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Energy and environment

Kai Ruggeri, Johanna Immonen, Amel Benzerga, Ondrej Kacha, Marvin Kunz and Sander van der Linden

Columbia University; University of Cambridge, University of Helsinki, Columbia University, Masaryk University, University of Groningen and University of Cambridge

Acknowledgements: Annalisa Robbiana, University of Padova

Chapter summary

The most pressing environmental concerns of the twenty-first century include climate change, sustainable energy production, and access to clean air and water. Effective energy and environmental policies are needed beyond polarized debates around regulation. This is problematic as it is also widely argued that the public is simply not compelled by climate change as a personal matter. Though public willingness to utilize sustainable and pro-environmental options is increasing, actual behavior trends have not followed suit. A variety of behavioral insights present clear opportunities to achieve desired outcomes, with evidence from better engaging local communities to improved public campaigns, largely through the use of social norms. Other approaches, including choice architecture and setting default choices in favor of green energy, appear to result in “optimal” policy outcomes. In this chapter, we explore these and their potential for substantial impact if applied widely and appropriately.

Learning objectives

- Understand why evidence based policy is a relevant tool in addressing environmental and energy issues.
- Become familiar with current approaches to evidence-based policy in the energy and environment sector.
- Establish links between human behavior and environmental issues, particularly energy consumption.
- Understand how evidence-based policies succeed to different extents in addressing the value-action gap.
- Understand how behavioral insights can be used to address imperfect decision-making and to encourage proenvironmental behaviors.
- Understand the value that can be gained from evidence-based environmental policies compared to traditional policies.

Introduction

Recognizing the significant threats to sustainability, the World Bank launched the Energy and Environment program in 2014. The purpose of this program was to bring together industrial leaders, elected officials, scientific experts, and non-governmental organizations. These groups would then outline a path toward addressing the major challenges related to accessing, using, and optimizing energy sources, while protecting the environment. As a development organization, the World Bank sees inequalities in access to electricity as a major barrier to meeting the Sustainable Development Goals, particularly for the poorest regions. At the same time, they recognize the opportunity that providing clean, renewable energy options to those groups can bring as a way to protect the environment without sacrificing economic growth. Developing countries not only lack a proper and widespread access to electricity, they will also suffer disproportionately from the consequences of climate change.

Energy consumption and human impact on the environment is clearly not only a matter for developing regions. A considerable amount of research has been carried out to look at how behaviors in OECD countries impact the environment. The economy in the western world remains highly dependent on non-renewable fossil fuels, further contributing to human induced climate change. The excessive energy consumption created by households as well as the energy requirement of the economy are a significant challenge worldwide (Marques & Fuinhas, 2016; Apergis & Payne, 2010; Apergis & Payne, 2009). Direct negative consequences for the environment are loss of water supplies and glaciers (Chevallier et al., 2011), threats to human health (Patz et al., 2014), deforestation (Ahmed et al., 2015), the production of extreme waste (Robinson, 2009), and the pollution of natural habitats, which can be observed in the extensive loss of biodiversity (Liu et al., 2003), comparable to major catastrophic extinctions in prehuman world history (Ceballos, 2015). Beside these direct consequences, there are further alarming processes. Energy consumption does not only contribute to climate change but is also expected to rise by 40 percent by 2030 if no major policy changes are introduced (International Energy Agency, 2009).

With the current climate trend continuing, and assuming the economy will be directly affected by climate change as well, the Food and Agriculture organization of the United Nations (FAO, 2012) estimates that another 122 million people will live in poverty by 2030, reversing decades of decline in poverty rates. An additional effect of climate change will be the loss of available arable land per person as a consequence of the changes in rainfall and temperature, and extreme weather events (Gornall et al., 2010). Furthermore, it is expected that by 2030 up to 50 percent of the global population could live in areas with high water stress and up to 60 percent of the world population could still lack access to sanitation installations (CBD, 2010). The combination of these two factors contributes significantly to diarrhea, already one of the leading causes of child mortality (WHO, 2016).

Agriculture is also directly linked to many environmental issues. It is perhaps the largest source of many greenhouse gas emissions (U.S. Environmental Protection Agency, 2012), yet it is often left out of the discussion on environmental policies. Some actions regarding animal agriculture in particular could be deferred to consumers, but it remains questionable whether this would result in meaningful change.

Consumer demand under free market is not generally a sufficient way for extensive adoption of “green” products (Battisti, 2008). “Green” products are defined as products which, when consumed, do the least possible harm for the environment. Regulation and

fiscal incentives are also needed to ensure the accelerated usage of green products. Planning and implementing sustainable environmental practices is essential for the management of common pool resources (i.e. resources that are shared among a social group). This could be achieved in a number of ways such as: 1) allowing for state-level regulation with simultaneous community-level organization; 2) empowering the local knowledge of communities so that they can better manage their resources and 3) more specific tailoring of strategies to manage common-pool resources to specific cases (Pang et al., 2017).

Human behavior can be directly linked to almost all of these challenges, making decision-making and other behaviors a natural lever for impact (Sovacool, 2014). Behavioral scientists have been actively studying ways to change how we think and behave toward our environment (Steg et al., 2014; van der Linden et al., 2015). These are not only negative; humans also have an opportunity to directly contribute to a number of proactive steps to improve the environment (De Leeuw et al., 2015). Such initiatives have involved land reclamation, reforestation, and redesigning community spaces in urban areas (Wolch et al., 2014).

Researchers also focus on how environmental factors influence our behavior, making it a tool on its own for influencing choices and outcomes (Schultz et al., 2013). However, it has been estimated that for a national program in the US to have a meaningful impact, it would have to cost less than \$2.2 billion (Allcott & Mullainathan, 2010), meaning there is a tremendous need to consider costs in delivering a major change, particularly in industrialized countries. Whether behavioral insights can lead to increased sustainable environmental practices is a major area of ongoing study and debate, though available evidence indicates a clear potential for impact.

