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The behavioral intervention "positive cueing": Altering self-perception, increasing green awareness, or undermining the signaling value of costly green behavior?

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ABSTRACT

The social marketing technique "positive cueing" has been suggested to help increase pro-environmental behavior by changing perceptions of the self to which consumers want to align their behavior. However, positive cueing may also draw attention to the pro-environmental nature of previous decisions that people typically do not interpret as such. Therefore, we argue that positive cueing effects occur by making people aware that many (common) choices in everyday life are related to environmental friendliness, without leading to changes in self-perception. We present empirical support that is more in line with the reasoning that positive cueing results in a shift in the perception of choices consumers encounter rather than a shift in self-perception. Still, this account cannot explain the full pattern of results since positive cueing does not only increase low identity signaling pro-environmental choices, but even decreases high identity signaling pro-environmental choices. In hindsight, we argue that the positive cueing intervention may undermine the signaling value of costly pro-environmental behavior and increase the signaling value of cheap pro-environmental behavior. We discuss the implications for the use of positive cueing as a social marketing technique.

1. Introduction

Recently, several behavioral interventions aimed at encouraging more pro-environmental decision making have been studied. One of these interventions is "positive cueing". This social marketing technique points out the positive environmental effects of behaviors one already exhibits (e.g. turning off lights, recycling trash) and has been shown to result in a greater willingness to make pro-environmental choices (Cornelissen, Pandelaere, Warlop, & Dewitte, 2008).

Whereas positive cueing may be an interesting way to encourage pro-environmental decision making, other studies with comparable cueing interventions did not observe such positive effects (e.g. van der Werff, Steg, & Keizer, 2014, 2014b; Lacasse, 2015, 2016; Noblet & McCoy, 2018; Urban, Braun Kohlová, & Bahník, 2021; Van Der Werff & Steg, 2018) and still others observe positive cueing effects (Millet, Du, Cabooter, & Weijters, 2022),[1] but suggest that its effect is limited, given its context-specificity, and lack of generalizability across domains. Therefore, more insight into the potential psychological mechanism is needed to better understand the effectiveness of positive cueing as a social marketing technique. That is, by understanding why positive cueing effects emerge, policy makers may also better understand when this technique could be successfully applied.

1.1. Two different psychological mechanisms that may result in positive cueing effects

The original explanation for positive effects of positive cueing is based on changes in self-perception. Since people derive attitudes from observations of their own actions (Bem, 1972), pro-environmental choices may result in increased pro-environmental self-perceptions. Because positive cueing highlights the pro-environmental nature of ordinary choices people already make in everyday life, they may conclude that they care about the environment (Cornelissen et al., 2008). Furthermore, preference for consistency (Cialdini, Trost, & Newsom, 1995) may result in additional pro-environmental choices to align behavior with the salient identity.

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[1] In two studies, of which one preregistered.

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We propose another more parsimonious explanation, "green awareness", which makes no assumptions about changes in self-perception. Instead of directly drawing conclusions about the self, positive cueing may lead to mere conclusions about the pro-environmental nature of decisions in daily life. Indeed, as pointed out by Cornelissen et al. (2008), the technique raises awareness of the pro-environmental nature of some ordinary choices people already make in everyday life, but which they did not automatically associate with it (e.g. turning off lights). Therefore, after positive cueing, people may also become more aware of the environmental friendliness of other regular choices that they did not associate herewith before the intervention. Whereas the original account focuses on altered self-perception, this alternative account focuses on the change in perceived diagnosticity of specific choices for the self. Thus, whereas self-perception is important in both accounts, the crucial difference is that the "green awareness" account does not presume any change in self-perceptions due to positive cueing directly. Summarized, whereas Cornelissen et al. (2008) point to a psychological mechanism including both awareness and consistency with an "altered self-perception" to explain the positive cueing effect, we argue that increased awareness and consistency with a "non-altered self-perception" may be sufficient to elicit positive cueing effects. At least consistent with this increased green awareness account, the studies that observed positive cueing effects focused on very common, low-cost pro-environmental behavior (i.e. using scrap paper and non-conspicuous products, Cornelissen et al., 2008; Dutch students using their bike, and consumers preferring tap water, Millet et al., 2022). To disentangle the two different psychological mechanisms, we focus on the identity signaling value of pro-environmental choices and how the "altered self-perception" and "green awareness" accounts lead to opposing predictions regarding the moderating role of identity signaling value.

