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How we decide shapes what we choose: decision modes track consumer decisions that help decarbonize electricity generation

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Abstract
With concerns regarding climate change rising, companies and policy makers seek to understand the precursors to environmentally-friendly consumer choice. Decision modes are the qualitatively different psychological processes employed to arrive at decisions. Across six studies, the present project establishes (a) which decision modes are employed by consumers to decide between electricity plans that differ in environmental impact, and (b) how employed decision modes affect those choices. We demonstrate that consumers are most likely to use Calculation Modes when facing such choices. Importantly, we find that Affect or Role Modes promote more environmentally-friendly choices, while Calculation Modes decrease environmentally-friendly choices. Experimentally promoting use of a Role Mode over a Calculation Mode increases selection of environmentally-friendly alternatives, and the relative degree of employing the Role Mode mediates this effect. Our findings provide insight into how decision mode usage can alter environmental decisions, and suggest mechanisms and tools for marketers and policy makers to influence consumer choice.

Keywords Decision modes · Environmental decision-making · Green marketing and sustainability · Green consumerism · Cognitive psychology · Emotions

1 Introduction

Theory development across disciplines, say psychology and economics, is no easy task. It requires some training and competence in both disciplines as well as willingness and ability to cross barriers of disciplinary language and frameworks to combine valuable insights in an effort to better describe and predict empirical

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realities. Behavioral economics was designed to enrich and extend economic theory and models with psychological constructs and insights, but we can count the number of economists who seriously engage with psychology in such efforts on two hands. Peter Wakker is a pioneer and leader in this small group. It is very fitting to dedicate this special issue of *Theory and Decision* to his work, as these two topics ("theory" and "decision") have been central to his efforts to put the psychological analysis of decision processes on a sound axiomatic measurement basis that allows for a concise understanding of where and how the decisions of homo sapiens differ from those of homo economicus.

Of the three modes of decision-making analyzed in this paper and described in greater detail below, Peter has focused on calculation-based decision processes, axiomatizing rank-dependent utility maximization and analyzing phenomena like risk-aversion, loss-aversion, and regret. However, in the process of doing so, his theoretical extensions of rational choice processes make contact with both emotion-based and role- and rule-based decision processes, the two decisions modes contrasted to calculation-based decision processes in this paper.

In December 2015, leading politicians and environmental policy makers from around the world met in Paris to discuss how to battle climate change and craft an agreement to limit global temperature increase to below 2 °C above pre-industrial levels (UNFCCC, 2017). Several countries have set ambitious goals to fulfill their commitment to this agreement and reduce their carbon emissions. For example, Sweden aims to become the first fossil-fuel-free nation by 2045 (Sweden, 2017). In the United States, more than 50% of businesses have increased their commitment to renewable energy (Deloitte, 2019). Achieving the global goal of limiting temperature rise will require action not only by governments and industries: consumers will also need to modify their energy consumption behavior (Grubler et al., 2018). Fortunately, the majority of consumers view themselves as environmentalists (Mackoy et al., 1995), suggesting a broad willingness to embrace pro-environmental options. Indeed, there is support across the spectrum of political ideology for environmentally-friendly electricity (Sunstein and Reisch, 2014). Surveys show that 88% of customers in the United States and Europe want brands to help them make more environmentally-friendly decisions (Townsend, 2018). Policy makers as well as marketers need to understand what influences consumers' decisions to promote environmentally-friendly choices and curb global temperature rise.

In the United States, electricity generation is the largest single source of carbon emissions, with residential energy use accounting for 19% of all emissions from fossil fuel combustion in 2017 (Agency, 2018). Given the primary contribution of electricity generation to emissions, the present research focused on consumer decisions regarding electrical energy plans. Prior research has demonstrated that people are more likely to adopt environmentally-friendly energy plans when they are set as the default or status quo (Ebeling & Lotz, 2015). Additionally, emphasizing environmental or health benefits of energy conservation effectively promoted energy efficiency, leading to greater conservation than other appeals that emphasized financial savings (Asensio & Delmas, 2015, 2016). Appeals to decrease energy usage have also been shown to be more effective when they highlight how

one's energy use compares with one's neighbors, appealing to social norms to encourage conservation (Allcott, 2011). While such findings are helpful for suggesting interventions that can be used to promote environmentally-friendly behaviors, an organizing framework that spans different interventions has been elusive.

The present research examines how the ways in which consumers consider options influence their choices. By shifting the focus to how consumers make decisions, we offer insight into the psychological precursors associated with environmentally-friendly decisions. Towards that end, we examine decision modes—qualitatively different ways in which people approach decisions. Prior research has established a taxonomy of three different decision modes: Calculation Modes, Affect Modes, and Role Modes (Ames et al., 2004; Weber & Lindemann, 2007; Weber et al., 2005). These decision modes can operate in parallel during decision-making (Krosch et al., 2012; Weber & Lindemann, 2007) and may have ramifications for choice. Existing research supports the notion that different decision modes may lead to different choices. Calculation Modes promote a focus on economic exchange which may reduce the likelihood of acting to promote others' best interests (Clark & Mills, 1979; Clark et al., 1987). As environmentally-friendly options typically come at a personal cost to generate benefit towards others or society broadly, this implies that use of Calculation Modes will reduce the likelihood of environmentally-friendly choices. Affect Modes promote the use of feelings in decisions, which may promote environmentally-friendly choices, given the potential for a "warm glow" to promote prosocial decision-making (Andreoni, 1990). Role Modes typically involve making a decision on the basis of one's identity or role with respect to others. Given the rich literature on the relationship between social identity considerations and conservation (Goldstein et al., 2008; Griskevicius et al., 2010; Van Vugt, 2001), Role Modes seem likely to promote environmentally-friendly choices by heightening awareness of social norms and enhancing consideration of one's actions on the broader community. The present research tests these propositions in a series of six studies.

The present research makes four important conceptual contributions. First, it extends the decision modes' framework to consumer decisions. Prior research has not characterized how and whether people use different decision modes when facing consumer decisions. Second, this is the first work to tie general decision mode use directly to choice. While previous work characterized how different types of decisions might prompt people to use different decision modes (Weber & Lindemann, 2007), it stopped short of connecting decision mode use with choices. Here, we examine the effect of decision mode use on consumer choices. Third, we establish a causal link between decision mode use and choices by directly manipulating decision mode usage. Fourth, the present research has implications for marketing managers and policy makers seeking to understand how to promote environmentally-friendly decisions and combat global temperature rise.

1.1 Conceptual development

Consumers make decisions using qualitatively different psychological processes, referred to as decision modes. Decisions can be reached in a highly diverse set of ways, but efforts to create a taxonomy of decision modes have identified three general classes: Calculation Modes, Affect Modes, and Role Modes (Ames et al., 2004; Weber & Lindemann, 2007; Weber et al., 2005). Calculation Modes utilize detailed evaluations and trade-offs between advantages and disadvantages, probabilities, and time delays of each course of action to calculate the best (or at least a good) decision. The quantitative optimization models of rational choice theory, such as expected utility theory (von Neumann & Morgenstern, 1944), are a prime example of Calculation Modes, but psychological models that grew out of the realization of bounded rationality, such as prospect theory (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992; Wakker, 2010) and query theory (Johnson et al., 2007; Weber et al., 2007), also belong to the same family. Other variants of Calculation Modes were characterized by the adaptive decision-making framework (Payne et al., 1988), which highlights how decision-makers may tailor their option evaluation and information integration approach to the costs and benefits of expending more or less effort and cognitive capacity on a decision. In general, detailed use of a Calculation Mode can result in increased demands on cognitive resources.