Currently, energy policies often focus on energy efficiency, supply security, and balancing markets. Take the example of the European Parliament's Energy Union that has published a strategy targeting the aforementioned areas (Erbach, 2015). Among the five major dimensions, energy efficiency is often highlighted and Member States are thus encouraged to prioritize energy efficiency policies, which is largely an industrial and regulatory matter. This means most policies are focused on major entities as opposed to individuals. Similarly, energy security is addressed with the aim of strengthening the cooperation between Member States and the EU's role on global energy markets. In this holistic strategy, EU-wide energy market aims to match the energy supply with demand. These goals are sought through new legislative means. Transport and buildings are identified as targets for energy efficiency measures, and research on energy-neutral buildings and sustainable transport system is looked for. However, in addition to economic incentives, market-based solutions and regulatory processes, the knowledge gained from environmental psychology and behavioral insights is an important addition to shaping and evaluating environmental policies.

Thinking green

So what does the evidence offer about addressing the impact of human behavior on the environment? It may surprise many that results show people generally *want* to “act green” (Frederiks et al., 2015; van der Linden, 2018), yet for some reason, it is apparently a struggle to convert those beliefs into practice. This is generally referred to as the value-action gap (Blake, 1999): which is when an individual holds a certain belief (in this case, the desire to act pro-environmentally) yet fails to carry it out in practice. Biblical scholars may choose to

understand this as “faith without deeds”. In practice, this gap is a major challenge for energy and environmental policies.

The other big challenge is that not everyone cares about the environment or values pro-environmental behavior (Whitmarsh, 2011), while some even deny the existence of climate change and other major environmental issues (Hoffman, 2011). This denial is often rooted in ideologies that resist progressive change, favor the status quo, or strongly oppose regulation of the free-market (Lewandowsky & Oberauer, 2016; van der Linden, 2017). Importantly, although belief in climate change is not always a prerequisite for people’s willingness to *adapt* to changing environmental conditions, behavioral engagement generally remains low (van der Linden, 2017).

One potential explanation for low engagement in pro-environmental behavior may be our tendency to minimize our perceived value of future events and outcomes, thus weighting immediate needs higher (Weisbach & Sunstein, 2008). This is referred to as **future discounting**: a small immediate reward can seem more attractive than a larger one in the future (Frederick & Loewenstein, 1999). Green alternatives, such as green technology, sometimes require investments in the short term, and the advantages can only be seen later (Teng et al., 2014). Van der Linden et al. (2015) report that climate change is seen as distant, both in time and space, which lessens engagement in pro-environmental behavior. It is difficult to be concerned about something that you cannot directly or emotionally experience. Every year, Pew Research Center investigates how Americans rank top national priority concerns. The environmental concerns systematically lag behind other issues, such as the economy or terrorism. This might be partly so because people tend to think that climate change and its consequences are less likely to affect them than others (Gifford et al., 2009). However, given the immediate challenges such as extreme weather and rising sea levels posed by climate change, behavioral insights toward engaging the public with the issue are becoming increasingly urgent. Some polls have been conducted to find out more about the public’s approval of green nudges. While there exists some national variation, in many cases the majority approves of the use of green nudges (Hagman et al., 2015).

■ Green as the norm, not as activism

As covered in some detail in Chapter 5, social norms are rules of behaviors that are considered acceptable within a given group in a given context (Cialdini & Trost, 1998). Energy and environmental policies sometimes try to influence these norms, typically to induce **pro-environmental behaviors**. For example, **green options** include products, services, or behaviors that lead to reduced consumption of a non-renewable resources, or increase uptake of a replacement product that is less harmful for the environment. You may have heard of “re-use, reduce, recycle” at some point in your life; these were some of the most common initiatives to induce pro-environmental behaviors: getting more out of something before replacing it with a new option, cutting out unnecessary uses, or making sure old products were disposed of in the most environmentally-friendly way. Presenting the green option as socially desirable may then increase willingness to engage in those actions (Santos & van der Linden, 2016).

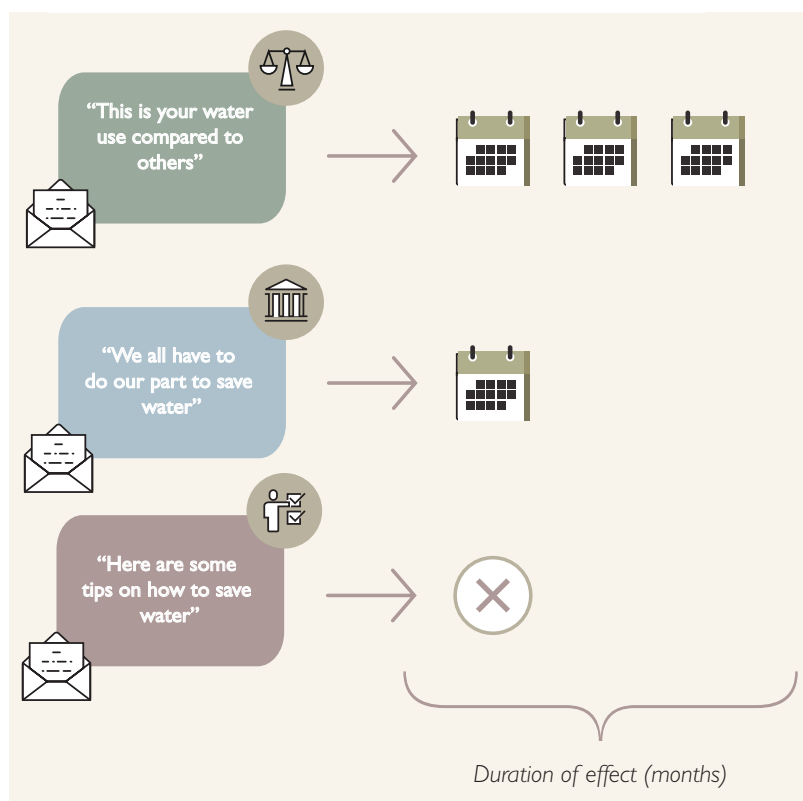
But how do we best approach this using evidence? One option points to utilizing **social comparisons**, which involves showing one group how they compare to the average behaviors (in other words, the social norms) of others. An example of how these are used is by providing personalized feedback on energy or water usage to homes that are then subsequently

compared to averages for the surrounding community. There have been a number of attempts to study this approach scientifically, many with positive results. For example, Ferraro et al. (2011) used social norms as a strategy to promote water conservation. Residents were sent three different types of postcards. One was a personal postcard that stated the total household water consumption during the past few months compared to the county as a whole. The second was a generic postcard that promoted pro-environmental thinking in a socially responsible way (“We all have to do our part to protect Cobb County’s precious water resources”). The final version simply gave a few tips on how to save water at home.

