCon* is excluded to avoid perfect co-linearity; therefore, the regression coefficients and standard errors represent a comparison between the condition listed in a particular row and *ControlCon*.

¹⁹ Black, Stern, and Elworth (1985) consistently show that psychological and social factors account for much less of the variance in models predicting investment intentions relative to models predicting conservation intentions. They attribute this result to situational constraints (e.g. home ownership, income, etc.) on these actions.

Figure 2 shows the substantive effects of the treatments on the maximum amount participants were WTP for one energy efficient bulb.²⁰ The shaded bars represent the predicted amount participants are WTP as the score for each condition changes from 0 to 1.²¹ Figure 2 shows that the normative manipulation increases WTP \$0.80 in *NormPro* (\$3.32) and \$0.70 in *NormCon* (\$3.23). While norms clearly have a powerful impact on WTP, rhetoric (*ControlPro*) exerts a smaller (and statistically insignificant) effect – i.e. increasing the predicted value \$0.09 in the pro-norms sessions and \$0.24 in the control sessions. The data lend strong support for H8 regarding the impact of social norms on attitudes, intentions, and WTP. But there is less support in favor of H6 on the role of rhetoric in shaping attitudes and actions. The editorial had very little effect on attitudes, intentions, or WTP (except for *attitude toward CFLs*).

The data in Table 2 also lend strong support for the prediction that values influence attitudes, intentions, and WTP. As predicted (H5), higher scores associated with *universalism* result in more positive attitudes about reducing energy consumption, increased intentions to reduce energy consumption, and greater WTP for a CFL. Interestingly, *security* increases intentions to conserve energy (as predicted) but decreases WTP for a CFL (counter to my expectation). Thus, although *security* does promote greater intentions to curtail energy usage, it has a negative influence on paying more for a CFL as a specific means to reduce consumption.

[Insert Figure 2 here]

To determine if attitudes mediate the influence of values, norms, and rhetoric on behavioral intentions and WTP, I estimated three OLS regressions. I include the experimental conditions as independent variables as well as attitudes that were affected by the experimental manipulations in the

²⁰ I used *Clarify* to generate predicted values for WTP across conditions holding *universalism* and *security* at their mean values (King, Tomz, & Wittenburg, 2000; Tomz, Wittenburg, & King, 2003).

²¹ The lighter shaded bars equal the same amount because this represent the average WTP with all conditions set equal to 0 and both values set to their mean score.

previous analyses (i.e. *attitude toward CFL*, *attitude importance*, and *collective efficacy*). If mediation is present, the main effects stemming from the influence of norms and values on *intentions* and *WTP* should drop out once attitudes are included in the model.

Table 3 shows that the impact of social norms and values on behavior, reported in Table 2, are mediated by attitudes hypothesized to influence intentions and actions (supporting H5, H7, and H9).²² As predicted, *attitude about CFLs*, *attitude importance*, and *collective efficacy* significantly increase *curtailment intentions*. *Importance* and *efficacy* are also positively associated with *investment intentions*. While *security* and *universalism* continue to exert a direct and positive effect on *curtailment* and *investment intentions* (respectively), the effects are not as strong as reported in Table 2 - suggesting that the impact of values on intentions and actions is partly mediated by attitudes. However, values continue to exert an effect on behavior independent of attitudes. The far right hand column in Table 3 also shows a clear mediational influence of norms on behavior. Norms had a direct effect on both *WTP* and *curtailment intentions* in Table 2, but the effects drop out in Table 3 once attitudes are included as independent variables. Thus, the impact of norms on *WTP* and intentions is mediated by attitudes. This is one of the first studies to document the specific process by which norms operate to influence politically relevant behavior – i.e. by shaping what individuals think about an action, its importance, and its impact.

