

# The Journal of Science Policy & Governance



POLICY MEMORANDUM:

THE BEHAVIORAL DIMENSION OF  
CLIMATE CHANGE POLICY

BY

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To: Peter Kent, Minister of the Environment  
From: Noah Castelo  
Subject: The Behavioral Dimension of Climate Change Policy  
Date: March 14, 2012

### *Executive Summary*

Despite near-consensus among climate scientists regarding the urgent action required to combat climate change, most governments and corporations continue to resist change. One of the most common reasons for this resistance is the large up-front cost involved in many effective interventions. ‘Nudging’ represents a viable alternative to these policies in the form of a low-cost, behavioral science-based method of changing the behavior of individuals and organizations so as to be more environmentally friendly. This Memorandum will discuss the neuropsychological basis of nudges and provide examples of how nudges have already been successfully implemented to address climate change. While the international community remains deadlocked in the development of an up-to-date regulatory framework to combat climate change, the Canadian government should establish a working group in the Ministry of the Environment dedicated to evaluating and implementing behavioral science-based climate change policies.

### *Two Systems*

Nudges are behavioral interventions intended to improve individuals’ decision-making without restricting freedom of choice. Popularized by Thaler & Sunstein (2008) as a form of ‘libertarian paternalism’, which they describe as a philosophy that aims to paternalistically shape decision-making outcomes while simultaneously maintaining freedom of choice. Nudges make use of our innate human biases by presenting choices in such a way that makes certain decisions more likely than others, often without the nudged individual realizing they have been nudged at all. Placing healthy foods at eye level, for example, is a nudge that has been shown to improve eating

habits in school cafeterias (Thaler & Sunstein, 2008). This intervention reflects the paternalistic desire to improve public health, while still maintaining people's freedom to eat whatever they wish. The fact that such interventions can be so powerful is largely based in the growing understanding that human beings do not always make completely rational choices. Traditional economic models of decision-making view people as *homo economicus*, caring only about maximizing their own utility and able to do so by taking into account all relevant information and accurately predicting which choice today will lead to the most utility, or happiness, in the future. This model of decision-making has been undermined in recent decades by the emergence of behavioral economics, which has systematically documented countless ways in which human beings predictably deviate from the *homo economicus* model: relying on heuristics, mental short cuts, rules of thumb, altering their decision based simply on the way a choice is framed, being overconfident, loss aversion, susceptibility to social norms, and other factors. In light of this more realistic view of decision-making, behavioral scientists and policymakers have begun to consider how to design policies that compensate for these systematic, predictable departures from rational decision-making, thus 'nudging' people into making better decisions.

It is useful to consider nudges within the framework of dual-process theory of cognition. This theory posits two distinct, interacting systems: System 1, which is heuristic-based, quick and inflexible, automatic, and relatively undemanding of cognitive effort; and System 2, which is rational, relatively slow and flexible, and demanding of cognitive effort (i.e. Sloman, 1996; Smith & DeCoster, 2000; Evans, 2003; Deneys, 2006). Recent evidence from neuroscience also lends support to the theory (Cohen, 2005; Lewis & Todd, 2007; Felsen & Reiner, 2011). This framework suggests a distinction between what I call *lower-order nudges*, which intervene at the

System 1 level, making use of our innate human biases and heuristics; and *higher-order nudges*, which intervene at the System 2 level, which attempt to counter or override those biases by appealing to slower and more deliberate cognitive processes (Castelo, Reiner, & Felsen, 2011). Both kinds of nudges have been applied to a wide variety of climate change-related behaviors, from home electricity consumption to recycling to water conservation.

### *Applications*

Hotels have recently become interested in having their patrons conserve water, by utilizing cards found in hotel bathrooms that implore their guests to re-use their towels. While these efforts may indeed be largely financially motivated (i.e. lower laundry, detergent, energy, and labor costs), they have been shown to be an effective form of nudging people towards more environmentally friendly behavior. Goldstein et al. (2008) showed that guests whose cards asked them to re-use their towels in order to “HELP SAVE THE ENVIRONMENT” and “SHOW YOUR RESPECT FOR NATURE” complied 35% of the time - significantly higher than hotels not using any such cards. This kind of intervention is a ‘higher-order nudge’ since it engages the deliberate, rational consideration of an issue, typical of System 2 processing.