While Calculation Modes may incorporate affective evaluations of different choice alternatives (such as reflections on how an option may make one feel in the future), the momentary and often incidental emotional experience of the choice process plays no role. Conversely, Affect Modes utilize feelings experienced at the time of choice to guide decisions (Weber & Lindemann, 2007; Weber et al., 2005). For example, a consumer may experience excitement or fear when faced with a risky option, and that immediate emotional response may guide their choice (Damasio, 1993; Finucane et al., 2000; Loewenstein et al., 2001). Reliance on affect during decision-making can also make people less sensitive to magnitude changes (Hsee & Rottenstreich, 2004). Different emotions will evoke different cognitive or behavioral tendencies (Han et al., 2007; Lerner & Keltner, 2001; Lerner et al., 2004), and thus color the decision-making process. Fight or flight responses (Cannon, 1929) belong to the set of Affect Modes, as does impulsive shopping (Hausman, 2000). Affect Modes are inextricably linked to the emotional state that the consumer is experiencing at the time of choice, and therefore distinct from other classes of decision modes. They may also be relatively automatic, or can be consciously engaged.

Finally, Role Modes utilize recognition of the decision as a member of a category for which a decision rule exists. This recognition may be based on expertise in a particular domain, say chess (Chase & Simon, 1973; Simon, 1990), in which case the expert decision-maker retrieves which response is necessitated by the situation. Alternately, recognition can be based on a social role, say that of a doctor, in which case the professional decision-maker retrieves and executes the response that is associated with his or her role, e.g., providing medical care to anyone in need, as specified by the Hippocratic Oath (March, 1994). Other Role Modes include the use

of a moral code of conduct, or the application of standard operating procedures in work settings. Aspects of role mode use are also apparent in the Theory of Planned Behavior (Ajzen, 1991), as it incorporates considerations related to normative beliefs. Role Modes can be automatically engaged and thus involve a few cognitive resources, or they can be consciously engaged and require more cognitive resources.

To summarize, the three classes of decision modes involve qualitatively different choice processes. Calculation Modes involve evaluation, comparison, and integration, of outcome dimensions of different choice alternatives; Affect Modes register and react to the decision-maker's emotional response to the choice situation; Role Modes evaluate the choice situation for category information associated with previously learned decision rules that are then executed.

Previous theorizing has examined the genesis of different decision modes and characterized the variability in which they are applied across individuals and contexts. Weber (1998) hypothesized that the three classes of decision modes co-exist, because they allow the decision-maker to satisfy different needs or goals, with Calculation Modes satisfying material needs, Affect Modes satisfying the need for autonomy, and Role Modes satisfying social needs. This functional perspective also provides predictions for expected variation in decision mode usage across individuals and cultures. For example, since the use of a Role Mode affirms one's social identity, one would expect its use to be more frequent in cultures that value affiliation and social identity and in choice domains where social identity is seen as more central. Evidence supporting these hypotheses was provided by an analysis of the frequency by which the decision modes were described as being employed by characters making decisions in a broad range of content domains in American versus Chinese novels (Weber et al., 2005). There is additional evidence that people's reported use of decision modes in real-world decisions varies across different decision contexts (Weber & Lindemann, 2007; Weber et al., 2005).

Prior research has demonstrated that different decision modes are more likely to be used in different contexts. Given that the three modes utilize quite different features of the choice situation, this divergence of mode use is intuitively appealing. For example, when making financial decisions such as choosing an investment option, people are more likely to adopt a Calculation Mode, in which they explicitly trade off costs against benefits and select the option that maximizes the personal benefit (Weber & Lindemann, 2007). In contrast, when making more hedonic decisions such as selecting a dish at a restaurant, people are more likely to adopt an Affect Mode, focusing on their immediate emotional responses to the options available and choosing accordingly. When deciding on a matter related to their personal identity, such as religious or political matters, people are more likely to adopt a Role Mode, reflecting on what someone in their role should do under the circumstances or has habitually done in the past, and often choosing options that go against their personal self-interest or comfort. However, while prior work has demonstrated that different decision modes are used in different contexts, it stopped short of showing that use of different decision modes influenced choices.

In many consumer choices as in other decision contexts, multiple decision modes likely operate in parallel to guide people's considerations. This parallel processing is likely especially true of decisions about green consumer products or energy

products or services, which may trigger all three of the decision modes, by virtue of involving quantitative trade-offs, strong emotional reactions, and issues related to social identities (Litvine & Wustenhagen, 2011; Ozaki, 2011; Wustenhagen et al., 2007). In such circumstances, the relative influence of each decision mode on choice remains uncharacterized. A key question thus arises: does it matter by which mode a decision is made? It is certainly plausible that the decision mode employed influences which choice option is selected. There have been some empirical demonstrations that using conflicting decision modes while making an ethical decision leads to greater post-decisional worry and regret and that specific moral decision mode use shapes such ethical decisions (Krosch et al., 2012). However, prior research has stopped short of linking decision mode use to consumer choice.

There are reasons to expect that the use of different decision modes would trigger different considerations when choosing between options that can lead to decisions that are more or less environmentally-friendly. Importantly, decision modes may provide a cohesive framework that can account for disparate findings regarding how to promote environmentally-friendly decisions. Calculation Modes promote a focus on economic exchange as the basis for making one's selection. Exchange-based approaches in other domains typically lead to less generous behavior and reduced likelihood of acting to promote others' best interests (Clark & Mills, 1979; Clark et al., 1987), suggesting that Calculation Modes may therefore diminish environmentally-friendly choices, since such options typically come at a personal cost to generate benefit towards others or society more generally. Indeed, other research has shown that economic appeals to embrace environmentally-friendly options have been less successful than appeals that highlight environmental or health benefits (Asensio & Delmas, 2015; Ungemach et al., 2018). Affect Modes may promote environmentally-friendly choices, given the potential for a "warm glow" to promote prosocial decision-making (Andreoni, 1990). Positive emotions are often associated with helping others, including future generations, and have been associated with selecting environmentally-friendly alternatives (Schneider et al., 2017; Zaval et al., 2015). It is possible, therefore, that emotions arising at the time of choice may guide consumers using Affect decision modes to embrace options that minimize harm to the natural environment. Role Modes prompt consideration of one's social identity and rules for guiding one's behavior. Prior research has shown that information about others' consumption can promote conservation (Allcott, 2011). Defaults have also been shown to evoke consideration of social norms (McKenzie et al., 2006), and people are more likely to adopt an environmentally-friendly energy plan when it is the default (Ebeling & Lotz, 2015). Appeals to social identity generally encourage conservation (Goldstein et al., 2008; Griskevicius et al., 2010; Van Vugt, 2001), consistent with the notion that Role Modes may promote environmentally-friendly choices.

The present paper examined the relative use of different decision modes when making decisions between different energy plans offered by electric utility companies and how reliance on different decision modes shapes such consumer choice. This research pursued three key aims. First, we sought to characterize the relative use of each of the three classes of decision modes when consumers were faced with decisions between residential electricity plans that differed in their

environmental impact and other attributes. Policy makers and marketing managers from utilities implicitly assume that consumers rationally weigh costs against benefits (a Calculation Mode) as they choose whether to adopt an offered environmentally-beneficial energy plan. But instead, consumers may also use Affect or Role Modes, which may lead to different energy choices. Determining the relative use of each of three decision modes would provide key insight into the psychological processes typically underlying these consumer decisions. Second, we sought to establish the relationship between use of each of the three types of decision modes and environmentally-friendly choices. Documenting links between specific mode use and environmentally-friendly decisions enhances understanding of the precursors to pro-environmental behaviors and suggests a potential means to influence decisions. Our final aim was therefore to establish a causal link between the use of specific decision modes and environmentally-friendly choice. Such a connection between decision mode use and pro-environmental choice would provide a means for policy makers and energy market managers to impinge upon consumer decision-making and promote environmental conservation.

