



Less is more in energy conservation and efficiency messaging

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ABSTRACT

Campaigns aiming to encourage people to reduce their energy consumption frequently make three well-intentioned but inadvertent mistakes in their communications strategies. These mistakes are driven by a deeply embedded yet often counterproductive popular intuition: that ‘more is better.’ We identify three messaging pitfalls that can result from this assumption, namely that a message will be more persuasive if it emphasizes the greatest number of people engaging in undesirable behavior, the greatest number of victims of such behavior, and the greatest number of reasons why one should adopt particular energy conservation and efficiency measures. We cite experimental evidence demonstrating that these strategies can in fact reduce the persuasive power of a message, and review several underlying psychological mechanisms that may explain these counterproductive effects. Finally, we provide a number of alternative messaging strategies that are likely to improve the performance of energy conservation campaigns.

1. Introduction

Given indications that behavioral habits are the most important determinant of variations in household energy use (Chen et al., 2015), targeting consumption behaviors and the latent ‘behavioral capital’ that lies therein (Beretti et al., 2013) should be an important element of climate change mitigation strategies. In order to accomplish such objectives, governments and environmental groups often use information campaigns to persuade people to reduce their energy consumption by engaging in either energy conservation or energy efficiency measures.¹ Emerging empirical evidence suggests that these campaigns may be flawed due to three common, but inadvertent, messaging mistakes that recent experimental evidence has shown to lead to counterproductive effects. The degree to which their underlying intuition is embedded in the collective popular wisdom means that these messaging strategies are not only pervasive and resistant to change, but also go quite unnoticed, and therefore represent a uniquely problematic and underestimated issue when it comes to energy conservation objectives.

Each of the mistakes we outline can be seen as a manifestation of a shared intuition: that more is better. In what follows, we explain how this assumption can be detrimental to the objectives of persuasive messaging related to energy use, and argue that messaging strategies should be informed not by intuition, but by empirical evidence

regarding their behavioral impacts. First, we provide an overview of several prominent behavior change theories and situate the role of information campaigns within these theoretical frameworks. We note that messaging campaigns are often designed based on a key assumption of rational choice theory: that information will be processed in a rational way through deliberative cognitive processes. This framework generally overlooks the existence of heuristic decision-making processes and the fact that these processes can bypass analytical, deliberative processes. Messaging interventions designed using the framework of rational choice theory can therefore produce unanticipated and sometimes counterproductive behavioral impacts. In each of the subsequent sections, we present a counter-intuitive mistake in intervention design that inadvertently exploits some heuristic process, describe the underpinning psychological mechanisms that may be at play, and provide some practical suggestions for how to avoid the mistake in question. Namely, we address the social norm effect, the identifiability bias effect, and what we call the ‘too many reasons’ effect. These mistakes are not mutually exclusive and may even be likely to reinforce each other.

2. Theories of behavior change

Attempts to change one-shot or habitual energy-related behaviors are frequently based on theories of human behavior and behavior

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¹ Energy conservation involves reducing energy use through lifestyle changes (e.g. by line-drying clothing rather than using the dryer), while energy efficiency involves improving the efficiency of one’s energy use primarily through technological changes (e.g. by buying energy efficient appliances).

change. We do not provide a comprehensive review of this vast theoretical literature, as this is beyond the scope of our contribution and has already been accomplished by other scholars (e.g. [Brown and Sovacool, Forthcoming](#); [Darnton, 2008](#); [Martiskainen, 2007](#); [Jackson, 2005](#); [Kollmuss and Agyeman, 2002](#)). Rather, we overview a number of prominent theories, placing particular focus on the role of information provision as an intervention for behavior change. Interestingly, [Brown and Sovacool, \(Forthcoming\)](#) assert that their review ‘suggests that research (and policies) should focus on information deficits,’ yet they recognize that ‘addressing information deficits has not delivered large-scale impacts in terms of reductions in energy demand or changes in energy related practices’.

An appropriate starting point for our review is the ‘rational choice’ model, according to which people systematically weigh costs and benefits and adopt energy-related behaviors only if they are economically advantageous. Information regarding available choices is therefore a crucial component of agents’ decision-making processes ([Martiskainen, 2007](#); [Jackson, 2005](#)). Rational choice theory frequently assumes that suboptimal choices result from information deficits and accordingly, prescribes information provision in order to enable agents to make informed choices. Despite its intuitive appeal and universal ambitions, the rational choice model has been criticized on the grounds that it often overestimates people’s cognitive abilities, but also that it underestimates the complexity of the decision-making apparatus ([Costanzo et al., 1986](#); [Jackson, 2005](#)), failing to account for other factors that can bypass cognitive deliberation, such as habits, moral and social considerations, emotions, and cognitive biases. Evidence indeed shows that information provision alone does not automatically lead to the expected behavioral changes ([Abrahamse et al., 2005](#)).