[Insert Table 3 here]

In terms of substantive effects, as the measure of attitude toward the behavior changes from unfavorable (0) to favorable (1), and holding all other variables in Table 3 at their means, I find a huge *increase* (\$1.01) in participants reported *WTP for a CFL* (i.e. from a predicted value of \$2.17 for participants with an unfavorable attitude about paying more for CFLs to a predicted value of \$3.18 for

²² *NormPro* and *universalism* no longer have a statistically significant relationship with curtailment intentions (as in Table 2). Since both variables significantly shape attitudes and intentions in Table 2, and because their effect drops out in the full model in Table 3, I conclude that attitudes mediate the effect of norms and values on curtailment intentions (Baron and Kenny, 1986).

those reporting a favorable attitude toward CFLs). Similar effects are found for the impact of attitudes toward the behavior across the other dependent variables (intentions and observed behavior). This clearly demonstrates the strong and proximate influence of attitudes on behavior. Figure 3 plots the effects of *universalism* and *security* on WTP as these measures change from their minimum to maximum values. This shows that values are exerting a strong direct effect on expressed WTP. Higher scores associated with *universalism* result in a large increase in WTP (\$3.44 at the maximum and \$1.73 at the minimum), while higher scores associated with *security* decrease WTP (\$3.56 when set to the minimum and \$2.68 at the maximum).

[Insert Figure 3 here]

The final decision participants made involved the purchase of a package of light bulbs using a portion of the cash received for taking part in the study. Following completion of the second battery of questions, participants were given \$20 dollars in an envelope. The final set of instructions informed each participant they should use a portion of the cash to purchase either a 4-pack of standard light bulbs for \$1 or a 2-pack of energy efficient (CFL) bulbs for \$5. The vast majority of respondents selected the package of CFL bulbs (77%); however, there were interesting differences in purchasing behavior by condition.

Given the sample skew toward purchasing CFLs and the potential for ceiling effects, I begin by looking at a blunt measure of the effects of each manipulation on purchasing behavior. Model 1 in Table 4 reports the results from a Probit estimation of the effects of the pro-norm manipulation (i.e. PN - coded 1 if a participant attended the pro-norm session, and 0 otherwise) and the editorial manipulation (i.e. PE – coded 1 if a participant read the pro-action editorial, and 0 otherwise). The results from Model 1 show that the normative manipulation significantly increased the purchase of the energy efficient light bulb ($p < .05$).

[Insert Table 4 here]

Model 2 in Table 4 reports the results from a Probit estimation of the relative effects of key independent variables on purchasing behavior. Similar to the results for expressed *WTP for CFL*, participants' *attitude about CFLs* is a strong predictor of purchasing behavior (supporting H1). The predicted probability of purchasing the CFL package is 57% when the attitude toward the behavior is unfavorable but increases to 85% when the attitude is favorable (with all other variables held at their

means). Values also directly influenced participants' purchases. As hypothesized (H4), *universalism* exerts a positive influence on observed behavior with higher scores increasing the likelihood of buying a package of CFLs (51% when set to the minimum and 88% at the maximum); however, *security* reduces the likelihood of purchasing CFLs. I speculate that this negative effect stems from uncertainty associated with paying more personally to reduce energy consumption. Finally, there is an odd counter effect associated with the pro-editorial in the expanded model.

Discussion

The results presented above offer strong support for a psychological and contextual understanding of political behavior. While values and attitudes are important determinants of intentions and actions, the empirical data indicate that social norms have the strongest relative influence across the dependent measures in this study. The normative manipulation entailed focusing participants on a norm promoting energy conservation, and motivating participants to consider the social context by inducing people to believe they might be asked to justify their opinions and actions in a group discussion. The normative manipulation affected participants' attitudes, curtailment intentions, and WTP for an energy efficient device; however, the effect is mediated by a person's attitude toward a behavior, the attitude's importance, and attitude about the efficacy and impact of the action.

The normative manipulation also exerted a much stronger impact on behavior relative to the information (i.e. editorial) manipulation. The information manipulation consisted of different versions of a newspaper editorial with universally pro (or con) arguments for (or against) reducing energy consumption. The experimental design afforded a test of the relative impact of these two sources of influence on participants' attitudes and behaviors. Participants randomly assigned to the *NormCon* condition received a pro-behavior normative treatment coupled with arguments in an editorial *against* taking steps to reduce personal energy consumption. The results indicate that norms overpowered the con-behavior editorial to significantly increase attitudes, intentions, and actions to reduce energy consumption. Thus, an important implication from this study is that social norms inhibit the ability of elites to manipulate public attitudes (see also Druckman and Nelson, 2003; Druckman, 2004).