1.2. Identity signaling value of pro-environmental choices and positive cueing

Some choices are more indicative for the identity of the decision maker than others. For instance, when people choose which dish washing detergent to use, this does not signal much about someone's identity. However, the choice of hairstyle does. The identity signaling value of a specific choice is determined by the "belief that the behavior will convey particular information about the individual to the self or to others" (p. 257, Gal, 2015). Whereas identity signaling typically refers to an interpersonal process, it also includes self-signaling without considering the perceptions of others (Bodner & Prelec, 2003; Gal, 2015) and people aim to act consistently with the activated identity (Oyserman, 2009). In addition, identity signaling is also a driver of pro-environmental choices. For instance, identity labeling of the pro-environmental choice (e.g. "Those who care about the environment take reusable bags") has been shown to increase its purchase (Schwartz, Loewenstein, & Agüero-Gaete, 2020). This finding illustrates the importance of the identity signaling value of specific choices.

The two potential mechanisms introduced above both predict that the positive cueing effect is moderated by the identity signaling value of the choice. However, this moderation effect is expected to be very different depending on the specific account, resulting in two contrasting hypotheses. Based on an "altered self-perception" perspective, positive cueing will lead people to see themselves as more environmentally conscious and people aim to behave consistently with this self-perception. The higher the identity signaling value of a particular choice, the less consistent an environmentally unfriendly choice is with a green identity. Therefore, given that more people adopt a green identity after the intervention, positive cueing should increase the inclination to make a pro-environmental decision when the identity signaling value of the choice is higher (e.g. increased inclination to prefer only eating plant-based foods over eating meat), but not necessarily so when the identity signaling value is lower (e.g. no increased inclination to prefer buying fruit transported by ship over buying fruit transported by plane). Consequently, the positive association between the inclination to make a pro-environmental choice and its identity signaling value should become stronger after positive cueing. Summarized, positive cueing will (a) increase the preference for pro-environmental choices that score high (but not low) on identity signaling to avoid inconsistency with one's self-perception and as a result (b) increase the association between identity signaling value of a sustainable choice and the preference for this choice given that more consumers will see themselves as 'green' consumers. Thus, following this account:

Hypothesis 1.
a. Positive effects of positive cueing may especially emerge for choices that score high on identity signaling
b. The association between the identity signaling value of and preference for a sustainable choice option is especially pronounced after positive cueing.

Based on a "green awareness" perspective, positive cueing will increase awareness that many choices made in daily life (and more than anticipated) are related to environmental friendliness. Therefore, choices that typically score low on identity signaling may be seen as more diagnostic of someone's green attitudes after positive cueing, and as diagnostic for the self as high identity signaling choices. Hence, positive cueing will (a) increase the preference for sustainable choices that score low (but not high) on identity signaling given that green consumers want to act in line with their attitude and now also the choices scoring low on identity signaling are seen as diagnostic of one's green attitudes (and not just the choices scoring high on identity signaling). As a result, this will (b) attenuate the association between identity signaling value of a sustainable choice and the preference for this choice. Formally:

Hypothesis 2.
a. Positive effects of positive cueing may especially emerge for choices that score low on identity signaling.
b. The association between the identity signaling value of and preference for a sustainable choice option is attenuated after positive cueing.

