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When saving the planet is worth more than avoiding destruction. The importance of message framing when speaking to egoistic individuals

Maria Lagomarsino^{a,*}, Linda Lemarié^b, Michael Puntiroli^c

^a Consumer Decision and Sustainable Behavior Lab, Department of Psychology, University of Geneva, 9, Chemin des Mines, 1202 Geneva, Switzerland

^b Audencia Business School, Route de la Jonelière 8, 44312 Nantes, France

^c University of Neuchâtel, Rue A.-L. Breguet 2, 2000 Neuchâtel, Switzerland

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ABSTRACT

This paper sheds light on the reasons why conventional messages prove largely ineffective at fostering pro-environmental behaviors among individuals with high egoistic values. We conducted three experiments comparing the effectiveness of prevention-focused and promotion-focused messages at promoting pro-environmental behaviors. We found that egoistic individuals exposed to prevention-focused messages tended to perceive pro-environmental efforts as less worthy, compared to those exposed to promotion-focused messages. This effect, in turn, decreased their willingness to take environmental action. We also observed that the negative effect prevention-focused messages have on egoists is attributable to a defense mechanism. Egoistic people exposed to prevention-focused messages seem to deny the veracity of the message, which in turn decreases the perceived worthiness of the environmental effort and thus the intention to act. The findings highlight the best way to frame environmental communication to reach those who are least likely to adopt eco-responsible behavior, i.e., egoistic people.

1. Introduction

Knowledge of climate change and human-caused environmental problems is far from recent. For more than 30 years, scientists have been stressing the need to act and fight global warming. However, the seriousness of the situation only seems to be becoming evident today and few major actions have yet been implemented.

“Humanity is currently using nature 1.75 times faster than our planet’s ecosystems can regenerate” (Global Footprint Network, 2019). In 2019, the Earth Overshoot Day was on July 29. On that day, humanity had consumed all the natural resources that the planet can renew in a year and started to consume resources that the earth is not able to regenerate. The situation is only getting worse. In 1960, humanity consumed only half of its biocapacity. In 1987 for the first time it exceeded the figure of one year of resources, while in 2000 the day fell on October 1 and in 2010 on August 21 (Global Footprint Network, 2019). The economic, social and health consequences are undeniable. It is estimated that 17.2 million climate migrants have been forced to leave their homes in 2018 due to extreme drought, floods or storms, and this figure could increase rapidly according to the United Nations (IDMC, 2019). Nearly 7 million people die each year from air pollution-related diseases such as lung cancer and stroke and an

additional 250,000 deaths per year are expected between 2030 and 2050 (WHO, 2018). Already more than 1 in 4 deaths of children under 5 years of age are attributable to an unhealthy environment (WHO, 2017).

According to the report of the Intergovernmental Panel on Climate Change (IPCC, 2013) conducted in 2013 for the United Nations, human activities are the main cause of the situation we are currently experiencing. Importantly, it is not the overpopulation and development of the poorest countries that is to blame, but the overconsumption of the richest countries. We would need about 5 planets if we each consumed like an American, 2.8 if we each consumed like a Swiss and only 0.7 if everyone consumed like an Indian (Overshootday, 2019). The level of consumption in rich countries has become unsustainable from an environmental point of view.

Conventional marketing and marketing researchers probably play their part in the establishment and enrichment of this over-consumption situation. Therefore it is also important that marketers get involved and try to find tools to promote the adoption of more responsible and environmentally friendly consumption behaviors (White, Habib, & Hardisty, 2019). Many actions have been already developed. Many environmental campaigns have been launched, leading to an increase of environmental consciousness and of people taking actions to protect the

* Corresponding author.

E-mail addresses: maria.lagomarsino@unige.ch (M. Lagomarsino), linda.lemarie@audencia.com (L. Lemarié), michael.puntiroli@unine.ch (M. Puntiroli).

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environment. However, a segment of the population still seems to be resistant to the effect of these environmental campaigns. In a recent poll 30% of the U.S. population stated that economic growth should be given priority over the environment and 35% believed that the severity of global warming is generally exaggerated (Gallup poll, 2019).

The question we are asking in this research and trying to find an answer to is why, despite the proliferation of awareness campaigns and media coverage of the effects of climate change, a part of the population remains reluctant to adopt pro-environmental behaviors. We believe that a piece of the puzzle is still missing both in research and in practice. By focusing on message effectiveness amongst the general public, it is possible to overlook undesirable side effects experienced by specific segments. To answer the above-mentioned question, two elements must be highlighted: (1) which psychological characteristic best defines those who resist the adoption of pro-environmental behaviors and (2) which awareness messages prove to be effective or ineffective at persuading them.

With regard to individual characteristics, egoistic values have often been presented as contrary to the adoption of environmentally friendly behavior (de Groot and Steg, 2009; Aoyagi-Usui, Vinken, & Kuribayashi, 2003), because of the trade-off between personal benefits and short-term costs that is not in favor of the environment. The focus of our research will therefore be placed on this value.

With regard to the message and its effectiveness, currently, the majority of environmental messages stress the importance of avoiding the destruction of our planet (Chang, 2012). We suggest that such messages can be ineffective and even generate a boomerang effect when addressed to egoistic people. We formulate this suggestion based on previous literature, which shows that individuals feel motivated and engage in actions when they consider the effort related to these actions as worthwhile (Cryder, Loewenstein, & Scheines, 2013; Kuppuswamy & Bayus, 2017). It is therefore important to consider the values that individuals embrace in order to develop messages that can positively affect the perception of the significance of their environmental efforts.

We test our suggestion with three experiments and show that there is an interaction between the framing of the message and egoistic values which shapes respondents' willingness to protect the environment. For people with high egoistic values, prevention-focused messages – i.e. messages that focus on the possible destruction of our planet - increase the perception of exaggeration about the environmental crisis and lower the perceived worthiness of pro-environmental behaviors, thereby reducing their willingness to protect the environment.

The remainder of this paper is organized as follows. Section 2 reviews the literature on the relationship between egoistic values and pro-environmental behaviors, as well as on the communication strategies that can promote such environmental actions. It also provides evidence on the expected interaction between egoistic values and message framing. Section 3–5 present the three studies composing this research, their methodologies and results. Finally, Section 6 concludes by highlighting the managerial and policy implications of our results.

2. Conceptual framework

2.1. Egoistic values and pro-environmental behaviors

As already mentioned, despite all the available communication and campaigns stressing the urgency to take action for the environment, there are still people who have difficulties adopting pro-environmental behaviors. Personal values appear to be an interesting avenue to identifying these individuals (e.g., de Groot & Steg, 2007, 2009) and to understanding how to motivate them more effectively. Specifically, egoistic values have been presented as incompatible with the collective interest motivating pro-environmental behaviors and thus as an individual characteristic of the least pro-environmental people (Milfont & Gouveia, 2006; Moore & Loewenstein, 2004; Lindenberg & Steg, 2007). Highly egoistic individuals tend to primarily consider the personal

benefits that they can gain from a given situation and to have a self-centered view. Their goals in life revolve mainly around the attainment of personal wealth, power, success and achievement, which is to the detriment of collective goals and the community spirit (e.g., De Groot & Steg, 2007). This focus on self-enhancement reflects a general orientation toward seeking self-benefits (Schultz, 2001) and it has been shown that people whose character is shaped in such a way do not consider other people or other living things within their self-boundary (Schultz & Zelezny, 1999). This also means that individuals' values orientation shapes the cost-benefit calculations that individuals generally perform when determining their actions. Highly egoistic individuals consider how the costs and benefits of a desired action affects them personally before deciding what to do (Chong, Citrin, & Conley, 2001; De Groot & Steg, 2007; Ross, 2011). In the case of pro-environmental behaviors, the benefits are often long-term and collective. Short-term costs may therefore be perceived as outweighing the personal benefits to be gained and thus lead highly egoistic individuals to favor environmentally unfriendly behaviors (De Groot & Steg, 2006; Lu, Chang, & Chang, 2015).

There is no reason to believe that egoists have a particular aversion towards environmental issues, but rather that these issues are not currently framed in a way that is congruent with their values (De Groot & Steg, 2009; Stern, Dietz, Kalof, & Guagnano, 1995). Unfortunately, only a few studies have examined the effects of message framing on this specific segment of the population. Research mostly focuses on people with high biospheric values which characterize the most pro-environmental people. Thus, more research is needed to understand how to communicate with egoistic individuals and motivate them to adopt environmental actions.

2.2. Environmental communication and message frame

To understand how to communicate effectively with egoists and motivate them to adopt pro-environmental behaviors, we start by describing message framing theories and how they are used in the environmental domain. In the next section, we highlight the reasons why we expect that the frame that is commonly used in messages promoting environmental protection is not effective and even counterproductive for highly egoistic individuals.

Message framing theories describe how the effectiveness of a message may depend on what aspects are salient in the communication (Lee & Aaker, 2004; Levin, Schneider, & Gaeth, 1998; Rothman & Salovey, 1997). Among the different conceptual frameworks about message framing, in this study, we are particularly concerned with messages' regulatory focus (Higgins, 1997). By featuring different attributes, the same product or behavior may be seen as serving different goals. Messages promoting pro-environmental behaviors can focus on seeking positive outcomes such as working to build a better future for the environment or the avoidance of negative consequences such as the destruction of our planet. According to regulatory focus theory, these two frames reflect two types of message orientations, prevention and promotion, which can influence messages' persuasiveness (Higgins, 1997), and the ones that are the most effective are those that match individuals' focus orientations (Aaker and Lee, 2001, 2006; Avnet & Higgins, 2006).

Despite the fact that environmental protection can be framed in either way, the majority of news and campaigns tends to reflect a prevention focus orientation by alarming people about the threatening consequences of unsustainable lifestyles (Chang, 2012; Chang, Zhang, & Xie, 2015; Cheng, Woon, & Lynes, 2011). The idea behind this is to encourage people to become aware of the harmful impact they have on the environment, to highlight their responsibility for these negative outcomes and thus increase their willingness to adopt environmental behaviors (e.g., Markowitz & Shariff, 2012; Smith & Joffe, 2013; Verma, Chandra, & Kumar, 2019). In the next section, we cover why we hypothesize that messages that focus on prevention, but not on

promotion, are not aligned with egoistic values and are therefore ineffective at motivating this segment of population to adopt pro-environmental behaviors.

