Article:
Schwartz, D, Bruine de Bruin, W orcid.org/0000-0002-1601-789X, Fischhoff, B et al. (1 more author) (2015) Advertising energy saving programs: The potential environmental cost of emphasizing monetary savings. Journal of Experimental Psychology: Applied, 21 (2). pp. 158-166. ISSN 1076-898X

https://doi.org/10.1037/xap0000042

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Advertising Energy Saving Programs:

The Potential Environmental Cost of Emphasizing Monetary Savings

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Abstract

Many consumers have monetary and environmental motivations for saving energy. Indeed, saving energy produces both monetary benefits, by reducing energy bills, and environmental benefits, by reducing carbon footprints. We examined how consumers' willingness and reasons to enroll in energy-savings programs are affected by whether advertisements emphasize monetary benefits, environmental benefits, or both. From a normative perspective, having two noteworthy kinds of benefit should not decrease a program's attractiveness. In contrast, psychological research suggests that adding external incentives to an intrinsically motivating task may backfire. To date, however, it remains unclear whether this is the case when both extrinsic and intrinsic motivations are inherent to the task, as with energy savings, and whether removing explicit mention of extrinsic motivation will reduce its importance. We found that emphasizing a program's monetary benefits reduced participants' willingness to enroll. In addition, participants' explanations about enrollment revealed less attention to environmental concerns when programs emphasized monetary savings, even when environmental savings were also emphasized. We found equal attention to monetary motivations in all conditions, revealing an asymmetric attention to monetary and environmental motives. These results also provide practical guidance regarding the positioning of energy-saving programs: emphasize intrinsic benefits; the extrinsic ones may speak for themselves.

Keywords: environmental motivation; monetary motivation; environmental decision-making; overjustification hypothesis; energy conservation

Advertising Energy Saving Programs:

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The U.S. produces 20% of all energy-related carbon dioxide emissions worldwide, with approximately 21% of that coming from U.S. households' energy consumption (U.S. Energy Information Administration, 2009). Reducing household energy usage is central to programs that aim to decrease carbon emissions. In fact, many states have adopted goals for reducing electricity consumption (American Council for an Energy-Efficient Economy, 2011). In order to meet these goals, utility companies and governmental agencies promote residential energy-saving programs, typically emphasizing ways to help consumers save money, while occasionally emphasizing environmental benefits as well (e.g., Department of Energy and Ad Council's campaign: "Saving energy, saves you money"; Ad Council, 2011). However, programs that focus on energy-pricing schemes, such as rebates, find relatively low consumer interest (e.g., Star, Isaacson, Haeg, & Kotewa, 2010).

Normatively, learning about monetary benefits should increase consumers' motivation to enroll in energy-saving programs, serving as an extrinsic reason that supplements intrinsic reasons, such as environmental protection. However, there are also reasons to believe that emphasizing the monetary benefits of saving energy may actually reduce pro-environmental consumers' motivation to enroll in residential energy-saving programs. Previous research has found that providing financial rewards for behaviors that people would have done anyway can undermine their intrinsic motivation (Deci, Koestner & Ryan, 1999; Deci & Ryan, 1985). For example, Frey & Oberholzer-Gee (1997) found that, without financial incentives, 50.8% of Swiss supported proposals for a nearby nuclear waste repository, whereas support fell to 24.6%

when compensation was offered. The overjustification hypothesis, based on self-perception theory (Bem, 1965, 1967; deCharms, 1968), has been offered as an explanation for these results: when extrinsic rewards, such as monetary payments, are offered, people attribute their behavior to those rewards rather than to their intrinsic motivation (Deci, 1971; Lepper, Greene, & Nisbett, 1973; Tang & Hall, 1995). Extrinsic rewards may lead people to see themselves as more greedy, making them less willing to engage in prosocial behavior (Benabou and Tirole, 2006; Bolderdijk, Steg, Geller, Lehman, & Postmes, 2012). This would imply that people who intrinsically engage in an activity should not be simultaneously motivated by monetary benefits. However, to the best of our knowledge, studies suggesting that extrinsic rewards undermine intrinsic motivations have not examined activities that inherently provide extrinsic ones – as is the case with energy savings, where monetary savings accompany environmental benefits.

