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A Light Bulb Goes On: Norms, Rhetoric, and Actions for the Public Good

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Abstract This paper explores whether invoking social norms, in the context of a persuasive appeal, affects individuals' willingness to take action for the public good. The framework I develop brings together a host of factors treated as distinct in past work, including attitudes, rhetoric, and social norms. I test predictions from this framework in an experiment that focuses on a particularly important behavior—actions regarding the consumption of energy. I find that highlighting norms in the context of an appeal for energy conservation increases the importance individuals' associate with these actions, intentions to conserve energy, and actual behavior on a light-bulb purchasing decision. The findings have implications more generally for understanding when individuals take actions that promote the public good.

Keywords Social norms · Persuasive appeals · Collective action · Energy conservation

A fundamental problem in societies involves how best to coordinate behavior for the provision of public goods—things that benefit everyone but which no one has an individual incentive to provide. Governments exist, in part, to serve this role; but how governments determine what laws and regulations need to be in place depends, largely, on citizens actions in areas of their lives that sometimes involve choices about whether to assume personal costs for a collective good. When do individuals take these actions? Why do some, but not all, citizens make sacrifices for the sake of the public good? These questions are of obvious importance for those interested in political behavior; however, little work—other than research on

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participation—examines the impact of messages that highlight social norms on individuals' decisions to which the government has an incentive to attend. This paper explores how such appeals influence private choices that have clear political consequences: actions regarding the consumption of energy.

I begin by identifying the factors that contribute to individuals' decisions to take collective actions. The framework I develop brings together a host of factors treated as distinct in past work. This includes existing attitudes and beliefs (Ajzen and Fishbein 1980; Fazio 1986), and contextual forces including rhetoric (O'Keefe 2002; Druckman and Miller 2004; Druckman 2005) and messages highlighting social norms (Cialdini 2001, 2005; Gerber et al. 2008, 2010; Nolan et al. 2008; Tetlock 1985). I then test the prediction that a persuasive appeal associated with energy conservation will be more effective when a social norm promoting action is made salient. I find that highlighting a pro-conservation norm in the context of an appeal increases the importance individuals' associate with taking action, intentions to conserve energy, and actual behavior on a light-bulb purchasing decision. The findings have implications more generally for when individuals take actions that promote the public good; understanding these conditions help us to make sense of what governments need to do in terms of providing collective goods, and what can be done to promote individual contributions.

Private Actions for the Public Good

I focus on the determinants of behavior taken to secure a *public good*. A public good is something that cannot feasibly be withheld from others in a group if it is provided for any 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 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 conserve energy may result in private economic benefits such as money saved from reduced consumption, but these actions may also entail sacrifices such as driving smaller vehicles and reducing travel with benefits that accrue to the general population. Thus, reducing energy usage, in part, may result from the desire to contribute to the public good of energy conservation.¹

I explain variation in three primary measures of individual behavior: intentions to conserve energy, willingness to pay for an energy-saving device, and actual behavior on a purchasing decision. First, intentions are widely used to study turnout (Rosenstone and Hansen 1993; Lau and Pomper 2001), vote choice (Campbell et al. 1960; Krosnick 1988; Ansolabehere et al. 2008), and other participatory behaviors (Brady et al. 1995; Goidel and Nisbet 2006); thus, I account for intentions to reduce energy usage through energy conservation (e.g., adjusting ambient home temperature,

¹ Allcott (2010, p. 5) explains that “because some externalities, primarily from power plant greenhouse gas emissions, are not internalized in electricity prices, many consumers perceive that energy conservation helps provide a public good (more moderate global climate).”

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, I measure the maximum monetary amount an individual is willing to pay for an energy efficient bulb as a measure of support, or demand, for the public good (Green et al. 1998; McFadden 1994). Third, I move beyond what is typical in political science and record actual behavior on a light-bulb purchasing decision. While there are exceptions, most research on political behavior focuses exclusively on measures of attitudes and intentions and does not assess actual behavior.²