The experimental method I used to assess the impact of social context on behavior is ideal because psychological research suggests that individuals may be unwilling, or unable, to assess the degree to which normative social influence shapes their own actions (Nolan et al., 2008; Cialdini, 2005). Studies have shown that individuals tend to suffer from an “introspective illusion when judging the cause of their own behavior” whereby greater weight is placed on attitudes and beliefs relative to the evidence of “behavioral conformity” in the decision context (Nolan, et. al, 2008, p. 914; see also, Pronin, Molouki, and Berger, 2007; Schultz, et al., 2007). Thus, experimental research that alters the social context promises to shed light on the causal process by which social norms shape attitudes and actions. This is encouraging because critics maintain that existing theories of planned behavior fail to “capture the diverse forms in which normative influences on intentions arise” (O’Keefe, 2002, 109).

One limitation in the present study is that I do not distinguish between the internal effect of focusing individuals on a norm, and the external power of norms to constrain or promote actions. To distinguish between these internal and external mechanisms of influence, it is necessary to conduct additional research that either focuses the norm or alters the context to promote norm-compliant-behavior. A second limitation relates to the uniform direction of the norm and editorial manipulations employed in this study. It is conceivable that the impact of the manipulations depends on its direction (e.g. negativity bias). Future research is necessary to test whether the direction of the norm matters in terms of shaping attitudes, intentions, and actions.

Conclusion

Compared to research on political attitudes and opinions, political scientists have paid less attention to the determinants of political action. This paper broadens the scope of research on political behavior to an important class of private actions with public and political consequences. Understanding what individuals are willing to do to reduce energy consumption, and lifestyle adaptations individuals are willing to make to combat climate disruption, is a critical issue now facing humanity. This paper focuses on the internal and contextual determinants of an important class of environmentally-significant

behaviors. I find that norms and values have a powerful influence on attitudes about a behavior, its importance, and its efficacy. In turn, these attitudes have a strong influence on intentions and actions.

The results offer insights to policymakers seeking to reduce consumer energy usage (e.g. through the use of social marketing campaigns). The *New York Times* recently reported that a Sacramento, CA utility company added a smiley face or a frown face to 35,000 households' energy bills.²³ The type of face (smile or frown) was based on a comparison of each household's energy usage with 100 similar residences. The customized energy bill significantly reduced energy usage for treated households. Other metropolitan areas are considering implementation of similar peer-comparison programs.

This study is a first step in political science at understanding the determinants of individuals' decisions about energy consumption. In addition, this research is one of the few to include a measure of overt behavior rather than relying exclusively on self-reported actions. The results provide a more comprehensive understanding of the internal and external determinants of human thought and action. Moving forward, it is necessary to test the model across a wider range of politically-relevant actions.

²³ Kaufman, January, 30, 2009.

Appendix A

Press Release – Pro-Behavior Norm

“Cook County Residents Committed to Reducing Energy Consumption”

Researchers at Northwestern University have released the results of a study on energy attitudes among Cook County residents. One of the more notable findings is the considerable extent to which residents are willing to take steps to reduce personal energy consumption. For example, the vast majority of respondents said that the next time they buy a car they will consider energy efficient alternatives, and most respondents said that they have, or intend to buy, energy-efficient light bulbs. Also, nearly 90% reported that it is “very important” that all Americans purchase energy efficient light bulbs even though they are more costly. Full details of the study are available at www.northwestern.edu/cookcounty/energysurvey

Press Release – Control Group (No Norm)

“Cook County Residents Say Economy is the Most Important Issue Facing Nation”

Researchers at Northwestern University have released the results from a study on issues important to Cook County residents in the upcoming presidential election. Similar to the results from national polls, 36% of respondents said that the general economic situation is the most important issue facing the nation. The situation in Iraq was the second most frequently cited problem with 20% of the sample volunteering this response. Other issues cited as important included immigration policy, energy and fuel costs, and health care costs. Full details of the study are available at www.northwestern.edu/cookcounty/electionsurvey.