In the short-term, positive effects were shown for both groups (social comparisons and pro-environmental messages). However, over the next three summers, only those who were provided with a social comparison showed a sustained effect (see Figure 7.1). When no social norms were used, effects dissipated. The postcard with tips showed no effect at any point. Similar evidence for a sustained effect of normative messages was found in the domain of electricity consumption (Allcott & Rogers, 2014). However, although in both studies the effect showed a decaying trend over time, these insights may indicate that a comparison to a reference group is more effective at generating long-term gains.

What does this tell us about using behavioral insights to reduce energy use at home? Well, it appears that information alone is unlikely to be sufficient. For example, a study that examined ways to reduce bottled water consumption concluded that disclosure alone did

FIGURE 7.1 Social comparison messages to save water.



not result in significant changes, but when provided alongside social proof that like-minded others have considered the information as well, significant reductions were observed (van der Linden, 2015b). Similarly, Griskevicius et al. (2010) found that engagement in green practices were higher when such behaviors provided an opportunity to boost one's social status. In short, social incentives make up for another behavioral tool to improve environmental outcomes.

Something to watch out for when utilizing social comparison in environmental policies is **the boomerang effect** (Schultz et al., 2007). The boomerang effect got its name from its two-level functioning – one intervention can lead to a positive effect for one group and a negative effect in another. In the original case, this meant decreased energy consumption for the problematic group, but increased consumption for the group that had previously been doing well (as an example, see Figure 7.2). The argument used to explain this is that individuals utilize norms as a way to center their own behaviors, which pulls everyone to the middle – regardless of whether the norm is positive or negative by comparison (Frederiks et al., 2015).

Some studies have presented ways to avoid the boomerang effect. In the most compelling and widely cited example, Schultz et al. (2007) wanted to counter a boomerang effect from reliance on social norms in the context of energy conservation, so that the net gain would remain positive. They introduced a common distinction between descriptive norms (what others are doing) and injunctive norms (what others think we *ought* to be doing). The authors noticed that when people received descriptive normative information (e.g. that they were acting greener than their peers), they often increased their energy consumption to conform to the norm (Figure 7.2). To counter this, the researchers provided customers with

FIGURE 7.2 The boomerang effect and its potential drawback for energy usage.

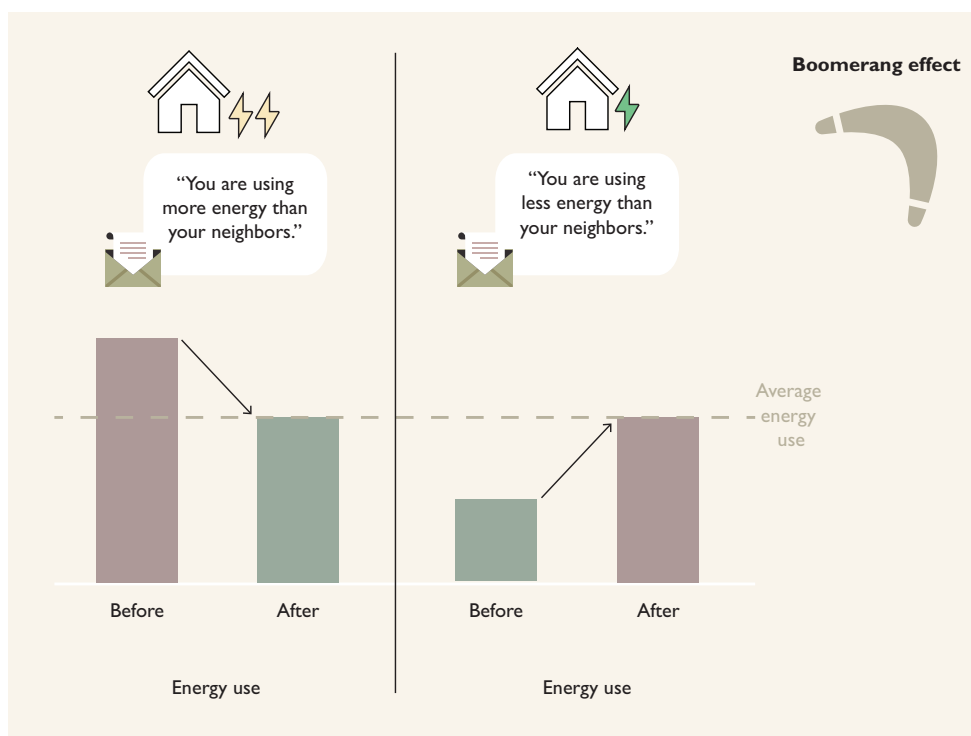
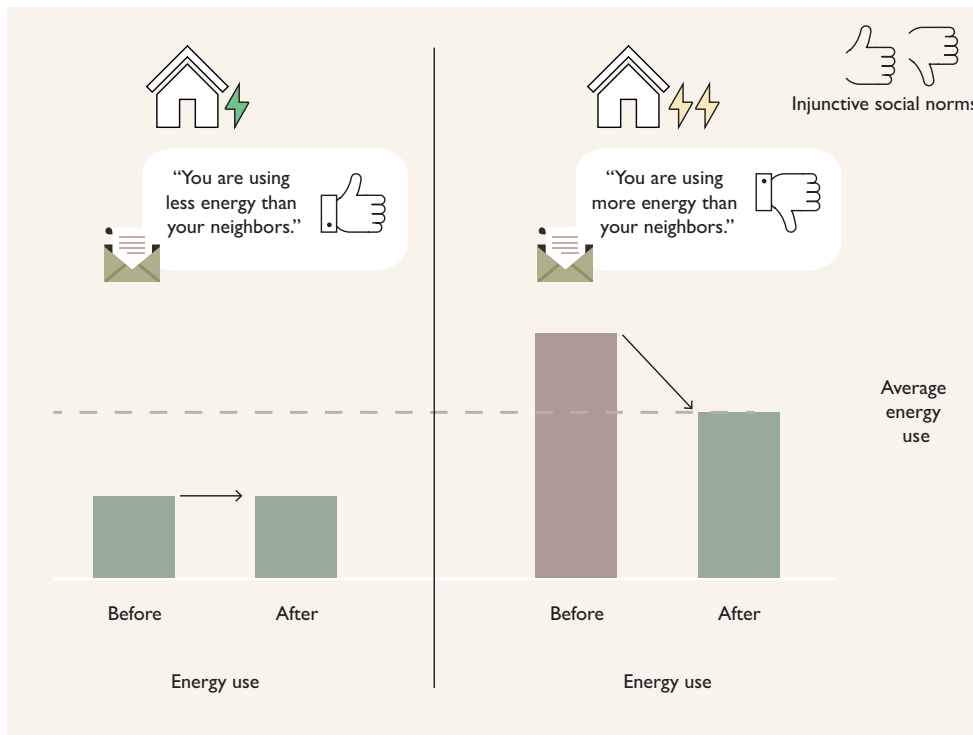