Although it is possible to create experimental tasks that separate intrinsic and extrinsic motivations, in some important real-world decisions that is not possible. Saving energy always saves money, even for people focused on saving the environment; if so, then the theories discussed above imply that those monetary savings may *inherently* undermine intrinsic motivations. People who turn up their air-conditioner thermostat by three degrees both help the environment and save money. Here, we ask how emphasizing monetary and environmental benefits, alone or in combination, affects behavior when the two are necessarily confounded. We predict that emphasizing monetary benefits, with or without environmental benefits, will undermine the intrinsic motivation for consumers wishing to reduce their carbon footprint, but not for consumers without that interest (as seen in Calder & Staw, 1975).

Our experiment uses stimuli adapted from programs used by electric utilities trying to get consumers to enroll in energy-saving programs, with the goal of either overall energy

conservation or peak-shaving, reducing consumption when demand might overload the grid (e.g., hot summer afternoons, with heavy air conditioner usage). In addition to eliciting enrollment preferences, we asked for reasons to enroll, expecting fewer environmental reasons when programs emphasized monetary benefits and, consistent with the overjustification hypothesis, fewer monetary reasons when programs emphasized the environment. We also examined participants' responses as a function of their political views. Because conservatives tend to have lower pro-environmental attitudes and are less concerned about climate change, compared to liberals and moderates (Bruine de Bruin, Wong-Parodi, & Morgan, in press; Coffey & Joseph, 2013; Franzen & Vogl, 2013), emphasizing monetary benefits should affect them less (as they have less intrinsic motivation to suppress).

Method

Participants

We recruited 1,406 participants through Craigslist and Amazon's mTurk, a Website often used for behavioral research (Paolacci, Chandler, & Ipeirotis, 2010). We excluded 15 who were not U.S. residents and 93 who did not receive a bill for electricity (e.g., because it was included in their rent), and 126 who did not answer these questions. Among the remaining 1,172, mean age was 33.2 (*SD* = 11.9) and 63.7% were females. Fifty-three percent had at least an undergraduate college degree. Most (67%) reported being the household member responsible for paying their residential electricity bills. Participants reported mean summer and winter monthly bills of $129.35 (SD = $116.7) and $139.83 (SD = $122.7), respectively, moderately higher than the mean national electricity bill of $104.52 (U.S. Energy Information Administration, 2011).

Procedure and materials

Participants were randomly assigned to receive one of six advertisements, which promoted one of two residential energy programs, with one of three emphases. The two programs were designed to promote either (a) energy conservation, by reducing overall electricity use, or (b) by peak shaving, reducing electricity use at times of top demand (U.S. Department of Energy, 2006). For each program, the three advertisement emphases were (a) monetary, "reduce your electricity bill"; (b) environment, "reduce your environmental impact"; or (c) both, "reduce your electricity bill and your environmental impact."[1] Programs specified 5% of savings in their 'electricity bill' and/or their 'electricity use' depending on the advertisement, a realistic estimate for such programs (Davis, Krishnamurti, Fischhoff, and Bruine de Bruin, 2013).[2] Energy experts reviewed the advertisements to ensure their accuracy, and extensive pilot-tests improved their comprehensibility. All were written at the 9th-10th grade Flesch-Kincaid level (Kincaid, Fishburne, Rogers, & Chissom, 1975), despite their technical content. Programs' advertisements are in the appendix.

After reading the advertisement, participants checked whether they would engage in each of 10 possible actions for reducing electricity usage. These questions were intended to make the effort needed to save electricity more concrete, and avoid ceiling effects in decisions about enrolling in the energy-saving programs. Participants then indicated their *willingness to enroll* in the energy program offered to them ("Would you enroll in the [name of the program] in the next

[1] Any program requires some motivation to save energy. As a result, we had no pure control condition. As supplementary to the three combinations of emphases, we tested (N = 235) and found that the emphasis "save energy" may be treated similar to a monetary emphasis (see additional analysis in Supplementary Material).

[2] In a supplementary study (N = 347) with the same population, we found that participants did not expect higher savings when peak-shaving programs emphasized monetary savings compared to other conditions.

month?"), on a scale anchored at 1 = "definitely not" and 8 = "definitely yes." Then, they were asked to provide *reasons* for their decision in a text box introduced with "Please explain why you selected [participant's answer] in your decision to enroll in the [name of the program] next month."

Finally, participants answered, "How well the program is explained?" [from 1="very badly" to 6="very well"] and true-false questions (e.g. "Enrolled households can figure out how much their electricity use increases when they use their dishwasher") testing how well they had paid attention to the program (with a chance to win one of several $60 gift cards for participants having the highest scores). They also answered, "In general, how would you describe your political views?" [choosing between "liberal," "moderate," or "conservative"] and demographic questions (see *supplementary material* for a description and additional analyses).