2.3. Egoistic values and message frame

Values guide individuals' behaviors and also affect how messages are perceived (e.g., Steg, Bolderdijk, Keizer, & Perlaviciute, 2014; De Groot, Steg, & Poortinga, 2013; Perlaviciute & Steg, 2014). While the literature has focused primarily on the effect of message framing on populations that are a priori most concerned with environmental issues (see Cheng et al., 2011 for a review), little is known about the effect of message framing on those who are less likely to adopt pro-environmental behaviors. Considering individuals' values, we believe the difference in messages' regulatory foci to be especially relevant to understanding (a) why current pro-environmental messages appear to be ineffective on highly egoistic individuals and (b) how to frame a message to successfully promote pro-environmental behaviors to them.

Several studies in the literature guide us in the formulation of our hypotheses. First, as mentioned above, the pursuit of power and personal achievement are key characteristics of egoistic individuals (Schwartz, 1992). In fact, the items measuring these two dimensions are central to assessing egoistic value (Steg, Perlaviciute, Van der Werff, & Lurvink, 2014; Steg, Dreijerink, & Abrahamse, 2005; Steg & Vlek, 2009). The "achievement" dimension focuses on what can be achieved whereas the "power" dimension focuses on the attainment of power (Schwartz, 1992). According to the goal-frame theory (Lindenberg, 2001), goals that are relevant to the individuals and are active in their mind "influence what persons think of at the moment, what information they are sensitive to, what action alternatives they perceive, and how they will act" (Lindenberg & Steg, 2007, p.119). Highly egoistic individuals should then be particularly sensitive to achievement-oriented information. Moreover, it has been demonstrated that the natural fit that is experienced when messages are aligned with individuals' goals increase messages' persuasiveness (Aaker and Lee, 2001, 2006; Avnet & Higgins, 2006). According to these studies, a message frame that highlights what can be achieved, rather than avoided, should speak more directly to egoists.

Second, it has been shown that a common link exists between egoism and dispositional greed (Batson et al., 1999), and between egoism, greed and entitlement (Krekels & Pandelaere, 2015). This link is interesting for two reasons. Krekels and Pandelaere (2015) explain that greedy individuals tend to (a) be unsatisfied with what they have, thereby potentially justifying an ever-present intention to achieve better outcomes, and (b) be overly confident that in the future they will have access to their desired resources. Since egoistic people share these tendencies, this literature also leads us to assume that environmental messages that are focused on promotion will be more effective than those that are focused on prevention on people with high egoistic values.

Third, according to Joireman, Van Lange, and Van Vugt (2004, p. 200), "an individual's propensity to act in a pro-environmental manner is based on the extent to which that individual's actions have consequences for things they value". In addition, egoists seem primarily concerned with enhancing their self-benefit (Schultz, 2001) and largely unconcerned about what is related to the collective. The self-concept of egoistic people does not extend beyond themselves as it does for non-egoistic people (Schultz, 2001). This means that collective concepts and concerns, such as the environment and the well-being of society, may not affect egoistic individuals because they do not feel concerned about such issues. Since they cannot fear losing that which they are not interested in, it seems reasonable to argue that preventive messages should be ineffective at influencing their behavior. However, this does not mean that egoistic people are unable to perceive the personal benefits that they can gain from an improvement in the collective situation. It can therefore be envisaged that they will positively receive a

message highlighting the individual benefits that they could gain from an overall improvement of the environment.

This point is further supported by self-construal theory, which states that individuals tend to construe the self either as independent or interdependent from others (Markus & Kitayama, 1991; Singelis, 1994). At an individual level, an independent self-view is characterized by a self-centered view of the world, whereas an interdependent self-view is construed in a sense of being part of a larger social context (e.g., Brewer & Gardner, 1996; Gardner, Gabriel, & Lee, 1999). Independent and interdependent self-construal underlays and reflects very different psychological goals (Heine, Lehman, Markus, & Kitayama, 1999; Gardner et al., 1999). Interestingly, a strong independent view of self reflects high egoistic values and self-interest goals (Schultz & Zelezny, 2003) and many studies observed that messages with a promotion focused orientation are more persuasive for those who have strong independent self-views rather than messages with a prevention focused orientation (e.g., Lee, Aaker, & Gardner, 2000). These three points lead us to the hypothesis that messages that are focused on prevention, unlike messages focused on promotion, are ineffective on individuals who hold high egoistic values.

H1. Egoistic values moderate the effect of regulatory focused message on intention to adopt pro-environmental behaviors. When exposed to prevention-focused messages (vs. promotion-focused), individuals with high egoistic values have a lower (higher) intention to adopt pro-environmental behaviors than individuals with low egoistic values.

Exploring the mechanism behind the interaction between egoistic values and message framing, we consider the perceived effort worthiness as a mediator. According to De Groot and Steg (2009, p.62), values "influence behavioral beliefs and thus which aspects are considered in a given situation". We expect the message framing to influence how individuals with high egoistic values perceive the costs and benefits of the goal that is promoted and, accordingly, make different judgments regarding the value of taking action to benefit the environment. We further hypothesize that the negative effect of prevention-focused messages for egoists is attributable to a defense mechanism. As the benefits highlighted in prevention-focused messages do not align with egoists' values, they are keen to deny the message and thus claim these efforts not worthy. In the next section, we provide theoretical support for our hypotheses on the underlying psychological mechanism.

2.4. The underlying psychological mechanism

We expect perceived effort worthiness to mediate the effect of message framing on the intention to adopt pro-environmental behaviors. This construct is built on self-efficacy as the belief in one's ability to perform the action (Bandura, 1977). However, for an individual to act, he/she must not only perceive that he is capable of acting, but also that there is worth in doing so. For example, with regard to recycling, people may feel that they can sort their waste and dispose of it in appropriate recycling bins. However, they may or may not perceive that their effort makes a real contribution towards reducing climate change.

The literature has identified a personal sense of impact as a necessary motivation for making prosocial actions (Cryder et al., 2013). The extent to which an action is perceived to be worthwhile has been found to predict engagement in behaviors (Cryder et al., 2013; Kuppaswamy & Bayus, 2017). For example, Kuppaswamy and Bayus (2017) found that crowdfunding contributions increase when approaching the target goal, because at that point, donors are more likely to perceive that their contribution will make an impact. In the crowdfunding platform that is used for the study, projects are funded only if the target goal is reached. Moreover, in an experiment conducted by Cryder et al. (2013), the authors manipulated the information that is provided by the charity fundraising material and found that details promoting a sense of impact increased donation intentions compared to general and low-impact information.

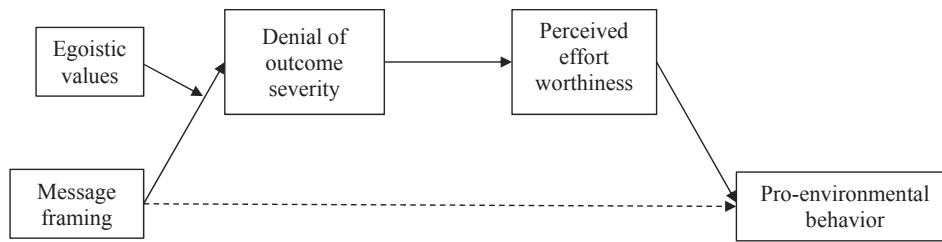


Fig. 1. Conceptual framework.

Evidence that communication strategies, and specifically message framing, can affect individuals' perceived effort worthiness in the environmental domain can be found in the article by Van de Velde, Verbeke, Popp, and Van Huylenbroeck (2010). In their study, the authors randomly distributed a promotion or prevention-focused message supporting the use of biofuels as an alternative environmentally friendly energy source. After reading the message, respondents assessed the perceived effectiveness of the message and perceived consumer effectiveness in helping the environment by using biofuels. They found that the promotion-focused message significantly increased the perceived consumer effectiveness. However, they did not measure whether the effect actually influences behavior.

As mentioned in the previous paragraph, the perceived prospective costs and benefits of an action determine whether the action is worth taking (i.e., marketing pricing: Fiske, 1992). The literature shows that message framing alters the attention that individuals pay to information and the resulting understanding before making their decisions (Aaker and Lee, 2001, 2006; Freitas, Liberman, & Higgins, 2002; Zhao & Pechmann, 2007). Prevention-focused messages, emphasizing the costs of not taking action, direct one's attention to the cost side of the costs-benefits calculation, leading individuals to attribute greater importance to this aspect. Instead, promotion-focused messages, emphasizing the benefits that the target action carries, may steer individuals' attention away from over-focusing on the costs.

However, as described in the previous section, individuals' values can shape how message frames are processed. We therefore expect that the interactive effect of message framing and values on intentions to behave pro-environmentally will be mediated by how worthy people consider the pro-environmental effort to be. For individuals with high egoistic values, we believe that prevention-focused messages decrease the perceived effort worthiness of acting pro-environmentally because they reinforce the attention on the personal costs of eco-friendly choices without counterbalancing these costs with the appropriate benefits.

H2. Perceived effort worthiness mediates the effect of the interaction between egoistic values and regulatory focus messages on pro-environmental behaviors. Specifically, when exposed to prevention-focused messages, individuals with high egoistic values perceive a lower sense of effort worthiness than individuals with low egoistic values. This lower sense of effort worthiness in turn decreases pro-environmental behaviors. For promotion-focused messages, egoistic values do not affect the perceived sense of effort worthiness.

We further propose, that egoistic people activate a defensive mechanism when facing environmental prevention-oriented messages, which accentuates even further the hypothesized detrimental effect of such messages for this segment of the population. Indeed, it has been shown that individuals exposed to messages that may challenge the perception of themselves as "adaptively and morally adequate" (Steele, 1988, p. 262) may develop defensive reactions such as denial (Van't Riet & Ruiter (2013)). By denying the veracity of the message, individuals can continue to perpetrate a negative behavior without affecting their self-view or questioning their morality. According to self-affirmation theory (Steele, 1988), the desire to maintain the perceived worth and integrity of the self is an overriding desire that drive

individuals to defend themselves when they perceive their self-view to be threatened.

