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Effects of message framing in policy communication on climate change

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Abstract

In two studies, we investigated the framing effects of policy messages regarding climate change. In Study 1, we asked participants to read policy messages that envisioned positive consequences. Messages varied as to their outcome sensitivity (achievement of positive outcomes versus avoidance of negative outcomes), regulatory concern (growth versus safety) and goal-pursuit strategy (investment in renewable energy versus intervention on greenhouse gas emissions). Participants showed the highest agreement with a policy message on renewable energy when it was formulated in terms of the achievement of positive, growth-related outcomes and with a greenhouse gas emissions message when it was formulated in terms of the avoidance of negative, safety-related outcomes. The same held for the intention to vote for candidates proposing those policies. In Study 2, participants' regulatory focus moderated these effects, with promotion-focused participants preferring messages focused on the achievement of positive outcomes and prevention-focused participants preferring messages focused on the avoidance of negative outcomes. Results show that the fit among the various levels of framing of a policy message regarding climate change, moderated by individual regulatory focus, increases the probability that recipients agree with the policy.

Since the Rio Declaration on Environment and Development (UNFCCC, 1992), national and international institutions have intensified efforts to address the issue of global warming and climate change and developed complex policies to deal with these two related issues. However, seeking support for these policies is difficult for governments, and even discussing these issues is a challenge. Firstly, although there is scientific consensus (Bray, 2010; Oreskes, 2004) that global warming is the result of human activities that promote the emission of greenhouse gases (primarily CO_2), many people are sceptical of the human origin of global warming and even doubt its existence (McCright & Dunlap, 2000, 2011). Secondly, the efforts required to effectively combat global warming have serious and unprecedented scope, ranging from small changes in individual lifestyle, such as reducing energy consumption at home, to large-scale changes to the present economic system. Thirdly, the technicalities of its measurement and the seemingly distant consequences of global warming make it hard to capture the interest of citizens in comparison with more familiar matters, such as the economic downturn.

In the environmental domain, as in others, communication promoting the adoption of a given policy often focuses on the consequences of adopting (or not adopting) that policy, and these consequences may be framed in different ways. Frames are used to select and organise information on an issue or event (Chong & Druckman, 2007; Entman, 1993; Gamson & Modigliani, 1989; Scheufele, 1999), by providing meaning and attributing a positive or negative value to it. By emphasising some aspects of an event over others, frames can influence attitudes to and opinions on events.

Research on how climate-related policies are presented by policy makers and the media (Cox, 2010; Floyd, 2010; Hulme, 2008; McDonald, 2013; Nisbet, 2009) shows that policies are often framed in terms of the achievement of potential gains or the avoidance of potential losses (Gifford & Comeau, 2011; Moser & Dilling, 2007; Reber & Berger, 2005). Differences in how environmental policies are framed may reflect different, complementary approaches to climate change. The aim of some policies is to increase energy generation through renewable means, such as wind, solar and hydroelectric power. The aim of others is to reduce the current emission levels of greenhouse gases by imposing regulations on energy and industrial production, transportation, household heating and electricity consumption. Some policies combine the two approaches (Bang, 2010).

Understanding which frames are effective in promoting support for policies related to renewable energy and greenhouse gas emissions is obviously important. In the sections that follow, we will briefly discuss the main findings on the effects of message framing in climate change communication. Then, we will discuss some limits of this research and the possibility of overcoming them, at least in part, through the extension of the self-regulatory model of message framing (Cesario, Corker, & Jelinek, 2013) to the study of the effects

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of communication on climate change. The self-regulatory model of message framing is a comprehensive model that accounts for different forms of message framing. These forms reflect the motivational and behavioural orientations that are likely to guide recipients in their evaluation of the messages to which they are exposed. We will present two studies in which we manipulated policy messages about climate change according to the self-regulatory model of message framing and then measured agreement with the policies and intention to vote for the politician proposing them. In Study 2, we also assessed the moderating role of the recipients' regulatory focus (Higgins, 1997), defined as an individual orientation to achieve positive outcomes (promotion focus) or avoid negative outcomes (prevention focus).