Having specified my dependent variables, I next move to the determinants of taking action for the public good. A person's attitude toward a behavior often is a powerful predictor of action (Ajzen and Fishbein 1980; Ajzen 1991). An attitude is an evaluation toward an object, such as a candidate, policy, or potential action.³ A person's attitude toward a behavior is primarily a function of beliefs about its likely consequences (Ajzen and Fishbein 2005, p. 199). For instance, a person's attitude toward taking action to conserve energy might stem from considerations about the economic and/or environmental implications. 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: one's attitude about the *importance* and *efficacy* of personal action. An attitude's importance refers to its perceived significance. Important attitudes have been shown to guide actions such as voting, writing letters to public officials, and making donations to political organizations (Boninger et al. 1995, p. 62). Second, *efficacy* refers to the extent to which individuals believe that their actions have an influence on the collective outcome. 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 theory, but also one's perceived personal influence over collective outcomes, whether the group is likely to succeed, and the expected reciprocity of others (Finkel et al. 1989; Lubell et al. 2007). Other research shows that individuals engage in collective actions because they perceive their behavior as diagnostic of how similar others will act (Quattrone and Tversky 1984).⁴ Although prior work clearly demonstrates the impact of the attitudes reviewed above on one's willingness to engage in collective actions, scholars know less about how contextual forces influence individuals' decisions (Druckman 2004; Druckman and Lupia 2000).

² This is important given the debate over the validity of intention measures as predictors of behavior—e.g., literature analyzing voter turnout (see Vavreck 2007); also, see Chandon et al. (2005) for research in marketing on consumers' purchasing choices. 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. But see, Green and Gerber (2010), Lau and Redlawsk (2001).

³ Whether one's evaluation toward an object is positive, neutral, or negative depends on the availability, accessibility, and applicability of various considerations about the object (Chong and Druckman 2007).

⁴ These studies find that individuals tend to systematically overestimate their own personal influence on outcomes when considering participation in a collective action. The end result of these psychological "miscalculations" is that individuals engage in collective actions at a higher rate than predicted by traditional expected-utility theory.

Invoking Norms in Appeals for Action

A vast literature demonstrates that *rhetoric*—i.e., verbal or textual communications targeting attitude change—can shape individuals' attitudes and preferences (Bartels 1993; Chong and Druckman 2007; Druckman and Holmes 2004; Druckman and Parkin 2005; Hoveland et al. 1953; O'Keefe 2002; Petty and Cacioppo 1986; Zaller 1992). Much of this work focuses on the processes by which persuasion occurs. O'Keefe (2002, p. 5) defines persuasion as messages “designed to influence others by modifying their beliefs, values, or attitudes.” Thus, persuasion occurs when a communication causes a change in a person's underlying evaluation (i.e., attitude) toward an object.⁵

A number of studies demonstrate that exposure to persuasive messages can directly impact political behavior. For instance, Druckman and Parkin (2005) find that a reliance on different sources of news in a Minnesota Senate campaign influences reported vote choice. In another study, Miller and Krosnick (2004) find that an appeal drawing attention to a potentially threatening policy change increases financial contributions to a group fighting against the change. Brader et al. (2008) demonstrates that an appeal highlighting the negative consequences of immigration, and including a Latino ethnic cue, significantly increases the tendency to seek information about immigration policies and email a member of Congress. Thus, drawing from the extant literature, *I hypothesize that reading an appeal that promotes personal action to conserve energy will increase behavioral intentions to reduce consumption, willingness to pay for an energy saving device, and actual purchases of energy-efficient light bulbs* (Hypothesis 1).

A growing literature explores the impact of highlighting social norms in the context of appeals for actions such as voting (Gerber and Rogers 2009; Gerber et al. 2008; Green and Gerber 2010), encouraging energy conservation (Nolan et al. 2008), and a variety of other desirable behaviors (Cialdini 2005; Cialdini and Goldstein 2004; Schultz 1999; Schultz et al. 2007). A *norm* refers to what is deemed acceptable and unacceptable behavior in a society.⁶ Social psychologists distinguish between descriptive-norm-based-messages, which describe how most people behave in a given context, and injunctive-norm-based-messages, which describe how people *ought* to behave regardless of how people are actually behaving. In this paper, I follow the majority of scholars in focusing exclusively on the impact of descriptive-norm-based-messages.

⁵ Related work on *framing effects* reveals that exposure to political rhetoric affects the availability, accessibility, and applicability of cognitions toward an attitude object (Chong and Druckman 2007, 2010).

⁶ Norms evolve in communities as a way to regulate social life, and norms can be especially powerful in situations in which an individual's action causes negative effects on the lives of others (Biel and Thøgersen 2007; Thøgersen 2008). In these situations, norms serve to restrain egoistic impulses and induce cooperation among group members in providing public goods. For instance, research in behavioral economics on *conditional cooperation* demonstrates that people are more likely to contribute to the provision of public goods when they perceive others as contributing (Allcott 2010, p. 5; Alpizar et al. 2008; Axelrod 1984; Frey and Meier 2004; Shang and Croson 2004). However, individuals vary in the extent to which they regulate and control their actions when they are being monitored by others (Snyder 1987; Berinsky 2004).

