

# Mental representation changes the evaluation of green product benefits

Kelly Goldsmith<sup>1\*</sup>, George E. Newman<sup>2</sup> and Ravi Dhar<sup>2</sup>

**Although campaigns designed to promote pro-environmental behaviours increasingly highlight self-interest, recent research suggests that such appeals may not always be effective<sup>1-3</sup>. For example, individuals are more likely to check their tyre pressure when prompted with self-transcendent (that is, benefits to the environment) versus economic motives<sup>1</sup>; and, self-transcendent appeals are more likely to promote recycling behaviours than self-interested appeals<sup>2</sup>. The present experiments identify an important psychological factor that helps to explain when highlighting economic benefits will be more or less effective in encouraging pro-environmental behaviours. Specifically, we demonstrate that highlighting economic benefits (for example, the money a consumer can save) reduces consumer interest in sustainable products when individuals are in more abstract mindsets compared with when the evaluation is more immediate (that is, their mindset is more concrete). Further, we provide evidence that this shift in interest is driven by the lack of 'fit' between abstract thinking and economic motivations, in the context of pro-environmental behaviour.**

The prediction that different levels of mental representation will change the evaluation of economic versus self-transcendent benefits<sup>1-3</sup> is rooted in construal level theory (CLT)<sup>4</sup>. CLT proposes that mental representations of stimuli that are psychologically near tend to be lower level and concrete, whereas representations of stimuli that are psychologically distant are comparatively high level and abstract (for example, a product to be purchased today is represented more concretely than a product to be purchased in the distant future)<sup>5</sup>. Recent research has demonstrated that individuals can be prompted to form abstract versus concrete representations of stimuli even with subtle, unrelated cues<sup>6,7</sup>. For example, when individuals are asked to write about their life one year (versus one day) from now, their subsequent behaviours are generally more reflective of their values<sup>8-13</sup>. This is thought to occur because abstract representations activate an 'idealistic' self-concept, which enhances preference for ideological benefits over instrumental benefits<sup>14</sup>.

The present studies draw on CLT to suggest that the evaluation of sustainable products and their associated economic (versus self-transcendent) benefits will therefore vary as a function of mental representation. Specifically, we suggest that when individuals form an abstract representation, they will experience greater meta-cognitive difficulty<sup>15-19</sup> when evaluating a sustainable product that is framed as offering economic (versus self-transcendent) benefits, due to a lack of fit between the product's economic benefits and the values-oriented motives for purchase. Therefore, when individuals form an abstract representation, highlighting self-transcendent (versus economic) benefits may make a sustainable

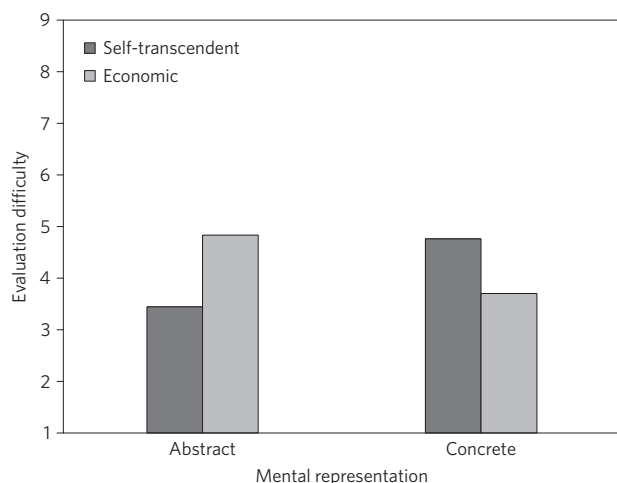
product more appealing, because that framing fits with abstract, higher-order values associated with helping the environment<sup>1-3</sup>. In contrast, when individuals form a concrete representation, highlighting a sustainable product's economic benefits may not negatively affect interest (and may even enhance it), because that framing is congruent with a desire to satisfy more immediate concrete needs<sup>6</sup>. We tested these predictions in four experiments and provide evidence that the fit between abstract thinking and values-oriented motivations contributes to consumer interest in sustainable products.