As electricity generation is a major contributor to greenhouse gas emissions (Agency, 2018), the present research focused on consumer decisions regarding electrical energy plans. Energy plans can be environmentally-friendly either because they offer electricity generated by non-carbon renewable sources and thus do not contribute to greenhouse gas emissions (Batley et al., 2001; Litvine & Wustenhagen, 2011) or because they promote less energy use during peak consumption hours and thus reduce grid peak load and the need to construct additional power stations (Newsham & Bowker, 2010). The present research examines decisions about the adoption of both types of environmentally-friendly electricity plans. Electricity plans featuring renewable sources of energy are common and available to consumers in most Western countries (MacDonald & Eyre, 2018). Energy plans that aim to control grid load through pricing that varies based on customer demand have gained importance in recent years, as fluctuating energy supply from renewables and increasing peak demand have increased the need for more flexible and adaptive energy demand from consumers (Newsham & Bowker, 2010; Roscoe & Ault, 2010; Wolsink, 2012). Different forms of peak pricing have shown to be effective in this regard (Newsham & Bowker, 2010).

The decision between energy plans that offer electricity generated by renewable energy only versus plans that offer electricity generated mainly by other sources that increase greenhouse gas emissions involves a trade-off between an environmentally-friendly option which usually comes at higher cost versus a cheaper option with a larger carbon footprint (Litvine & Wustenhagen, 2011; MacDonald & Eyre, 2018). In the peak scenario choice, the choice is between a time of use plan that entails higher effort or reduced comfort during peak service hours as consumers are only able to use a limited number of electric appliances at a given time for which they received some financial benefit (Newsham & Bowker, 2010) and a standard services plan which does not involve any restrictions on use of appliances but comes either with an additional service fee or without a financial benefit. The present research examines decisions between electricity plans that feature both types of trade-offs as well as decisions that vary with respect to their financial ramifications

for consumers, with some environmentally-friendly plans incurring additional financial costs and others resulting in financial savings.

1.2 Overview of studies

We propose that people will use different decision modes in parallel when making decisions about electrical utility plans. We anticipate that use of the Calculation Mode will lead to less adoption of environmentally-friendly options, while use of the Affect or Role Modes will lead to more adoption of environmentally-friendly options. Additionally, we examine the extent to which people have lay theories of how decision modes influence choice.

We conducted six online studies in two different countries: Switzerland and the United States. Table 1 summarizes the findings from the four studies that investigate the relationship between decision mode use and choice. Across our six experiments, we demonstrate (a) that qualitatively different choice processes operate in parallel, (b) that the degree to which a consumer deploys different decision modes correlates with consumer choices of environmentally-friendly options, and (c) that encouraging the use of different decision modes can influence selection of environmentally-friendly electrical plans.

2 Study 1

Study 1 sought to assess the extent to which different decision modes are evoked by consumer decisions about the sources of electricity generations which impact the planet's climate and whether the use of different decision modes influenced selection of environmentally-friendly options. Toward that end, participants were asked to make decisions about electrical utility plans either offering electricity generated by renewable sources only or mainly by non-renewable sources such as coal with a higher negative impact on the environment and then to report their use of each of the three main decision modes.

2.1 Methods

Participants: 226 Swiss participants (111 women) were recruited from an online panel provider. Most participants (92.5%) indicated that they were involved in household energy decisions. Participants were between 18 and 69 years old (M = 42.6, s.d. = 13.7, see Web Appendix for additional demographics) and provided informed consent prior to participating. This sample size combined with a power of 80% enabled us to detect effects greater than $f^2 = 0.035$.

Materials: To measure participants' self-reports of decision mode use after making a decision, we adapted a scale used in previous research about ethical decision-making (Krosch et al., 2012). This measure (included in the Web

Table 1 Self-reported decision mode us and impact on environmentally-friendly choice Studies 1, Supplemental 1, 3, and 4

Study	Type of Choice	Choice of environmentally-friendly option[a]	Higher use of Calculation Mode	Effect on environmentally-friendly choice[d]			Respondents N Country Type
				A	R	C	
1	Green vs. Standard	69.5%	(✓)[b]	↑	↑	↓	226 CH panel
Sup. 1		66.7%	(✓)[c]	↑	↑	↓	132 US mturk
3	Peak vs. Standard	84.8%	✓	↑	↓	↓	132 CH customers
4		70.6%	✓	↑	↑	↓	442 CH panel

A Affect Mode, *R* Role Mode, *C* Calculation Mode

[a] $p < 0.05$

[b] Only higher than Role Mode

[c] Only higher than Affect Mode

[d] Black arrows: $p < 0.05$; grey arrows: ns

Appendix) separately assessed use of the Affect Mode (four items asking "To what extent do you…", e.g., "…trust your gut feelings", Cronbach's $\alpha = 0.85$), Role Mode (five items, e.g., "…do what a responsible person would do", Cronbach's $\alpha = 0.87$), and Calculation Mode (four items, e.g., "…weigh potential benefits against risks", Cronbach's $\alpha = 0.83$) using a seven-point response scale anchored with "Not at all" and "Very likely". On a seven-point scale anchored with 1 as "Not at all" and 7 as "Very much", participants rated the extent to which they felt different positive emotions (i.e., happiness, pleasure, satisfaction, pride, and Cronbach's $\alpha = 0.93$) and negative emotions (i.e., sadness, guilt, anger, regret, and Cronbach's $\alpha = 0.91$) when they imagined themselves choosing each of the two utility plans. Prior research has demonstrated that people have introspective access to their decision mode use (Krosch et al., 2012; Weber & Lindemann, 2007), consistent with our use of self-report here. All materials were composed in English and then translated to German, and equivalence of translation was confirmed via back translation.

Procedure: After providing informed consent, participants were asked to imagine they had moved to a new city and needed to establish their utilities. They were presented with two possible electrical utility plans for their consideration, which differed in the source of the electricity provided (Fig. 1). The "Standard Power" plan cost 110 Swiss Francs per month and featured an energy mix with 70% of the energy produced from coal or gas, 20% of the energy produced from nuclear plants, and 10% of the energy produced from renewable sources. The "Green Power" plan cost 130 Swiss Francs per month and featured an energy mix with 50% of the energy produced from hydroelectric sources, 35% of the energy produced from wind farms, and 15% of the energy produced from other renewable sources. The energy source breakdowns and costs of these plans were developed by reviewing existing electrical utility plans available to residential customers in Switzerland in

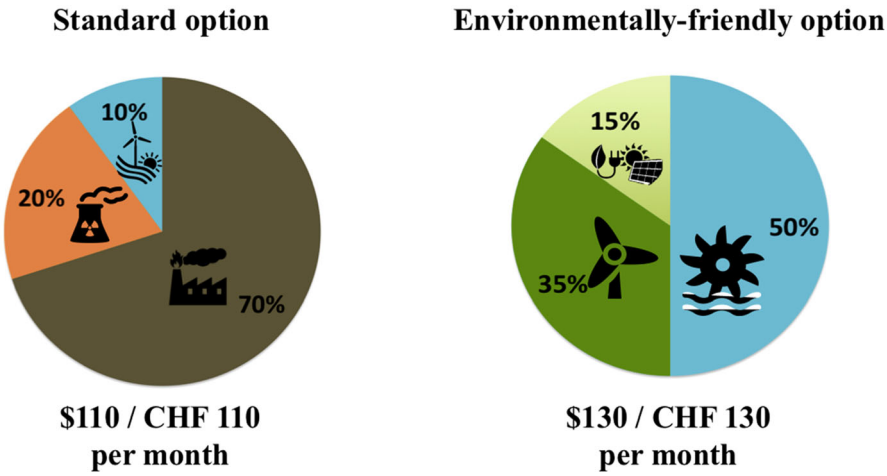

Fig. 1 Options presented in Study 1. Participants were confronted with the choice between an electrical plan that relied upon non-renewable sources for energy and a plan that relied only on renewable sources of energy