Why Invoking Norms Matters

Scholars have known for decades that simply learning about the opinions of others can trigger social influence (Asch 1956; Noelle-Neumann 1984; Mutz 1992, 1998). Mutz (1998, p. 5) explains, "...the literature on American political behavior is replete with examples of situations in which people's political behaviors are influenced by their perceptions of the attitudes or experiences of mass collective, collectives that exist well beyond the boundaries of communities they know through personal experiences." For instance, being informed that turnout is likely to be high in an upcoming election has been shown to significantly increase intentions to vote (Gerber and Rogers 2009).

Multiple psychological processes may account for the impact of invoking behavioral norms in appeals for collective action. In a recent study that focuses on how perceptions about mass opinion influences individuals' beliefs about five non-electoral issues, Sonck and Loosveldt (2010) make an important distinction between explanations that involve *high-level-information-processing* and those that involve *low-level-information-processing*. When individuals closely attend to information regarding appropriate norms (i.e., "high-level" processing), the impact of invoking norms may stem from (a) information about the costs and benefits of alternative courses of action (Ajzen and Fishbein 2005), (b) attitude change via persuasion processes (O'Keefe 2002; Chong and Druckman 2007), or (c) due to monitoring and compliance with collective opinion so as to avoid social sanction (Noelle-Neumann 1984). When individuals are less motivated and engaged to carefully scrutinize the content of messages (i.e., "low-level" processing), norm-based cues in messages may lead to social influence through processes similar to the well-known *bandwagon effect*. Bandwagon effects occur when people believe and do things merely because other people do it. For instance, in experimental settings, individuals—particularly independents and party-learners—tend to shift their voting loyalties toward the candidate most likely to win, regardless of that candidate's partisanship (Goidel and Shields 1994; Nadeau et al. 1993). These effects also have been shown to influence voting in U.S. Presidential elections (Bartels 1985, 1987; Skalaban 1988). Based on this literature, *I predict that invoking a social norm—in the context of an appeal promoting energy conservation—will increase favorable attitudes, intentions, and willingness to take action to conserve energy* (Hypothesis 2).

Experiment: Participants, Design, Procedures

To test the predictions stated above, I implemented an experiment. The experiment included two manipulations: (1) the content of an appeal associated with personal energy conservation, and (2) whether a norm regarding conservation was made salient. I chose not to vary the direction of the normative treatment because all related prior work explores how norms *promote*—rather than discourage—environmentally significant actions (Stern 2000; Nolan et al. 2008; Cialdini and Goldstein 2004). I acknowledge the presence of other norms that may be relevant

that may conflict with the single pro-conservation norm (e.g., consumer choice, see Thaler 2008, p. 22; Hopkins and Kornienko 2004). Table 1 lists each experimental condition.

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 between August and October of 2008.⁷ 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 at Northwestern University in the Political Science Research Lab (31%).⁸

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 of the editorial emphasized the importance of *consumers* taking steps to conserve energy. The second version focused on the relatively *small impact that consumer decisions*—such as purchasing energy efficient light bulbs—have on the nation's overall configuration of energy resources. Moreover, this version argued that asking consumers to pay more for energy-efficient technologies would do little to foster a transition away from a reliance on fossil fuels. Although both versions of the appeal advocate the need for action on energy conservation, the articles differ in terms of who is assigned responsibility for dealing with the extant problem—i.e., consumers

Table 1 Experimental design

	Pro-behavior norm	No norm
Pro-consumer action editorial	<i>Pro-Norm + Pro-Consumer Appeal</i>	<i>Pro-Consumer Action Appeal</i>
Pro-government action editorial	<i>Pro-Norm + Pro-Government Action Appeal</i>	<i>Pro-Government Action Appeal</i>

⁷ The four locations were: Evanston, IL; Warrenville, IL; Mount Prospect, IL; and, Lovington, IL. I transported the laptops to businesses, libraries, and community centers that generously agreed to provide a conference room to conduct the experimental sessions. Collecting data from multiple sites increased the heterogeneity of my sample; however, the location of administrative sites may have depressed the validity of some of the measurement scales described below because of increased opportunity to conserve energy in urban areas (e.g., access to public transportation).