The Effects of Message Framing on Support for Energy and Climate Policies

Classical research on prospect theory (Tversky & Kahneman, 1981) shows that people can make radically different choices when presented with messages that emphasise either positive or negative aspects of the same potential outcome. Because of a general tendency for risk aversion, negatively framed messages tend to be more effective than positively framed ones in various contexts (Kahneman & Tversky, 1979; Meyerowitz & Chaiken, 1987; Tversky & Kahneman, 1981). The same effect has been observed in the case of environmental communication. Davis (1995) found that loss-framed messages resulted in higher interest among participants and a greater intention to act in an environmentally responsible way than gain-framed messages did. The effectiveness of gain-framed and loss-framed messages, however, is moderated by the degree of uncertainty associated with the outcome. In a study on the effects of persuasive messages promoting pro-environmental behaviour, Morton, Rabinovich, Marshall, and Bretschneider (2011) found that uncertainty reduced participants' intention to act after being exposed to loss-framed messages, but it increased intention to act after being exposed to gain-framed messages.

Research on climate change communication has compared the persuasiveness of messages framed in terms of (i) low versus high likelihood of negative consequences of climate change (Morton et al., 2011), (ii) preventing versus failing to prevent the effects of climate change (Spence & Pidgeon, 2010), (iii) concern for environmental and health risks versus the promotion of economic or social well-being (Bain, Hornsey, Bongiorno, & Jeffries, 2012) and (iv) an appeal to personal sacrifices or motivation to act in favour of climate mitigation (Gifford & Comeau, 2011; Nordhaus & Shellenberger, 2007). The results of these studies have not been entirely consistent, however. This may be partly due to the variety of ways in which framing has been operationalised in the studies concerned (Levin, Schneider, & Gaeth, 1998).

Another limitation of the research in this domain is that relatively little attention has been devoted to examining how individual differences moderate framing effects in environmental communication (Gifford & Comeau, 2011). The effectiveness of message framing may depend on various individual variables, including age, gender, education, political orientation, values, local identity, endorsement of social norms and values, health and economic concerns (see Gifford and Nilsson, 2014, for a review). Regulatory focus—that is, the individual tendency to focus on the achievement of positive outcomes (*promotion focus*) or the avoidance of negative outcomes (*prevention focus*) (Higgins, 1998; Higgins, Shah, & Friedman, 1997)—is another individual variable that has been shown to moderate framing effects in various domains (Cesario, Higgins, & Scholer, 2008; Updegraff & Rothman, 2013). Hence, it might also play a role in moderating framing effects in the environmental domain. To our knowledge, however, no studies on the role of regulatory focus in environmental communication have been conducted.

A Self-regulatory Framework of Climate Policy Message Framing

Given the current limitations of research on framing effects in environmental communication, a unified approach might be useful to analyse the interplay between different forms of message framing, different features of the advocated environmental behaviours and policies and the different behavioural orientations of the message recipients. One such approach is the self-regulatory model of message framing proposed by Cesario et al. (2013). The model attempts to explain the effects of message framing using the principles of behavioural self-regulation (Higgins, 1998; Higgins et al., 1997). According to this model, an in-depth analysis of framing effects should include more detailed distinctions beyond the simple one of gain/loss, considering, for example, how message framing can resonate with the different needs and motivations of receivers. Cesario et al. argue that the application of this model may help disentangle the effects of different aspects of message framing that are otherwise confounded. Four levels of message framing are proposed, namely hedonic consequences, outcome sensitivities, regulatory concerns and goal-pursuit strategies. The following sections discuss these four levels of message framing and their application to the climate change domain.

Hedonic Consequences

When advocating behaviours or policies, persuasive messages can describe either the desirable states that will result from adopting them or the undesirable states that will result from not adopting them. The first level of message framing included in the model of Cesario et al. (2013) starts with this distinction and considers the *hedonic consequences* of the behaviours proposed in a message. A message is centred on the *pleasures of adherence* if it emphasises the positive consequences of adopting the recommended behaviour. Conversely, a message is centred on the *pains of non-adherence* if it emphasises the negative consequences of not adopting the recommended behaviour. In communication on climate change issues, a message can, for example, highlight the benefits of increased use of renewable energy sources (pleasures of adherence) or highlight the harms of insufficient use of renewable energy sources (pains of non-adherence). In our research, we consider only those messages describing the pleasures of adherence to a given policy, which are often used by policy makers when introducing new measures (Scrase & Ockwell, 2010; Szarka, 2004). They were formulated as upward prefactual statements ('If we invest in renewable energy sources like solar and wind

power, we will obtain a positive return on the economic development') describing the positive consequences derived from adopting the proposed policies.