Experiment 1 tests for the predicted interaction between mental representation (abstract versus concrete) and the type of benefit that is highlighted (self-transcendent versus economic) on the meta-cognitive difficulty people experience when evaluating a sustainable product. Mental representation was first manipulated using a well-established task in which participants wrote about either their life 'one year from tomorrow' (abstract representation) or their life 'tomorrow' (concrete representation)<sup>20</sup>. Next, participants were presented with what they believed to be an unrelated task, in which they read a fictional advertisement for an eco-friendly household cleaner. Between participants we further varied whether the self-transcendent benefits of the product (benefits to the environment) versus the economic benefits of the product (cost savings) were highlighted (see Supplementary Appendix for all experimental stimuli). Participants were then asked to complete three measures that assessed the meta-cognitive difficulty associated with evaluating the information about the product (all scales: 1 = not at all difficult to 9 = very difficult;  $\alpha = 0.814$ , where  $\alpha$  is Cronbach's alpha).

The results indicated a significant interaction between mental representation and highlighting self-transcendent versus economic benefits on evaluation difficulty,  $F(1,169) = 12.35$ ,  $p = 0.001$ , where  $F$  is the F statistic. Among those who formed an abstract representation, highlighting economic benefits significantly increased evaluation difficulty ( $M = 4.83$ , s.d. = 2.55) as compared with highlighting self-transcendent benefits ( $M = 3.44$ , s.d. = 1.83),  $F(1,166) = 7.98$ ,  $p = 0.005$ ,  $d = 0.63$ , where  $M$  is the mean and  $d$  is Cohen's  $d$ . In contrast, among participants with a concrete representation, evaluation difficulty was lower when economic benefits were highlighted ( $M = 3.70$ , s.d. = 2.32) than when self-transcendent benefits were highlighted ( $M = 4.76$ , s.d. = 2.30),  $F(1,166) = 4.62$ ,  $p = 0.003$ ,  $d = -0.46$  (see Fig. 1).

The subsequent experiments tested our prediction that this shift in meta-cognitive difficulty would produce downstream implications for the purchase of sustainable goods. In Experiment 2, participants completed the same manipulation of mental representation used in Experiment 1. Next participants read the

<sup>1</sup>Department of Marketing, Kellogg School of Management, Northwestern University, Evanston, Illinois 60208, USA. <sup>2</sup>Department of Marketing, Yale School of Management, Yale University, Connecticut 06520, USA. \*e-mail: [Kelly-Goldsmith@Kellogg.Northwestern.edu](mailto:Kelly-Goldsmith@Kellogg.Northwestern.edu)



**Figure 1 | Results of Experiment 1.** The effect of self-transcendent (versus economic) benefits on evaluation difficulty is moderated by mental representation.

same fictional advertisement for an eco-friendly household cleaner, highlighting either self-transcendent benefits or economic benefits. The dependent measure was participants' willingness to consider using the product (scale: 1 = definitely no to 9 = definitely yes). Additionally, participants completed measures of socioeconomic status (SES)<sup>21</sup>, to test whether the observed results would generalize across varying levels of SES.