To test the two contrasting hypotheses, we make use of publicly available secondary data from a study (experiment 2, N = 1615) recently reported in Millet et al. (2022) but in which they did not obtain evidence for the positive cueing effect. In this study, an externally validated set of 81 choice pairs was developed based on Moran et al. (2020), covering a diverse range of consumption domains. Each choice pair includes a sustainable and non-sustainable option. Respondents were either assigned to a control or positive cueing condition and then received one out of the 81 choice pairs. This allowed to test if positive cueing effects generalize across consumption domains and to test for interactions with other pretested features of the specific choice pairs presented. Importantly, as suggested by Millet et al. (2022), their research approach for this specific study leaves the opportunity to use the data as input for future research. We collected primary data to examine to what extent the 81 behavior pair decisions hold identity signaling value and then ran a multilevel analysis with positive cueing, identity signaling value and their interaction as predictors. We followed the Ethical guidelines of the American Psychological Association (APA) and preregistered the procedure and hypotheses before collecting the data. Preregistration, data and syntax can be found on ResearchBox#1232.

2. Study

The aim of the study is to test the two contrasting hypotheses against each other.

2.1. Primary data collection

We recruited UK participants on Prolific. In our sample N = 466, age ranged from 18 to 84 years (M = 41.7, SD = 14.0) and 50.1% of respondents were women. Each participant received a random subset of nine choice pairs sampled from the set of 81 choice pairs (used in Study 2, Millet et al., 2022). We aimed to gather 50 responses for each choice pair. For each of these pairs, participants were presented with the following instructions: "Suppose someone had the following 2 options, and decided to do A (not B) (followed by A: [description of sustainable choice] and B: [description of non-sustainable choice])." Option order (i.e., whether A or B was the sustainable option) was randomized. Participants then answered the following two questions on identity signaling (adapted from Berger & Heath, 2007): (a) "How much does the choice for one of the options contribute to self-expression (i.e., a person's ability to express their identity)?", (b) "How much do people use the choice for one of the options in this decision context to make inferences about others (i.e., people think they know a lot about a person based on their choice in this particular choice dilemma)?". The mean rating of these two items (r = 0.85) was then calculated as a measure of identity signaling of each choice pair (N = 81). A data table is provided in Appendix A.

2.2. Secondary data

We make use of Study 2 from Millet et al. (2022) and refer to this paper for procedural details but summarize the main features here. The experiment of interest used a two (positive cueing vs. control) by 81 (81 behavior pairs) between-subjects design. The experiment consisted of a cueing procedure and a choice task. First, participants were randomly assigned to one of two between-subjects conditions (positive cueing vs. control). In both conditions, participants were asked to indicate, on a seven-point scale ranging from "strongly disagree" to "strongly agree," whether they usually engage in each of five behaviors (presented in a random order). In the positive cueing condition, the question was formulated as follows: "I usually engage in the following pro-environmental behavior," and the behaviors were five green behaviors that people regularly engage in: turning off the light, reusing grocery bags, not littering, sorting trash, and using reusable water bottles/cups/coffee mugs. In the control condition, the question was worded as follows: "I usually engage in the following behavior," and the behaviors were five neutral, common behaviors that have no clear relation to environmentalism: watching Netflix series, listening to music, reading news articles, chatting with friends, and cooking.

Next, participants received a choice task. They were randomly assigned to one of 81 behavior pairs, with each pair consisting of a non-ecological and an ecological behavior. Participants were asked to choose between the sustainable option and the non-sustainable option (e.g., use recycled toilet paper vs. use non-recycled toilet paper): "Which of both options would you choose right now?". Participants indicated their preferences on a five-point (labeled) scale, where one corresponds to an absolute preference for the former option over the latter one, five corresponds to the opposite. The order of the sustainable and non-sustainable options (i.e. which one is on the left/right side of the scale presented) was randomized. All responses were recoded from 1 to 5, so that higher scores indicate a more sustainable ("ecological") choice; this variable is henceforth called 'eco-choice.' Note that the 81 choice pairs will not be treated as fixed categories in the analysis. Whereas they were treated as instantiations of specific levels of substitutability in Millet et al. (2022), they will be treated here as instantiations of specific levels of identity signaling value (information per choice pair obtained by our primary data collection, see above). Appendix B provides a data table in which the relevant primary data (i.e., mean identity signaling rating for each choice pair) are merged with the relevant secondary data (i.e., mean eco-choice for the positive cueing vs. control condition for each choice pair).