FIGURE 7.3 Injunctive social norms counter the boomerang effect.

an injunctive message, in this case, smiley faces for those who were doing well, which was mostly effective in keeping consumption low concurrently while reducing the consumption of those above the average (Figure 7.3). The study illustrates the fragility of behavioral interventions: subtle nudges can not only be rendered ineffective by other psychosocial factors (Thaler & Sunstein, 2008), but they may also backfire in parts of the population who were originally doing well.

■ Focusing on the positive to improve energy consumption

Particularly when it comes to risking gains, people tend to be loss averse (Tversky & Kahneman, 1991) (see Chapter 4). This means that people focus more on losses when adopting new behaviors, and that they might discount equivalent gains and benefits, particularly those that only come in the future (Frederiks et al., 2015). This means that losses related to specific behaviors (such as being pro-environmental) can prevent people from engaging in them even if there are also benefits to be gained (Tversky & Kahnemann, 1992). People are also risk-seeking in loss domains, which means that they are more willing to take a chance to avoid a loss than to secure a gain. This suggests that in order to change behavior, the immediate negative aspects should be diminished and gains should be highlighted in environmental policies (Tversky & Kahneman, 1985).

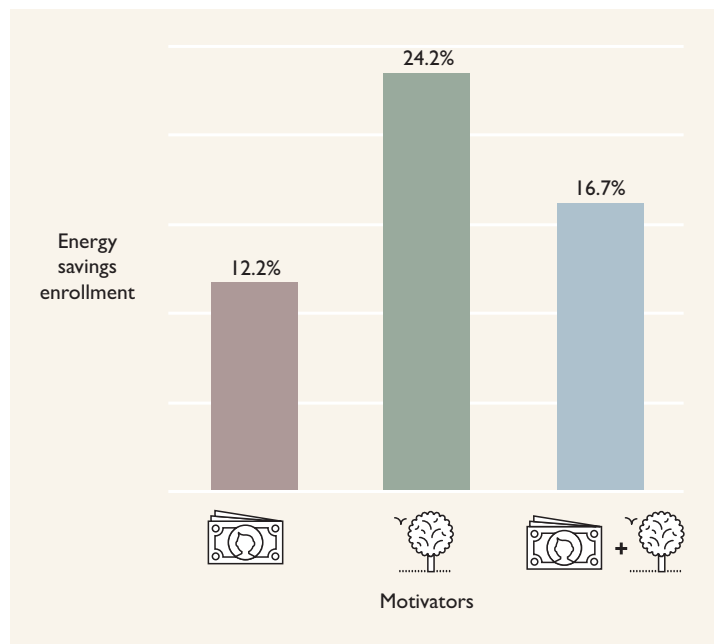
Environmental policies are often framed as immediate losses, such as using higher taxes to reduce consumption (Stern, 1999). Think of the last time you were told to do something environmentally friendly: you were likely asked to consume less instead of saving money. Van der Linden et al. (2015) argue that climate change could be framed around the gains of immediate actions instead of losses. For example, a study by Hurlston et al. (2014) showed that by framing emission reductions as gains rather than losses people reported more willingness to reduce CO₂ emissions. More specifically, people were informed about the influence of a reduction in CO₂ emissions on per capita income in two different ways. In the loss-frame scenario, people were told how much a 25 percent reduction in national CO₂ emissions lowers the predicted income level by 2020, compared to the income level that would have been predicted without the emission reductions. In the second, gain-frame scenario, people were told how much the income level would rise from the current level despite the reduction. In the latter option, people reported significantly more support for emissions reductions.

■ Leveraging intrinsic motivation towards energy-saving

To engage in any behavior, we need to be motivated to do so. Our intention to turn down the heating might be driven by a range of motivations. We might do it to save money as an economic incentive (Ackerman, 1997), or to comply with our neighbors, as a motivation to adhere to the social norm (Schultz et al., 2007), or because reducing the risk from climate change is inherently important to us, as an intrinsic motivation (Kollmuss & Agyeman, 2002). Using prevailing theory, it is common to understand motivation by two key drivers of human behavior: **extrinsic motivation** and **intrinsic motivation** (Deci & Ryan, 1975, 1985; Ryan & Deci, 2000). If one pursues an action to receive an external reward such as money or acknowledgement of others, the motivation is extrinsic. On the contrary, when we turn down the heating because protecting the environment is embedded within our personal values, our motives are intrinsically-based. Previous research has shown that intrinsically-motivated actions are associated with interest, persistence, behavioral quality, and well-being (Ryan & Deci, 2000; van der Linden, 2015b, 2018).