Prevention-focused environmental messages point out behaviors that are bad for the environment, and therefore emphasize human mistakes that have been made. These messages can be perceived as a threat to one's integrity and morality, and may cause the individual to adopt a "defensive response" (Sherman & Cohen, 2002). We believe that this effect will be particularly true for egoistic people because they generally hold a highly positive view of themselves and their values (Robins & John, 1997) and often adopt anti-environmental behaviors (De Groot & Steg, 2006; Lu et al., 2015). Denying the veracity of an environmental message, for instance by perceiving the environmental crisis as greatly exaggerated, would allow egoists to avoid negative self-evaluative emotions and to maintain their self-view, without having to adopt environmentally friendly behaviors that are perceived as costly. The whole model is illustrated in Fig. 1.

H3. When exposed to prevention-focused messages, individuals with high egoistic values will be more likely to activate a defensive mechanism, i.e., denying the severity of the threat to the environment, than individuals with low egoistic values, and this negatively affects perceived effort worthiness and the adoption of pro-environmental behaviors.

3. Study 1

3.1. Methodology

The data for this study were collected between April and June 2018 as part of the Swiss Survey of Household Energy Demand (SHEDS, 2018). This survey is conducted annually among 5000 respondents¹. Of these respondents, two hundred and eighty-one ($M_{\text{age}} = 48$, $SD = 14.89$; 54.8% of men) were randomly selected and assigned to one of our two conditions. The participants were recruited via a panel provider and paid according to the country's wage standards. The survey is available in three languages and the respondents could choose among the French, English or German version of the survey.

The main part of the survey includes a short version of the values scale that was developed by Schwartz (1992, and adapted by Steg et al., 2014; 16 items; each value is measured by four items that were averaged for the analyses). We measured the four values, i.e., *egoistic* values (Cronbach's $\alpha = 0.79$), *hedonic* values (Cronbach's $\alpha = 0.78$), *altruistic* values (Cronbach's $\alpha = 0.76$) and *biospheric* values (Cronbach's $\alpha = 0.88$), to evaluate the effect of our manipulation for each value and isolate the main effects on egoistic values.

The second part of the survey is devoted to the experiments. We

¹ "The Swiss Household Energy Demand Survey (SHEDS) has been developed as part of the research agenda of the Competence Center for Research in Energy, Society, and Transition (SCCER CREST). It is designed to collect a comprehensive description of the Swiss households' energy-related behaviors", specifically in the fields of heating, electricity, and mobility (SCCER CREST, <https://www.sccer-crest.ch/research/swiss-household-energy-demand-survey-sheds/>, 2018).

manipulated the message framing using feedback because it is becoming increasingly popular, it has been suggested as an effective instrument (White et al., 2019) and because the messages that are received in a salient moment are more effective than the messages that are read when the concerned behavior is less salient (Chaiken & Eagly, 1983; Petty & Cacioppo, 1986).

In this section, we invited our subset of respondents to calculate their mobility footprint by answering five questions: (1) How many kilometers do you travel in total by car, either as a driver or as a passenger, during your working week, i.e., Monday-Friday (Car and Electric car); (2) How many kilometers do you travel in total by car, either as a driver or as a passenger, during your weekend (Car and Electric car); (3) How many kilometers do you travel in total using other means of transportation during your working week, i.e., Monday-Friday (Bike, scooter, bus, and train); (4) How many kilometers do you travel in total using other means of transportation during your weekend (Bike, scooter, bus, and train); and (5) How many hours did you fly by airplane last year. The answer options were adjusted according to the Swiss statistics (Federal Statistical Office FSO, 2017) and the average CO₂ emissions of each answer was computed.² They then received feedback, which was framed according to their condition.

The respondents were randomly exposed to a prevention or a promotion-focused feedback regarding their annual mobility footprint. The feedback had three main components (see Appendix A for the whole text). First, the respondents were provided with their annual mobility footprint in tons of CO₂ emissions. Then, a text with a prevention (versus promotion) focus regarding the importance of taking action followed. In the prevention condition, the text emphasized how the environment is changing for the worse, and that individuals must take action if they do not want to destroy the planet. The emphasis was therefore placed on a sense of responsibility, which characterizes a prevention focus (Higgins, 1997). In the promotion condition, instead, the text highlighted how the environment can be saved, and that individuals must take action to save the future of our planet. The emphasis here was placed on a sense of accomplishment and hope (Higgins, 1997). A picture concluded the message.

As a dependent variable, the respondents assessed how much they would be willing to pay to encourage the development of green infrastructure on a 5-point scale ranging from 0% to 0.8% of the rental value of their home (tax per unit). We used the percentage of the rental value of their property as a basis for the calculation because it avoids the potential effects of income levels and it is a value that all Swiss people know (either because they pay rent or because it is required for income tax purposes). Next, the respondents answered two questions that assess the perceived effort worthiness, specifically, how strongly they believed that paying the tax could make a difference/be valuable with regards to helping the environment ($r = 0.82$, $p < .001$, adapted from Cryder et al., 2013). Finally, to check that the manipulation worked as expected, the respondents indicated whether the feedback they received was oriented toward preventing something negative/achieving something positive(r) (Mogilner, Aaker, & Pennington, 2007). For the analysis, we reversed the achieving something positive (r) item and then we averaged the two items. The perceived effort worthiness and the manipulation check were measured on a 7-point Likert scale (0 = Not at all; 6 = Very much).

3.2. Results

Egoistic values and mobility footprint. First, we ran a series of tests that confirmed that our manipulations were successful (see web appendix for more details). Then, according to the literature, egoistic values have a negative correlation with pro-environmental behaviors, and

environmental motives indeed often contradict personal interests (De Groot & Steg, 2007; Kim, 2011; Lu et al., 2015). Therefore, we tested whether this finding was observable regarding mobility-related behaviors. We assess the correlation between respondents' values and their mobility footprint. Egoistic values ($r = 0.21$, $p = .001$) were positively and significantly correlated with the mobility footprint, meaning that they make less eco-friendly and more polluting choices for transportation. Hedonic values ($r = -0.004$, $p = .950$) were not significantly correlated with the mobility footprint. Altruistic ($r = -0.12$, $p = .044$) and biospheric values ($r = -0.18$, $p = .002$) were negatively and significantly correlated with the mobility footprint.

Willingness to pay. We ran an analysis of variance (ANOVA) to examine the direct effect of the feedback framing, the values and their interaction on the willingness to pay for the development of green infrastructure (H1) (for the full description of the results see the web appendix). There was no main effect of the feedback framing ($F(1, 280) = 1.21$, $p = .272$) and egoistic values ($F(1, 280) = 0.70$, $p = .521$) on the willingness to pay. Additionally, there was a significant two-way interaction between the feedback framing and egoistic values ($F(1, 280) = 6.08$, $p = .014$).

To further explore this significant interaction, we examined the slopes of the egoistic values for each type of feedback framing. The slope of the egoistic values on the willingness to pay was not significant in the promotion condition ($\beta = 0.06$, $t(139) = 0.42$, $p = .673$), while it was significant and negative in the prevention condition ($\beta = -0.43$, $t(138) = -2.80$, $p = .006$). Next, we applied the Johnson-Neyman procedure to identify the regions with significant effects of the message framing on the willingness to pay across different levels of egoistic values (Spiller, Fitzsimons, Lynch, & McClelland, 2013) by running a moderation analysis with Process MACRO model 1. We focused on the prevention condition, given our finding that egoistic values did not affect the willingness to pay in the promotion condition. The floodlight analysis showed that for low levels of egoism (Johnson-Neyman significant region; 1.42), the prevention-focused message significantly increased the willingness to pay ($\beta = 0.60$, $p = .050$, 95% CI [0.00, 1.21]), but for high levels of egoism (Johnson-Neyman significant region; 3.90), the prevention-focused message decreased the willingness to pay ($\beta = -0.61$, $p = .050$, 95% CI [-1.22, -0.00]). We expected this significant interaction to be mediated by perceived effort worthiness, and so we next explore this hypothesis (H2).

Egoistic values and perceived effort worthiness. To test our hypothesis regarding the role of egoistic values in perceiving the message framing, we ran an ANOVA with the message framing, the values and their interaction on perceived effort worthiness (H2) (for the full description of the results see the web appendix). The main effect of the message framing was not significant ($F(1, 280) = 0.99$, $p = .321$). Egoistic ($F(1, 280) = 0.16$, $p = .724$) did not have a significant main effect. However, as expected, there was a significant two-way interaction between the message framing and egoistic values ($F(1, 280) = 6.96$, $p = .009$).

To further investigate this significant interaction, we tested the moderated mediation model using the PROCESS Macro Model 7 by Hayes (2018), with 10,000 bootstrap samples for bias correction and a 95% confidence interval. We tested message framing (promotion = 0 and prevention = 1) as independent variable, egoistic values as moderator variable, perceive effort worthiness as mediation variable and willingness to pay as dependent variable. The direct effect of message framing on perceived effort worthiness was significant, such as that the prevention focused message significantly increased respondents' perceived effort worthiness ($\beta = 1.48$, $SE = 0.75$, $p = .049$, 95% CI [0.01, 2.95]). These results show that, globally, respondents exposed to the prevention-focused message perceived pro-environmental action of higher value than those exposed to the promotion-focused message. The direct effect of egoistic values marginally significantly increased respondents' perceived effort worthiness ($\beta = 0.34$, $SE = 0.19$, $p = .065$, 95% CI [-0.02, 0.72]). As expected, the interaction between message framing and egoistic values was significant ($\beta = -0.72$, $SE = 0.27$,

² Henkel and KGaA (2018). Footprint calculator. Wuppertal Institut für Klima, Umwelt, Energie. <https://footprintcalculator.henkel.com/en>.