⁸ See Table 3 in the Appendix for details on the demographic composition of the sample.

versus government—as well as the importance associated with taking personal action. The content of the messages was based on an analysis of news stories, public service announcements, and appeals advocating energy conservation over time 1970–2007 (Bolsen 2011). Each version of the appeal was pre-tested on an undergraduate class at Northwestern University to ensure they effectively communicated the intended messages.⁹ The full text of each treatment is in the Appendix.

Pro-Norm Manipulation

Prior to each session, I randomly assigned each session to include a pro-energy conservation norm or no norm. To invoke a pro-conservation norm, participants attending a *pro-norm* session read a “press release” about the results from a recent survey of Illinois residents. The press release stated that the “vast majority of Illinois residents support energy conservation” and “over 90%” agree that it is important for “all Americans to make energy efficient consumption decisions.”¹⁰ Participants attending a pro-norm session were also informed that there would be a brief group discussion about their responses and purchasing decision at the conclusion of the study. Participants assigned to the control sessions were informed that their responses were confidential and that they could leave upon completing the final battery of questions. In sum, the normative manipulation merged two pieces of information: (1) a description of the attitudes of local residents about energy conservation, and (2) instructions about whether one’s actions will be monitored by others.¹¹

Procedures and Measures

At the beginning of each session, all participants were given written instructions detailing the procedures involved, and agreed to participate by signing an

⁹ Subjects in the pre-test were asked to evaluate one of two versions of an editorial and whether it encourages or discourages “individuals taking personal steps to reduce energy consumption” (on a 7-point scale where 1 = “definitely opposes taking steps” and 7 = “definitely supports taking steps”). Subjects did perceive differences as to whether the editorial advocates or discourages taking personal steps to reduce energy consumption ($p < .001$), with the mean score for the pro-action editorial at 6.09 and the mean score for the no-action editorial at 2.74. In addition, individuals were asked to assess whether reading each editorial would decrease or increase their likelihood of conserving energy (on a 7 point scale where 1 = “definitely decreases likelihood” and 7 = “definitely increases likelihood”). The means for this question were 5.12 after reading the pro-action editorial and 3.59 after reading the editorial questioning the importance of taking personal steps ($p < .001$). Both articles were rated as equally easy to read and understand, and there were no differences in perceptions of how effective the editorials were in terms of making the case for conservation (means of 4.91 and 4.56 on a seven point scale for “how effective each article is in making its case”).

¹⁰ In contrast, participants assigned to *no-norms* sessions read an unrelated press release. The full text of each press release is included in the Appendix.

¹¹ This ensures that individuals have knowledge about prevailing behavioral standards in a decision context and a belief that their expressed intentions and actions are subject to monitoring by others. I acknowledge that this may also induce social desirability effects in which respondents seek to behave in socially desirable ways (see Streb et al. 2008; Berinsky 2002; Kuklinski et al. 1997; Sniderman and Carmines 1997).

IRB-approved consent form. The instructions explained that the study focused on attitudes about U.S. energy policy, and that each participant would complete a background questionnaire, read a press release and a newspaper editorial, and answer a few questions about what they read. The instructions further 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.

Following completion of the initial battery of questions, participants read a press release followed by an editorial. Participants then responded to a battery of questions measuring key constructs. To measure each respondent's attitude toward purchasing energy efficient light bulbs, participants responded to the question "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." Participants also responded to several questions measuring the importance of taking action to conserve energy (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 combined into a single measure for *attitude importance* ($\alpha = .66$). Beliefs about the collective efficacy of conservation were assessed by measuring the degree to which participants agreed or disagreed with the following statements (1–4 disagree/agree scale): "I believe my actions have an influence on the nation's energy situation"; "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 personal influence on collective outcomes and the second item focuses on the expected reciprocity of others. These items were combined into a single measure of beliefs about the *collective efficacy* ($\alpha = .76$) of action to secure a public good.

Participants also completed a battery of questions measuring their intentions related to energy conservation. 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 single measure of energy *curtailment intentions* ($\alpha = .68$), while the latter three intentions were combined to create a single measure for intentions to make capital investments into energy-efficiency—i.e., *investment intentions* ($\alpha = .68$).¹² I measured the maximum amount

¹² These terms have been used previously by scholars to distinguish between distinct classes of energy conservation (Black et al. 1985; Stern and Gardner 1981; Stern 2000).