Pro-environmental messages may be framed to leverage intrinsic motivation to act sustainably. In a study by Schwartz et al. (2015), 1406 participants, recruited online, were presented with hypothetical energy saving programs that either emphasized extrinsic incentives (saving money for energy bills) or intrinsic incentives (reducing one's environmental footprint). The presence of the intrinsic benefits led to a greater number of participants willing to enroll in the energy program (24.2 percent) compared to participants presented with monetary incentives (12.2 percent). The larger effect of intrinsic incentives in pro-environmental messages has also been found in other studies (Asensio & Delmas, 2015; Bolderdijk et al., 2012). The study by Schwartz et al. (2015) has also tested messages that contained both intrinsic and extrinsic incentives, resulting in 16.7 percent willingness to enroll, significantly lower than in messages containing only intrinsic incentives (see Figure 7.4) This has provided further evidence for extrinsic incentives undermining intrinsic interest (Deci et al., 1999; Frey & Oberholzer-Gee, 1997).

Intrinsic motivation may offer a promising policy lever for improving food-purchasing behaviors. In 2015, the European Commission of Consumers, Health, Agriculture and the Food Executive Agency (CHAFEA), conducted a field study at the Milan Expo (OECD, 2016d). In their experiment, CHAFEA aimed to reduce food waste by increasing the

FIGURE 7.4 Intrinsic and extrinsic motivation to enroll in energy saving program.

acceptance of food that does not reach the high visual standards for supermarket foods (i.e. “perfect” foods). Five hundred visitors to the exposition were presented with either a message about avoiding food waste (extrinsic motivation), or an authenticity message (intrinsic motivation), which stressed that imperfect food is natural and therefore just as desirable as perfect food. The latter was intended to target the intrinsic motivation of people evaluating food from a more naturalistic perspective.

Visitors presented with the intrinsic motivation message on average did indeed rate the imperfect food as being of higher quality than the visitors who were presented with a control or an extrinsic message. These findings suggest that the intrinsic message succeeded in this instance in convincing participants that imperfect food contain favorable traits. To assess the extent of these impacts, they also varied pricing, which was expected to undermine intrinsic motivation. Indeed, when prices were the same, sales increased in both intrinsic and extrinsic motivation groups, compared to those receiving no message, but the two messages had roughly equal outcomes, except with moderate price reductions, when the anti-waste message yielded significantly higher sales of imperfect foods. While it did appear that prices thus had some influence, there were a number of different comparisons reported, thus it is important to be reserved about what broad conclusions are drawn.

A limitation to consider is that emphasizing intrinsic benefits often appears to drive easier, low-cost behavior changes rather than difficult, high-cost behavior changes (van der Linden, 2018). In addition, they tend to be most effective when personal values of the target population align with the promoted actions or when they can be framed in a manner consistent with an individual’s personal values. In practice, this often means that individuals need to sufficiently value pro-environmental behavior prior to the intervention. Instruments that increase intrinsic interest in sustainable practices are few and have yet to find their way to actual policies. On the other hand, the cost-benefit tradeoff is potentially high, as the

benefit of intrinsic engagement lies in its self-sustaining nature and independence of external rewards, making it particularly suited to deliver lasting policy outcomes (van der Linden, 2015a, van der Linden 2018).

■ The more you know

Climate change and the greenhouse effect are complex phenomena, and the public often holds misconceptions about them (Bostrom et al., 1994; van der Linden, 2017). In the earliest instances of climate change being recognized as a major global challenge, influencing choices centered on providing the public with information about the benefits of pro-environmental behavior. To be effective at this, governments and civil services had to be certain that informing the public about environmental issues would lead to better awareness, and that this awareness would lead populations to take up opportunities to act in more environmentally-friendly ways.

In the mid-1990s, the Dutch Ministry of the Environment designed a mass media public information campaign to increase public awareness of the nature and causes of greenhouse gas emission. National television, newspapers and billboards conveyed the message to the public for more than 2 months. The campaign was evaluated with surveys before and after the campaign to assess changes in knowledge, problem awareness, willingness to show pro-environmental behaviors and perceived necessity of additional superimposed policy measures (Staats & Midden, 1996). Before the campaign, 965 respondents completed the survey and after the campaign 704 participants from the original sample again took part in the survey. There was a slight increase in knowledge about the greenhouse effect after the campaign, especially among the group that reported having noticed the campaign in all four mediums via which it was conveyed. Disappointingly, knowledge and awareness did not have a strong relationship with more self-reported ecologically-friendly behaviors. Thus, along with the value-action gap, there is also a **knowledge-action gap**, likely moderated heavily by value orientations. Beyond that, though, the implication is that simply having more information is no guarantee of improving behavior across a population (van der Linden, 2017).

The Western Cape Government in South Africa also attempted an information campaign to promote pro-environmental behavior over a 2-year period (OECD, 2017i). They had noticed that government office buildings utilized 1.5 times more energy compared to the industry standard, so they aimed to reduce energy consumption in these buildings. The intervention consisted of sending emails with four different levers:

- (1) employees were **provided with information** about energy use, with tips for translating knowledge into action;
- (2) **reminders** to switch off devices at the end of the day;
- (3) **social competition** was used by **comparing** energy consumption between different floors;
- (4) **assigning responsibility** over “wise” energy behaviors through **sharing duties**.

The government office building floors were divided into three groups, one of which was a control group and the other two were targeted with emails. The floors that belonged to the control group did not get leveraging emails during any phase of the intervention. In the first 3 months, every intervention floor received the same emails that were about general energy tips and reminders. Over the following 6 months, the office workers from the two

intervention groups were sent different emails – one received emails creating social competition between floors, and the other intervention group received, on top of the same emails as the first group, emails that allocated the “energy saving advocacy” to a given person. In total, 991 employees took part in the experiment. For the group that was provided information and tips during the first phase, there was a 2 percent reduction in energy use, but this result was not statistically significant. However, for the social competition combined with naming the energy saving advocate, a 14 percent reduction in energy use was observed. Based on these insights, it appears that information disclosure alone may offer only a minor contribution, while introducing active participation seems to be a much more powerful insight.

■ Using salient labels to increase pro-environmental consumer choices

An **eco-label** provides consumers with information about the relative environmental friendliness of the product. By providing information about the environmental properties of the product in a salient manner, labeling is a simple way to influence choices. For example, a Danish study showed that putting an eco-label on everyday products makes grocery shopping convenient and effortless for people who are interested in these products (Thøgersen et al., 2012). Could labeling also make people choose environmentally friendly products more often?