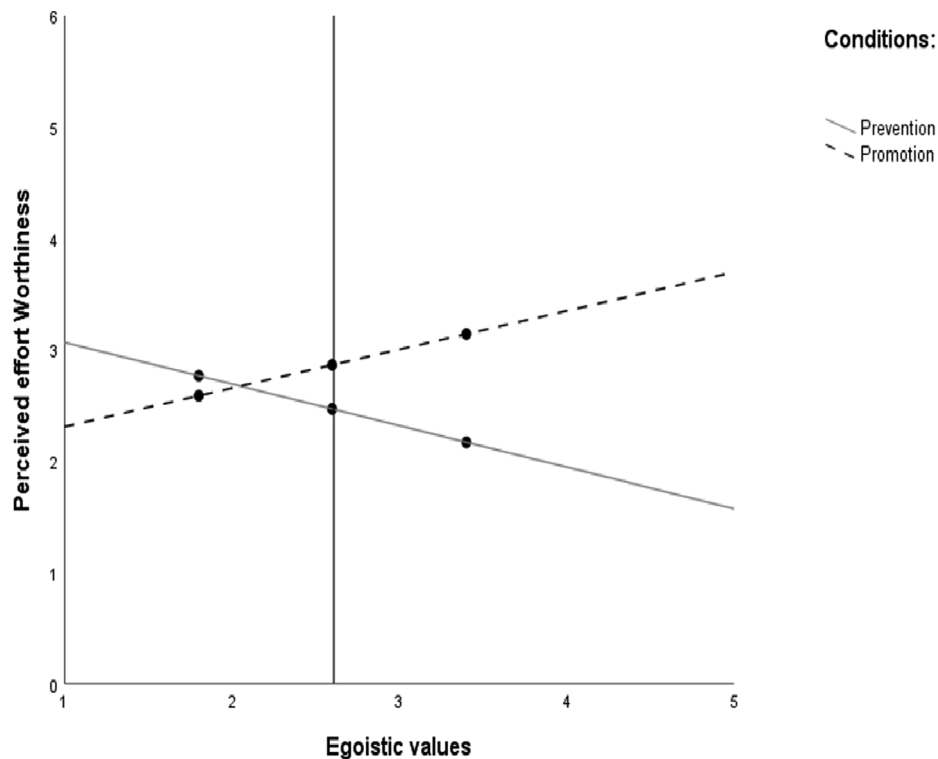


Fig. 2. Moderating effect of egoistic values on the effect of the message framing on perceived effort worthiness; Study 1.

$p = .008$, 95% CI $[-1.25, -0.19]$). Specifically, at low levels of *egoistic* values ($-1SD = 1.8$), prevention-focused message had not significant effect on *perceived effort worthiness* ($p = .561$). At high levels of *egoistic* values ($+1SD = 3.4$), prevention-focused message had a significant and negative effect on *perceived effort worthiness* ($\beta = -0.97$, $SE = .29$, $p < .001$, and 95% CI $[-1.54, -0.41]$). Next, we applied the Johnson-Neyman procedure to identify the regions with significant effects of the *message framing* on *perceived effort worthiness* across different levels of *egoistic* values (Spiller et al., 2013). We found that prevention-focused messages significantly decrease the *perceived effort worthiness* at and above 2.61 on the *egoistic* values scale ($\beta = -0.41$, $p = .050$, and 95% CI $[-0.81, -0.00]$). We found that promotion-focused messages significantly increase the *perceived effort worthiness* at and above 2.61 on the *egoistic* values scale ($\beta = 0.41$, $p = .050$, and 95% CI $[0.00, 0.81]$). Below the level of 2.61 on the *egoistic* values scale, the effect of *message framing* on perceived effort worthiness was not significant (Fig. 2).

Finally, the direct effect of *message framing* was not significant ($p = .362$) and *perceived effort worthiness* significantly increased *willingness to pay* ($\beta = 0.30$, $SE = 0.04$, $p < .001$, 95% CI $[0.22, 0.39]$). The indirect effect of *message framing* through *perceived effort worthiness* (mediation variable) was significant and negative for high levels of *egoistic* values ($+1SD = 3.4$) given that the confidence interval did not include zero ($\beta_{\text{high}} = -0.29$; 95% CI $[-0.49, -0.12]$). It was not significant for medium (median = 2.6) and low levels of *egoistic* values ($-1SD = 1.8$) given that their confidence intervals included zero ($\beta_{\text{medium}} = -0.12$; 95% CI $[-0.24, 0.00]$; $\beta_{\text{low}} = 0.05$; 95% CI $[-0.14, 0.26]$).

3.3. Discussion

First, in line with previous literature, the results confirm the existence of a negative relationship between egoistic values and the adoption of pro-environmental behaviors. We observed a positive relationship between egoistic values and the ecological footprint score which shows that individuals with high egoistic values make less sustainable choices and pollute more than individuals with low egoistic

values.

Second, we found that people with high egoistic values react differently to environmental messages than the rest of the population as a whole. We observed that the messages, depending on their framing, had a different influence on the willingness of egoistic people to support environmental policies. Specifically, respondents with high egoistic values were more willing to pay a tax for the development of green infrastructure when the message was focused on promotion rather than when it was focused on prevention (H1).

Finally, we provided evidence that the way in which egoistic people interpret messages affects their perception of the worthiness of a given effort and that this perception influences their willingness to invest in the environmental domain. For very egoistic people, prevention-focused messages are ineffective at promoting pro-environmental behavior, and can significantly reduce the perceived value that is associated with behavioral effort (H2).



4. Study 2

The purpose of Study 2, in addition to replicating the results of Study 1 in a different context, is to further investigate the underlying mechanism that drives highly egoistic people to respond unfavorably to prevention-focused messages. More specifically, we expect that egoistic people exposed to prevention-focused messages will be more inclined to deny the veracity of the environmental message, by perceiving the environmental crisis as greatly exaggerated, which in turn will negatively affect the perceived worthiness of the effort and thus their intention to act environmentally friendly (H3).

4.1. Methodology

This study included a sample of 417 US respondents (55.4% men; $M_{\text{age}} = 38$, $SD = 11.88$) recruited from a US-based online pool (MTurk). The main structure of the survey was identical to Study 1; however, in this survey, the context was different as respondents were exposed to an environmental campaign designed to reduce single-use plastics.

Table 1
Pictures adopted in the manipulation for Study 2.

Conditions	
Prevention-focused	Promotion-focused
	
<p>9 MILLION TONS OF PLASTIC WASTE END UP IN THE OCEAN EVERY YEAR.</p> <p>LET'S PREVENT THE OCEANS FROM BECOMING EVEN MORE FILLED WITH PLASTIC, REDUCE SINGLE-USE PLASTIC IN YOUR DAILY LIFE.</p> <p>BEFORE IT'S TOO LATE. BEGIN YOUR PLEDGE.</p>	<p>9 MILLION TONS OF PLASTIC WASTE END UP IN THE OCEAN EVERY YEAR.</p> <p>LET'S WORK TO KEEP THE OCEANS CLEAN AND PLASTIC-FREE, INCREASE THE USE OF PLASTIC-FREE ALTERNATIVES IN YOUR DAILY LIFE.</p> <p>DRIVE THE CHANGE NOW. BEGIN YOUR PLEDGE.</p>

*Inspired by <https://www.nationalgeographic.com/environment/plasticpledge/>.

We first included a few demographic questions to verify US citizenship and measure values (same scale as Study 1; *egoistic* values (Cronbach's $\alpha = 0.82$), *hedonic* values (Cronbach's $\alpha = 0.83$), *altruistic* values (Cronbach's $\alpha = 0.87$) and *biospheric* values (Cronbach's $\alpha = 0.94$)). We then introduced our cover story by asking respondents to give their impressions and comments about a new environmental campaign. Then, respondents were randomly assigned to one of the two conditions (*message framing*: prevention vs. promotion) and exposed to an advertising message encouraging individuals to take a pledge to reduce single-use plastics (see [table 1](#)). The [UN environment \(2019\)](#) highlights that reducing plastic pollution of the oceans is a priority issue on which single-use plastics have a major impact. Shortly after, they were asked to assess their likelihood of taking the plastic pledge on a 7-point Likert scale, as [De Groot and Steg \(2009\)](#) suggest that self-commitment can be an effective means to change behavior. We measured respondents' perception of effort worthiness by adapting the two items used in Study 1, specifically we asked, how strongly they believed that taking the pledge *could make a difference/be valuable with regards to helping the environment* ($r = 0.86$, $p < .001$, adapted from [Cryder et al., 2013](#)). Then, to measure the message denial we asked to what extent they believe that the "ecological crisis" has been greatly exaggerated on a 5-point Likert scale ([Dunlap, Van Liere, Mertig, & Jones, 2000](#)).

We pre-tested the stimuli with an online survey (Mturk; $N = 191$; 55.5% men; $M_{age} = 35$, $SD = 9.85$). Respondents were randomly submitted either to the promotion- or prevention-focused message, and then they were asked to rate the message credibility on 10 items ([Beltramini, 1982; 1988; Chang, 2011](#); 7-point, bipolar scale $\alpha = 0.95$). Subsequently they answered the same manipulation check as in Study 1 asking how much they thought that the message was oriented toward *preventing something negative/achieving something positive*(r) ([Mogilner et al., 2007](#); on a 7-point Likert scale). We also controlled for self-construal, as it could have been a confounding variable in explaining the main effect of our messages. As described in our theoretical framework, the literature highlights a compatibility between message framing and self-construal ([Aaker & Lee, 2001; Kareklas, Carlson, & Muehling, 2012; Lee et al., 2000](#)). Therefore, it is important to verify

that we exclusively manipulated regulatory focus and not self-construal in our conditions. We measured independent and interdependent self-view with 6 items, three of which asked whether the message was priming an independent self-view (e.g., While you were reading the ad, please describe the extent to which you thought just about yourself) and the other three asked whether the message was priming a dependent self-view ([Aaker & Lee, 2001](#); on a 7-point Likert scale; Independent subscale: $\alpha = 0.95$; Interdependent subscale: $\alpha = 0.95$). With a series of tests, we confirmed that our manipulation was successful. Respondents considered the two messages as similarly believable and our manipulation did not prime self-construal (see [web appendix](#) for more details).

4.2. Results

Intention to take a pledge to reduce single-use plastics. We ran an analysis of variance (ANOVA) to examine the direct effect of the *ad framing*, the *values* and their interaction on *intention to reduce single-use plastics* (H1) (for the full description of the results see the [web appendix](#)). There was no main effect of the *ad framing* ($F(1, 407) = 0.26$, $p = .873$) on *intention to reduce single-use plastics*. However, *egoistic* values had a positive marginal significant main effect on *intention to reduce single-use plastics* ($F(1, 407) = 2.98$, $p = .08$). Additionally, there was a marginally significant two-way interaction between *ad framing* and *egoistic* values ($F(1, 407) = 3.00$, $p = .084$) on *intention to reduce single-use plastics*.