The results indicated a significant interaction between mental representation and whether self-transcendent versus economic benefits were highlighted,  $F(1,250) = 9.39$ ,  $p = 0.002$ . Participants who formed an abstract representation were significantly more likely to consider using the product when the self-transcendent benefits were highlighted ( $M = 7.90$ ,  $s.d. = 1.17$ ) than when the economic benefits were highlighted ( $M = 6.94$ ,  $s.d. = 1.69$ ),  $F(1,247) = 9.86$ ,  $p = 0.002$ ,  $d = 0.66$ . In contrast, for participants who formed a concrete representation, the benefit manipulation did not have a significant effect ( $M_{\text{economic}} = 6.88$ ,  $s.d. = 1.78$ ,  $M_{\text{self-transcendent}} = 6.51$ ,  $s.d. = 2.05$ ),  $F(1,247) = 1.44$ ,  $p > 0.2$ . There was also a main effect of representation such that participants were more likely to consider using the product when they formed an abstract ( $M = 7.38$ ,  $s.d. = 1.54$ ) versus concrete ( $M = 6.70$ ,  $s.d. = 1.91$ ) mental representation,  $F(1,250) = 11.33$ ,  $p = 0.001$ . No other main effects emerged in the analysis. These results also held and remained significant when various measures of SES were included in the model as covariates (see Supplementary Appendix for additional analyses).

Experiment 3 tested for convergence with the results of Experiment 2 using a different sustainable product. Mental representation was manipulated following Experiments 1 and 2. Next participants read an advertisement for compact fluorescent light bulbs (CFLs) that highlighted either self-transcendent benefits or economic benefits. The dependent measure was participants' willingness to replace their current light bulbs with CFLs (scale: 1 = definitely would not to 9 = definitely would). The results indicated a significant interaction between mental representation and whether self-transcendent versus economic benefits were highlighted,  $F(1,194) = 4.15$ ,  $p = 0.043$ . Participants who formed an abstract representation were significantly more likely to say they would switch to CFLs when the self-transcendent benefits were highlighted ( $M = 7.56$ ,  $s.d. = 1.85$ ) than when the economic benefits were highlighted ( $M = 6.51$ ,  $s.d. = 2.38$ ),  $F(1,191) = 7.21$ ,  $p = 0.008$ ,  $d = 0.49$ . For participants who formed a concrete representation, the benefit manipulation did not have a significant effect ( $M_{\text{economic}} = 7.36$ ,  $s.d. = 1.69$ ,  $M_{\text{self-transcendent}} = 7.26$ ,  $s.d. = 1.87$ ,

$F < 1$ ). There was also a marginal main effect of benefit such that the self-transcendent benefit increased interest in CFLs ( $M_{\text{self-transcendent}} = 7.42$ ,  $s.d. = 1.86$ ,  $M_{\text{economic}} = 6.92$ ,  $s.d. = 2.11$ ),  $F(1,194) = 3.05$ ,  $p = 0.082$ . No other main effects emerged in this analysis. This experimental design was replicated in two supplemental experiments using sustainable goods drawn from different product categories (solar panels and ethanol gasoline) and measuring willingness to pay. The observed interaction replicated and was significant at the  $p < 0.05$  level in both cases (Supplementary Appendix provides information on these replications).

Having shown robust support for the predicted interaction between mental representation and benefit type using hypothetical product evaluations, Experiment 4 was designed to test for the ecological validity of these results using a consequential choice task. Testing actual consumer behaviour in the context of sustainable product purchases was particularly important given existing findings revealing that consumers' evaluations of sustainable products do not always directly translate into purchase behaviour<sup>22–26</sup>. Participants completed the same manipulation of mental representation as in the previous experiments and then were given an actual choice between receiving additional compensation (US\$1.25) or a sustainable product (an 'eco-friendly reusable water bottle'). The description of the product highlighted either self-transcendent benefits or economic benefits and the dependent measure was participants' choice. Finally, participants completed an instructional manipulation check<sup>26</sup> in addition to the subjective SES measures used in Experiments 1 and 2. In this experiment, gender and subjective SES significantly affected choice outcomes ( $F(1,171) = 6.63$ ,  $p = 0.01$  and  $F(1,171) = 3.39$ ,  $p = 0.07$  respectively); therefore, these variables were retained as covariates in the model predicting choice. The results indicated a significant interaction between mental representation and whether self-transcendent versus economic benefits were highlighted,  $B = 1.34$ ,  $s.e.m. = 0.65$ ,  $Wald = 4.22$ ,  $p = 0.04$ , where  $B$  is beta and  $Wald$  is the Wald statistic. Participants who formed an abstract representation were significantly more likely to choose the sustainable product (versus US\$1.25) when the product's self-transcendent ( $P = 68.3\%$ , where  $P$  is the percentage.) versus economic ( $P = 44.2\%$ ) benefits were highlighted,  $\chi^2(1) = 5.08$ ,  $p = 0.025$ . In contrast, for participants who formed a concrete representation, the benefit manipulation did not affect choice ( $P_{\text{economic}} = 44.7\%$ ,  $P_{\text{self-transcendent}} = 40.0\%$ ,  $\chi^2(1) = 0.19$ ,  $p > 0.6$ ). No main effects emerged in this analysis beyond those previously reported.