2015 and using the average electricity costs of the green plan and the standard plan for a typical household consuming about 2500 kWh a year. To examine whether there was an effect of information presentation on decision mode use, for half of the participants, these plans were described using only text, while for the other half of the participants the plan description included images. As analyses revealed no effects of presentation format on choices or mode use, this feature is ignored in all analyses. After learning about the two plans, participants rated their emotional reactions to each plan. The presentation order of the two plans and the order in which participants rated the plans were counterbalanced. Subsequently, participants indicated which plan they would select if they faced this decision in real life. They then rated their use of each of the three decision modes in making their selection. Prior research has demonstrated that people have insight into their decision mode use and can provide such self-reports of their decision-making process (Krosch et al., 2012; Weber & Lindemann, 2007; Weber et al., 2005). Finally, participants completed the GREEN scale (Haws et al., 2014), a brief index of engagement in environmental behaviors, the Consumer Spending Self-Control questionnaire (Haws et al., 2012), the short version of the Marlowe-Crowne Social Desirability Scale (Reynolds, 1982), and a brief demographics questionnaire. These variables were used as control variables.

2.2 Results and discussion

Relative use of decision modes: In their choice of preferred electrical plan, participants reported using all three decision modes, albeit to different degrees. On average, they were more likely to use either the Affect Mode ($M = 5.1$, $t(225) = 5.87$, $p < 0.001$) or the Calculation Mode ($M = 5.1$, $t(225) = 4.53$,

$p < 0.001$) than the Role Mode ($M = 4.7$). Use of the Affect and Calculation Modes did not differ ($p > 0.6$).

Decision mode use correlates with electrical utility choice: Overall, participants were more likely to choose the environmentally-friendly option (69.5%) than the standard option (30.5%, $x^2(1) = 34.27$, $p < 0.001$). To evaluate whether decision mode use influenced electrical utility plan decisions, we performed a logistic regression modeling choice using participants' ratings of their use of the three decision modes (Table S1). Use of all three decision modes correlated significantly with choices. Greater use of both the Affect Mode ($\beta = 1.25$, $p < 0.001$) and the Role Mode ($\beta = 0.48$, $p = 0.024$) positively correlated with the decision to adopt the environmentally-friendly energy plan, while greater use of the Calculation Mode ($\beta = -0.97$, $p < 0.001$) negatively correlated with that decision. These effects were not driven by individual differences in demographics (including gender, age, income, education, or home ownership), engagement in other environmentally-friendly behaviors, concern over personal spending, or social desirability (see Web Appendix).[1]

Emotional responses to electrical utility options: To assess emotional responses to the two electrical utility plans, participants' ratings were analyzed using a repeated-measures ANOVA with the within-subject factors of plan (Standard or Green) and valence (positive or negative emotion). This analysis revealed a main effect of plan ($F(1,225) = 5.92$, $p = 0.016$), with the Green plan receiving slightly higher emotional ratings than the Standard plan. This analysis also revealed a main effect of valence ($F(1,225) = 88.90$, $p < 0.001$), as generally participants reported higher positive than negative emotional reactions. Importantly, there was a significant interaction between plan and valence ($F(1,225) = 152.71$, $p < 0.001$). Participants reported experiencing more positive emotion ($t(225) = 11.77$, $p < 0.001$) and less negative emotion ($t(225) = 11.19$, $p < 0.001$) when considering the Green option compared to the Standard option. While considering the Green plan, participants experienced more positive than negative emotion ($t(225) = 16.43$, $p < 0.001$), whereas while considering the Standard plan, they experienced more negative than positive emotion ($t(225) = 4.08$, $p < 0.001$).

To assess whether emotional reactions to the plans correlated with choice, electrical utility plan choice was regressed on the emotion ratings (Table S1). Positive emotional reactions to the Green plan ($\beta = 0.80$, $p < 0.001$) and negative emotional reactions to the Standard plan ($\beta = 0.48$, $p = 0.011$) significantly correlated with adoption of the Green plan, while negative emotional reactions to the Green plan ($\beta = -0.40$, $p = 0.045$) and positive emotional reactions to the Standard plan ($\beta = -0.53$, $p = 0.003$) significantly correlated with adoption of the Standard plan.

It thus seems possible that the relationship observed between decision modes and utility plan selection might be driven by differences in emotional reactions to the plans, as positive emotional responses to green energy might promote the adoption

[1] Similar measures were incorporated for Supplemental Study 1, Study 3, and Study 4. Generally speaking, the effects of decision modes on choice were not driven by variability in demographics, attitudes, personality differences, or other measured individual differences. The details of these analyses are available in the Web Appendix.

of an Affect or Role Mode as well as selection of the Green plan. If this were the case, the observed effects would reflect simple mood effects on choice. Thus, we repeated the logistic regression testing the relationship between choice and decision mode use, but this time included the four emotion ratings of the plans as predictors (Table S1). Importantly, the effects of decision modes on choice remained significant, with use of both the Affect ($\beta = 1.18$, $p < 0.001$) and Role Modes ($\beta = 0.66$, $p = 0.025$) correlating with choice of the Green plan and use of the Calculation Mode ($\beta = -1.38$, $p < 0.001$) correlating with choice of the Standard plan. While positive emotional reactions to the Green plan increased selection of the Green plan ($\beta = 1.10$, $p < 0.001$) and positive emotional reactions to the Standard plan decreased selection of the Green plan ($\beta = -0.82$, $p = 0.002$), negative emotional ratings were no longer significantly related to choice (p's > 0.07). Thus, emotional responses to the options presented do not drive the observed relationship between decision mode use and utility plan choice. Rather, the observed relationship between decision mode use and adoption of environmentally-friendly electricity plans is a robust and separate phenomenon, not mediated by differences in mood.

3 Study 2

Study 1 established that people report using different decision modes to different degrees when considering utility plans, and that the use of these decision modes is related to their choices. Study 1 demonstrated that employing the Affect or Role Modes tends to promote environmentally-friendly choices while employing the Calculation Mode tends to discourage environmentally-friendly choices. As these are the first findings linking decision modes to consumer choice, we sought to replicate them and extend them to consumers in the United States in Supplemental Study 1 (see Web Appendix). These findings confirmed those from Study 1. Study 2 therefore examined (a) whether people intuited the relationships between decision modes and choice, and (b) which decision modes they perceived as most appropriate for making decisions about electrical utility plans.

3.1 Methods

Participants: 202 participants (79 women) in the United States were recruited from an online panel provider. Participants were between 18 and 70 years old ($M = 35.1$, s.d. = 10.5) and provided informed consent prior to participating. This sample size combined with a power of 80% enabled us to detect effects greater than $w = 0.197$.

Procedure: After providing informed consent, participants read about each of the three decision modes (see Web Appendix for text). They then completed a three-item quiz to assess their comprehension of the three modes. 92.6% of participants provided accurate responses on all three questions, and findings are qualitatively similar when analyses are restricted to only these participants. Participants then read about the two plans employed in Study 1: the "Standard Power" plan that featured a mix of non-renewable and renewable sources of energy and the "Green Power" plan that featured only renewable sources of energy, with order of plans

counterbalanced across participants. Participants were then asked to imagine how someone using each of the three modes would approach this decision. For each mode in turn, the participant indicated whether they thought someone using that specific mode would be more likely to choose the Standard Power plan, the Green Power plan, or equally likely to choose either power plan. This last option was provided to prevent arbitrary responses if participants genuinely felt that there would be no difference, and people who selected this response were removed from analyses involving this dependent variable. Finally, participants ranked which decision mode was most appropriate for making decisions about electrical utility plans before completing a brief demographics questionnaire. None of the findings reported below were moderated by gender, race, income, political attitudes, political party affiliation, or whether participants held a college degree.