Results

Understanding. The mean score on the true-false questions was 90.2% (95% CI [0.89, 0.91]) of correct answers. Participants also rated the programs as relatively well explained, *Mean* = 4.86 (CI 95% [4.81, 4.91]). Neither measure differed significantly across program emphases or program types (all *p*s > 0.10).

Willingness to enroll. A 3×2 Analysis of Variance examined the effects of emphasizing different program benefits (environmental savings, monetary savings, or both), when describing the two programs types (energy conservation or peak shaving) on reported willingness to enroll. We found a significant main effect of emphasized benefits $F(2, 1168) = 6.87$, $p < 0.01$, with pair-wise comparisons indicating greater willingness to enroll when emphasizing environmental savings ($M = 6.16$, $SD = 1.46$), compared to when emphasizing monetary savings ($M = 5.74$, *SD*

= 1.57), $F(1, 1168) = 13.55$, $p < 0.01$, $d = 0.27$, CI 95% [0.13, 0.41], or both ($M = 5.89$, $SD = 1.63$), $F(1, 1168) = 5.85$, $p = 0.02$, $d = 0.17$, CI 95% [0.03, 0.31], with no significant difference between the latter two, $F(1, 1168) = 1.63$, $p = 0.20$, $d = -0.09$, CI 95% [-0.23, 0.05], as seen in Figure 1. There was also a significant main effect for program type, with participants reporting greater willingness to enroll in the program focused on energy conservation ($M = 6.08$, $SD = 1.53$) than the one focused on peak-shaving ($M = 5.76$, $SD = 1.58$), $F(1, 1168) = 12.11$, $p < 0.01$, $d = 0.21$, CI 95% [0.09, 0.32]. There was no significant interaction between program emphasis and program type here ($p = 0.46$), or in any of the following analyses.

Participants who self-identified as "liberal" were more willing to enroll when programs emphasized environmental savings ($M = 6.25$, $SD = 1.33$), compared to monetary savings ($M = 5.81$, $SD = 1.50$), $F(1, 453) = 6.57$, $p = 0.01$, $d = 0.32$, CI 95% [0.09, 0.54], but not significantly compared to when both were emphasized ($M = 6.06$, $SD = 1.62$), $F(1, 453) = 0.99$, $p = 0.32$, $d = 0.13$, CI 95% [-0.10, 0.36]. Participants who reported being politically "moderate" were more willing to enroll when the emphasis was environmental benefits were emphasized ($M = 6.19$, $SD = 1.57$) rather than monetary ones ($M = 5.69$, $SD = 1.56$), $F(1, 475) = 7.99$, $p < 0.01$, $d = 0.32$, CI 95% [0.10, 0.55], or both ($M = 5.81$, $SD = 1.66$), $F(1, 475) = 5.61$, $p = 0.02$, $d = 0.24$, CI 95% [0.02, 0.45]. In contrast, participants who reported being "conservative" responded similarly to programs with all three emphases: environment ($M = 5.88$, $SD = 1.46$), money ($M = 5.72$, $SD = 1.77$), or both ($M = 5.72$, $SD = 1.57$), all ps > 0.10.[3] There were no significant differences

[3] The sample contained relatively few conservative participants ($N_{conservative} = 232$, $N_{moderate} = 479$, and $N_{liberal} = 457$), reducing its statistical power to detect differences within that group.

between programs emphasizing monetary or both benefits, for participants with any of the three political views (all *p*s > 0.10). [4]

*** Figure 1 ***

Reasons for willingness to enroll. Reasons were coded by two independent judges as monetary or environmental (see Supplementary Material for details of reasons provided by participants), $Kappa_{environment} = 0.95$, $p < 0.01$, and $Kappa_{monetary} = 0.84$, $p < 0.01$. Logistic regressions found that participants were significantly more likely to provide environmental reasons when the program emphasized environmental savings (24.2%) rather than monetary savings (12.2%), *OR* = 2.29, CI 95% [1.56, 3.36], $p < 0.01$, or both (16.7%), *OR* = 1.59, CI 95% [1.12, 2.27], $p = 0.01$, but not for the latter two, *OR* = 1.44, CI 95% [0.96, 2.15], $p = 0.08$. By comparison, as shown in Figure 2, the likelihood of providing a monetary reason was not significantly different with an environmental emphasis (41.3%), a monetary one (43.1%), *OR* = .93, CI 95% [0.70, 1.23], $p = 0.60$, or both (43.5%), *OR* = .91, CI 95% [0.69, 1.21], $p = 0.52$ (with no difference between the last two, *OR* = 1.02, CI 95% [0.77, 1.35], $p = 0.90$). There were