To further explore this significant interaction, we examined the slopes of *egoistic* values for each type of *ad framing*. The slope of *egoistic* values on *intention to reduce single-use plastics* was not significant in the prevention condition ($\beta = 0.20$, $t(209) = 1.45$, $p = .147$), while it was significant and positive in the promotion condition ($\beta = 0.43$, $t(204) = 3.05$, $p = .003$).

As mentioned in the introduction of the study, we suggest that individuals with high *egoistic* values, exposed to prevention-focused messages may activate a defense mechanism and deny the veracity of the message by perceiving the environmental crisis as greatly exaggerated (*denial of outcome severity*), which in turn decreases the

perceived value of the effort and thus the intention to take action. Therefore, we next explore the validity of this suggested mechanism.

Egoistic values, defense mechanism and perceived effort worthiness. To test our hypothesis regarding the role of *egoistic* values in perceiving the *ad framing*, we ran an ANOVA with *ad framing*, values and their interaction on *denial of outcome severity* (for the full description of the results see the [web appendix](#)). The main effect of *ad framing* on *denial of outcome severity* was not significant ($F(1, 407) = 0.25, p = .617$). *Egoistic* values ($F(1, 407) = 31.93, p < .001$) had positive significant main effects on *denial of outcome severity*. Moreover, as expected, there was a significant two-way interaction between *ad framing* and *egoistic* values on *denial of outcome severity* ($F(1, 407) = 13.498, p < .001$).

To further investigate this significant interaction, we tested the moderated multi-step mediation model using the PROCESS Macro Model 83 by Hayes (2018), with 10,000 bootstrap samples for bias correction and a 95% confidence interval. We included in the model *ad framing* (promotion = 0 and prevention = 1) as independent variable, *egoistic values* as moderator variable, *denial of outcome severity* and *perceived effort worthiness* as mediation variables, and *intention to reduce single-use plastics* as dependent variable. The direct effect of *ad framing* on *denial of outcome severity* was significant. The prevention-focused message significantly decreased respondents' *denial of outcome severity* ($\beta = -0.81, SE = 0.38, p = .034, 95\% CI [-1.55, -0.06]$). These results show that, globally, respondents exposed to the prevention-focused message perceived the environmental situation as significantly less exaggerated than those exposed to the promotion-focused message. The direct effect of *egoistic* values was not significant ($p = .496$). However, as expected, the interaction between *ad framing* and *egoistic* values was significant ($\beta = 0.42, SE = 0.13, p = .001, 95\% CI [0.17, 0.68]$). Specifically, at low levels of *egoistic* values ($-1SD = 1.8$), prevention-focused message had no significant effect on *denial of outcome severity* ($p = .801$). At high levels of *egoistic* values ($+1SD = 3.6$), prevention-focused message had a significant and positive effect on *denial of outcome severity* ($\beta = 0.72, p < .001, 95\% CI [0.41, 1.04]$). The Johnson-Neyman procedure to identify the regions with significant effects showed that prevention-focused messages significantly increase *denial of outcome severity* for respondents that have a score of 2.46 or above on the *egoistic* values scale ($\beta = 0.24, p = .050, 95\% CI [-0.81, -0.00]$). Below this level of 2.46 on the *egoistic* values scale, the effect of *ad framing* on *denial of outcome severity* was not significant (fig. 3 on the [web appendix](#)). Moreover, *ad framing* had no significant direct effect on *perceived effort worthiness* ($p = .593$) but *denial of outcome severity* significantly decreased *perceived effort worthiness* ($\beta = -0.38, SE = 0.07, p < .001, 95\% CI [-0.51, -0.25]$). Finally, the direct effect of *ad framing* was not significant ($p = .126$), *denial of outcome severity* significantly decreased ($\beta = -0.13, SE = 0.06, p = .017, 95\% CI [-0.24, -0.02]$) and *perceived effort worthiness* significantly increased intention to reduce single-use plastics ($\beta = 0.65, SE = 0.04, p < .001, 95\% CI [0.57, 0.72]$).

The indirect effect of *ad framing* through *denial of outcome severity* and *perceived effort worthiness* (mediation variables) on *intention to reduce single-use plastics* was significant for medium (median = 2.6) and high levels of *egoistic* values ($+1SD = 3.6$) given that their confidence intervals did not include zero ($\beta_{\text{medium}} = -0.07; 95\% CI [-0.15, -0.02]$; $\beta_{\text{high}} = -0.18; 95\% CI [-0.31, -0.07]$). It was not significant for low levels of *egoistic* values ($-1SD = 1.8$) given that the confidence interval included zero ($\beta_{\text{low}} = 0.01; 95\% CI [-0.08, 0.09]$).

4.3. Discussion

Study 2 replicates the results of Study 1, finding that *egoistic* values moderate the effect of the message frame on motivating pro-environmental behaviors (H1). To strengthen the generalizability of our results, in Study 2, we changed the environmental context as well as our dependent variable. We kept the focus on environmental protection, but this time we investigated the effectiveness of a campaign to eliminate

single-use plastics and thus reduce ocean pollution, one of the top priorities of UN Environment (UN environment, 2019). Moreover, instead of asking respondents their willingness to pay a tax to compensate their pollution, as we did in Study 1, we asked them to take action by reducing single-use plastics. We found that respondents with high *egoistic* values were more willing to take a pledge to reduce single-use plastics when the message was focused on promotion rather than when it was focused on prevention. These results confirm once again that when communicating with *egoistic* individuals it is highly preferable to use environmental messages with a promotion frame. In fact, while Study 1 emphasized the detrimental aspect of employing a prevention-frame, both studies emphasize that it is a safer option to adopt promotion-focused environmental messages if persuasion is to be attained.

Moreover, in this study, we made a step forward in understanding the mechanism behind the identified effect. We observed that respondents with high *egoistic* values exposed to prevention-focused messages judged the environmental situation as more exaggerated than those exposed to promotion-focused messages, which decreased the value they attributed to the effort required and, in turn, decreased their intention to take any action toward the environment (H2). Thus, for highly *egoistic* respondents, prevention-focused messages were not only ineffective but were counterproductive.

These results offer additional evidence supporting our hypothesis that *egoistic* values are incompatible with prevention-focused messages. To strengthen further our results we run a third study in which we isolated the effect of *egoistic* values by manipulating them.

5. Study 3

Study 3 aims at providing additional evidence for the validity of our model. Specifically, we use the same context as in Study 2, addressing ocean pollution and the environmental impact of using single-use plastics, but instead of measuring *egoistic* values we manipulated these with a writing task.

While it is thought that each person has a stable value hierarchy (Schwartz, 1992), the literature offers numerous examples of values being activated or enhanced in given contexts (Bullock, Johnson, & Southwell, 2017; Hahnel, Ortmann, Korcaj, & Spada, 2014; Verplanken & Holland, 2002). These studies suggest that situational primes can activate values and help overcome an individual's pre-existing value hierarchy. In other words, by making values more salient (central) for individuals, the stimuli affects the way individuals prioritize their values and therefore the extent to which values influence beliefs, intentions and behaviors. This means that priming a specific value tends to induce behaviors that are consistent with the activated value.

5.1. Methodology

This study included a sample of 542 US respondents (48.9% men; $M_{\text{age}} = 35, SD = 10.55$) recruited from a US-based online pool (MTurk). We presented this survey as a series of two unrelated studies, we explicitly separated them and we changed the font between the two sections to make it more credible. In the first part of the survey, we had a writing task to manipulate *egoistic* values. The second part was almost identical to Study 2.

First, respondents were randomly assigned to one of the two writing task conditions (values activation: *egoistic* values vs. control). We asked respondents to write about different aspects of their life and encouraged them to share all the examples and specific memories that come to their mind. To manipulate *egoistic* values, we made respondents write about each of the five distinct *egoistic* values (ambitious, influential, social power, authority, wealth; Schwartz, 1992; Steg et al., 2014). For example, the first input was “**Talk about your aspirations and ambitions: What do you dream about? What are your goals for this new year? What would you like to achieve?**”. In the control condition, we asked neutral questions about their life -e.g., describe their everyday life- (see

Appendix B for the whole writing task description).

For the second part of the survey, as in Study 2, we asked respondents to give their impressions and comments about a new environmental campaign about ocean pollution and single-use plastics danger. Respondents were randomly assigned to one of the two conditions (*message framing*: prevention vs. promotion; adapted from Study 2). Shortly after, they were asked to assess their likelihood to support the cause and recommend it to others on a 7-point Likert scale. As for Study 1 & 2, we measured respondents' perception of effort worthiness by asking how strongly they believed that contributing to the cause could make a difference/be valuable with regards to helping the environment ($r = 0.80$, $p < .001$, adapted from Cryder et al., 2013). Then, to measure the message denial (same as Study 2) we asked to what extent they believe that the "ecological crisis" has been greatly exaggerated on a 5-point Likert scale (Dunlap et al., 2000). We added two questions to control whether the two conditions also manipulated (1) social norms and (2) feeling overwhelmed by the environmental situation. We asked respondents (1) how many people they think would contribute to the cause (1 = No one, 7 = Everyone) and (2) to what extent they agree with the statement: "I feel overwhelmed when I think about the environmental situation" (1 = Strongly disagree, 7 = Strongly agree). Moreover, as we slightly changed the text of the manipulation to broaden the scope of the campaign, we added two questions to control message clarity. We measured to what extent they thought that the message was clear and believable on a 7-point Likert scale. Finally, we included a few demographic questions.

We pre-tested the egoistic values-activation writing task with an online survey (Prolific Academic; $N = 307$; 28% men; $M_{age} = 36$, $SD = 11.66$). Respondents were randomly submitted either to the egoistic values-activation or the control condition. Then, as a manipulation check, we asked to what extent the writing made them think that *they are a person of worth/their point of view is important* (2 items: 7-point; $r = 0.80$, $p < .001$). We also controlled for mood, as the two writing tasks could elicit a different mood and thus confound the results. Respondents self-reported how they felt after the writing task (1 = Extremely bad; 5 = Extremely good). The results suggest that the manipulation was successful and we can discard mood as confounding variable (see web appendix for more details).