3.2 Results and discussion

Intuitions about how decision modes influence environmentally-friendly choices: We first examined participants' intuitions about how using each of the three decision modes would influence decisions about whether to adopt an electrical plan that featured only renewable sources of energy. Participants expected that those who employed the Affect Mode would be more likely to select the Green Power plan (73.0%) compared to the Standard Power plan (27.0%, $x^2(1) = 32.24$, $p < 0.001$). Participants also expected that those who employed the Role Mode would be more likely to select the Green Power plan (88.8%) compared to the Standard Power plan (11.2%, $x^2(1) = 101.54$, $p < 0.001$). Finally, participants expected that those who employed the Calculation Mode would be less likely to select the Green Power plan (14.9%) compared to the Standard Power plan (85.1%, $x^2(1) = 86.45$, $p < 0.001$). Thus, participants' expectations about the influence of decision modes on choice align with the findings from Study 1 and Supplemental Study 1.

Perceptions of decision mode appropriateness: When indicating which decision mode was most appropriate to use when making choices about energy plans, people rated the Calculation Mode as the most appropriate (79.1%), followed by the Role Mode (11.7%), and finally the Affect Mode (9.2%, $x^2(2) = 194.57$, $p < 0.001$). Thus, people overall felt that the Calculation Mode was the most relevant decision mode for this type of consumer decision.

4 Study 3

Study 1 and Supplemental Study 1 collectively demonstrate that employing the Affect or Role Modes tends to promote environmentally-friendly choices while employing the Calculation Mode tends to discourage environmentally-friendly choices, and Study 2 shows that people generally intuit this relationship between decision mode use and choice. One potential limitation of these experiments is that they involved hypothetical consumer choices. Although the majority of participants in Study 1 and Supplemental Study 1 reported that they were responsible for their household's energy decisions, the options presented in the experiments were

hypothetical and presented outside of the typical context in which respondents made decisions about utility plans. In Study 3, we therefore sought to establish these effects in a framed field experiment (Harrison & List, 2004), using utility customers encountering these options through their current utility company.

4.1 Methods

Participants: 132 customers (22 women) of a Swiss utility company participated in the experiment through the utility company's website. All participants indicated that they were involved in household energy decisions, were over 18 years old, and provided informed consent prior to participating (see Web Appendix for additional demographics). The utility provider limited the time this study was available on their platform, resulting in a lower sample size than Study 1. This sample size combined with a power of 80% enabled us to detect effects greater than $f^2 = 0.060$.

Procedure: Utility customers viewed the current survey experiment on the website portal for their energy company. The procedure was nearly identical to that employed in Study 1, with four changes. First, instead of varying based on how the electricity was generated, the plans differed in their allowance of energy use at any given time (see Web Appendix). Under the standard plan, the customer could use all household appliances at the same time and did not have to monitor consumption. The new peak service plan allowed customers to contribute to grid stability and a better integration of renewable energies into the electricity system, at the cost of having to monitor their electricity consumption and avoid using too many appliances at the same time. This new service plan would be accompanied with an in-home visualization tool to help customers to monitor and manage their electricity consumption. Furthermore, this tool would allow customers to set an alarm which would warn them when they approach the limit of concurrent electricity consumption. These options were used as the utility company we partnered with for this experiment was developing such a plan featuring capped usage and was interested in evaluating consumer reactions to this new option. This plan shares features with the existing plans that limit the use of certain appliances at predefined points in time (Newsham & Bowker, 2010), except that it does not monitor a single, specific appliance but rather general electricity use. Whereas the standard option did not provide any benefit to the environment and reflected the current service plan of most customers, the peak option provided environmental benefits (e.g., better integration of renewable energy into the electrical grid) and the utility company envisioned that it would offer a financial benefit to the customers by lowering their base costs.

Second, the description of the plan that capped usage was varied between-subjects to emphasize different benefits (see Web Appendix). At the time of the study, the utility company was still assessing how to introduce this new service plan to customers, and in particular was still evaluating whether they should focus on the environmental benefits, the financial benefits to the customer, or both. To explore this issue, three experimental groups were designed. The new peak service plan required customers to limit the simultaneous use of too many appliances at a given time in all three conditions. In one condition, customers could not overstep this

maximal grid load limit, but this personal cost to the customer was counterbalanced with emphasizing benefits to the environment and the energy grid. In the second and third condition, customers could overstep the maximal grid load limit, but had to pay a surcharge; in the second condition, the financial savings to the customer were emphasized as a compensation, while in the third condition, both environmental benefits and financial savings were emphasized as offsets. All participants indicated at the end of the experiment whether or not they had understood the two utility plans described.

Third, at the end of the experiment, we asked participants about the extent to which they felt that the presentation of the options was trying to encourage a specific choice, using a single-item, five-point scale ("I was upset because I had the feeling that you intended to influence my choice through the way in which the two energy service plan alternatives were presented," ranging from Strongly Disagree to Strongly Agree).

Finally, in addition to asking customers which of the plans they preferred, we also asked customers if they were interested in being among the first to test the new plan that capped energy usage and whether they wanted to be informed when the plan became available from the utility company. Of the customers who selected the environmentally-friendly plan in our study, 96.4% also indicated that they would like to be notified as soon as the utility company actually began offering the plan. After the study had completed, the utility company decided to implement the plan which limited the simultaneous use of too many appliances at a given time but allowed customers to overstep this limit for a surcharge. The company followed up with a subset of the customers to inquire if they would adopt the new plan capping usage. 66.7% of the customers who indicated in our study that they preferred the plan with capped usage eventually adopted it when it was offered by the utility company.

4.2 Results and discussion

Relative use of decision modes: After selecting their preferred electrical plan, participants reported their use of each of the three decision modes. Participants were more likely to adopt the Calculation Mode ($M = 5.5$) than either the Affect Mode ($M = 5.0$, $t(131) = 4.38$, $p < 0.001$) or the Role Mode ($M = 4.8$, $t(131) = 5.55$, $p < 0.001$). Reported use of the Affect Mode and Role Mode did not differ ($p = 0.164$). A repeated-measures ANOVA with the within-subjects factor of Mode and the between-subjects factor of Condition did not reveal any significant effects of the description manipulation on decision mode use (p's > 0.16). Overall, participants were most likely to use the Calculation Mode when choosing between the energy plan that capped electrical usage and the plan that did not.

Decision mode use correlates with electrical utility choice: Overall, participants were more likely (84.8%) to choose the environmentally-friendly option—which capped energy usage—than the standard option (15.2%, $x^2(1) = 64.12$, $p < 0.001$). The likelihood of choosing the environmentally-friendly option did not differ significantly across the three description conditions ($x^2(1) = 0.74$, $p = 0.692$). To evaluate whether decision mode influenced electrical utility decisions, we

performed a logistic regression modeling choice using participants' ratings of the three decision modes (Table S2). The Affect Mode exhibited a significant positive relationship with selecting the environmentally-friendly option ($\beta = 0.60$, $p = 0.005$), but neither the Role Mode ($\beta = -0.14$, $p = 0.522$) nor the Calculation Mode ($\beta = -0.19$, $p = 0.383$) showed a significant relationship with choice.[2]

To assess whether the relationship between decision mode use and choice varied across the three description conditions, the logistic regression was repeated with condition and each of the three decision modes as predictors, including the interaction between condition and each decision mode. While the main effect of Affect Mode on choice remained significant ($\beta = 2.06$, $p = 0.001$), there was also a significant interaction between Affect Mode and condition on choice ($\beta = -0.72$, $p = 0.012$). No other effects were significant (p's > 0.05). Post-hoc analyses revealed that the Affect Mode use was significantly related to choice when both the environmental and financial benefits were emphasized ($\beta = 1.30$, $p = 0.005$), but was only marginally significant when only the financial benefits were emphasized ($\beta = 0.52$, $p = 0.087$), and was not significant when only the environmental benefits were emphasized ($\beta = -0.54$, $p = 0.234$). Therefore, although use of the Affect Mode did not significantly differ between the three conditions, its relationship with choice was only significant when both the environmental and financial benefits of the capped usage plan were emphasized in the description.