## Conclusions

Researchers have struggled to understand consumers' reactions to pro-environmental products in the marketplace<sup>1–3,22–25</sup>. The current findings highlight a new important dimension underlying the evaluation of sustainable goods—namely, the relative fit between consumers' mental construal (abstract versus concrete) and the benefits associated with sustainable products (economic versus self-transcendent). These findings enhance the current understanding of when communicating economic benefits can reduce consumer interest in sustainable goods<sup>1–3</sup>. For example, a field study<sup>1</sup> demonstrated that consumers were less likely to accept a coupon for a free tyre check when the advertisement highlighted economic motives ('Do you care about your finances?') than when it highlighted self-transcendent motives ('Do you care about the environment?'). We build on this work by revealing that this effect is particularly pronounced among individuals who form a more abstract representation. That is, we reveal an important moderator to these previous findings by demonstrating that mental representation plays a critical role in shaping how consumers react to the different benefits derived from pro-environmental actions.

**Table 1 | Testing for the effects of mental representation, benefit type and their interaction on interest (results from the internal meta-analysis).**

Effects on product valuation	Estimate	s.e.m.	z-score	p
Main effect of abstract (versus concrete) representation	0.4367	0.4441	0.98	0.33
Main effect of self-transcendent versus economic benefits	-0.7022	0.4447	-1.58	0.11
Interaction: Type of benefit × type of representation	-1.7	0.4435	-3.83	<0.001
(a) Simple effect: Abstract representation conditions (self-transcendent > economic benefit)	-1.2011	0.313	-3.84	<0.001
(b) Simple effect: Concrete representation conditions (self-transcendent < economic benefit)	0.4989	0.3151	1.58	0.11
(c) Simple effect: Economic benefit conditions (concrete > abstract benefit)	-0.6317	0.3145	-2.01	0.04
(d) Simple effect: Self-transcendent conditions (abstract > concrete benefit)	1.0684	0.3132	3.41	<0.001

All simple effects reported.

One question that follows is whether there are instances when highlighting economic benefits might increase interest in sustainable goods. Although we observed that highlighting an economic (versus self-transcendent) benefit significantly decreased evaluation difficulty among participants who formed a concrete representation, the implications for purchase interest were mixed. To test whether this effect might emerge when aggregating across experiments, we performed an internal meta-analysis of our data, which allowed us to address this question, in addition to examining whether any significant main effects might emerge when aggregating across our results. Testing for such main effects was important, given previous work demonstrating that self-transcendent (versus economic) appeals are often superior for promoting pro-environmental actions<sup>1,2</sup>.