Goldstein et al. then compared this to a card that used a social norm-based message rather than relying on a strictly environmental appeal. These cards asked guests to “JOIN YOUR FELLOW GUESTS IN HELPING TO SAVE THE ENVIRONMENT” and informed them that “ALMOST 75% OF GUESTS WHO ARE ASKED TO PARTICIPATE IN OUR NEW RESOURCE SAVINGS PROGRAM DO HELP BY USING THEIR TOWELS MORE THAN ONCE.” These guests re-used their towels 44% of the time, significantly higher than guests who did not see a

social-norm based message. This second intervention is a ‘lower-order nudge’ since it engages heuristic-based processing characteristic of System 1 – in this case, the powerful heuristic that motivates us to comply with social norms.

Social norm-based nudges have also been shown to be effective at reducing home electricity consumption. Schultz et al. (2007) demonstrated that providing households with information on how their electricity use compared to their neighborhood average significantly affected electricity consumption. Specifically, households told that they used more than average decreased their consumption, while households informed that they used less than the average increased their consumption. Researchers then found that including another nudge—a smiley-face ☺ in the feedback for lower-than-average consumers—apparently reinforced their low usage and prevented the undesirable increase in consumption. Furthermore, providing a frowny-face ☹ to above-average households led to an even larger reduction in their consumption. Importantly, these effects were achieved without imposing any explicit penalties or incentives – people were nudged into reducing their electricity consumption by making use of heuristic-based social norms.

Another example of how nudges have been applied to climate change-related behaviors pertains to recycling. Duffy & Verges (2009) found that recycling containers with round, can-sized holes for aluminum cans and glass and plastic bottles, and narrow-slits for paper (see image below) increased recycling rates by 34% compared to containers without these lids.

The authors of this study hypothesized that these effects were attributable in part to the ability of the lids to engage subconscious mechanisms of cognition – in other words, the lids served as a

lower-order nudge. Specifically, the authors suggested that while many people *intend* to recycle, our limited cognitive capacity might prevent them from always doing so. For example, engaging in another task simultaneously (conversation, dialing a phone, etc.) may occupy the cognitive capacity that would be required to dispose of the appropriate waste item in the appropriate container. Specialized lids that make it easier to recycle are, therefore, another effective form of nudging people into more environmentally friendly behavior.

### *Conclusion*

Climate change is one of the most pressing yet intractable policy issues facing governments around the world. While its effects are already being seen, economic barriers – especially in light of current budget crises – have largely prevented most governments from seriously addressing it. Meanwhile the behavioral sciences – psychology, neuroscience, and behavioral economics – are producing mounting evidence for the effectiveness of a range of low-cost behavioral interventions that can be applied to addressing climate change – namely, nudges. The United States and the United Kingdom (UK) have already recognized the value of nudges, as Sunstein and Thaler – the co-authors of *Nudge*, the book that popularized the concept – are now advisors to the Obama and Cameron governments, respectively. The value of such interventions should thus be clear in Canada as well, which is one of the world’s highest per-capita contributors to climate change.

Canada’s Minister of the Environment should establish a working group dedicated to examining and applying the evidence relevant to environmental decision-making. This group would be similar to but more focused than the UK Cabinet Office’s Behavioral Insights Team (House of

Lords, 2011), which is responsible for advising Cabinet on how to use behavioral science-based interventions to address a number of policy areas including smoking cessation and personal debt reduction. Canada's version, however, would focus solely on climate change policy, and would employ a small number of researchers to conduct ongoing reviews of the behavioral science literature, and then make recommendations to the Minister of the Environment. By keeping up to date with academic research in psychology, behavioral economics, and neuroscience, researchers in this group would be able to identify effective and low-cost climate change-related nudges, such as those discussed in this Memorandum. When such interventions are identified, the group would produce a document summarizing the intervention and briefly discussing how it could be used effectively in Canada. For example, the researchers might note that utility companies who make use of social norm-based messaging effectively lower the demand for electricity; they could then draft a recommendation that the Minister introduce legislation in the House of Commons, mandating that all Canadian utility companies make use of such messaging. As there is already a wealth of similar research available, there would be no need for the Ministry to fund original research of its own. Costs would thus be kept very low for the Government, as well as for industry. The potential benefits of these interventions, however, are disproportionately high: from encouraging lower home energy use and recycling, to getting people out of cars and on to public transportation, behavioral interventions have a demonstrated potential to mitigate the effects of climate change by changing people's behavior without restricting their freedom. While the international community remains deadlocked in the development of a comprehensive climate change treaty, this working group would allow Canada's Ministry of the Environment to take an original, evidence-based lead in improving a range of climate change-related behaviors.

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Noah Castelo is currently finishing his B.Sc. in psychology at the University of Toronto. He plans to pursue a PhD in organizational behavior, focusing on how an understanding of decision-making informed by psychology and behavioral economics can improve policy making.

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