Reactions to descriptions of the plans: Participants indicated at the end of the experiment whether they felt that the presentation of the two plans had influenced their choice. Overall, participants did not report that they felt they were being influenced, with the average rating ($M = 2.0$) falling significantly below the midpoint of the scale, $t(131) = 12.23$, $p < 0.001$. To assess whether decision mode use was correlated with feelings of being influenced, we regressed participants' decision mode use against their ratings of feeling influenced. Use of none of the three decision modes was significantly related to feelings of being influenced (p's > 0.5). We subsequently examined whether feelings of being influenced differed based on the description of the plans. A one-way ANOVA revealed a significant effect of description on feelings of being influenced ($F(2, 129) = 3.06$, $p = 0.050$). Participants who viewed the description that emphasized the environmental benefits only ($M = 2.2$) felt more influenced than those who viewed the description that emphasized both the environmental and the financial benefits ($M = 1.7$, $t(86) = 2.45$, $p = 0.016$). This finding indicates that highlighting only the environmental benefits of a utility offering might engender concerns about the intentions of the utility company (Bang et al., 2018), suggesting that descriptions of such plans will be more favorably viewed if they also include information about the direct financial benefits to the customer.

[2] Supplemental analyses using just two-items for each mode revealed significant effects in the expected direction for both the Affect ($\beta = 0.70$, $p < 0.001$) and Calculation ($\beta = -0.58$, $p = 0.025$) modes, but not the Role mode ($\beta = 0.03$, $p = 0.887$).

5 Study 4

Study 3 demonstrated that the Affect Mode is associated with adoption of environmentally-beneficial electricity plans in actual decisions made by utilities customers, and that this relationship is strongest when both the environmental and financial benefits of such plans are highlighted. The absence of significant effects for the Role and Calculation modes may be the result of lower power, given the smaller sample size in Study 3. In Study 4, we sought to examine the influence of decision modes on choice in a larger sample of similar participants in Switzerland. Additionally, we sought to assess whether people are sensitive to the amount of the financial benefit of the environmentally-friendly plan. Although Study 3 demonstrated that highlighting both environmental and financial benefits produced the strongest relationship between the Affect Mode and choice and that this type of description produced fewer feelings of being influenced than highlighting the environmental benefit alone, it remains unclear whether the mere presence of a financial benefit produces this effect or if people are sensitive to the amount of the financial benefit. In Study 4, we created two versions of the description that highlighted the financial benefit, one featuring a substantial financial saving and the other featuring a modest financial saving.

5.1 Methods

Participants: 442 Swiss participants (223 women) were recruited through an online panel provider. 416 participants (94.1%) indicated that they were involved in household energy decisions. All participants were over 18 years old (M = 43.3) and provided informed consent prior to participating (see Web Appendix for additional demographics). This sample size combined with a power of 80% enabled us to detect effects greater than $f^2 = 0.018$.

Procedure: The procedure was identical to Study 3 with two key differences. First, participants were recruited from an online panel provider rather than via a utility company website. Second, we sought to investigate the extent to which participants were sensitive to information regarding pricing. Toward that end, we modified the descriptions to be more specific about the financial savings associated with the plan that capped energy usage and varied the savings amount between participants. In one condition, only the environmental benefits were emphasized. In the second condition, only the financial savings were emphasized, and the amount of savings was estimated at approximately 30% of one's typical bill. This 30% savings aligns with the utility company's estimate of average household savings for those that adopt this plan. In the third condition, both the environmental and financial benefits (i.e., 30% savings) were emphasized. In the fourth condition, both the environmental and financial benefits were emphasized, but the savings was estimated to be a more modest 10% of one's typical bill.

5.2 Results

Relative use of decision modes: As with Study 3, participants were more likely to adopt the Calculation Mode ($M = 5.4$) than either the Affect Mode ($M = 5.0$, $t(441) = 6.03$, $p < 0.001$) or the Role Mode ($M = 4.7$, $t(441) = 9.77$, $p < 0.001$). Participants were also more likely to adopt the Affect Mode than the Role Mode ($t(441) = 5.31$, $p < 0.001$). A repeated-measures ANOVA with the within-subjects factor of Mode and the between-subjects factor of Condition did not reveal any significant effects of the description manipulation on decision mode use (p's > 0.2).

Decision mode use correlates with electrical utility choice: Similar to Study 3, participants were more likely (70.6%) to choose the environmentally-friendly option—which capped energy usage—than the standard option (29.4%, $x^2(1) = 74.94$, $p < 0.001$). Importantly, the likelihood of choosing the environmentally-friendly option differed significantly across the four description conditions ($x^2(3) = 9.33$, $p = 0.025$). Participants who viewed the description that only emphasized the 30% financial savings were less likely to adopt the plan that capped usage than participants in any of the conditions that referenced environmental benefits. Specifically, those who only viewed information about financial benefits were significantly less likely to adopt the greener plan than those who viewed the description that emphasized both the 30% savings and the environmental benefits ($x^2(1) = 6.60$, $p = 0.010$) or the description that emphasized both the environmental benefits and the 10% savings ($x^2(1) = 6.48$, $p = 0.011$), and were marginally less likely to adopt the plan that capped usage than participants who viewed the plan that emphasized only the environmental benefits ($x^2(1) = 3.56$, $p = 0.059$). There were no differences in choice between the three conditions that included an emphasis on the environmental benefits (p's > 0.5). Thus, consumers do not appear to be sensitive to the amount of the financial benefit of the plan.

To evaluate whether decision mode use influenced electrical utility decisions, we performed a logistic regression modeling choice using participants' ratings of the three decision modes (Table S2). In contrast with Study 3, all three decision modes exhibited a significant relationship with choice. The Affect Mode ($\beta = 0.75$, $p < 0.001$) and Role Mode ($\beta = 0.25$, $p = 0.037$) exhibited a significant positive relationship with selecting the environmentally-friendly option, while the Calculation Mode ($\beta = -0.33$, $p = 0.003$) exhibited a significant negative relationship with selecting the environmentally-friendly option. To assess whether the relationship between decision mode use and choice varied across the description conditions, the logistic regression was repeated with condition and each of the three decision modes as predictors, including the interaction between condition and each decision mode. Neither the main effect of condition nor any of the interactions between condition and decision mode was significant (p's > 0.2).

5.3 Discussion

Overall, participants were most likely to use the Calculation Mode when choosing between the energy plan that capped electrical usage and the plan that did not. Swiss consumers also used the Affect Mode more often than the Role Mode.

The findings of Study 4 indicate that highlighting the financial benefits of environmentally-friendly utility plans alone may actually discourage their adoption. This is consistent with prior demonstrations that emphasizing the financial benefits alone of green behaviors is less likely to encourage conservation than demonstrations that emphasize environmental benefits (Asensio & Delmas, 2015, 2016). Additionally, it appears that, when environmental benefits are highlighted, people are somewhat insensitive to the amount of financial savings, as similar adoption rates were observed between the conditions that did not emphasize a monetary benefit, emphasized a modest monetary benefit, and emphasized a significant monetary benefit. The influence of decision mode on choice did not vary with the features of the plan emphasized in the description. Finally, differences in description did not influence the feelings of being influenced (see Web Appendix), and use of the Affect Mode was associated with feeling less influenced by how the plans were presented.