This analysis revealed a significant interaction between mental representation and the type of benefit that was communicated ( $z = -3.21$ ,  $p < 0.001$ ). Consistent with the previously reported results, simple effects tests revealed that among those with an abstract representation, highlighting self-transcendent (versus economic) benefits increased interest ( $z = -2.98$ ,  $p < 0.001$ ; Table 1, comparison (a)). In contrast, participants with a concrete representation directionally showed the opposite pattern ( $z = 1.56$ ,  $p = 0.11$ ; comparison (b)); although this effect was not statistically significant. However, consistent with the notion that forming a concrete (versus abstract) representation would increase the attractiveness of economic benefits<sup>6</sup>, a comparison across mental representation revealed a significant positive effect of concrete thinking on the evaluation of economic benefits ( $z = -0.63$ ,  $p = 0.04$ ; comparison (c)). Finally, we observe no evidence of significant main effects of mental representation or benefit. Although previous work has shown that self-transcendent (versus economic) appeals are often superior for promoting pro-environmental actions<sup>1,2</sup>, this work did not examine the impact of such appeals on the immediate purchase of a product. Therefore, future research may wish to examine the factors that moderate the emergence of such main effects. Further, future research may wish to measure evaluation difficulty and preference in the same experiment, to statistically validate the relationship between the two.

At present, the current research offers important theoretical insights into the psychological antecedents to pro-environmental consumption behaviours. In addition, these findings also offer several practical implications. In particular, campaigns that seek to promote sustainable products may wish to consider the mental representation of the customer when developing product messaging. As mentioned, when individuals consider purchases they may make in the distant future (for example, through television advertisements), they are more likely to form abstract representations<sup>5</sup>. Therefore, in this format, it may be wise to emphasize the self-transcendent benefits of sustainable products to arouse purchase interest. Likewise, firms who wish to introduce

products that are positioned around self-transcendent benefits, as many green products are, may benefit from a sales context that promotes more abstract processing; such as one where products are categorized on the basis of their benefits (versus attributes)<sup>27</sup>.

In sum, this research demonstrates that the congruence (versus incongruence) between individuals' mental representation and the benefits that are associated with a sustainable product has important implications for evaluation difficulty, which carry over to affect purchase interest and choice behaviour. It is possible that this congruence (versus incongruence) could have additional implications, for example, affecting the tendency of sustainable product evaluations to create positive 'spillover' behaviours in unrelated pro-environmental domains<sup>2,3</sup>. We hope that the current findings will promote further research in this area, to form a broader framework for understanding the psychological antecedents to different pro-environmental actions.

## Methods

Methods and any associated references are available in the [online version of the paper](#).

Received 2 March 2016; accepted 6 April 2016;  
published online 9 May 2016

## References

- Bolderdijk, J. W. *et al.* Comparing the effectiveness of monetary versus moral motives in environmental campaigning. *Nature Clim. Change* **3**, 413–416 (2013).
- Evans, L. *et al.* Self-interest and pro-environmental behavior. *Nature Clim. Change* **3**, 122–125 (2012).
- Thøgersen, J. Inducing green behavior. *Nature Clim. Change* **3**, 100–101 (2013).
- Trope, Y. & Liberman, N. Construal-level theory of psychological distance. *Psychol. Rev.* **117**, 440–463 (2010).
- Trope, Y. & Liberman, N. Temporal construal. *Psychol. Rev.* **110**, 403–421 (2003).
- Meyvis, T., Goldsmith, K. & Dhar, R. The importance of the context in brand extension: how pictures and comparisons shift consumers' focus from fit to quality. *J. Mark. Res.* **49**, 206–217 (2012).
- Freitas, A. L., Gollwitzer, P. & Trope, Y. The influence of abstract and concrete mindsets on anticipating and guiding other's self-regulatory efforts. *J. Exp. Soc. Psychol.* **40**, 739–752 (2004).
- Eyal, T. & Liberman, N. in *The Social Psychology of Morality: Exploring the Causes of Good and Evil* (eds Mikulincer, M. & Shaver, P. R.) 185–202 (Herzliya Series on Personality and Social Psychology, American Psychological Association, 2012).
- Agerström, J. & Björklund, F. Moral concerns are greater for temporally distant events and are moderated by value strength. *Soc. Cogn.* **27**, 261–282 (2009).
- Eyal, T., Sagristano, M. D., Trope, Y., Liberman, N. & Chaiken, S. When values matter: expressing values in behavioral intentions for near vs. distant future. *J. Exp. Soc. Psychol.* **45**, 35–43 (2009).
- Giacomantonio, M. *et al.* Psychological distance boosts value-behavior correspondence in ultimatum bargaining and integrative negotiation. *J. Exp. Soc. Psychol.* **46**, 824–829 (2010).