Outcome Sensitivities

People may differ in terms of what they consider pleasure or pain. The second level of framing proposed by Cesario et al. (2013) is the *outcome sensitivities* level, which reflects this difference by subdividing the pleasures derived from adherence and the pains derived from non-adherence, depending on the presence or absence of gains and losses. According to this distinction, the pleasures of adhering to a proposed behaviour can be framed as the *presence of positive outcomes* (i.e. gain) or the *absence of negative outcomes* (i.e. non-loss). Conversely, the pains of not adhering to a proposed behaviour can be framed as the *presence of negative outcomes* (i.e. loss) or the *absence of positive outcomes* (i.e. non-gain). As stated earlier, our research focuses only on the pleasures of adherence, framing messages that support (not oppose) a given policy. Therefore, we compare only the presence of positive outcomes versus the absence of negative outcomes in experimental manipulations of this level of framing. For example, in the message focusing on the positive consequences of the application of a renewable energy policy, we presented these consequences either as economic opportunities deriving from the development of 'green' technologies (presence of positive outcomes) or as the lack of economic and environmental costs deriving from continued use of non-renewable fuels (absence of negative outcomes).

Regulatory Concerns

The definition of the third level of framing included in the model of Cesario et al. (2013) is based on the *regulatory concerns* driving behaviour. Individuals can be guided by growth and nurturance needs or by safety and security needs (Higgins, 1997). Similarly, persuasive messages can be framed in a way that appeals to the growth or safety needs of recipients. *Growth-framed* messages describe outcomes that may affect recipients' self-fulfilment needs and aspirations, whereas s*afety-framed* messages describe outcomes that may affect recipients' basic needs and obligations. In the case of climate change policies, growth-framed messages can emphasise how the proposed policies would affect the self-fulfilment needs of leisure, well-being and economic welfare, in terms of climatic stability and the economic opportunities deriving from the development of new technologies related to renewable energy sources. Conversely, safety-framed messages can emphasise how the proposed policies would affect basic human needs for security, health and economic sustainability endangered by extreme climatic conditions and by the increasing economic and environmental costs of continued dependence on fossil fuels. The manipulation of regulatory concern was also included in our research.

Goal-pursuit Strategies

The fourth level of framing in the model of Cesario et al. (2013) is the level of *goal-pursuit strategies*, which concerns the means through which the advocated behaviour or policy attain the desired goal. People adopt *eager approach strategies* when they seek a desired goal by proactively engaging in activities aimed at success, whereas they adopt *vigilant avoidance strategies* when they seek a desired goal by carefully tackling potential sources of failure (Cesario, Grant, & Higgins, 2004; Lee & Aaker, 2004). Although Cesario et al. assumed that this distinction can be useful when analysing message framing, they did not directly investigate this level of framing in their studies. In the present research, we did investigate this fourth level of message framing. As discussed earlier, climate change policies can be divided into two broad categories, namely those aimed at promoting renewable energy production and those aimed at intervening on greenhouse gas emissions. Renewable energy policies propose a way to advance a new paradigm of energy production. This goal is pursued by proposing investment in new, efficient and environment-friendly sources. Thus, these policies may reflect an 'eager approach' strategy. Greenhouse gas emissions policies have the aim of reducing and eventually removing the negative impact on climate of older methods of energy production. This goal is pursued by imposing limitations on current emissions or more complex mechanisms (such as special taxation regimes) to deter high-emission activities. Thus, these policies may reflect a 'vigilant avoidance' strategy.

Interactions among Framing Levels

Certain combinations of the foregoing four levels of framing may make a message more persuasive than others. Cesario et al. (2013) found that *outcome sensitivity* interacts with *regulatory concern*, making gain-framed messages more effective when the expected outcome was related to growth and making loss-framed messages more effective when the expected outcome was related to safety. In the same vein, one might expect both the outcome sensitivity and regulatory concern levels of framing to influence the persuasiveness of messages, depending on the underlying goal-pursuit strategy of the advocated behaviour or policy. Messages framed in terms of achieving positive outcomes and fulfilling growth-related needs might fit with the eager approach strategies better than with the vigilant avoidance strategies. Conversely, messages framed in terms of avoiding negative outcomes and fulfilling safety-related needs might fit better with vigilant avoidance strategies than with eager approach strategies. In our research, for the first time, we tested this interaction among these three levels of message framing, assuming renewable energy policies to be examples of eager approach strategies and greenhouse gas emissions policies to be examples of vigilant avoidance strategies.