6 Study 5

Spontaneously deploying different decision modes was associated with variability in the likelihood that people would select environmentally-friendly electrical utility plans. Seeking to establish a causal relationship between decision modes and environmentally-friendly choice, we sought to manipulate people's use of decision modes and observe the impact on choice.

6.1 Methods

Participants: 269 US participants (127 women) were recruited through Amazon Mechanical Turk to complete the present experiment. Three additional participants completed the experiment, but were removed from all analyses due to failing a comprehension quiz at the end of the experiment (described below). Results are qualitatively similar when responses from these three participants are included. All participants were over 18 years old (M = 35.8, s.d. = 10.1) and residing in the United States. This sample size combined with a power of 80% enabled us to detect effects greater than f = 0.190.

Procedure: After providing informed consent, participants were asked to write about a time that they made a decision in the past. Participants were randomly assigned to one of three conditions: writing about a time they used the Affect Mode, a time they used the Role Mode, or a time they used the Calculation Mode. Rather than labeling these modes, the writing prompt instead described the approach that someone using that mode would employ (see Web Appendix). Participants wrote about a time they used the decision mode in their own lives and were required to write at least 20 words and for at least 30 s about the experience. After completing this writing task, participants were then presented with the two energy plans used in Study 1 (i.e., standard power mix or renewable power only) with the option presentation counterbalanced across participants. After selecting one of the two plans, participants rated their use of each of the decision modes to make the choice,

their emotional responses to the options, their understanding of the plans, how realistic the decision seemed, and the extent to which they felt the presentation of the options influenced their choice. After completing these measures, participants also completed a 4-item quiz regarding the two plans to confirm that they understood each of the options, followed by individual difference and demographics measures. All participants answered at least 3 out of 4 of the questions on the comprehension quiz correctly. Participants reported high levels of understanding the decision presented to them ($M = 6.6$ on a seven-point scale) and that the decision was realistic ($M = 5.6$ on a seven-point scale), and these measures did not differ between conditions (p's > 0.1).

6.2 Results and discussion

Relative use of decision modes: We first examined the extent to which our essay manipulation about using one of the three modes in a past decision influenced participants' subsequent use of the three decision modes when making their electricity plan decision. A repeated-measures ANOVA with the within-subjects factor of scale (Affect, Role, or Calculation scale) and the between-subjects factor of condition (Affect, Role, or Calculation writing prompt) examined participants decision mode use. There was a main effect of scale, $F(1.46,\ 387.59) = 8.47$, $p = 0.001$, as participants generally reported less use of the Role Mode compared to the other two modes. There was also a significant main effect of condition, $F(2,\ 266) = 3.09$, $p = 0.047$, as participants reported less decision mode use overall following the Calculation Mode writing prompt. Importantly, these main effects were qualified by a significant interaction, $F(2.914,\ 387.59) = 5.25$, $p = 0.002$. Endorsement of the Affect Mode was higher for participants who wrote about using the Affect Mode compared to those who wrote about using the Calculation Mode, $t(187.9) = 2.48$, $p = 0.014$, but did not differ from those who wrote about using the Role Mode, $t(168.3) = 1.31$, $p = 0.193$. Similarly, endorsement of the Role Mode was higher for participants who wrote about using the Role Mode compared to those who wrote about using the Calculation Mode, $t(173.2) = 2.17$, $p = 0.032$, but did not differ from those who wrote about using the Affect Mode, $t(167.6) = 0.71$, $p = 0.476$. Endorsement of the Calculation Mode did not differ between the Calculation Mode and Affect Mode writing conditions, $t(178.6) = 1.14$, $p = 0.256$, but was marginally higher for those who wrote about using the Calculation Mode compared to those who wrote about using the Role Mode, $t(153.1) = 1.91$, $p = 0.058$. Generally speaking, participants reported high use of the decision mode that they had previously recollected when making the green energy choice and described using in a previous decision.

Decision mode condition and choice: As with our previous studies, participants were generally more likely to choose the environmentally-friendly option (62.1%) than the standard option (37.9%, $x^2(1) = 15.71$, $p < 0.001$). The likelihood of choosing the environmentally-friendly option was marginally significantly different across the three writing conditions ($x^2(2) = 5.71$, $p = 0.058$). Subsequent analyses revealed that participants in the Role Mode condition were more likely to select the environmentally-friendly option (72.2%) compared to those in the Calculation

Mode condition (54.6%, $x^2(1) = 5.70$, $p = 0.017$). There was no significant difference in choice between the Affect (61.3%) and Role Modes ($x^2(1) = 2.25$, $p = 0.133$). Additional analyses demonstrated that these effects were not moderated by demographics (including age, gender, income, education, race, political attitudes, or environmental attitudes).

Decision mode use mediates the relationship between condition and choice: Participants who wrote about using the Role Mode were more likely to select the environmentally-friendly utility option than participants who wrote about using the Calculation Mode (with those who wrote about using the Affect Mode falling between the other two conditions). We next examined whether differences in self-reported mode use mediated these effects of condition on choice. A mediation model (PROCESS model 4) revealed significant mediation of the difference between the Role and Calculation conditions via endorsement of the Role Mode Scale (95% CI 0.05, 1.23). That is, those in the Role condition reported greater use of the Role Mode compared to those in the Calculation condition, and this increased Role Mode use subsequently increased the likelihood of selecting the environmentally-friendly utility option. A similar analysis was conducted to examine whether the difference between the Affect and Calculation condition was mediated by endorsement of the Affect Mode Scale and also revealed significant mediation (95% CI 0.35, 3.13). Those in the Affect condition reported greater use of the Affect Mode than those in the Calculation condition, and this increased Affect Mode use subsequently increased the likelihood of selecting the environmentally-friendly utility option. Thus, changes in decision mode use mediate the impact of condition on environmentally-friendly choice, such that increases in the use of the decision mode that participants wrote about in the Affect and Role conditions increased their propensity to choose the greener utility plan.

7 General discussion

In the present series of experiments, we demonstrated that people report using all three decision modes, but to varying degrees, when making decisions about electrical utility plans. In general, across all studies, people were most likely to report using the Calculation Mode when considering whether to adopt a standard electrical plan versus one that was environmentally-beneficial (Table 1). The high use of this mode aligns with the fact that such choices often involve weighing costs and benefits and comparing numerical aspects of such plans, such as the financial savings or impact on carbon emissions. Across studies, the use of both the Affect Mode and Role Mode was also high, although their relative use varied. In Studies 1, 4, and 5, participants were more likely to adopt an Affect Mode; in Supplemental Study 1, participants were more likely to adopt a Role Mode; and in Study 3, they were equally likely to adopt both decision modes. Future work should establish the circumstances under which people are more likely to adopt the Affect or the Role Mode.