12. Hunt, C. V., Kim, A., Borgida, E. & Chaiken, S. Revisiting the self-interest versus values debate: the role of temporal perspective. *J. Exp. Soc. Psychol.* **46**, 1155–1158 (2010).
13. Torelli, C. J. & Kaikati, A. M. Values as predictors of judgments and behaviors: the role of abstract and concrete mindsets. *J. Personal. Soc. Psychol.* **96**, 231–247 (2009).
14. Kivetz, Y. & Tyler, T. R. Tomorrow I'll be me: the effect of time perspective on the activation of idealistic versus pragmatic selves. *Organ. Behav. Hum. Decis. Process.* **102**, 193–211 (2007).
15. Aaker, J. L. & Lee, A. Y. 'I' seek pleasures and 'we' avoid pains: the role of self-regulatory goals in information processing and persuasion. *J. Consum. Res.* **28**, 33–49 (2001).
16. Lee, A. Y. & Aaker, J. L. Bringing the frame into focus: the influence of regulatory fit on processing fluency and persuasion. *J. Personal. Soc. Psychol.* **86**, 205–218 (2004).
17. Labroo, A. A. & Lee, A. Y. Between two brands: a goal fluency account of brand evaluation. *J. Mark. Res.* **43**, 374–385 (2006).
18. Lee, A. Y., Keller, P. A. & Sternthal, B. Value from regulatory construal fit: the persuasive impact of fit between consumer goals and message concreteness. *J. Consum. Res.* **36**, 735–747 (2010).
19. White, K., MacDonnell, R. & Dahl, D. W. It's the mind-set that matters: the role of construal level and message framing in influencing consumer efficacy and conservation behaviors. *J. Mark. Res.* **48**, 472–485 (2011).
20. Förster, J., Friedman, R. S. & Liberman, N. Temporal construal effects on abstract and concrete thinking: consequences for insight and creative cognition. *J. Personal. Soc. Psychol.* **87**, 177–189 (2004).
21. Griskevicius, V. *et al.* When the economy falters, do people spend or save? Responses to resource scarcity depend on childhood environments. *Psychol. Sci.* **24**, 197–205 (2013).
22. Auger, P., Burke, P., Devinney, T. M. & Louviere, J. J. What will consumers pay for social product features? *J. Bus. Ethics* **42**, 281–304 (2003).
23. Auger, P. & Devinney, T. M. Does what consumers say matter? The misalignment of preferences with unconstrained ethical intentions. *J. Bus. Ethics* **76**, 361–383 (2007).
24. Carrington, M. J., Neville, B. A. & Whitwell, G. J. Why ethical consumers don't walk their talk: towards a framework for understanding the gap between the ethical purchase intentions and actual buying behavior of ethically minded consumers. *J. Bus. Ethics* **97**, 139–158 (2010).
25. Öberseder, M., Schlegelmilch, B. B. & Gruber, V. 'Why don't consumers care about CSR?': a qualitative study exploring the role of CSR in consumption decisions. *J. Bus. Ethics* **104**, 449–460 (2011).
26. Oppenheimer, D. M., Meyvis, T. & Davidenko, T. Instructional manipulation checks: detecting satisficing to increase statistical power. *J. Exp. Soc. Psychol.* **45**, 867–872 (2009).
27. Lambertson, C. P. & Diehl, K. Retail choice architecture: the effects of benefit- and attribute-based assortment organization on consumer perceptions and choice. *J. Consum. Res.* **40**, 393–411 (2013).

### Acknowledgements

The authors would like to thank B. McShane for his assistance in conducting the meta-ANOVA required to perform an internal meta-analysis across experimental results. In addition, the authors would like to thank C. Roux and J. Savary for their thoughtful comments on the research.