BOX 7.1 AUTONOMY AND PRO-ENVIRONMENTAL BEHAVIOR

Under Self-Determination Theory (Ryan & Deci, 2000), autonomy is a huge part of human well-being. In fact, it is one of the three pillars they conclude are innate to our psychological needs. Do you think giving people choices where they are able to choose pro-environmental options (such as energy and paper in this chapter) will influence well-being? Do you think the effect will be stronger if there is a clear value-action gap?

It seems like a simple win given all the ingredients are there: a desire to act in a certain way without being able to, providing the mechanism to do so, and letting that mechanism be a purely independent (autonomous) choice. However, this hasn't been fully reflected in studies on the topic. What might explain the lack of conclusive evidence in support of this?

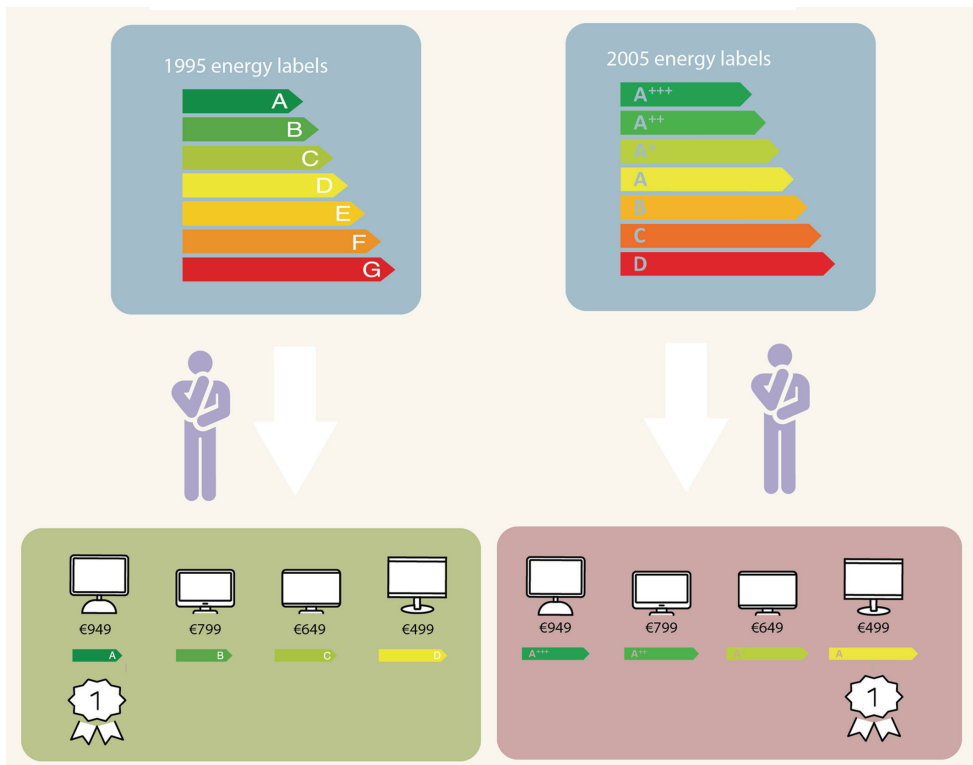
When designing an eco-label, it is important to consider how to make the distinctions between the different categories salient enough. A good example of this is the labeling system used to define the energy class of electro domestics. In 1995, the European Union introduced a mandatory energy labelling scheme for electrical appliances. The labelling scheme classified the appliances on a seven-point, colored scale, that marked the most energy efficient appliances in the market with an “A” and the least energy efficient ones with a “G”.

In fewer than 10 years, around 90 percent of refrigerators, washing machines, and dishwashers sold in stores had reached class A (Olander & Thøgersen, 2014; European Commission, 2010), which appears to be a pleasant side-effect. Due to industry resistance against revising the criteria, the decision was made to introduce three new classes on top of class A, and the new categories of A+, A++, and A+++ were introduced. The color coding was kept the same, and the lowest three values (E, F, and G) were dropped.

This simple change has influenced consumers' shopping behavior. In a study of Heinzel and Wüstenhagen (2012) around 190 German consumers answered questions on what product choice they would make. The researchers presented the consumers with different television models in a quasi-realistic buying situation. The consumers were split in two different groups which differed in the energy labels for the different types of television models. The group presented with the old energy label list of A to G made more environmentally friendly choices than the group that presented with the currently used list of A+++ to D (see Figure 7.5).

Why might a simple change in letters influence decision-making? The answer can be found in examining two cognitive biases that are at play. **Anchoring**, which is where the first piece of information provided reduces the value of the rest of the information, which could explain how seeing the letter A may influence the perception of other information (Olander & Thøgersen, 2014). In that sense, all categories that are labelled with A are similar, no matter how many pluses are added. This leads people to assume that the step between A and A+ is smaller than the step between D and C, although they are the same in their respective list. **Satisficing**, accepting our minimum requirement rather than the best choice (Simon, 1957a), may also be a useful construct to consider. These two biases in combination most likely explain why people change their decisions when presented with different labeling lists. People may want to make an energy efficient choice and they feel that they do when they select a product with the energy label A, the steps to A+ or A+++ are perceived as negligible.

FIGURE 7.5 The effect of labelling types.



The idea behind the energy label is to help consumers to make a well-informed decision (Heinzler & Wüstenhagen, 2012). However, the extension of the list to include As with different pluses is only confusing customers, as the information is perceived very differently from what was intended. When using labeling of products as a decision-aid for customers to help them, the labels need to be easily understood and so it is best to avoid unfamiliar rating systems.