Importantly, reported decision mode use during deliberation was related to consumer choice. Deploying the Affect Mode or the Role Mode was associated with

selecting the environmentally-beneficial option, while deploying the Calculation Mode was associated with selecting the less environmentally-friendly option (Table 1). Importantly, these observed relationships held when controlling for demographic variables, attitude differences, and personality measures. Critically, we demonstrate in Study 5 that manipulating decision modes alters choice, demonstrating a causal link between decision modes and selection of environmentally-friendly options. The relationship between the Calculation Mode and choice was significant in all experiments except for the framed field study reported in Study 3. This absence of a significant effect may be partially due to the slightly lower sample size used in that study, which may have limited our ability to detect the effect. This hypothesis is confirmed by the fact that in Study 4, which employed the same design with larger samples, Calculation Mode use showed a robust relationship with choice. On one hand, it may be surprising that use of the Calculation Mode was consistently associated with selection of the less environmentally-friendly option, since in several of the studies, the environmentally-friendly option was actually the somewhat cheaper option. However, employing the Calculation Mode likely promoted a focus on economic exchange as a basis for the decision (Clark & Mills, 1979; Clark et al., 1987), which diminished the extent to which the benefit to others and social welfare contributed to the decision. If these social and societal benefits of the environmentally-friendly option are discounted or neglected during deliberation, the financial savings may be judged to be insufficient to merit the inconvenience associated with the cheaper environmentally-friendly option. Indeed, the present finding that the Calculation Mode is associated with choosing the less environmentally-beneficial option is consistent with previous demonstrations that emphasizing financial benefits does not promote environmentally-friendly choices (Asensio & Delmas, 2015, 2016), as well as our finding in Study 4 that emphasizing financial benefits alone is least likely to result in adoption of the environmentally-friendly plan.

Use of both the Affect Mode and the Role Mode was consistently associated with adoption of the environmentally-friendly option. The relationship observed with the Affect Mode may reflect the influence of a "warm glow" on these decisions, as consumers may have experienced positive emotions when considering options that would contribute to the social good or help others (Andreoni, 1990; Schneider et al., 2017). Generally, the relationship between use of the Role Mode and choice was smaller in magnitude than the relationship between the other two decision modes and choice. This weaker influence might be due to variability across participants in their identities. If a person does not identify with environmental goals or consider their energy use as part of their citizenship behavior, the relationship between the Role Mode and choice would be weaker. At the same time, when decision mode use was manipulated, use of the Role Mode was most associated with selecting the environmentally-friendly option. Previous work has emphasized the social nature of environmental decisions (Goldstein et al., 2008; Griskevicius et al., 2010; Van Vugt, 2001), and considering one's social role and identity during deliberation by utilizing the Role Mode seems to steer one towards the environmentally-friendly option consistent with these prior findings. Use of the Role Mode likely prompts consideration of social norms and rules for guiding one's behavior. Our finding that

promoting use of the Role Mode during deliberation prompts environmentally-friendly choice dovetails well with findings from other interventions that prompt environmentally-friendly energy behaviors. Providing information about others' consumption (Allcott, 2011), setting an environmentally-friendly plan as a default (Ebeling & Lotz, 2015), and highlighting public health benefits (Asensio & Delmas, 2015, 2016) likely all evoke Role Mode use, perhaps explaining their association with environmentally-friendly energy behaviors. The observed relationship between Role Mode use and environmentally-friendly decisions suggests that marketing materials that seek to leverage the influence of the Role Mode on choice should likely either target individuals that identify strongly with environmental goals or activate those identities in their communications, similar to previous findings regarding signposting (Ungemach et al., 2018). Determining which populations might be more likely to employ specific decision modes would be highly relevant for marketing managers and policy makers. While outside of the aims of the present paper, we include supplemental analyses in the Web Appendix to examine whether demographics are associated with reported decision mode use.

Overall, participants across the experiments generally exhibited a preference for the environmentally-friendly utility plan. This finding is consistent with reports that people generally value protecting the environment (Mackoy et al., 1995) and demonstrations that people prefer environmentally-friendly alternatives (Sunstein & Reisch, 2014). Importantly, participants also reported that they did not feel unduly influenced in their plan choice in Studies 3 and 4. This preference for the environmentally-friendly plan was also present in Study 3, which featured real customers making decisions on their utility provider's web portal, with some of those customers eventually enrolling in a plan similar to the one described.

One limitation of the present research is that the experiments relied upon self-report to assess decision mode use. However, previous research has validated this approach by demonstrating people do have awareness of the modes they use (Krosch et al., 2012; Weber & Lindemann, 2007). Future research could complement this approach by assessing other means of measuring decision mode use, such as through the use of neuroimaging techniques (Hutcherson et al., 2015). An additional limitation of the present approach is we only examined decisions between two electrical utility plans rather than a menu of options. This design decision was made to simplify the structure of our experimental design, but future research could expand the array of options considered. However, we predict that the same processes would predict choice, with Affect or Role Mode use predicting the adoption of electrical utility plans that are more environmentally-friendly and use of the Calculation Mode predicting adoption of electrical utility plans that are less environmentally-friendly.

Another limitation of the present research is we focused on single decisions rather than examining long-term behaviors. Decision modes have been theorized to influence spillover effects in the environmental domain, potentially increasing or decreasing the likelihood of one initial environmentally-friendly action leading to other future environmentally-friendly actions (Truelove et al., 2014). Prior work has found that offering an incentive for green behaviors reduces the likelihood of someone engaging in a later green behavior, and that emphasizing identity increases

the likelihood of someone engaging in a later green behavior (Maki et al., 2019). These results are consistent with our findings that the Calculation Mode (which should be more engaged in the presence of economic incentives) is associated with less environmentally-friendly choice and the Role Mode (which should be more engaged by identity appeals) is associated with more environmentally-friendly choice. Future research could explore this connection further by examining more directly the relationship between decision mode use and spillover effects.

Generally similar effects emerged across both the US and the Swiss samples examined in the present research. These similar effects suggest that the findings are robust across cultures. While the US and Switzerland do differ in important ways (Schwartz, 1999; Schwartz & Bardi, 2001), with US culture valuing mastery, traditionalism, and hierarchy more than Swiss culture (or most other Western European cultures), they are generally similar along other dimensions such as individual versus collective orientation. As decision mode use has previously been reported to vary across individualist and collectivist cultures (Weber et al., 2005), further research could address whether countries with more divergent cultural backgrounds, such as comparing European and East Asian cultures, would trigger different mode uses and reveal distinct relationships between decision mode use and consumer choice.

The present findings have several implications for marketing managers and policy makers seeking to encourage environmentally-friendly consumer choices. First, they should not emphasize cost savings alone in marketing materials. Our findings from Study 4 revealed that people were least likely to adopt the environmentally-friendly options when only financial benefits were emphasized. Additionally, presentation of financial benefits alone may encourage use of Calculation mode during deliberation, which leads to less environmentally-friendly choices. Second, practitioners should use marketing materials that will be more likely to evoke a Role or Affect mode than ones that will evoke a Calculation mode. Third, as people may have diverse social identities that are more or less salient at different points in time, marketers and policy makers seeking to encourage Role mode use to promote environmentally-friendly choices should target customer segments that identify strongly with environmental goals or otherwise activate those goals using marketing materials. By considering the decision modes of their consumers, marketers and policy makers can identify new ways to impinge upon consumer decision-making and promote adoption of environmentally-friendly options.

Taken together, the present experiments reveal that decision modes are related to consumer decisions about products and services that influence the natural environment. These findings have important implications for policy makers and marketers. Marketers and policy makers could target environmentally-friendly products or services to individuals who are more likely to adopt an Affect or Role Mode, or tailor their messaging to encourage the use of such decision modes. For example, appealing to social roles and communal dependencies would likely promote adoption of Affect and Role Modes during decision-making and thus increase selection of environmentally-friendly options. Importantly, the present work also indicates that financial benefits of such plans should not be discussed in

isolation, and that information regarding environmental benefits should also be highlighted to promote environmentally-friendly choices. Using the decision modes' framework, marketers and policy makers can tailor communications to prompt consumers to adopt environmentally-friendly decision modes during deliberation and thus also enhance the market share of environmentally-beneficial options.

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Declarations

Conflict of interest The authors declare no financial conflict of interest.

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