[4] We also collected pro-environmental beliefs, as measured on the New Ecological Paradigm (NEP) scale (Dunlap et al., 2000). As expected, NEP scores were higher for participants who reported being liberal ($r = 0.30$, $p < 0.01$) and lower for those who reported being conservative ($r = -0.34$, $p < 0.01$). NEP scores were unrelated to whether participants reported being moderate, $p = 0.38$. Findings using the NEP scale paralleled those using political views (detailed in Supplementary Material). However, there were significant differences in NEP between advertisement (emphases) conditions, but not in reported political ideology, suggesting that the former may have been affected by the manipulation.

no significant differences between types of programs (energy conservations, peak shaving) with respect to providing monetary or environmental reasons (all *p*s > 0.10).

Next, we tested whether the effect of program emphasis on participants' reported willingness to enroll was mediated by their reasons, as depicted in Figure 3. Participants reported being more willing to enroll in an energy-saving program when they provided environmental reasons ($\beta = 1.11$, $p < 0.01$). The effect of emphasizing monetary benefits on reducing willingness to enroll, alone or in combination with environmental benefits, was reduced when controlling for whether participants provided environmental reasons, from $\beta = -0.41$ to $\beta = -0.28$ for the monetary emphasis, and from $\beta = -0.27$ to $\beta = -0.19$ for the 'both' condition (relative to the condition using an environmental emphasis). We assessed indirect effects of giving environmental reasons on reported willingness to enroll with a bias-corrected bootstrap method (Preacher & Hayes, 2004, Shrout & Bolger, 2002) with 5,000 samples (rescaling coefficients because of the dichotomous mediator). We obtained 95% confidence intervals of [-0.51, -0.18] and [-0.34, -0.05] for the indirect effect of monetary emphasis and 'both' emphases (relative to programs with an environmental emphasis), respectively, on willingness to enroll through environmental reasons; thus, both were significantly different from zero.[5] On the other hand, even though participants who provided monetary reasons were more likely to report willingness to enroll ($\beta = 1.03$, $p < 0.01$), monetary reasons cannot mediate the effect of emphasis on willingness to enroll because there were no significant differences across conditions.

[5] Because we asked participants for their reasons after they indicated their willingness to enroll, their reported reasons may have been affected by their enrollment decision. Reasons about enrolling explained why participants did or did not enroll, thus reflecting causal antecedence rather than temporal antecedent.

*** Figure 2 ***

Next, we examined reasons to enroll by political view. Liberal participants were significantly more likely to provide environmental reasons when programs emphasized environmental benefits (29.4%), compared to monetary ones (13.9%), *OR* = 2.61, CI 95% [1.48, 4.63], $p < 0.01$, but not compared to both emphases (22.1%), *OR* = 1.49, CI 95% [0.88, 2.54], $p = 0.14$; nor was there a difference between monetary and both emphases, *OR* = 1.75, CI 95% [0.97, 3.15], $p = 0.06$. Moderate participants were significantly more likely to give environmental reasons when programs emphasized environmental savings (22.2%), compared to monetary ones (11.0%), *OR* = 2.30, CI 95% [1.22, 4.33], $p = 0.01$, or both emphases (14.4%), *OR* = 1.70, CI 95% [0.96, 2.99], $p = 0.07$, although this latter CI 95% includes 1. There were no significant differences in the likelihood of providing environmental reasons when programs emphasized monetary or both benefits for moderate participants, *OR* = 1.35, CI 95% [0.69, 2.66], $p = 0.38$. For conservative participants, there were no significant differences across emphases in providing environmental reasons (13.4% in average, all *p*s > 0.10). There were no differences in the likelihood of providing monetary reasons across the program emphases for any political view (all *p*s > 0.10), with more conservatives providing monetary reasons (50.4%), across conditions, compared to liberals (40.0%), *OR* = 0.66, CI 95% [0.48, 0.90], $p = 0.01$, or moderates (41.3%), *OR* = 0.69, CI 95% [0.51, 0.95], $p = 0.02$.

Discussion

We found that emphasizing monetary motives reduces reported willingness to engage in activities that *inherently* have both intrinsic and extrinsic motivation, namely residential energy

savings programs, using advertisements modeled on those currently offered by utility companies seeking two goals: overall conservation and peak shaving. This effect was stronger for liberal and moderate participants, who tend to have relatively pro-environment beliefs, but not for conservative participants who tend to be less concerned about the environment and climate change, as found here and elsewhere (Bruine de Bruin, Wong-Parodi, & Morgan, in press; Dunlap, Van Liere, Mertig, and Jones, 2000; Dunlap, Xiao, and McCright, 2001).