■ Making green the default option

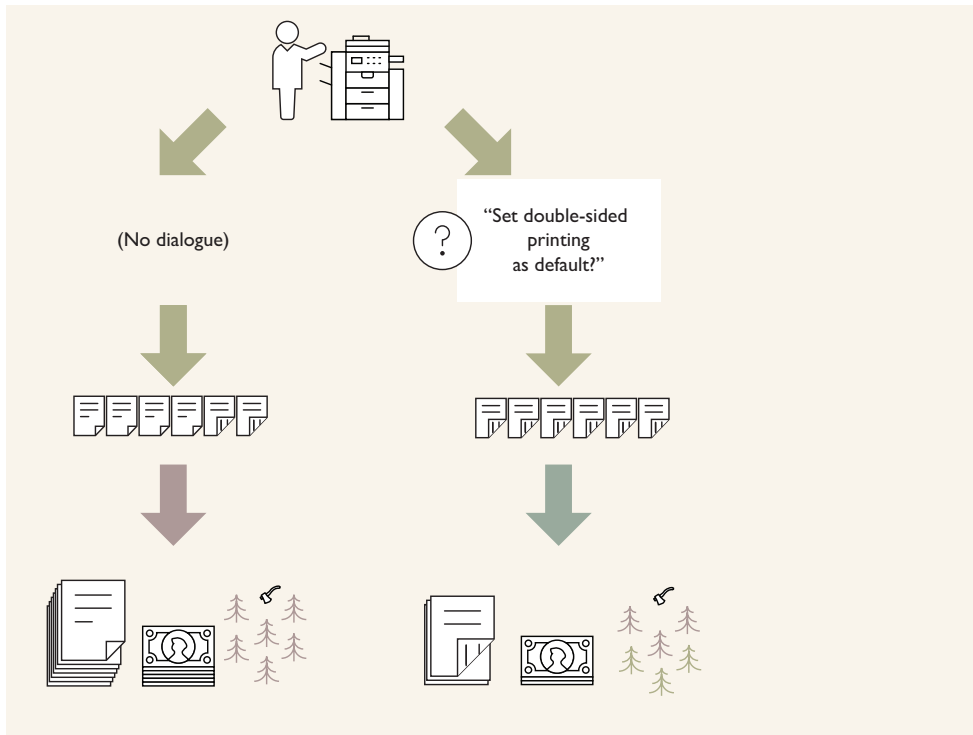
Simply put, to encourage a certain desired behavior in a population, such as being more pro-environmental, easier and more convenient opportunities to act are most likely to reduce the value-action gap. One way in which this has been done is by tapping into people's **status quo bias** (Samuelson & Zeckhauser, 1988), which is a reluctance to move away from an already established point of reference. People tend to not change their behavior unless the motivation is strong enough (Samuelson & Zeckhauser, 1988). Inspiring such motivation can be considered one of the challenges faced when promoting pro-environmental behavior, and therefore shifting the status quo altogether is a hopeful possibility for environmental policymaking.

A new and "green" point of reference may be used through a process termed the **default effect**. The default effect is the idea that a desired behavior can be promoted by making it the predetermined first choice, without mandating it or impeding other choices. A default choice is one that is passively made because it is the already available choice unless someone chooses differently. In cases when a default choice is already pre-selected, an individual might not even actively make a choice, but might merely accept the default option by not making a choice in the first place.

In 2015, the paper and pulp production industry accounted for 5 percent of the total production-related waste disposal in the U.S. (United States Environmental Protection Agency, 2017). Campaigns encouraging reduced paper consumption are widespread, and by utilizing knowledge of human cognitive biases, interventions can be developed aimed at promoting such pro-environmental behavior by making default choices environmentally friendly. An example study conducted by the US Department of Agriculture's (USDA) Economic Research Service (ERS), in collaboration with the Social and Behavioral Sciences Team (SBST) aimed to encourage the conservation of resources by testing the ability of a green default printing option (i.e. double-sided) in reducing the amount of paper used in ERS offices (Social and Behavioral Sciences Team, 2015). The method was to prompt printer users who had initiated a single-sided print job with a dialog box encouraging them to change their default printer setting to double-sided. The treatment condition was randomized throughout the ERS, where people, depending on which printers they habitually used, would be either exposed to the prompts or not.

As shown in Figure 7.6, Users who were prompted by the dialog box used double-sided printing 5.6 percent more often than those who were not (46 percent). While this difference may appear marginal, spread across a large organization, it is not negligible, especially if applied to larger print jobs. As a result, the ERS adopted double-sided printing as their default setting on all of their printers, therefore increasing the likelihood of users printing double-sided. Such outcomes have implications both for environment and cost-savings in an organization.

Manipulating defaults may also be effective toward increasing energy efficiency. The OECD ran a randomized controlled trial in one of its offices during the winter period to see if changing the default thermostat settings elicits any change in temperature choices of the

FIGURE 7.6 Encouraging change with defaults to green options.

employees (Brown et al., 2012). It was found that the most effective strategy was to decrease the default thermostat settings progressively by 1°C each week, rather than changing the default temperature setting more rapidly, which made the employees more likely to adjust the thermometer settings.

As with other behavioral tools, the effectiveness of the defaults to promote pro-environmental behaviors depends heavily on context. Defaults work best in environments where individuals are driven by their fast, automatic processing system as opposed to their slow conscious processing system (see Kahneman, 2003b). In the first study, changing the default option was effective as people tend to click on the “print” button as soon as the dialog box appears, rather than spend additional time with thinking about possible printing options including the double-sided printing. In the second study, the default effect proved most effective in reducing energy usage when the change of temperature was small and thus less likely to interfere with employees’ conscious processing.

■ Morals versus money

A range of behavioral studies have pointed out the double-edged nature of financial incentives. Despite their capability to improve policy outcomes, they have been found to undermine intrinsic prosocial motivation. Frey and Oberholzer-Gee (1997) conducted a survey that asked Swiss citizens whether they agree with a placement of one of two nuclear waste repositories close to their village. The approval rate of almost 51 percent dropped to around

25 percent when the surveyed citizens were offered a monetary compensation for the placement of the repository in their proximity. The authors offered an explanation that the presence of extrinsic incentives crowded out altruistic tendencies. The evidence for monetary incentives undermining intrinsic motivation has been documented in a range of empirical studies (Deci et al., 1999). Financial incentives can be effective, but they should be aligned with behavioral tools as the motivational basis for engaging in a certain behavior can vary. Chater and Lowenstein (2016) argue that sense-making and the pursuit of things fitting to the image of the “good life” are underestimated drives for decision making. Sense making refers to the desire to understand our experiences and the world around us. If pro-environmental values are embedded in individuals’ sense making, they might be more likely to engage in pro-environmental behavior and seek information about them.