Some theories have attempted to expand the expectancy value structure (i.e., according to which choices are understood to be made on the basis of their expected outcomes and the value that one attaches to these outcomes) of the rational choice model in order to take into account the influence of social and psychological factors such as expectations about others’ attitudes towards a behavior and perceptions about one’s control over the situation. One very well-established theory is the Theory of Planned Behavior ([Ajzen, 1991](#)), which states that behaviors are determined by behavioral intentions, which are in turn determined by attitudes, subjective norms, and perceived behavioral control. Within this framework, messaging campaigns aim to affect these antecedents (i.e., attitudes, norms, and perceived behavioral control) in an attempt to ultimately affect behavior. Although this model does help to understand some types of intentional behaviors, it overlooks several affective and cognitive dimensions of the decision-making process. In some cases, for example, behaviors can be modified without modifying attitudes, norms, or perceived behavioral control, suggesting that these antecedents are not the only important determinants of behavior ([Martiskainen, 2007](#); [Jackson, 2005](#)).

Another direction for improving the predictive power of theories based on the rational choice model is to explicitly incorporate the dynamic formation of moral beliefs, rather circumventing them. If morals are to be understood as fixed preferences, alignment with one’s morals represents a form of self-interest. Several theoretical frameworks, such as Norm-Activation Theory ([Schwartz, 1977, 1992](#)) and Value Belief Norm Theory ([Stern et al., 1999](#)), explore this possibility. Value Belief Norm Theory, for instance, is based on the premise that prosocial attitudes and personal moral norms are significant predictors of pro-environmentally-friendly behaviors. According to this theory, human behavior is the end result of a causal chain comprised of five elements (personal values, ecological worldview, adverse consequences for valued objects, perceived ability to reduce threat, and pro-environmental personal norms), each of which can conceivably be influenced by the provision of new information. Interestingly, it has been recognized that several value orientations can co-exist within the same individual, suggesting that behavior critically depends on the salience of specific values and beliefs in a given decision-making context ([Jackson, 2005](#)).

A criticism of this theory is the relatively weak empirical correlation that is frequently found between personal norms and pro-environmental behaviors, suggesting the possible role of situational factors ([Martiskainen, 2007](#); [Jackson, 2005](#)).

The Theory of Interpersonal Behavior ([Triandis, 1977](#)) attempts to integrate elements of rational decision-making with an explicit role for habits and social and emotional factors. This model assumes that behavior is influenced by an individual’s intentions, habits, as well as facilitating conditions of the decision-making environment. Intentions in turn are influenced by attitudes and social and affective factors. There are indeed some indications that emotions are ‘a more or less unconscious input to decision-making, (...) governed by instinctive behavioral responses to particular situations’ ([Jackson, 2005](#)). While this theory addresses several of the criticisms faced by the rational choice model, its complexity has led to its infrequent use in empirical investigations ([Martiskainen, 2007](#); [Jackson, 2005](#)).

Given our focus on information provision as an intervention for inciting behavior change, it seems appropriate to devote some attention to persuasion theories (for an overview, see [O’Keefe, 2016](#)). The broad category of persuasion theory contends that the persuasiveness of a message depends on three main elements: the credibility of the source of the message, the persuasiveness of the arguments contained in the message, and the responsiveness of the audience receiving the message ([Hovland et al., 1953](#)), further assuming that sufficiently persuasive messages have the power to change attitudes and intentions accordingly. ‘Cognitive dissonance theory’ refers to a situation involving conflicting attitudes, beliefs, or behaviors. Cognitive dissonance can occur when one receives information that calls attention to such conflict (e.g. when someone who is convinced that he uses little energy receives energy-use feedback indicating that in fact he uses a lot of energy). To reduce the psychological discomfort this generates and to restore cognitive harmony, people are susceptible to altering either their attitudes, beliefs, or behaviors ([Kantola et al., 1984](#)) in order to realign any perceived conflict between them. A more recent persuasion model, the Elaboration Likelihood Model ([Petty and Cacioppo, 1986](#)) also formalizes the notion that changes in attitudes can occur via two different types of psychological processes: central (i.e. deliberative) and peripheral (i.e. heuristic) processes.

[Vlaev and Dolan \(2015\)](#) state that ‘most traditional theories of behavior change have relied mostly on influencing higher-order mental processes as a route to altering deliberate responses whereas more recent theorizing postulates that interventions can also rely on using contextual cues influencing lower-order processes as a route to changing spontaneous responses.’ Information and messaging interventions that seek to change people’s attitudes and behaviors are frequently grounded in the postulate that the information provided will be processed by what has been called System 2 (deliberate cognition), which is characterized as slow, effortful, infrequent, conscious, logical, and calculating. Recent evidence demonstrates, however, that the same information can also be processed through System 1 (automatic cognition), which is characterized as fast, automatic, frequent, unconscious, emotional, and stereotypic ([Kahneman, 2011](#)). Dual-process theories of cognition can be found across many disciplines and share a distinction between two different cognitive processes akin to System 1 and System 2. In what follows, we invoke this distinction in order to understand the experimental evidence we raise within the context of a broader theoretical framework regarding behavior change. Evidence suggests, moreover, that people are generally unaware of how heuristic processes shape their behavior while preserving their higher-order cognition such as beliefs and attitudes. [Vlaev and Dolan \(2015\)](#), for example, find evidence suggesting that people unconsciously attempt to rationalize their behaviors ex-post. In what follows, we draw upon a large and growing body of empirical work that supports such dual-process theories of decision-making. Without dismissing the role of deliberate cognition in determining some types of behaviors, we contend that behavior is largely context-dependent and that even introspective

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