Editorial (Pro-Behavior)

“Editorial: Your Choices about Energy Consumption Matter”

Energy is essential to the economic activity that sustains and improves the quality of our lives. But in the last 25 years, world energy demand has increased about 60 percent, raising questions about how to address the increased energy usage.

Some argue that the government needs to take responsibility. Others say the responsibility lies more with individuals’ consumption decisions. Along these lines, a recent report from McKinsey Global Organization found that the growth rate of worldwide energy consumption could be cut substantially through more aggressive energy-efficiency efforts by households. For instance, switching from familiar, incandescent light bulbs to longer-lasting, energy-saving compact fluorescent bulbs would save consumers billions of dollars annually and save the world from millions of metric tons of greenhouse gases. Compact fluorescent light bulbs are only slightly more costly than conventional bulbs, yet consume 75 percent less electricity. “This is not a sacrifice deal,” Roger Walker, head of Cambridge Energy Research Associates, says of energy conservation. “This is a technology deal. After all, we’re twice as energy efficient now as we were in the 1970s, and this increase in efficiency is largely a result of consumers’ actions aimed at reducing energy costs. We must continue to urge consumers to make energy efficient choices.”

In July of 2007, the National Petroleum Council released the results of a two-year study commissioned by U.S. Energy Secretary Samuel Bodman. One of five core strategies the report lists to assist markets in meeting energy challenges for 2030 and beyond involves reducing energy demand by increasing the efficiency of transportation and residential energy uses. Thus, consumers will play an increasingly important role in U.S. energy policy in the coming decades. Whether these policies are effective depends on our ability to reduce energy consumption.

Editorial (Con-Behavior)

“Editorial: Government Must Take Action to Achieve Energy Independence”

Energy is essential to the economic activity that sustains and improves the quality of our lives. But in the last 25 years, world energy demand has increased about 60 percent, raising questions about how to address the increased energy usage.

Some argue that individuals should take steps to reduce energy consumption, while others say the government needs to take responsibility. According to the latter group, only government has the capacity to coordinate the actions of millions of individuals and businesses to ensure a stable, reliable energy supply. For instance, a strong financial commitment to research and development of alternative energy sources, such as renewable energies and energy-efficient technologies, might one day free the U.S. from dependence on oil. But the transition from a primarily fossil-fuel-based society to a renewable-energy-society will take decades and require government leadership. Voluntary reductions in personal energy consumption will have a relatively small impact on the nation’s overall energy usage. For example, decisions consumers make about light bulb and appliance purchases will do little to foster a transition away from a reliance on energy produced from burning fossil fuels. Nonetheless, recent energy legislation includes regulations that will actually cost consumers more money in the short term. To assuage voters, politicians hide the price tag when they try to impose conservation. The efficiency standards for appliances, far from paying for themselves, will cost consumers roughly \$50 billion through 2050, according to Roger Walker, head of Cambridge Energy Research Associates. Not only do these measures cost consumers a lot, but they also do little to nothing in terms of affecting the nation’s energy situation.

Instead of mandating that individuals pay more for household products and appliances, a successful long-term approach to energy security requires expanding and diversifying energy production by investing in cost-effective energy technologies, providing a reliable energy infrastructure, and funding research and development for environmentally-clean ways to utilize the nation’s vast domestic coal reserves. Thus, it is government, not consumers, who must commit to taking action if we hope to achieve real energy independence.