When asked to explain their enrollment decisions, participants provided monetary reasons at the same rate, whatever motivation was emphasized. However, their rate of offering environmental reasons was almost halved when monetary benefits were emphasized, even when environmental ones were highlighted as well. Thus, monetary motivations undermine environmental ones, without the converse being true, as might happen if consumers did not want to appear motivated by money once the environment was emphasized. Note that this result is not consistent with the overtjustification effect, in which people attribute their decisions to monetary motives rather than intrinsic ones when given extrinsic incentives.[6] Thus, at least in this context, *attention* to the environment is malleable, but not attention to money, even when the two are inseparable, as with energy savings. If so, then those promoting energy-saving programs can assume that environmental benefits bear mentioning whereas monetary ones go without saying and might, indeed, best be left unsaid. Following Query Theory (Weber & Johnson, 2009), how programs are evaluated may depend on the order in which reasons are retrieved from memory. If

[6] We thank an anonymous reviewer for suggesting that this difference from previous studies may be due to that in those studies using independent, rather than inherent, monetary motives, individuals are more likely to negatively perceive monetary incentives.

money comes to mind naturally for some people, then environment may be neglected, unless it is made more available (e.g., through advertisements emphasizing it).[7]

As mentioned, these effects depended on respondents' ideology (as seen in Gromet, Kunreuther, and Larrick, 2013). Compared to the general US population, the present sample has relatively few conservatives (Gallup, 2014a), but similar overall environmental concern (Gallup, 2014b). As in previous studies (e.g. Franzen and Vogl, 2013), we found that self-identified conservatives gave lower priority to environmental matters than did moderates and liberals. Our results suggest that promoters of energy-saving programs may increase the effectiveness of their campaigns with environmental appeals. Doing so may increase their success with liberals and moderates, without reducing their success with conservatives. Broadly, energy-saving campaigns emphasizing monetary benefits can result in reduced interest in "idealistic" energy consumer segments, as described in Sütterlin, Brunner and Siegrist (2011). Other segments, oriented to financial gains of saving energy, probably already acknowledge these benefits, and would not be affected by emphasizing environmental benefits.

Although monetary and environmental benefits are the most common motivations for engaging in energy savings (e.g. Leighty & Meier, 2011), one question for future research is whether similar results are obtained with other inherently coupled forms of non-monetary motivation, such as technological innovation or energy independence. A second is whether the presentation of sufficiently large monetary savings will overcome the tendency for money to

[7] We thank an anonymous reviewer for prompting the following analysis. Among participants who provided both monetary and environmental reasons in the open-ended question, 60% (N = 39) offered a monetary reason first when programs emphasized environmental benefits and ~~75~~76% (N = ~~24~~25) when programs emphasized monetary benefits. Although these subsamples were too small for the comparison to have statistical power, the difference suggests the effects of task framing on reasoning processes considered by Query Theory.

undermine environmental motivation, although field experiments have typically found relatively small energy savings in similar energy-saving programs (e.g. Davis, 2011; Davis, Krishnamurti, Fischhoff, and Bruine de Bruin, 2013), and some within the range of Hawthorne effects (Schwartz, Fischhoff, Krishnamurti, and Sowell, 2013). A third question is how program emphases affect actual enrollment, rather than the hypothetical choices studied here – even if the advertisements were based on those that consumers typically receive. A fourth is how motivation affects energy-savings behavior for consumers receiving various forms of feedback (e.g. Abrahamse, Steg, Vlek, & Rothengatter, 2005) once they have already enrolled.

Thus, our results extend understanding of the undermining effect of extrinsic motivation, by examining a task where intrinsic and monetary benefits are inherently tied to the target behavior. We find that with a task addressing a familiar, realistic kind of decision, monetary incentives go without saying, while raising them erodes the importance of intrinsic environmental incentives for those who care about them. Given how natural it is for the promoters of such programs to advertise all possible benefits, our results also suggest the value of using psychological theory and method to pretest programs before launching them. They might find that emphasizing monetary benefits is not effective – at least when targeting individuals who already acknowledge those benefits, but may need a reminder to pay attention to energy-saving features that also matter to them.