The Department of Energy and Climate Change in the UK launched a project called “Green Deal” (Behavioural Insights Team, 2011). Its purpose was to improve household energy efficiency, while removing the high upfront costs associated with investments in energy efficient renovations. Households could e.g. take the Green Deal loan to improve their loft insulation. The loan was then repaid from the savings that resulted from the improved energy efficiency. To further incentivize people to adopt the Green Deal, immediate monetary rewards were included: part of the Green Deal was a one month entitlement to a council tax holiday and vouchers for products and services. The Green Deal was a creative financial mechanism to increase pro-environmental behavior, and it did improve the energy efficiency of 14,000 households, with expected 0.4 million tons of carbon dioxide saved over the project’s lifetime (National Audit Office, 2016). Evaluating the Green Deal is unfortunately not easy, as clear expectations were not stated before the implementation. Independent empirical evaluations have shown that uptake of the Green Deal was rather low (Pettifor et al., 2015).

Another example of how financial incentives affect energy consumption comes from California during 2000–2001. The state was experiencing an energy crisis which led to rapid changes in energy prices. A study tracked how the rapid changes in price together with the state’s public appeals influenced energy consumption (Reiss & White, 2008). People reacted quickly by decreasing their own consumption: in 60 days, average household electricity use fell by more than 13 percent. Such outcomes had actually been conceptualized as “prices doing the work of morals” by Bowles (2008). His reasoning was that there may be a number of prosocial behaviors we perceive as being worthy, yet when observed in practice, economic forces will ultimately dictate behavior at scale. Such a conclusion may be considered controversial within contemporary behavioral science networks focusing on behavioral insights and behavioral economics, given how much of the work focuses on notions of working outside the standard market drivers (price and quantity). Regardless of how one interprets this, though, it is important that behavioral and motivational aspects are considered.

■ Conclusion

Why does it matter that we implement behavioral energy policies? It has been argued that ineffective energy and environmental policies can be seen as unethical, as they take time and effort away from more effective policies designed to address urgent environmental issues such as climate change (Schubert, 2017). This means that there is a tremendous opportunity to utilize insights that directly demonstrate how pro-environmental behaviors may be increased. However, ethical concerns around nudges – green or otherwise – arise because

of their perceived liberal paternalism. For example, changing a default can be seen as being distrustful of people's own judgement and as a way to manipulate their decisions in a direction that is convenient for policy makers (Schubert, 2017). However, this point of view is of limited utility as there are always many (competing) influences exerted on the unconscious and conscious decisions people make.

Policies are not laws and can therefore, in many cases, only influence voluntary behavior. This means many are implemented without setting legal restrictions on choices. As mentioned in the beginning of this chapter, it has been questioned whether consumer demand under a free market is sufficient for the extensive adoption of green products (Battisti, 2008). Energy and environmental policies based on sound behavioral science are useful, but even if they are scalable and successful, it is still questionable whether they have the power to forge a more sustainable energy system, reduce the unwanted effects of climate change, and result in a cleaner environment globally. In this chapter, we have presented a range of options that have so far had some positive effects. Expanding this toolkit and building on relevant theories – both within this book and beyond – may offer greater potential toward sustained benefits for the environment through changing human behavior and decision-making.

Essay questions

1. Why are behavioral insights important in energy and environmental policies?
2. What might help bridge the knowledge-action gap?
3. What are the limitations of evidence-based policies in energy and environmental policies? Think of environmental issues where you could not use behavioral insights.
4. Discuss the pros and cons of using defaults, social norms, labelling, intrinsic motivation and providing information.
5. Argue which of the presented behavioral insights is most effective in prompting pro-environmental behavior and why?
6. What are the implications of changing efficiency ratings from A-E to A+++, A++, A+? Justify this with established theories.

Additional insights and further reading

Behavioral interventions and energy efficiency

Allcott, H. & Mullainathan, S. (2010). Behavior and energy policy. *Science*, 327(5970), 1204–1205.

Disclosure and green energy choice

Litvine, D. & Wüstenhagen, R. (2011). Helping “light green” consumers walk the talk: results of a behavioural intervention survey in the Swiss electricity market. *Ecological Economy*, 70, 462–474.

Social values driving pro-environmental purchasing decisions

Norazah, M. S. (2016). Consumer environmental concern and green product purchase in Malaysia: Structural effects of consumption values. *Journal of Cleaner Production*, 132, 204–214. doi: 10.1016/j.jclepro.2015.09.087

Combined intervention strategies for reducing energy consumption

Dolan, P. & Metcalfe, R. (2011). *Better Neighbors And Basic Knowledge: A Field Experiment on the Role Of Non-Pecuniary Incentives On Energy Consumption*. Oxford: University of Oxford.

Strategies for behavioral influence

Dolan, P., Hallsworth, M., Halpern D., King, D., Metcalfe R. & Vlaev, I. (2012). Influencing behaviour: The Mindspace way. *Journal of Economic Psychology*, 33, 264–277.

Methods of influencing choice architecture

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Ecolabels as environmental nudges

Sammer, K. & Wüstenhagen, R. (2006). The influence of eco-labelling on consumer behavior – results of a discrete choice analysis for washing machines. *Business Strategy and Environment*, 15, 185–199.

Defaults for light bulbs

Dinner, I., Johnson, E. J., Goldstein, D. G. & Liu, K. (2011). Partitioning default effects: Why people choose not to choose. *Journal of Experimental Psychology: Applied*, 17, 332–341.

Simplifying efforts to reduce energy consumption

Scholl, G., Rubik, F., Kalimo, H., Biedenkopf, K. & Söbech, Ó. (2010). Policies to promote sustainable consumption: Innovative approaches in Europe. *Natural Resources Forum*, 34, 39–50.

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Smith, N. C., Goldstein, D. G. & Johnson, E. J. (2013). Choice without awareness: Ethical and policy implications of defaults. *Journal of Public Policy & Marketing*, 32(2), 159–172.

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