Table 2 Distribution of dependent variables

	Mean (std. dev.)	<i>Pro- Norm + Pro- Consumer Action Appeal</i>	<i>Pro- Norm + Pro- Gov't Action Appeal</i>	<i>No- Norm + Pro- Consumer Action Appeal</i>	<i>No- Norm + Pro- Gov't Action Appeal</i>	Range (min/ max)
Total sample:		N = 52	N = 46	N = 49	N = 49	
Curtailment intentions	5.14 (1.24)	5.46 (1.05)	4.87 (1.17)	5.21 (1.30)	5.01 (1.37)	1–7
Investment intentions	3.81 (1.71)	4.12 (1.70)	3.42 (1.89)	4.01 (1.74)	3.77 (1.47)	1–7
Max WTP for CFL	\$2.97 (\$2.09)	\$3.35 (\$2.43)	\$3.24 (\$2.09)	\$2.75 (\$1.82)	\$2.52 (\$1.92)	\$.50–\$10
Light bulb choice (CFL = 1)	.77 (.42)	.83 (.38)	.83 (.38)	.65 (.48)	.77 (.42)	0–1

participants were willing-to-pay for 1 energy efficient light bulb (*WTP for CFL*).¹³ 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, along with the cash remaining in the envelope. The final instructions stated, “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 signed a receipt and were allowed to leave; individuals assigned to the pro-norms sessions were asked to remain seated until others had finished for the group discussion. *Light bulb purchase* is a variable coded 1 if the CFL package was chosen and 0 if the standard package was purchased.

Results

I begin by reporting the distribution of responses on the main dependent variables across conditions in Table 2.¹⁴ Not surprisingly, subjects are more willing to curtail energy usage as compared to making more costly capital investments for increased efficiency. Across all conditions, the average amount participants were willing to pay for an energy-efficient bulb was \$2.97. In addition, 77% of the sample

¹³ The question was worded as follows: “A standard light bulb costs about \$.50. An energy efficient light bulb is more expensive. What is the maximum amount you would be willing to pay for one energy efficient light bulb? Please enter an amount ranging from \$.50 to \$10.00 in the space provided below.” This protocol is an open-ended method of contingent valuation used to value environmental goods (Green et al. 1998; McFadden 1994).

¹⁴ As a randomization check, I regressed each condition on demographic and individual-level variables including gender, education, party affiliation, political ideology, and key values measures (universalism, egalitarianism). The randomization check confirmed that these variables were unrelated to condition assignment.

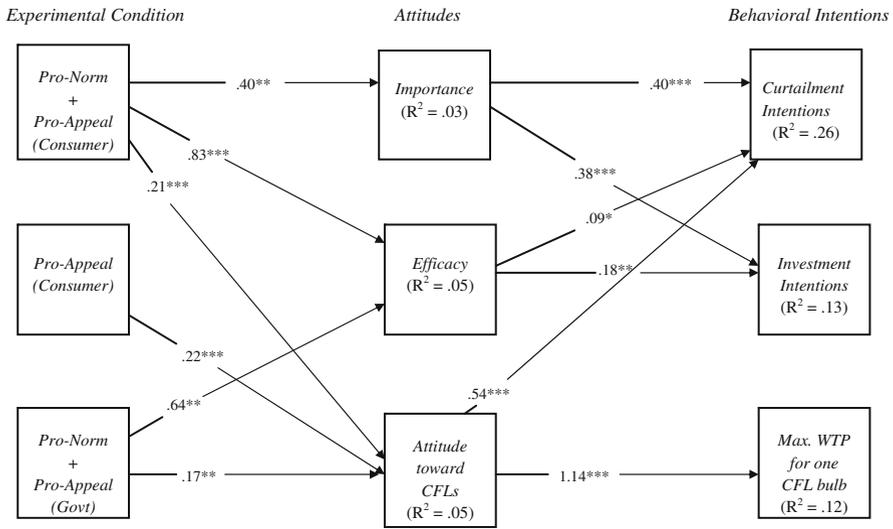


Fig. 1 Path diagram of treatment effects on behavioral intentions. *Note.* All coefficients are standardized ordinary least-squares (beta) coefficients, except for the model predicting *Attitude toward CFLs* (Probit coefficient) because the measure is dichotomous. *** $p \leq .01$, ** $p \leq .05$, * $p \leq .10$ for one tailed tests, because the hypotheses are directional. Coding of the variables is described in the text. The full results for each model are reported in Tables 4 and 5 in the Appendix

purchased the package of energy efficient bulbs, and 23% purchased the standard package. Notably, across all dependent measures the combination of the pro-conservation norm and the pro-consumer-action editorial produced the highest level of intentions to conserve energy.