Funding

Funding was provided by Carnegie Mellon's Electricity Industry Center, the Center for Behavior Decision Research, the Smart Grid Investment Grant (SGIG), and the Center for Climate and Energy Decision Making (SES-0949710), through a cooperative agreement between the National Science Foundation and Carnegie Mellon University. D. Schwartz was also supported by the Complex Engineering Systems Institute (ICM: P-05-004-F, CONICYT: FBO16), and the Business Intelligence Research Center (CEINE) of the University of Chile.

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Appendix: Programs and emphases

Imagine that your electric company has a new program that may interest you. Please read it carefully. Next, we will ask whether you would be willing to enroll in that program. You will also get true/false questions about this program, based on how well you understand its details.

1. Conservation program

1.1. Advertisement emphasizing monetary benefits

GOAL	We are offering a new program that will help you to SAVE MONEY. By using less electricity, you can reduce your electricity bill.
BENEFIT	Customers enrolled in the Money-Saving program typically reduce their electricity bill by 5%.
BACKGROUND	Most customers do not know when they use more electricity and when they could be saving money. Even though electricity use varies, most of our customers do not know how their spending on electricity changes at any given time.
GET MORE INFORMATION	In the Money-Saving program, you will see how your electricity use varies as you turn things on and off. You can check your electricity use at any time. When most of your things are off, your spending on electricity will be lower. When many things are on, your spending on electricity will be higher because you are using more energy. This will happen mainly on weekdays during hot summer afternoons, when you use your air conditioner.
GET A DISPLAY	To help you SAVE MONEY, you will get a free display that shows how much electricity you are using. It will show when your use is very high.
HOW TO DO IT	When you see that your use goes up, you can try to use less electricity. For example, you can set your thermostat higher in the summer, turn off your air conditioner, or hang your clothes to dry instead of using the dryer. Doing so will reduce your electricity bill.

1.2. Advertisement emphasizing environmental benefits

GOAL	We are offering a new program that will help you to SAVE ENERGY. By using less electricity, you can reduce your environmental impact.
BENEFIT	Customers enrolled in the Energy-Saving program typically reduce their electricity use by 5%.
BACKGROUND	Most customers do not know when they use more electricity and when they

	could be saving energy. Even though electricity use varies, most of our customers do not know how their electricity use changes at any given time.
GET MORE INFORMATION	In the Energy-Saving program, you will see how your electricity use varies as you turn things on and off. You can check your electricity use at any time. When most of your things are off, your environmental impact will be lower. When many things are on, your environmental impact will be higher because you are using more energy. This will happen mainly on weekdays during hot summer afternoons, when you use your air conditioner.
GET A DISPLAY	To help you SAVE ENERGY, you will get a free display that shows how much electricity you are using. It will show when your use is very high.
HOW TO DO IT	When you see that your use goes up, you can try to use less electricity. For example, you can set your thermostat higher in the summer, turn off your air conditioner, or hang your clothes to dry instead of using the dryer. Doing so will reduce your environmental impact.

1.3. Advertisement emphasizing monetary and environmental benefits

GOAL	We are offering a new program that will help you to SAVE MONEY AND ENERGY. By using less electricity, you can reduce your electricity bill and your environmental impact.
BENEFIT	Customers enrolled in the Money & Energy-Saving program typically reduce their electricity bill and electricity use by 5%.
BACKGROUND	Most customers do not know when they use more electricity and when they could be saving money and energy. Even though electricity use varies, most of our customers do not know how their use and spending on electricity change at any given time.
GET MORE INFORMATION	In the Money & Energy-Saving program, you will see how your electricity use varies as you turn things on and off. You can check your electricity use at any time. When most of your things are off, your spending on electricity and environmental impact will be lower. When many things are on, your spending on electricity and environmental impact will be higher because you are using more energy. This will happen mainly on weekdays during hot summer afternoons, when you use your air conditioner.
GET A DISPLAY	To help you SAVE MONEY AND ENERGY, you will get a free display that shows how much electricity you are using. It will show when your use is very high.
HOW TO DO IT	When you see that your use goes up, you can try to use less electricity. For example, you can set your thermostat higher in the summer, turn off your air conditioner, or hang your clothes to dry instead of using the dryer. Doing so will reduce your electricity bill and your environmental impact.