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Figure 1. Experimental Design

	Pro-Behavior Norm	No Norm
Pro-Action Editorial	<i>NormPro</i>	<i>ControlPro</i>
Con-Action Editorial	<i>NormCon</i>	<i>ControlCon</i>

Table 1. Distribution of Dependent Variables

	Mean	Std. Deviation	Range (min/max)
<i>Curtailement Intentions</i>	5.14	1.24	1; 7
<i>Investment Intentions</i>	3.81	1.71	1; 7
<i>WTP for CFL</i>	\$2.97	\$2.09	\$0.50, \$10
<i>Light Bulb Choice (CFL=1)</i>	0.77	.42	0; 1

Table 2. Effects of Experimental Manipulations on Key Variables

	Attitude Importance (1)	Collective Efficacy (2)	Attitude about CFLs (3)	Curtailment Intentions (4)	Investment Intentions (5)	WTP for CFL (6)
<i>NormPro</i>	.29 (.15)**	.51(.17)***	.20 (.08)***	.26 (.13)**	.16 (.15)	.77 (.41)**
<i>NormCon</i>	-.08 (.15)	.38 (.17)***	.16 (.08)**	-.08 (.13)	-.17 (.16)	.68 (.42)*
<i>ControlPro</i>	.12 (.15)	.17 (.17)	.21 (.08)***	.07 (.13)	.09 (.16)	.21 (.41)
<i>Universalism</i>	.23 (.07)***	.28 (.08)***	.18 (.04)***	.18(.06)***	.19(.07)***	.69 (.19)***
<i>Security</i>	.02 (.03)	.01 (.03)	-.01 (.02)	.05 (.02)**	-.00 (.03)	-.15(.08)**
<i>N / R2</i>	196/.09	196/.10	196/.15	196/.09	196/.06	196/.11
<p>The dependent variables reported in columns 1,2,4, & 5 are standardized regression coefficients (0,1) of measures of participants' attitudes and intentions. The dependent variable reported in column 3 is a dichotomous measure of participants' attitudes about CFLs (the results do not differ when Probit estimation is utilized rather than OLS estimation) . The dependent variable reported in column 6 is a continuous measure of the amount participants are willing to pay for 1 CFL (range is .50 to 10); standard errors are reported in parentheses; ***p< .01; ** p< .05; *p< .10, one-tailed test; <i>ControlCon</i> is the excluded experimental condition in each regression.</p>						