The Role of Individual Regulatory Focus

The effects of message framing depend not only on the correspondence among the different levels of framing but also on the correspondence among the levels of framing and the self-regulatory preferences of receivers. Regulatory focus theory (Higgins, 1998; Higgins et al., 1997) states that individuals regulate their behaviour according to an individual orientation to achieve positive outcomes (promotion focus) or to avoid

negative outcomes (prevention focus). Individual regulatory focus has been shown to moderate the effects of message framing, because gain-framed messages are generally more persuasive for promotion-focused individuals, whereas loss-framed messages are generally more persuasive for prevention-framed individuals (e.g. Cesario et al., 2004; Dijkstra, Rothman, & Pietersma, 2011; Holler, Hoelzl, Kirchler, Leder, & Mannetti, 2008). This phenomenon, denominated 'regulatory fit' (Cesario et al., 2008; Higgins, 2000, 2005), derives from the positive feeling induced by information matching the recipients' regulatory focus. By focusing attention only on messages that stress positive hedonic consequences, Cesario et al. also found that messages emphasising the presence of gains (*positive outcome sensitivity*) are more persuasive for *promotion-focused* individuals, whereas messages emphasising the absence of losses (*negative outcome sensitivity*) are more persuasive for *prevention-focused* individuals.

In the present study, we also analysed how individual differences in regulatory focus influence the persuasiveness of differently framed policy messages. We expected to replicate Cesario et al. (2013) results as regards the 'fit' between regulatory focus and outcome sensitivities. We also wished to assess whether this result would be moderated by the regulatory concern of the message, an effect not investigated experimentally by Cesario et al.

OVERVIEW OF THE PRESENT RESEARCH

To investigate the effects of the message framing of policies dealing with climate change from the perspective of the self-regulatory framework (Cesario et al., 2013), we carried out two studies. In both studies, we kept the first level of message framing (hedonic consequences) constant, proposing messages describing the positive consequences of the adoption of given policies. We manipulated the outcome sensitivity (presence of positive outcomes versus absence of negative outcomes) and the regulatory concern (growth versus security needs) of messages regarding two policies with different goal-pursuit strategies (eager approach versus vigilant avoidance). We chose to analyse the effects of outcome sensitivity and regulatory concern separately for each policy, because of the relevant differences in content and potential implications between the two policies, which were investments on renewable energy policy (eager approach strategy) and interventions on greenhouse gas emissions (vigilant avoidance strategy). In Study 2, we also investigated the interactions of the different levels of message framing with individual differences in regulatory focus (promotion versus prevention).

In Study 1, we analysed whether the persuasiveness of policies with different goal-pursuit strategies depended on their outcome sensitivities and regulatory concerns. As discussed earlier, in the case of a policy based on an eager approach strategy (i.e. a renewable energy policy), we expected messages framed in terms of the achievement of positive outcomes and growth regulatory concern to be more effective than messages framed in terms of the avoidance of negative outcomes and growth regulatory concern. Conversely, in the case of a policy based on a vigilant avoidance strategy (i.e. greenhouse gases emissions policy), we expected messages framed in terms of the avoidance of negative outcomes and safety regulatory concern to be more effective than messages framed in terms of the achievement of positive outcomes and safety regulatory concern.

In Study 1, we further investigated whether there was a relationship between the persuasiveness of a given policy message and the probability of voting for the candidate proposing it. Research on political decision making indicates that candidates' positions on relevant issues affect voters' choice (de Vries, van der Brug, vad Egmond, & van der Eijk, 2011; Goren, 1997). This link between agreement with issue position and voting intention is unclear in the case of environmental policies, however; some authors have found that pro-environmental attitudes do not translate into positive electoral results for 'green' parties and candidates (Guber, 2001), whereas others have suggested that environmental issues are increasing in importance for voting decisions (Davis & Wurth, 2003; Davis, Wurth, & Lazarus, 2008). We expected that the policy messages that induced the highest agreement with the two policies would also result in a higher probability of voting for the candidates proposing them, indicating that the participants in question would not only endorse the statements but also actively support them with their vote.