2.3. Results

Ecological choice rating is modeled as the dependent variable in a multilevel regression model, where respondents are the first level, the 81 behavior pairs are the second level. At the first level, eco-choice is regressed on a positive cueing dummy, where 0 = control condition, 1 = positive cueing condition. This regression weight is specified as a random coefficient. At the second level, eco-choice and the random slope are regressed on identity signaling value of the choice options (based on the 81 identity signaling values scores of the behavior pairs in the primary data).

More specifically, the data have a multilevel structure, with respondents ($N_{level\ 1}$ = 1615) nested in choice sets ($N_{level\ 2}$ = 81, with average cluster size = 19.94 observations). The dependent variable, eco-choice, is the rating that expresses respondents' relative preference for the sustainable option (vs. the non-sustainable option). Eco-choice has an intra-class correlation ICC = 0.354, indicating that a substantial proportion of variance in eco-choice is situated at the between choice sets level (level 2) and that a multi-level specification is required. We specify the variable identity signaling value at level 2, the experimental manipulation (i.e., the positive cueing dummy) at level 1. All variables except for the experimental manipulation are grand mean centered before analysis. We test the effects of interest in a multilevel model with a random intercept for eco-choice and a random slope for the experimental effect (at level 1), with the slope being moderated by choice set identity signaling value (at level 2), resulting in a cross-level interaction.

The fixed component of the effect of the positive cueing dummy on eco-choice is small and not statistically significant (Est. = 0.063, 95% CI = [-0.032, 0.159]). There is a significant main effect of identity signaling value on eco-choice (Est = 0.655, 95% CI = [0.294, 1.017]). Most importantly, the effect of POSCUE on eco-choice is significantly moderated by identity signaling value (Est. = −0.275, 95% CI = [-0.469, −0.081]). Fig. 1 provides a line plot with 95% confidence interval of the effect of positive cueing (on the y-axis) on eco-choice as a function of identity signaling (on the x-axis). At mean levels of identity signaling, positive cueing does not have an effect that is significantly different from zero (cf. the fixed component of the effect). By contrast, at lower levels of identity signaling, positive cueing increases eco-choice (whereas at higher levels of identity signaling, positive cueing tends to reduce it).[2] Thus, in support of hypothesis H2a (and in contradiction of H1a), positive effects of positive cueing may especially emerge for choices that score low on identity signaling.

For ease of interpretation, we also ran a single-level path model on the aggregated data where choice pair is the unit of analysis, but creating two outcome variables, one for each experimental condition, so that we have a dataset of N = 81. When using eco-choice in the control condition and eco-choice in the positive cueing condition as the two dependent variables and identity signaling as the independent variable, the unstandardized regression weight is B = 0.671 (95% CI = [0.286, 1.057]), R^2 = 0.132, for the dependent variable corresponding to the control condition, but only B = 0.376 (95% CI = [-0.003, 0.754]), R^2 = 0.047, for the dependent variable corresponding to the positive cueing condition, with the difference between regression coefficients d = 0.296 (95% CI = [0.097,.494]), which is in line with H2b (but not H1b).

[2] According to the confidence interval estimates visualized in Fig. 1, the positive cueing effect becomes significantly positive (i.e., the 95% confidence interval does no longer include zero) for identity signaling scores equal to or lower than −0.20 below the mean (Est. = 0.118, 95% CI = [0.016, 0.221]). The positive cueing effect becomes significantly negative for identity signaling scores equal to or greater than 1.10 (Est. = −0.239, 95% CI = [-0.473, −0.005]) above the mean.