### Author contributions

All authors contributed to the design of all experiments in the main text. K.G. and R.D. designed supplemental Experiments A and B. G.E.N. analysed Experiment 3. K.G. analysed all other experiments. K.G. wrote the manuscript; all authors commented.

### Additional information

Supplementary information is available in the [online version of the paper](#). Reprints and permissions information is available online at [www.nature.com/reprints](http://www.nature.com/reprints). Correspondence and requests for materials should be addressed to K.G.

### Competing financial interests

The authors declare no competing financial interests.

## Methods

In Experiment 1, participants were 170 adults (67% male;  $M_{\text{age}} = 30.95$ ,  $s.d. = 10.52$ ) who were recruited from Amazon's Mechanical Turk in exchange for US\$0.50. Participants first completed a task that manipulated their mental representation as described. Next, they were asked to imagine that they were shopping for household cleaners, and read an advertisement for a set of products that communicated either a self-transcendent benefit (benefits to the environment) or an economic benefit (cost savings). After reading the advertisement, participants were instructed to 'think about if you would be interested in buying these products, then answer the following questions.' The questions were: 'How difficult was it for you to decide whether or not you were interested in the Green Solutions Household Cleaning Products?', 'How difficult was it for you to evaluate the Green Solutions Household Cleaning Products?' and 'How difficult was it for you to form an opinion about the Green Solutions Household cleaning products?'. Finally, they completed a series of measures of subjective SES validated by previous work<sup>21</sup> consisting of a three-item measure of subjective childhood SES, and a three-item measure of subjective current SES (all measures reported in the Supplementary Appendix).

In Experiment 2, participants were 251 individuals (55% male;  $M_{\text{age}} = 34.8$ ,  $s.d. = 11.24$ ) who were recruited from Amazon's Mechanical Turk in exchange for US\$0.50. Participants first completed a task that manipulated their mental representation as described in the main text. Next, they read an advertisement for the same set of green household cleaning products used in Experiment 1, which communicated either a self-transcendent benefit or an economic benefit. They then completed the dependent measure reported in the main text. Finally, they completed the same series of subjective SES measures used in Experiment 1 in addition to two measures of objective SES (reported in the Supplementary Appendix).

In Experiment 3, participants were 195 individuals (32% male;  $M_{\text{age}} = 36.7$ ,  $s.d. = 12.92$ ) recruited from Amazon's Mechanical Turk, who were not current users of compact fluorescent light bulbs. They first completed the construal level manipulation as described and then read an advertisement for compact fluorescent light bulbs, which communicated either a self-transcendent benefit (benefits to the environment) or an economic benefit (cost savings). Finally, they completed the dependent measure described in the main text.

In Experiment 4, participants were 197 undergraduate students (35% male;  $M_{\text{age}} = 20.22$ ,  $s.d. = 4.93$ ) from Northwestern University who participated in a 15 min laboratory session consisting of unrelated studies in exchange for US\$5 compensation plus the outcome of their choice. They first completed the mental representation manipulation as described, and then were given an actual choice between additional participant compensation (US\$1.25) and a sustainable product (described as 'an eco-friendly reusable water bottle'), whose description emphasized either a self-transcendent benefit (benefits to the environment) or an economic benefit (cost savings). Their choice served as the main dependent measure. Finally, they completed the same measures of subjective SES used in experiments 1 and 2. Note that in this experiment, before analysing the data, 26 participants (13.2% of the original sample) were excluded from the analysis either because they failed to pass an instructional manipulation check validated in previous research<sup>26</sup> (reported in the Supplementary Appendix) indicating that they failed to read the experimental instructions ( $N = 24$ ) or because they spent less than 3 s reading the description of the choice task ( $N = 2$ ). This resulted in a final sample of 171 students. Exclusion did not vary on the basis of experimental assignment ( $p$ -values  $> 0.67$ ). Similar exclusions were not performed in other experiments because such measures were not collected.