To test the hypotheses stated above, I estimated a series of regressions to assess the impact of the experimental treatments on participants' attitudes and behaviors. I present the results from these estimations in a path model in order to show how attitudes mediate the direct impact of my treatments on behavioral intentions and purchasing behavior (see, e.g., Druckman and Parkin 2005). To avoid presenting an overly complicated path, I simplify the model in the following ways. First, I do not report paths that proved insignificant.¹⁵ Second, I exclude all demographic and values measures. The inclusion of these measures does not affect the results, and the additional analyses are available upon request.

Figure 1 shows a path model of the impact of the experimental treatments on key attitude and behavioral intention measures. In support of Hypothesis 1, the pro-consumer-action appeal significantly increases favorable attitudes toward the purchase of energy-efficient light bulbs (relative to the baseline condition which received a different version of the appeal arguing for government action); however, this version does not have a greater impact than the government-action appeal on attitude *importance* and *efficacy*. Second, in support of Hypothesis 2, invoking social norms by informing participants that most people are engaged in these actions

¹⁵ The full set of results for each model is reported in Tables 4, 5, and 6 in the Appendix.

not only influences one's direct attitude toward purchasing CFLs, but also the *importance* and *efficacy* associated with energy conservation. Relative to the baseline condition (No Norm + Government Responsibility Appeal), the combination of the pro norm message and the pro consumer action appeal increased the perceived importance associated with energy conservation 7% and the efficacy associated with action 13% ($p < .05$).¹⁶ In addition, even when the pro-norm message is coupled with the appeal arguing that *the government and not consumers* needs to take action, participants are significantly more likely to perceive personal energy conservation as efficacious and express a significantly more favorable attitude toward buying energy-efficient light bulbs (see the positive and significant effects of *Pro-Norm + Pro-Gov Appeal* in Fig. 1).

Although the experimental conditions have direct main effects on the behavioral intention measures on the right hand side of Fig. 1, these effects are mediated by attitudes about the *importance*, *efficacy*, and *favorability toward CFLs* (see Tables 4 and 5 in the Appendix for the full results from each model). In other words, once the attitudes explained by the treatments are included in the models predicting behavioral intentions, the main effects of the conditions on the behavioral intention measures drop out, providing clear evidence of mediation (Baron and Kenny 1986). Notably, attitude *importance* and *efficacy* beliefs are strong predictors of curtailment and investment intentions, but *attitude toward CFLs* is the proximate determinant of the maximum amount one is willing to pay for an energy-efficient bulb.

A final decision in the experiment involved participants using a portion of the cash received for taking part in the study (\$20) to purchase a package of light bulbs. Each participant was informed he or she should use a portion of their remuneration to purchase either a 4-pack of standard light bulbs for \$1 or a 2-pack of energy efficient (CFL) bulbs for \$5. A clear majority of respondents chose the package of CFL bulbs (77%); however, there were interesting differences in purchasing behavior across conditions (see Table 1). Eighty-three percent of individuals assigned to a pro-norm session purchased the energy efficient package of bulbs compared to 71% of those attending the no norms sessions ($p < .05$).

Figure 2 illustrates a path model of the impact of the experimental conditions on attitudes and light bulb purchase. Again, the experimental conditions directly influenced attitudes about the importance and efficacy of energy conservation; in turn, these beliefs directly shaped participants' favorability toward buying CFLs. As Fig. 2 shows, a person's attitude toward buying energy-efficient bulbs is a strong and proximate influence on actual behavior. The predicted probability of purchasing a package of energy efficient bulbs is 57% when the attitude toward the behavior is unfavorable but increases to 85% when the attitude is favorable. Also, once *Attitude toward CFLs* is included in the models predicting purchasing decision, the main effects of the conditions and other attitudinal measures drop out—again, suggesting mediation via one's attitude toward the behavior.

¹⁶ I used *Clarify* to generate predicted probability shifts across conditions (King et al. 2000; Tomz et al. 2003).