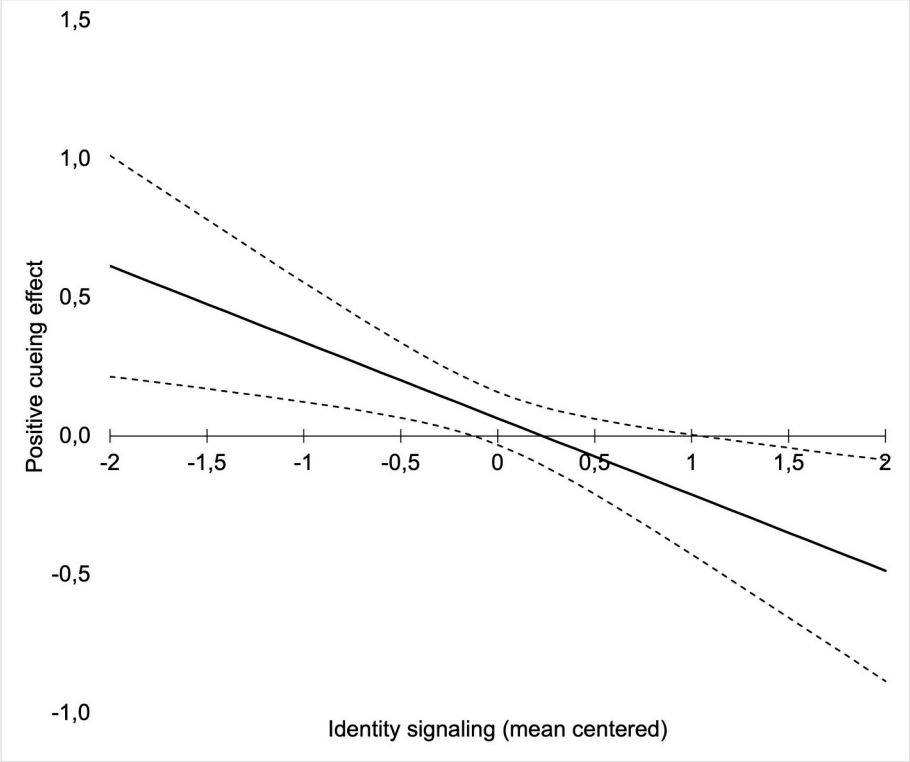

Fig. 1. Positive cueing effect as a function of identity signaling
Note. A line plot with 95% confidence interval of the effect of positive cueing (on the y-axis) on eco-choice as a function of identity signaling (on the x-axis).

3. Post-hoc interpretation from a costly signaling perspective

Whereas the results seem to be more consistent with a "green awareness" account than an "altered self perception" account, it cannot fully explain the specific pattern of results (i.e. the cross-over interaction). In hindsight, we argue that the positive cueing intervention may undermine the signaling value of costly pro-environmental behavior and increase the signaling value of cheap pro-environmental behavior, which may result in a shift from costly (high identity signaling) to cheap (low identity signaling) pro-environmental decisions.

More specifically, to make a signal reliable - that is, when people aim to signal information about themselves in a trustworthy way - costly signaling theory posits that it needs to be costly and the cost must be related to the quality being signaled (Grafen, 1990a, 1990b; Millet & Dewitte, 2007; Zahavi, 1975; Zahavi & Zahavi, 1997). For instance, as green inferior products are often more expensive than their non-green superior counterparts, the adoption of these green products demonstrates to others that their owners are voluntarily willing and able to incur the cost of owning a product that benefits the environment (Griskevicius, Joshua, & Van den Bergh, 2010) and as such signal that one truly cares about the environment.

On the other hand, costless behaviors that do not require any effort or cost to perform (i.e. there is no sacrifice on the part of the person engaging in it) do often not signal much. In the context of environmental behavior, certain actions, such as turning off the light, reusing grocery bags, not littering, sorting trash and using reusable water bottles may be considered cheap because they do not require much effort or sacrifice (and thus do not come at any cost to the person engaging in them). However, if these behaviors are presented as pro-environmental actions (e.g. by positive cueing), people may perceive them as being as effective at signaling their pro-environmental nature as more costly or effortful behaviors, such as driving a hybrid car or switching to a plant-based diet. As a result, people may be more likely to engage in such cheap behaviors after being positively cued, as they may see them as an efficient way to signal their pro-environmental values. At the same time, this shift from more costly to cheaper pro-environmental behaviors may have a negative effect on behaviors that are more costly or effortful, as they may be seen as less necessary for signaling one's pro-environmental values.