5.2. Results

Preliminary analyses. First, we ran an independent *t*-test to control whether the two conditions manipulated social norms. The difference between the two conditions was not significant ($M_{prevention} = 4.25$, $M_{promotion} = 4.30$; $t(540) = 0.45$, $p = .652$, two-tailed). Second, we ran an independent *t*-test to control whether the two conditions manipulated feeling overwhelmed by the environmental situation. The difference between the two conditions was not significant ($M_{prevention} = 4.43$, $M_{promotion} = 4.63$; $t(540) = -1.23$, $p = .218$, two-tailed). Additionally, we ran an analysis of variance (ANOVA) with *ad framing*, *egoistic condition* and their interaction on feeling overwhelmed by the environmental situation. Neither the two main effects nor the interaction effect on feeling overwhelmed were significant (NS). Third, we ran an independent *t*-test to assess whether both manipulations were clear and believable. The differences between the two conditions were not significant (clear: $M_{prevention} = 5.82$, $M_{promotion} = 5.83$; $t(540) = -0.09$, $p = .929$, two-tailed; believable: $M_{prevention} = 5.54$, $M_{promotion} = 5.66$; $t(540) = 1.01$, $p = .310$, two-tailed).

Egoistic condition, defense mechanism and perceived effort worthiness. To test our hypothesis regarding the role of *egoistic values* on the effect of *ad framing*, first, we ran an analysis of variance (ANOVA) with *ad framing*, *egoistic condition* and their interaction on *denial of outcome severity*. The main effect of *ad framing* ($F(1, 541) = 1.12$, $p = .290$) and *egoistic condition* ($F(1, 541) = 0.07$, $p = .785$) on *denial of outcome severity* were not significant. However, as expected, there was a significant two-way interaction between *ad framing* and *egoistic condition*

($F(1, 541) = 4.95$, $p = .026$) on *denial of outcome severity*.

To investigate further this significant interaction, we tested the moderated multi-step mediation model using the PROCESS Macro Model 83 by Hayes (2018), with 10,000 bootstrap samples for bias correction and a 95% confidence interval. We tested *ad framing* (promotion = 0 and prevention = 1) as independent variable, *egoistic condition* as moderator variable, *denial of outcome severity* and *perceived effort worthiness* as mediation variables, and *intention to support the cause* as dependent variable. The direct effect of *ad framing* ($p = .393$) and *egoistic condition* ($p = .160$) on *denial of outcome severity* were not significant. As expected, the interaction between *ad framing* and *egoistic condition* was significant ($\beta = 0.73$, $SE = 0.33$, $p = .026$, 95% CI [0.09, 1.38]). Specifically, for respondents in the control condition, prevention-focused message had no significant effect on *denial of outcome severity* ($p = .393$). However, for respondents in the *egoistic condition*, prevention-focused message had a significant and positive effect on *denial of outcome severity* ($\beta = 0.54$, $p = .025$, and 95% CI [0.08, 1.01]). Moreover, *ad framing* had no significant direct effect on *perceived effort worthiness* ($p = .175$) but *denial of outcome severity* significantly decreased *perceived effort worthiness* ($\beta = -0.13$, $SE = 0.03$, $p < .001$, 95% CI [-0.20, -0.06]). Finally, the direct effects of *ad framing* ($p = .804$) and *denial of outcome severity* ($p = .119$) were not significant, but *perceived effort worthiness* significantly increased *intention to support the cause* ($\beta = 0.69$, $SE = 0.03$, $p < .001$, 95% CI [0.63, 0.76]).

The indirect effect of *ad framing* through *denial of outcome severity* and *perceived effort worthiness* (mediation variables) on *intention to support the cause* was significant for respondents in the *egoistic condition*, given that the confidence interval did not include zero ($\beta = -0.05$; 95% CI [-0.11, -0.01]). It was not significant for respondents in the control condition, given that the confidence interval includes zero ($\beta = 0.02$; 95% CI [-0.02, 0.07]). We obtained similar results when we ran the model on *intention to recommend this cause to others* (see web appendix for more details).

5.3. Discussion

The results of Study 3 strengthen the validity of our model in two ways. First, in this study we activated egoistic values, instead of measuring them. In line with previous literature showing that the saliency of values can be experimentally manipulated (Bullock et al., 2017; Hahnel et al., 2014; Verplanken & Holland, 2002), we made egoistic values salient in respondents' minds through a writing task. We found that activating egoistic values influenced the perception of the message framing, and thus the effectiveness of the messages. When exposed to a prevention-focused message, respondents whose egoistic values were experimentally activated, denied the gravity of the environmental situation, which in turn decreased the value they attributed to the effort and thus their intention to support the cause (H3).

Second, we discarded an alternative hypothesis regarding social norms. The two messages did not lead to differences in the perceived support for the initiative, as respondents perceived that similar amounts of people would contribute to the cause. These results, by isolating the effect of egoistic values through the manipulation and by discarding the alternative hypothesis regarding social norms, further strengthen the results found in Study 1 and 2.

6. Conclusion

Recent years have seen a growing interest in studying the ways in which the promotion of pro-environmental behavior can be impacted by individual values in an effort to instill more of such desirable behaviors. Within this context, most researchers and practitioners have focused on identifying who is most receptive to environmental-related messages and the most effective way to target them. We believe, however, it is also fundamental to listen to and understand those whose

values appear to be in conflict with environmental goals.

Across three studies, we point out that egoistic individuals, who are generally unresponsive to pro-environmental messages, are more effectively persuaded by messages focused on promotion, than by messages focused on prevention. We also highlight a process that explains why prevention-oriented environmental messages may have a counterproductive effect on this particular segment of the population. Indeed, we observe that prevention-focused environmental messages, characterized by an emphasis on human responsibility and the necessity to take action to avoid further negative outcomes, tend to be rejected or even denied by egoistic individuals. This denial, operationalized in our research by the consideration that environmental messages exaggerate the environmental problem, prevents egoistic people from perceiving the environmental effort as worthwhile and therefore from acting. In our last study, we show that egoistic values can be temporarily activated in individuals independently of the values they hold (i.e., their hierarchy of values), which allowed us to manipulate this variable and validate further its effects. Individuals who were primed with egoistic values were less persuaded by environmental messages focused on prevention than by messages focused on promotion. Again, the reason appears to be a propensity to deny prevention-focused messages, resulting in a perceived less worthwhile environmental effort and, consequently, a reduced tendency to act pro-environmentally. This effect does not appear in the case of promotion-focused messages.

Our findings contribute to the growing stream of research positioned at the intersection between psychological characteristics and promotion of environmental behavior. While human behavior usually has multiple predictors (e.g. theory of planned behaviour; Ajzen, 1991), a great deal of evidence has demonstrated that the psychological values a person harbors often do shape their behaviors (e.g. Steg & De Groot, 2012; Abrahamse & Steg, 2011; Schultz & Zelezny, 1999; Fraj & Martinez, 2006). More specifically, it has been established that individuals with high egoistic values seek to maximize their own benefits while minimizing costs, often resulting in poor environmental choices (De Groot & Steg, 2007; Poortinga, Steg, & Vlek, 2004). Our results show that egoists are not necessarily reluctant to adopt pro-environmental behavior. In fact, contrary to previous research concluding that individuals with egoistic values are not environmentally friendly (Milfont & Gouveia, 2006; Moore & Loewenstein, 2004; Lindenberg & Steg, 2007), we show that by using appropriate communication tools, even highly egoistic individuals can be led to think and act in a pro-environmental manner. We also point out that it is ineffective to address egoistic individuals with the same prevention-focused messages as those used for the general public. This overlooks the fact that the content of these messages is in contradiction with their values and that the messages aimed at bringing about change are those that prevent this target group from taking action. Research has shown that egoists focus particularly on self-achievement (Schwartz, 1992) and therefore, as our

findings evidence, a promotion-focused environmental message that emphasizes what can be achieved, appears to be the best communication strategy to persuade this population. The current findings therefore strongly suggest that promotional messages should be considered more extensively than they currently are, and that prevention-focused messages should not be the default go-to message frame.

The psychological mechanism behind the effect highlighted in this research can be explained by the alignment of the individual's goals with the content of the message (Freitas et al., 2002; Zhao & Pechmann, 2007). Previous studies have shown that one of the greatest barriers to adopting pro-environmental behavior, is a difficulty in understanding the actual benefits of the effort that is required (Gifford, 2011; Kollmuss & Agyeman, 2002). This is due in part to the obvious difficulty in evaluating the effects of one individual's personal actions, even though each individual's contribution is important for the future of the planet (Lorenzoni, Nicholson-Cole, & Whitmarsh, 2007; Milfont, 2012). In line with the notion that understanding the benefits of an action facilitates the action, the perception of effort worthiness is often considered as the basis for most of our actions (Cryder et al., 2013; Kuppuswamy & Bayus, 2017). The current research shows that it can be important to consider certain cognitive dispositions specific to egoistic individuals that may prevent them from understanding that a particular environmental action would be worthwhile. Our results suggest that when exposed to prevention-focused messages, individuals with high egoistic values activate a defense mechanism, leading them to refuse the message and deny the gravity of the environmental situation (denial of outcome severity) and thus to depreciate the value of the environmental effort.

In conclusion, we found that promotion-focused messages were always more effective on egoistic individuals than prevention-focused messages, with egoists perceiving the effort asked in the message as more worthy. These results show that environmental messages should not necessarily have a prevention-focus by default. In fact, since the use of a promotion-message frame does not appear to have any negative effects on non-egoistic people and can, on the other hand, have very positive effects on egoistic people who tend to be reluctant to adopt pro-environmental behaviors, our findings encourage greater use of this type of message. These findings should have implications for marketers, businesses and governments who wish to increase the overall effectiveness of their environmental communication.

7. Formatting of funding sources

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Appendix A. Manipulation text for Study 1

Prevention-focused feedback

To avoid ecological disasters, the global target in terms of CO₂ emission is 2 tons per person annually. Right now, the Swiss average is 5.3 tons of CO₂ per person.

Your annual mobility footprint is [embodied personal score] tons of CO₂

Even if you think it's just a drop in the ocean, you personally can greatly contribute to the future our planet.

