

Altruism, self-interest, and energy consumption

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How can we encourage greater energy efficiency? Estimates that take account of behavioral plasticity—the ease with which actions can be taken—indicate that the United States could reduce overall greenhouse gas emissions by 7% if households adopted simple and money-saving efficiency actions (1). However, most households are not taking these actions despite the benefits for the environment and for household budgets. By engaging key factors that influence household energy consumption, Asensio and Delmas shed light on unrealized energy efficiency (2). Their results provide useful insights for the design of programs to encourage energy efficiency; in doing so, they hone our understanding of environmental decision making.

The analysis of Asensio and Delmas uses real-time energy consumption data at the appliance level for 118 apartments in southern California over 9 mo. During the study, the authors provided two kinds of feedback to encourage efficiency. Some randomly assigned households were given weekly feedback on their annual dollar cost-savings compared with the most efficient 10% of their neighbors. The other households received weekly feedback about their consumption in the metric of reduced air pollution emissions rather than as dollar costs to the household. That is, one group received information about how efficiency was serving their self-interest and the other about how efficiency was contributing to the common good of reduced air pollution.

The results are intriguing. Households who received the air pollution message reduced their electrical consumption by 8.2% over the 100-d experimental monitoring period. Those in this group who had children changed their behavior even more dramatically, achieving a 19% reduction in consumption. Information about air pollution reductions reduced consumption in all but the 10% of households with the smallest energy use. In contrast, the households that received the

monetary messages actually increased their consumption, and that increase was greater for households with children and for those in the highest use categories.

What Motivates Consumption?

Many programs intended to encourage energy efficiency assume that monetary costs and the amenities provided by energy are the dominant motivators of energy consumption. Asensio and Delmas's results fly in the face of this logic. However, the findings are consistent with our broader understanding of environmental decision making and environmentally significant consumption (3–5).

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One motivation for household energy use is obvious. We use energy to enhance well-being. Space heating and cooling, food refrigeration, cooking heat, hot water, lighting, and access to a vast array of information technologies all enhance well-being. However, for most households' energy uses there are diminishing returns to well-being with increased consumption. We don't want our rooms too hot or too cold, nor do we benefit from the plug load of appliances not in use. Energy efficiency actions are seeking to find an optimal trade-off between the amount of energy used and the amount of well-being produced. The goal is to provide the same improvement in well-being by using less energy, thus reducing monetary costs to the consumer and harm to the environment.

Cross-national comparisons demonstrate that beyond a modest threshold, increased national per capita energy consumption yields only minimal improvements in human

well-being (6–9). Thus, a case can be made that the well-being benefits of high energy consumption levels are minimal, whereas the move to higher levels of well-being by the poorest nations require only modest increases in energy use. Much the same logic applies at the household level. Costs to the household budget and harm to the environment can often be reduced without reducing the well-being provided by energy services. However, to realize the benefits of efficiency, we have to examine not only what improvements in well-being are derived from energy services, but also what people consider in making decisions about energy use.

Consumers consider energy price but are not terribly sensitive to it. Beliefs, norms, and values also exert strong influences on consumption, and one strength of Asensio and Delmas's study is that it is attentive to all three. Most consumers have rather inaccurate beliefs about household resource use and may select the wrong actions when they try to become more efficient (9–11). Thus, the appliance-specific feedback provided by Asensio and Delmas was probably essential in supporting effective action by those who were motivated. We know that norms—understandings of what our friends and neighbors are doing and what they expect of us—also have a strong influence on decisions (12). Therefore, being able to compare one's own consumption with that of an efficient group of neighbors undoubtedly encourages efficiency actions. In addition, when a decision has impacts not only on the household but also on other people or the environment, altruistic values can complement or even dominate the narrow self-interest presumed by a standard rational choice theory of decision making (13, 14).

The strong effects of the air pollution message in Asensio and Delmas's study demonstrate the importance of altruism in motivating environmentally significant consumption. Air quality is a classic commons problem, and purely self-interested

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individuals would not shift consumption much in response to information about the collective good. The air quality message both reminds the subjects of the impacts of their consumption on the environment and gives them information about what they can accomplish. That the impact on consumption was more than twice as large for families with children is consistent with theories that ground altruism in a general ethic of care and the avoidance of harm to innocents: being a parent surely strengthens altruistic concerns.

The seemingly perverse effects among households who received information on monetary savings are consistent with the literature on framing effects in environmental decision making. Signaling dollar savings may make the subjects think about their consumption as purely a matter of self-interest, just as the air pollution message invokes altruism. The savings were typically under \$7 per month per household, an amount that probably seems trivial to many households. So the monetary feedback may have suggested that energy is cheap and discouraged attention to efficiency actions.

Next Steps

A theoretically grounded and methodologically sophisticated understanding of environmentally significant consumption is emerging (3–5). It draws on and serves as a test bed for more general theories of decision making and it has the potential for shaping more effective and nuanced environmental policies. However, Asensio and Delmas's contribution to this literature also highlights two critical next steps that are required to derive full benefits from this body of work.

Better Data. Asensio and Delmas were able to achieve such striking results because of a carefully designed, theoretically driven, randomized controlled trial. Field experiments that are grounded in theory have been all too rare in the study of environmentally significant consumption. Of course, no single research design is definitive. Most randomized controlled trials have great strength in establishing causality within the sample but caution is required in generalizing beyond the sample (15). In Asensio and Delmas's study, the sample is limited to university apartments in southern California, so replications are needed to see how altruistic appeals will work in other contexts. Further, the results are based on a relatively short study duration, so longer-term monitoring

is needed to understand the dynamics of consumption over time. In contrast to field experiments, long-term observations of representative samples offer strong generalizability but must be interrogated carefully regarding the strength of the causal inferences they yield (16). No method is a “gold standard”: rather robust conclusions emerge from multiple approaches converging on the same general conclusions. Progress in bringing social science insights to bear on critical energy and environmental issues has been hampered by a lack of investment in high-quality datasets that build robust cumulative understanding. Ironically, public decisions that involve billions of dollars in costs and benefits are made on shaky scientific ground because of a lack of even modest investments in environmental social science research.

Differentiating Motivations. Asensio and Delmas compare the effects of an appeal to self-interest in the form of monetary savings with an appeal to the broader social good of reducing air pollution. Their subjects find the altruistic appeal more compelling. However, we also know appeals to public goods can have different impacts on different groups (17). Political polarization around environmental issues can influence not only political but also consumer decisions. For example, invoking energy security seems to motivate energy-efficient consumer choices among political conservatives, whereas invoking risks of climate change reduces support for energy efficiency (18). Clearly, what is considered a desirable public good and what is not depends at least in part on the

influence of political ideology and general beliefs. Nor is the interplay among values, beliefs, political ideology, and norms likely to be static; rather, it will evolve over time and change with the way a decision is framed. All this means that both theories of environmental decision making and programs intended to encourage efficiency have to be nuanced, grounded in empirical evidence, and designed to learn from experience (19).

Although challenges remain, current understanding of environmental decision making is already sufficient for informing programs to encourage efficiency in resource consumption. We know that at both the national scale and the household scale, substantial improvement in well-being can be achieved without increasing consumption, and that increases in consumption often do little to enhance well-being. We know that decisions can be influenced by providing information on what behaviors matter, on the behavior of comparison groups, and on how efficiency serves not only self-interest but also altruistic concerns. Of course, the implications of these general findings will vary across social contexts and types of consumption, and so effective programs will require ongoing experimentation. Asensio and Delmas provide an excellent model for the kind of research we need to both support program design and advance basic understanding.

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