2. Peak shaving program

2.1. Advertisement emphasizing monetary benefits

GOAL	We are offering a new program that will help you to SAVE MONEY. By using less electricity, you can reduce your electricity bill.
BENEFIT	Customers enrolled in the Money-Saving program typically reduce their electricity bill by 5%.
BACKGROUND	Most customers do not know that when people in their region use a lot of electricity at the same time, extra power plants are needed. These extra power plants increase the cost of electricity for their electric company. Even though this cost varies, most of our customers pay a fixed electricity price and do not know how the use and cost of electricity in their region change over time.
GET MORE INFORMATION	In the Money-Saving program, your electricity price varies each hour. It will be higher when we use extra power plants. You can check your price at any time. When people in your region use less electricity at the same time, your price will be lower. When people in your region use a lot of electricity, your price will be higher because we need to use extra power plants. This will happen mainly on weekdays during hot summer afternoons, when many people use air conditioner.
GET A DISPLAY	To help you SAVE MONEY, you will get a free display that shows your price and the use of electricity in your region. It will show when your price and the use in your region are very high.
HOW TO DO IT	When you see that the use of electricity in your region goes up, you can try to use less electricity. For example, you can set your thermostat higher in the summer, turn off your air conditioner, or hang your clothes to dry instead of using the dryer. Doing so will reduce your electricity bill.

2.2. Advertisement emphasizing environmental benefits

GOAL	We are offering a new program that will help you to SAVE ENERGY. By using less electricity, you can reduce your environmental impact.
BENEFIT	Customers enrolled in the Energy-Saving program typically reduce their electricity use by 5%.
BACKGROUND	Most customers do not know that when people in their region use a lot of electricity at the same time, extra power plants are needed. These extra power plants increase pollution from electricity in their region and increase the cost of electricity for their electric company. Even though this cost varies, most of our customers pay a fixed electricity price and do not know how the use and cost of electricity in their region change over time.

GET MORE INFORMATION	In the Energy-Saving program, your electricity price varies each hour. It will be higher when we use extra power plants. You can check your price at any time. When people in your region use less electricity at the same time, pollution will be lower. When people in your region use a lot of electricity, pollution will be higher because we need to use extra power plants. This will happen mainly on weekdays during hot summer afternoons, when many people use air conditioner.
GET A DISPLAY	To help you SAVE ENERGY, you will get a free display that shows your price and the use of electricity in your region. It will show when your price and the use in your region are very high.
HOW TO DO IT	When you see that the use of electricity in your region goes up, you can try to use less electricity. For example, you can set your thermostat higher in the summer, turn off your air conditioner, or hang your clothes to dry instead of using the dryer. Doing so will reduce your environmental impact.

2.3. Advertisement emphasizing monetary and environmental benefits

GOAL	We are offering a new program that will help you to SAVE MONEY AND ENERGY. By using less electricity, you can reduce your electricity bill and your environmental impact.
BENEFIT	Customers enrolled in the Money & Energy-Saving program typically reduce their electricity bill and electricity use by 5%.
BACKGROUND	Most customers do not know that when people in their region use a lot of electricity at the same time, extra power plants are needed. These extra power plants increase pollution from electricity in their region and increase the cost of electricity for their electric company. Even though this cost varies, most of our customers pay a fixed electricity price and do not know how the use and cost of electricity in their region change over time.
GET MORE INFORMATION	In the Money & Energy-Saving program, your electricity price varies each hour. It will be higher when we use extra power plants. You can check your price at any time. When people in your region use less electricity at the same time, your price and pollution will be lower. When people in your region use a lot of electricity, your price and pollution will be higher because we need to use extra power plants. This will happen mainly on weekdays during hot summer afternoons, when many people use air conditioner.
GET A DISPLAY	To help you SAVE MONEY AND ENERGY, you will get a free display that shows your price and the use of electricity in your region. It will show when your price and the use in your region are very high.
HOW TO DO IT	When you see that the use of electricity in your region goes up, you can try to use less electricity. For example, you can set your thermostat higher in the summer, turn off your air conditioner, or hang your clothes to dry instead of using the dryer. Doing so will reduce your electricity bill and your environmental impact.