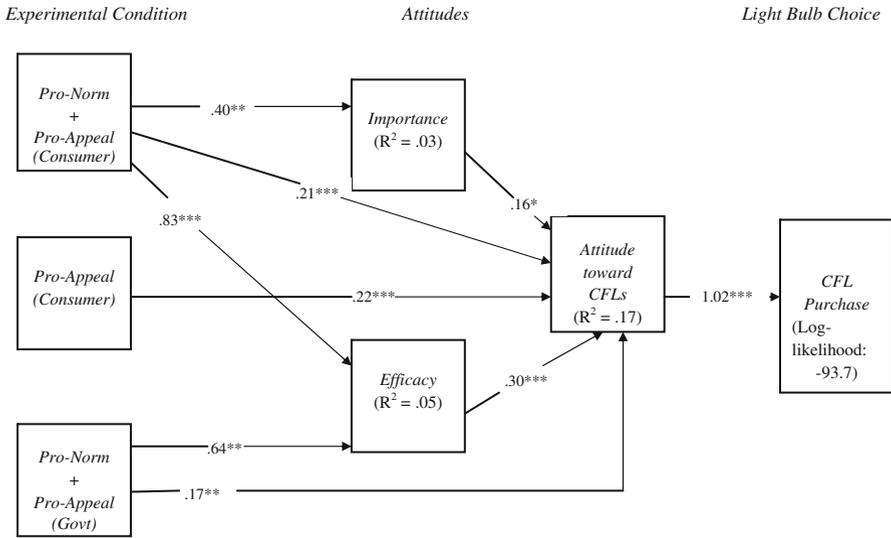


Fig. 2 Path diagram of treatment effects on purchasing behavior. *Note.* All coefficients are standardized ordinary least-squares (beta) coefficients, except for the model predicting *Attitude toward CFLs* (*Probit coefficient*) because the measure is dichotomous. *** $p \leq .01$, ** $p \leq .05$, * $p \leq .10$ for one tailed tests, because the hypotheses are directional. Coding of the variables is described in the text. The full results for each model are reported in Tables 4 and 6 in the Appendix

Conclusion

This paper demonstrates that invoking social norms in the context of an appeal for collective action increases the importance associated with taking action, intentions to contribute to the public good of energy conservation, and purchases of energy efficient light bulbs. The inclusion of an actual behavior (i.e., purchasing light bulbs) helps substantiate the intention measures (i.e., intentions to curtail energy use and invest in energy efficiency); each measure helps to build an even stronger case for the results. In support of my first hypothesis, an appeal that directly calls for action by *consumers* significantly increases the importance and efficacy of personal action (relative to an appeal that assigns responsibility to the *government*). In other words, the more consumers believe it is important and efficacious to take action, and the more they view themselves as individually responsible for collective outcomes, the more willing they are to contribute to the public good of energy conservation. The media assign responsibility to government for dealing with extant energy problems much more often than they assign responsibility directly to consumers (Bolsen 2011), and this may reduce individuals’ willingness to make voluntary contributions for the public good. Second, in support of Hypotheses 2, I find that highlighting a pro-conservation behavioral norm prior to reading the appeal significantly increases participants’ willingness to take action as measured by intentions and purchasing behavior. However, the direct treatment effects of invoking a pro-conservation norm on intentions and behavior are mediated by attitudes about the importance and efficacy of action.

The results from this study provide a number of important insights to both scholars and practitioners. First, the results tell us something about the power of invoking social norms in messages designed to promote environmental actions. This may be a cost-effective way for utilities (or governments) to promote conservation—e.g., in order to comply with legislation mandating these types of programs (Allcott 2010). Second, the results speak to broader questions about how collective action problems may be overcome. Specifically, emphasizing cooperation by others, and individual responsibility for collective outcomes, in these situations may be crucial—e.g., as opposed to emphasizing norms of self-interested behavior—because if others are not willing to cooperate and contribute to the public good then one's actions will not make a difference. Third, because people were compelled to contribute to the public good with little more than a brief mention of social norms, this suggests that citizens' actions may be shaped powerfully by perceptions about prevailing norms.

Of course, this is only one study, and additional research is necessary to generalize across populations, settings, and experimental treatments (Druckman and Kam 2011). More importantly, additional work is necessary to sort out the precise cognitive processes driving the observed treatment effects associated with invoking a social norm. For instance, is the finding that invoking norms “matters” driven by low-level-processing of information (e.g., bandwagon effects), higher-level processes (e.g., conformity to prevailing norms, information effects, etc.), or a combination of these mechanisms? To answer this question, additional experiments are necessary to account (separately) for the internal and external mechanisms of normative social influence.

Political scientists are united by a desire to understand, explain, and predict important aspects of the contexts in which individual and collective actions occur (Druckman et al. 2011). Experimental designs can be especially useful because they allow researchers to pinpoint the effects of contextual factors that might be difficult to assess using other forms of inference (Ostrom et al. 1992; Druckman et al. 2006, p. 627). This paper is a first step at exploring whether highlighting norms in the context of a persuasive appeal shapes politically-relevant behaviors. The results have implications more generally for when individual take actions that promote the public good; understanding these conditions help us to make sense of what governments need to do in terms of providing collective goods, and what can be done to promote individual contributions.