With all the significant changes our environment is undergoing, in such a short amount of time, we cannot help but be incredibly dubious about whether we will manage to effectively carry out all actions that are required to overcome such massive difficulties. In specific moments in history mankind has put all feudal differences aside and united to solve a common trouble. 99.9% of species that have ever existed have gone extinct, yet we, time and time again, have managed to plow on, outliving and outsmarting all our rivals, surpassing all our obstacles. Human beings are like that: adaptability and problem solving are our main assets. Yet this time the common trouble appears to be on a bigger scale, one that maybe trumps all our previous obstacles that threatened our very existence. We will dig deep if our story on this beautiful planet we call home is to continue. We can only succeed if everybody realizes they have to pull their weight. **On this note, one cannot help but feel skeptical about whether we as a species will be capable of overcoming the risks we are facing, and whether each and every one of us will fully acknowledge that we only have a very small margin for error left, if we are to continue writing pages in the books of history.**

All over the world, many communities have been tackling difficult environmental problems, and it is scientifically proven that by burying our heads in the sand, these problems we face will only get bigger.

Previously a luscious forest in South America has now become a wasteland, and is only one of an abundance of examples of the environment changing for the worst.



Promotion-focused feedback

A sustainable lifestyle in terms of CO₂ emission is 2 tons per person annually. Right now, the Swiss average is 5.3 tons of CO₂ per person.

Your annual mobility footprint is [embodied personal score] tons of CO₂

Even if you think it's just a drop in the ocean, you personally can greatly contribute to the future our planet.

Any time things start to look bleak, even when we are in a real pickle, humans always find a way to come up with the correct solution. Despite all the significant changes our environment is undergoing, in such a short amount of time, we cannot help but be incredibly hopeful because we always manage to delve deep into ourselves and overcome even massive difficulties. In specific moments in history mankind has put all feudal differences aside and united to solve a common trouble. And this time is no different. 99.9% of species that have ever existed have gone extinct, yet we, time and time again, have managed to plow on, outliving and outsmarting all our rivals, surpassing all our obstacles. Human beings are like that: adaptability and problem solving are our main assets. This time the common trouble might be on a bigger scale but there is no reason to think this time is any different from all the times rival apes, famine and plagues threatened our very existence. We will dig deep and our story on this beautiful planet we call home will continue. **We can only succeed if everybody realizes they have to pull their weight and it is beyond doubt that everybody will, because we have come this far and we still have many pages to write in the history books.**

All over the world, many empowered communities have been tackling difficult environmental problems, and many are succeeding admirably in their endeavors through will-power and sheer effort.

A wasteland in South America has now become a lush forest through direct human intervention.



Appendix B. Writing task of Study 3: values activation

On the next page, you will write about your life.

We ask that you spend at least 5 minutes to think and write down your thoughts. There is no right or wrong answer, feel free to write everything that comes to your mind.

For this task, we ask you to write about different aspects of your life. Feel free to share all the examples and specific memories that come to your mind.

The questions in italics are food for thought in case you get stuck or you don't know how to start your answer.

	Egoistic values condition	Control condition
[ambitious]	Talk about your aspirations and ambitions: <i>What do you dream about? What are your goals for this new year? What would you like to achieve?</i>	Talk about your everyday life: <i>What is your morning routine like? What is that one boring thing you do each day?</i>
[influential]	Describe how you influence the world around you (friends, family and colleagues): <i>Who comes to you asking for advice? What kind of advice do they ask from you (music, travel, food, fashion)?</i>	Describe what you do if you can't sleep at night: <i>Do you count sheep? Try to get up and write down your thoughts?</i>
[social power]	Talk about times when you made your voice heard: <i>In which situations, do you feel free to fully express yourself? What is the last big decision you made where you prioritized your own interests?</i>	Talk about something most people don't know about you: <i>Do you have any secret nobody knows about? Is there anything about yourself that you think people are oblivious to?</i>
[authority]	Describe how you manage to get your way: <i>How do you get people to respect your authority/opinion? How do you make sure that something is done the way you want it done?</i>	Describe what you do when you're carefree: <i>Do you find yourself singing? Dancing? Smiling?</i>
[wealth]	"Money doesn't buy happiness.... but it helps!" Talk about how money is important in your life: <i>What possessions did you gain this year? How do they help you to better your life?</i>	"Let's find a place to get lost in." Talk about your all-time favorite town or city: <i>What do you like most of this town or city? What did you think the first time you visited it?</i>
	What makes you unique?	What is your best quality and worst character flaw?

Web appendix

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jbusres.2020.06.046>.

References

Aaker, J. L., & Lee, A. Y. (2001). 'I' Seek Pleasures and 'We' avoid pains: the role of self-regulatory goals in information processing and persuasion. *Journal of Consumer Research*, 28(June), 33–49.

Aaker, J. L., & Lee, A. Y. (2006). Understanding regulatory fit. *Journal of Marketing Research*, 43(1), 15–19.

Abrahamse, W., & Steg, L. (2011). Factors related to household energy use and intention to reduce it: The role of psychological and socio-demographic variables. *Human Ecology Review*, 18(1), 30–40.

Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behavior and Human Decision Processes*, 50, 179–211.

Aoyagi-Usui, M., Vinken, H., & Kuribayashi, A. (2003). Pro-environmental attitudes and behaviors: An international comparison. *Human Ecology Review*, 23–31.

Avnet, T., & Higgins, E. T. (2006). How regulatory fit affects value in consumer choices and opinions. *Journal of Marketing Research*, 43(1), 1–10.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change.