Figures

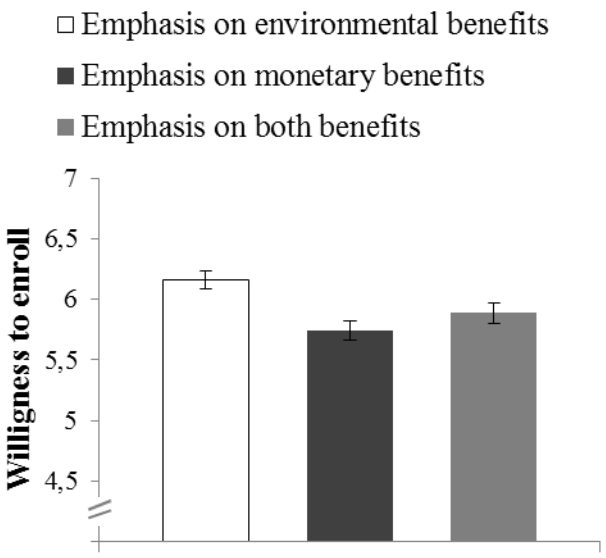

Fig 1. Willingness to enroll. Mean reported willingness to enroll in a residential energy-saving program emphasizing environmental, monetary or both benefits. Error bars represent ± one standard error.

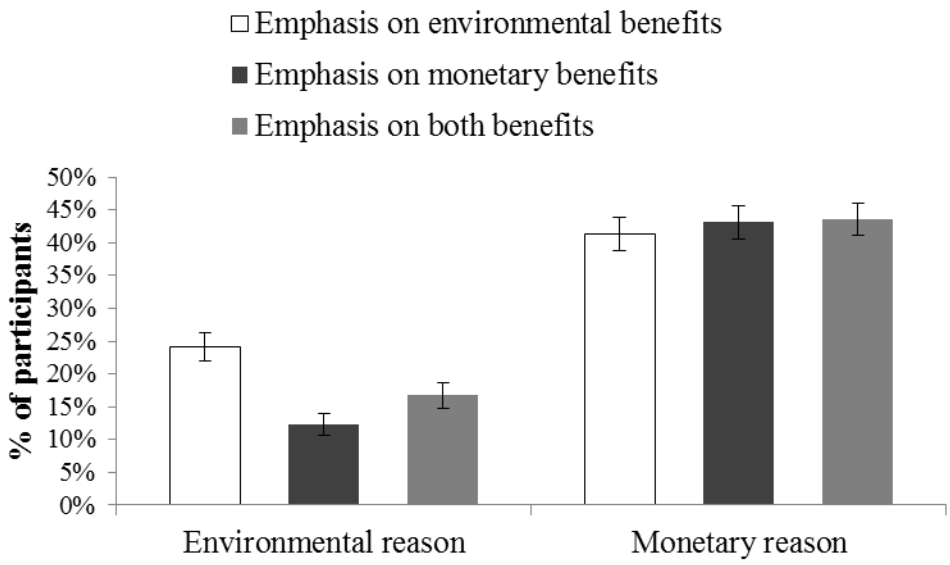

Fig 2. Reasons for enrollment decisions. Percentage (%) of participants who provided environmental or monetary reasons for enrolling, by advertisement condition. Error bars represent ± one standard error.

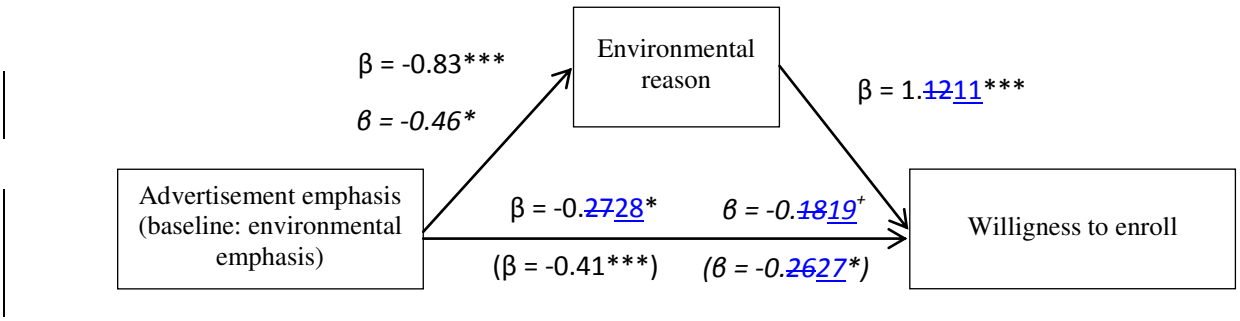

Fig. 3. Mediation analysis for the effect of benefits emphasized in the advertisement. Results are relative to advertisements emphasizing environmental benefits: monetary emphasis in regular font, and both emphases in italics. Direct effects without controlling for environmental reasons are in parenthesis, and values without parentheses represent the effect when the mediator is included. Monetary reasons cannot mediate the effect of any emphasis on willingness to enroll because participants provided these reasons similarly across conditions.

*** p<0.001, **p<0.01, *p<0.05, +p<0.1