4. Discussion

In the present paper we have collected information on the identity signaling value of the 81 choice dilemmas used in Study 2 of Millet et al. (2022) and used this as input for multilevel analyses on their data. Whereas no positive cueing effect was obtained in Millet et al. (2022), the current analysis reveals a positive effect on pro-environmental choices that are typically considered non-diagnostic of one's (green) identity and, although not predicted a priori, there appears to be a negative effect on identity signaling choices. What do we learn from this pattern of results?

First, the results are not in support of an "altered self-perception" perspective, as previously argued (e.g. Cornelissen et al., 2008), but more in line with the proposed "green awareness" account. If positive cueing increases awareness that many common choices made in daily life are related to environmental friendliness, choices scoring low on identity signaling may now also be seen as diagnostic of one's green attitudes (while not necessarily changing the perceived diagnosticity of identity signaling choices). Therefore, positive cueing may especially increase the preference for pro-environmental choices that score low on identity signaling. Still, whereas a part of the pattern of results is consistent with the awareness account, more empirical work is needed since the current study setup only provides indirect evidence for this account. For instance, future research may examine how a positive cueing intervention influences the diagnosticity of low- and high identity signaling product choices and if this perceived diagnosticity drives the effect on pro-environmental choices.

Second, whereas not a priori predicted here, positive cueing may also

result in a negative effect for choices that score high on identity signaling. As argued by Millet et al. (2022), positive cueing may result in negative effects due to motivated reasoning processes (Kunda, 1990): by stressing the pro-environmental nature of things people already do frequently, this may turn out to be the perfect excuse for not behaving in a pro-environmental way if people are not immediately able to justify their choices to themselves (i.e. when the choice's identity signaling value is high). As elaborated upon above in our post-hoc interpretation, we suggest that the "cost" of the pro-environmental choice matters. If the signaling value of "cheap" (common) behavior seems to increase (i.e., after positive cueing), this may prove to be the better option for signaling one's pro-environmental nature (assuming that identity signaling choices are more costly in nature). Future research may examine the extent to which this negative effect of positive cueing is reliable and when exactly it emerges. It would also be useful to further investigate if identity signaling choices are in general indeed more costly in nature, and whether consumers tend to switch from more costly to cheaper pro-environmental decisions after positive cueing. Moreover, it may also be valuable to test choice pairs on other characteristics in order to rule out potential alternative explanations for the observed pattern of results.

Third, it is important to note that whereas we preregistered the primary data collection, we already had access to the secondary data before we decided to collect additional data. Since secondary data exploration already took place before the data collection of the primary data, the current study can rather be considered exploratory (and not confirmatory) in nature. Therefore, a third avenue for further research may involve a (confirmatory) replication of the full study results with only the inclusion of primary data.

The current findings have important implications. When subtle interventions like positive cueing result in changes in self-perception, the effects may turn out to be long-lasting. Indeed, there is empirical evidence that when people care about the protection of nature and environment, they still express pro-environmental consumption intentions (i.e. reduced meat consumption) a year later (Van der, Werff, Steg, & Keizer, 2013). However, the question remains how long-lasting positive cueing effects are when the underlying psychological mechanism is about green awareness. This is another interesting avenue for further research. Moreover, while previous literature focused only on potential positive effects of positive cueing, the current findings show that positive cueing may also result in negative effects. Whereas more research is needed to better understand when positive cueing results in positive and when in negative effects, this at least shows that the use of the positive cueing technique is not without dangers and may even backfire when used in a thoughtless manner.

Author statement

Kobe Millet: Conceptualization; Methodology; Writing – Original Draft.

Bert Weijters: Methodology; Formal Analysis; Writing – Original Draft.

Appendix. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jenvp.2023.101979.

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