- Psychological Review*, 84(2), 191.
- Batson, C. D., Ahmad, N., Yin, J., Bedell, S. J., Johnson, J. W., & Templin, C. M. (1999). Two threats to the common good: Self-interested egoism and empathy-induced altruism. *Personality and Social Psychology Bulletin*, 25(1), 3–16.
- Beltramini, R. E. (1982). Advertising Perceived Believability Scale. Proceedings of the South-western Marketing Association, 1–3.
- Beltramini, R. F. (1988). Perceived believability of warning label information presented in cigarette advertising. *Journal of Advertising*, 17(2), 26–32.
- Brewer, M. B., & Gardner, W. (1996). Who is this “We”? Levels of collective identity and self-representations. *Journal of Personality and Social Psychology*, 71(1), 83.
- Bullock, G., Johnson, C., & Southwell, B. (2017). Activating values to stimulate organic food purchases: Can advertisements increase pro-environmental intentions? *Journal of Consumer Marketing*, 34(5), 427–441.
- Chaiken, S., & Eagly, A. H. (1983). Communication modality as a determinant of persuasion: The role of communicator salience. *Journal of Personality and Social Psychology*, 45(2), 241.
- Chang, C. (2011). Feeling ambivalent about going green. *Journal of Advertising*, 40(4), 19–32.
- Chang, C. T. (2012). Are guilt appeals a panacea in green advertising? The right formula of issue proximity and environmental consciousness. *International Journal of Advertising*, 31(4), 741–771.
- Chang, H., Zhang, L., & Xie, G. X. (2015). Message framing in green advertising: The effect of construal level and consumer environmental concern. *International Journal of Advertising*, 34(1), 158–176.
- Cheng, T., Woon, D. K., & Lynes, J. K. (2011). The use of message framing in the promotion of environmentally sustainable behaviors. *Social Marketing Quarterly*, 17(2), 48–62.
- Chong, D., Citrin, J., & Conley, P. (2001). When self-interest matters. *Political Psychology*, 22(3), 541–570.
- Cryder, C. E., Loewenstein, G., & Scheines, R. (2013). The donor is in the details. *Organizational Behavior and Human Decision Processes*, 120(1), 15–23.
- De Groot, J. I. M., & Steg, L. (2006). The role of value orientations in evaluating quality of life consequences of a transport pricing policy. *Transportation Research Part D: Transport and Environment*, 11(2), 160–165.
- De Groot, J. I., & Steg, L. (2007). Value orientations and environmental beliefs in five countries: Validity of an instrument to measure egoistic, altruistic and biospheric value orientations. *Journal of Cross-Cultural Psychology*, 38(3), 318–332.
- De Groot, J. I., & Steg, L. (2009). Mean or green: Which values can promote stable pro-environmental behavior? *Conservation Letters*, 2(2), 61–66.
- De Groot, J. I., Steg, L., & Poortinga, W. (2013). Values, perceived risks and benefits, and acceptability of nuclear energy. *Risk Analysis: An International Journal*, 33(2), 307–317.
- Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). New trends in measuring environmental attitudes: Measuring endorsement of the new ecological paradigm: A revised NEP scale. *Journal of Social Issues*, 56(3), 425–442.
- Fraj, E., & Martinez, E. (2006). Environmental values and lifestyles as determining factors of ecological consumer behaviour: An empirical analysis. *Journal of Consumer Marketing*, 23(3), 133–144.
- Federal Statistical Office FSO (2017). Population’s transport behaviour 2015. Swiss statistic. Ferenc Biedermann, FSO.
- Fiske, A. P. (1992). The four elementary forms of sociality: Framework for a unified theory of social relations. *Psychological Review*, 99(4), 689.
- Freitas, A. L., Liberman, N., & Higgins, E. T. (2002). Regulatory fit and resisting temptation during goal pursuit. *Journal of Experimental Social Psychology*, 38(3), 291–298.
- Gallup Poll. (2009). Environment. Retrieved December 13, 2019, from <https://news.gallup.com/poll/1615/environment.aspx>.
- Gardner, W. L., Gabriel, S., & Lee, A. Y. (1999). “I” value freedom, but “we” value relationships: Self-construal priming mirrors cultural differences in judgment. *Psychological Science*, 10(4), 321–326.
- Gifford, R. (2011). The dragons of inaction: Psychological barriers that limit climate change mitigation and adaptation. *American Psychologist*, 66(4), 290.
- Global Footprint Network (2019). Earth Overshoot Day 2019 is July 29th, the earliest ever. Retrieved December 13, 2019, from <https://www.footprintnetwork.org/2019/06/26/press-release-june-2019-earth-overshoot-day/>.
- Hahnel, U. J., Ortmann, C., Korcaj, L., & Spada, H. (2014). What is green worth to you? Activating environmental values lowers price sensitivity towards electric vehicles. *Journal of Environmental Psychology*, 40, 306–319.
- Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis second edition: A regression-based approach*. Guilford Press.
- Heine, S. J., Lehman, D. R., Markus, H. R., & Kitayama, S. (1999). Is there a universal need for positive self-regard? *Psychological Review*, 106(4), 766.
- Henkel AG & Co. KGaA (2018). Footprint calculator. Wuppertal Institut für Klima, Umwelt, Energie. <https://footprintcalculator.henkel.com/en>.
- Higgins, E. T. (1997). Beyond pleasure and pain. *American psychologist*, 52(12), 1280.
- Internal Displacement Monitoring Centre (IDMC) (2019). Global Report on Internal Displacement 2019.
- IPCC. (2013). Climate Change 2013: The Physical Science Basis. In T. F. Stocker, D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P. M. Midgley (eds.), Contribution of Working Group I to the fifth assessment report of the intergovernmental panel on climate change (p. 1535). Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press.
- Joireman, J. A., Van Lange, P. A., & Van Vugt, M. (2004). Who cares about the environmental impact of cars? Those with an eye toward the future. *Environment and Behavior*, 36(2), 187–206.
- Kareklas, I., Carlson, J. R., & Muehling, D. D. (2012). The role of regulatory focus and self-view in “green” advertising message framing. *Journal of Advertising*, 41(4), 25–39.
- Kim, Y. (2011). Understanding green purchase: The influence of collectivism, personal values and environmental attitudes, and the moderating effect of perceived consumer effectiveness. *Seoul Journal of Business*, 7, 65–92.
- Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, 8(3), 239–260.
- Krekels, G., & Pandelaere, M. (2015). Dispositional greed. *Personality and Individual Differences*, 74, 225–230.
- Kuppuswamy, V., & Bayus, B. L. (2017). Does my contribution to your crowdfunding project matter? *Journal of Business Venturing*, 32(1), 72–89.
- Lee, A. Y., & Aaker, J. L. (2004). Bringing the frame into focus: The influence of regulatory fit on processing fluency and persuasion. *Journal of Personality and Social Psychology*, 86(2), 205.
- Lee, A. Y., Aaker, J. L., & Gardner, W. L. (2000). The pleasures and pains of distinct self-construals: The role of interdependence in regulatory focus. *Journal of Personality and Social Psychology*, 78(6), 1122.
- Levin, I. P., Schneider, S. L., & Gaeth, G. J. (1998). All frames are not created equal: A typology and critical analysis of framing effects. *Organizational Behavior and Human Decision Processes*, 76(2), 149–188.
- Lindenberg, S. (2001). Social rationality versus rational egoism. In *Handbook of sociological theory*. Springer, Boston, MA. sociological theory (pp. 635–668). New York: Kluwer Academic/Plenum.
- Lindenberg, S., & Steg, L. (2007). Normative, gain and hedonic goal frames guiding environmental behavior. *Journal of Social Issues*, 63(1), 117–137.
- Lorenzoni, L., Nicholson-Cole, S., & Whitmarsh, L. (2007). Barriers perceived to engaging with climate change among the UK public and their policy implications. *Global Environmental Change*, 17(3–4), 445–459.
- Lu, L. C., Chang, H. H., & Chang, A. (2015). Consumer personality and green buying intention: The mediate role of consumer ethical beliefs. *Journal of Business Ethics*, 127(1), 205–219.
- Markowitz, E. M., & Shariff, A. F. (2012). Climate change and moral judgement. *Nature Climate Change*, 2(4), 243–247.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98(2), 224.
- Milfont, T. L. (2012). The interplay between knowledge, perceived efficacy, and concern about global warming and climate change: A one-year longitudinal study. *Risk Analysis: An International Journal*, 32(6), 1003–1020.
- Milfont, T. L., & Gouveia, V. V. (2006). Time perspective and values: An exploratory study of their relations to environmental attitudes. *Journal of Environmental Psychology*, 26, 72–82.
- Mogilner, C., Aaker, J. L., & Pennington, G. L. (2007). Time will tell: The distant appeal of promotion and imminent appeal of prevention. *Journal of Consumer Research*, 34(5), 670–681.
- Moore, D. A., & Loewenstein, G. (2004). Self-interest, automaticity, and the psychology of conflict of interest. *Social Justice Research*, 17(2), 189–202.
- Overshootday. (2019). How many Earths do we need. Retrieved December 2, 2019, from https://www.overshootday.org/content/uploads/2019/05/How_many_Earths_2019_English.pdf.
- Perlaviciute, G., & Steg, L. (2014). Contextual and psychological factors shaping evaluations and acceptability of energy alternatives: Integrated review and research agenda. *Renewable and Sustainable Energy Reviews*, 35, 361–381.
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. *Communication and persuasion* (pp. 1–24). New York, NY: Springer.
- Poortinga, W., Steg, L., & Vlek, C. (2004). Values, environmental concern, and environmental behavior: A study into household energy use. *Environment and Behavior*, 36(1), 70–93.
- Robins, R. W., & John, O. P. (1997). The quest for self-insight: Theory and research on accuracy and bias in self-perception. *Handbook of personality psychology* (pp. 649–679). Academic Press.
- Ross, S. (2011). Egoism and the everyday consumer: Developing a new theory on pro-social behaviours in consumption contexts. *Am Mark Assoc Summer*, 165–172.
- Rothman, A. J., & Salovey, P. (1997). Shaping perceptions to motivate healthy behavior: The role of message framing. *Psychological Bulletin*, 121(1), 3.
- SCCER CREST. (2018). Swiss Household Energy Demand Survey (SHEDS) description. From: <https://www.sccer-crest.ch/research/swiss-household-energy-demand-survey-sheds/>.
- Schultz, P. W. (2001). The structure of environmental concern: Concern for self, other people, and the biosphere. *Journal of Environmental Psychology*, 21(4), 327–339.
- Schultz, P. W., & Zelezny, L. (1999). Values as predictors of environmental attitudes: Evidence for consistency across 14 countries. *Journal of Environmental Psychology*, 19(3), 255–265.
- Schultz, P. W., & Zelezny, L. (2003). Reframing environmental messages to be congruent with American values. *Human Ecology Review*, 126–136.
- Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. In M. Zanna (Vol. Ed.), *Advances in experimental social psychology: Vol. 25*, (pp. 1–65). Orlando, FL: Academic Press.
- Sherman, D. K., & Cohen, G. L. (2002). Accepting threatening information: Self-Affirmation and the reduction of defensive biases. *Current Directions in Psychological Science*, 11(4), 119–123.
- Singelis, T. M. (1994). The measurement of independent and interdependent self-construals. *Personality and Social Psychology Bulletin*, 20(5), 580–591.
- Smith, N., & Joffe, H. (2013). How the public engages with global warming: A social representations approach. *Public Understanding of Science*, 22(1), 16–32.
- Spiller, S. A., Fitzsimons, G. J., Lynch, J. G., Jr., & McClelland, G. H. (2013). Spotlights, floodlights, and the magic number zero: Simple effects tests in moderated regression. *Journal of Marketing Research*, 50(2), 277–288.

- Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In *Advances in experimental social psychology* (Vol. 21, pp. 261–302). Academic Press.
- Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology, 29*(3), 309–317.
- Steg, L., Bolderdijk, J. W., Keizer, K., & Perlaviciute, G. (2014). An integrated framework for encouraging pro-environmental behaviour: The role of values, situational factors and goals. *Journal of Environmental Psychology, 38*, 104–115.
- Steg, L., & De Groot, J. I. M. (2012). Environmental values. In S. Clayton (ed.), *The Oxford handbook of environmental and conservation psychology* (p. 81e92). New York: Oxford University Press.
- Steg, L., Dreijerink, L., & Abrahamse, W. (2005). Factors influencing the acceptability of energy policies: A test of VBN theory. *Journal of Environmental Psychology, 25*(4), 415–425.
- Steg, L., Perlaviciute, G., Van der Werff, E., & Lurvink, J. (2014). The significance of hedonic values for environmentally relevant attitudes, preferences, and actions. *Environment and Behavior, 46*(2), 163–192.
- Stern, P. C., Kalof, L., Dietz, T., & Guagnano, G. A. (1995). Values, beliefs, and pro-environmental action: Attitude formation toward emergent attitude objects 1. *Journal of Applied Social Psychology, 25*(18), 1611–1636.
- UN environment. (2019). Annual Report 2018: putting the environment at the heart of people's lives.
- Van de Velde, L., Verbeke, W., Popp, M., & Van Huylenbroeck, G. (2010). The importance of message framing for providing information about sustainability and environmental aspects of energy. *Energy Policy, 38*(10), 5541–5549.
- Van't Riet, J., & Ruiter, R. A. (2013). Defensive reactions to health-promoting information: An overview and implications for future research. *Health Psychology Review, 7*(sup1), S104–S136.
- Verma, V. K., Chandra, B., & Kumar, S. (2019). Values and ascribed responsibility to predict consumers' attitude and concern towards green hotel visit intention. *Journal of Business Research, 96*, 206–216.
- Verplanken, B., & Holland, R. W. (2002). Motivated decision making: Effects of activation and self-centrality of values on choices and behavior. *Journal of Personality and Social Psychology, 82*(3), 434.
- White, K., Habib, R., & Hardisty, D. J. (2019). How to SHIFT consumer behaviors to be more sustainable: A literature review and guiding framework. *Journal of Marketing, 83*(3), 22–49.
- WHO. (2017). The cost of a polluted environment: 1.7 million child deaths a year, says WHO. Retrieved December 2, 2019, from <https://www.who.int/en/news-room/detail/06-03-2017-the-cost-of-a-polluted-environment-1-7-million-child-deaths-a-year-says-who>.
- WHO. (2018). Climate change and health. Retrieved December 2, 2019, from <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>.
- Zhao, G., & Pechmann, C. (2007). The impact of regulatory focus on adolescents' response to antismoking advertising campaigns. *Journal of Marketing Research, 44*(4), 671–687.
- Dr. Maria Lagomarsino** is a Post-Doctoral Researcher at the Consumer Decision and Sustainable Behavior Lab of the University of Geneva, Switzerland. Her research focuses on environmental and societal well-being, policy practices, social marketing, health communication, and consumer psychology.
- Prof. Dr. Linda Lemarié** Ph.D., is an associate professor of marketing at Audencia Business School in France. She was previously an assistant professor in advertising in the Management Institute, Faculty of Economics and Management, University of Neuchâtel, in Neuchâtel Switzerland. She obtained a doctorate in administration at HEC Montréal, Canada, where she was also a lecturer and did a post-doc. Her main research areas comprise Social Marketing, Consumer Behavior, Advertising Strategy and Regulation, Deceptive Advertising.
- Dr. Michael** is a Senior Researcher in Marketing at the University of Neuchâtel, Switzerland. He holds a Ph.D. in Cognitive Psychology from the University of Geneva and his research interests focus on selective attention, consumer behavior, and advertising.