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Appendix

See Tables 3, 4, 5, and 6.

Table 3 Demographic profile of the sample

Variable	Scale	Distribution (%)
Education (N = 137)	Less than high school	4
	High school	18
	Some college	44
	4 year degree	12
	Advanced degree	22
Age (N = 196)	18–24 years old	37
	25–34 years old	11
	35–50 years old	12
	51–65 years old	20
	Over 65	20
Ethnicity (N = 196)	White	77
	African American	5
	Asian American	15
	Hispanic	3
Sex (N = 196)	Male	37
	Female	63
Party identification (N = 196)	1 = strong Democrat	21
	2	17
	3	14
	4 = Independent	23
	5	9
	6	8
	7 = strong Republican	8
Ideology (N = 196)	1 = very liberal	15
	2	17
	3	17
	4 = moderate	26
	5	15
	6	6
	7 = very conservative	3

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.

Table 4 Treatment effects on attitudes and reported intentions

	Attitude importance (1)	Collective efficacy (2)	Attitude about CFLs (3)	Curtailement intentions (4)	Investment intentions (5)	WTP for CFL (6)
<i>Pro-Norm + Pro-Action Appeal (Consumers)</i>	.40 (.20)**^^^	.83 (.28)***++	.21 (.08)***	.45 (.25)**^^	.35 (.34)^	.82 (.42)***+
<i>Pro-Norm + Pro-Action Appeal (Government)</i>	-.08 (.21)	.64 (.29)**+	.17 (.08)**	-.14 (.25)	-.35 (.35)	.71 (.44)**+
<i>No Norm + Pro-Action Appeal (Consumers)</i>	.21 (.21)^	.33 (.29)	.22 (.08)***	.20 (.25)^	.24 (.34)^	.22 (.42)
N/R2	196/.03	196/.05	196/.05	196/.03	196/.02	196/.03

Standard errors are reported in parentheses; *** $p < .01$; ** $p < .05$; * $p < .10$, two-tailed test; *No-Norm + No-Action Appeal* is the excluded condition in each model to avoid perfect co-linearity

^ Significantly greater than *Pro-Norm + Gov't-Action Appeal*; + significantly greater than *No-Norm + Pro-Consumer-Action Appeal*

Table 5 Determinants of behavioral intentions

	Curtailement intentions	Investment intentions	WTP max for CFL bulb
<i>Pro-Norm + Pro-Action Appeal (Consumers)</i>	.10 (.22)	.05 (.33)	.41 (.42)
<i>Pro-Norm + Pro-Action Appeal (Government)</i>	-.26 (.23)	-.43 (.34)	.48 (.43)
<i>No Norm + Pro-Action Appeal (Consumers)</i>	-.04 (.22)	.11 (.33)	-.08 (.41)
Attitude about paying more for CFLs	.54 (.20)***	-.00 (.30)	1.13 (.39)***
Attitude importance	.40 (.08)***	.38 (.13)***	.23 (.22)
Collective efficacy	.09 (.05)*	.18 (.09)**	.19 (.19)
N	196/R2 = .26	196/R2 = .13	190/R2 = .12

Standard errors are reported in parentheses; *** $p < .01$; ** $p < .05$; * $p < .10$, one-tailed test; *No-norm + Government Action Appeal* is the excluded condition in each model to avoid perfect co-linearity

Table 6 Determinants of purchasing behavior

	Model 1	Model 2
<i>Pro-Norm</i>	.38 (.20)**	–
<i>Pro-Editorial</i>	–.20 (.20)	–
<i>Pro-Norm + Pro-Action Appeal (Consumers)</i>		–.02 (.31)
<i>Pro-Norm + Pro-Action Appeal (Government)</i>		.03 (.08)
<i>No Norm + Pro-Action Appeal (Consumers)</i>		–.65 (.30)**
Attitude about CFLs		1.02 (.26)***
Attitude importance		.06 (.11)
Collective efficacy		–.06 (.08)
N/log-likelihood	196/–103.35	196/–93.70

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; *** $p < .01$, ** $p < .05$. *No-norm + Pro-Government-Action Appeal* is the excluded condition in Model 2 to avoid perfect co-linearity

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 Action—Consumers)

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%, 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% 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 2-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 (Pro Action—Government)

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%, 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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