Figure 2. Effect of Treatments on Maximum WTP for a CFL

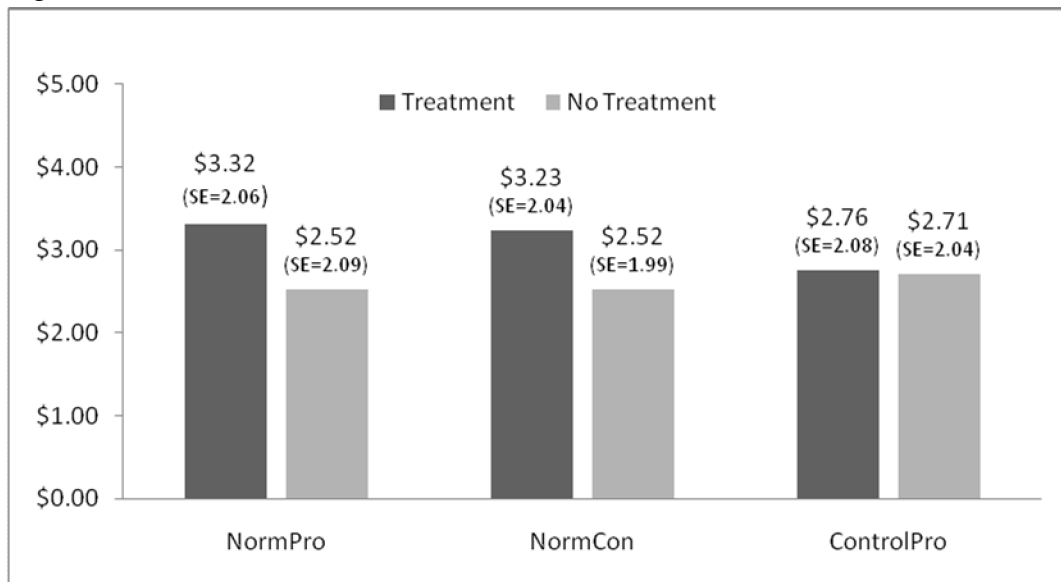


Table 3. Determinants of Behavioral Intentions and WTP for CFL

	Curtailement Intentions	Investment Intentions	WTP max for CFL bulb
<i>NormPro</i>	.10 (.12)	.04 (.15)	.45 (.41)
<i>NormCon</i>	-.12 (.12)	- .19 (.15)	.52 (.42)
<i>ControlPro</i>	-.03 (.12)	.05 (.15)	- .01 (.41)
Att. about CFLs	.26 (.11)**	-.06 (.14)	.89 (.39)***
Att. Importance	.28 (.06)***	.22 (.07)***	.20 (.21)
Collect. Efficacy	.07 (.05)*	.12 (.07)**	.15 (.19)
Universalism	.05 (.06)	.12 (.07)*	.44 (.20)**
Security	.04 (.02)*	-.01 (.02)	-.14 (.08)**
(N)	196/ R2=.27	196/R2=.11	190 / R2=.17
<p>The first and second columns reports standardized regression coefficients for two scaled measures of behavioral intentions. The dependent variable in the right hand column (WTP) is a continuous measure of the maximum amount participants were willing to pay for one CFL bulb (range = \$0.50 to \$10);standard errors are reported in parentheses; ***p< .01; ** p< .05; *p< .10, one-tailed test; <i>ControlCon</i> is the excluded condition.</p>			

Figure 3. Effects of Values on Maximum WTP for a CFL

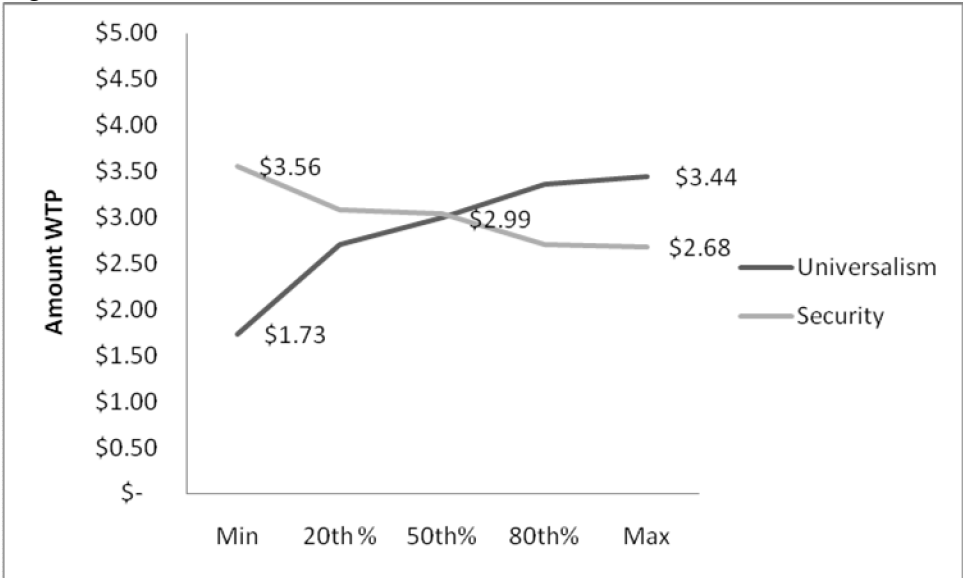


Table 4. Determinants of Purchasing Behavior

	Model 1	Model 2
PN	.38 (.20)**	-----
PE	-.20 (.20)	-----
<i>NormPro</i>		.02 (.32)
<i>NormCon</i>		.01 (.08)
<i>ControlPro</i>		-.18 (.08)**
Attitude about CFLs		.86 (.27)***
Attitude Importance		.05 (.16)
Collective Efficacy		-.11 (.14)
Universalism		.30 (.15)**
Security		-.08 (.06)*
<i>N</i> /log-likelihood	196/-103.35	196/-90.86
The coefficients from a Probit model estimating participants' purchasing behavior are reported above. The dependent variable is a dichotomous measure coded "1" if the CFL package was purchased. Standard errors are reported in parentheses; *** p< .01, **p< .05.		