In Study 2, we included individual regulatory focus in the design. We expected to replicate the results of Study 1 and to find that regulatory focus would moderate the effectiveness of message framing of the two policies, consistent with the results of Cesario et al. (2013). In particular, we expected that promotion-focused participants would agree more with messages framed in terms of the achievement of positive outcomes than with messages framed in terms of the avoidance of negative outcomes, whereas the opposite would be true for prevention-focused participants. We also tested whether participants' regulatory focus would interact with outcome sensitivities only or also with the regulatory concern of the message. We had no specific expectations in this regard. On the one hand, a fit between regulatory focus and multiple levels of message framing might enhance the persuasiveness of a message. On the other hand, a fit with one single level of message framing might be enough to significantly enhance the persuasiveness of a message. In this case, the presence of a fit with an additional level of message framing would not necessarily further increase this effect.

An empirical confirmation of our theoretical conjectures would contribute to a more comprehensive and fine-grained understanding of the communicative factors promoting or hindering support for climate change policies.

STUDY 1

In Study 1, participants were presented with two messages expressed by a candidate in national elections supporting policies to address climate change. The two messages implied two different goal-pursuit strategies: investments on renewable energy policy (i.e. an eager approach strategy) in one case and interventions on greenhouse gas emissions (i.e. a vigilant avoidance strategy) in the other.

We expected messages to induce higher agreement among participants when the messages' outcome sensitivity and

regulatory concern fitted with the goal-pursuit strategy of the policy. Specifically, we expected agreement with messages supporting investment in renewable energy sources (eager approach strategy) to be higher when the message presented the achievement of positive growth-related outcomes than when the message presented the avoidance of negative growth-related outcomes (H1).We did not expect to find differences related to the positive versus negative outcome sensitivity of the message regarding the eager approach strategy when it presented safety-related outcomes. Conversely, in the case of messages supporting intervention in greenhouse gas emissions (vigilant avoidance strategy), we expected agreement to be higher when the message presented the avoidance of negative safety-related outcomes than when the message presented the achievement of positive safety-related outcomes (H2).We did not expect to find differences related to the positive versus negative outcome sensitivity of the message regarding the vigilant avoidance strategy when it presented growth-related outcomes.

We also expected message framing to affect the probability of voting for the fictitious candidates who proposed the policies. Specifically, we expected that participants would express a higher probability of voting for a candidate who proposed a renewable energy policy through a message framed in terms of the achievement of positive growth-related outcomes than for a candidate who proposed the same policy through a message framed in terms of the avoidance of negative growth-related outcomes (H3). We expected no differences in voting probability in the case of messages on renewable energy policy with a safety concern. Similarly, we expected participants to express a higher probability of voting for a candidate who proposed a greenhouse gas emissions policy through a message describing the avoidance of negative safety-related outcomes than for a candidate who proposed the same policy through a message describing the achievement of positive safety-related outcomes (H4). We expected no differences in voting probability in the case of messages on greenhouse gas emissions with a growth concern.

Method

Participants

Ninety-five university students (77.9% female, age $M = 24.4$, $SD = 5.64$) participated in the study. Through the university's e-learning platform, students were asked to join an online study of 'green economy issues'. Participation was anonymous and on a voluntary basis.

Research Design

The design of the experiment was 2 (outcome sensitivity: presence of positives versus absence of negatives) × 2 (regulatory concern: growth versus safety) for each policy message, namely the renewable energy policy (eager approach strategy) and the greenhouse gas emissions policy (vigilant avoidance strategy).

Procedure and Measures

Baseline attitudes concerning investment in renewable energy sources and intervention on greenhouse gas emissions were initially assessed, asking participants to rate their agreement on a 7-point scale ranging from 1 (*not at all*) to 7 (*very much*). Participants were then invited to read different versions of policy statements attributed to a fictitious candidate in forthcoming national elections. All statements presented the positive consequences deriving from the adoption of the proposed policy. They were formulated in prefactual form, with the proposed policy as the antecedent (e.g. 'If we invest in renewable energy sources like solar and wind power…') and the predicted positive outcome of the policy as the consequent (e.g. '… we will obtain a positive return on the economic development'). All participants read two statements, one regarding investment in renewable energy sources (i.e. eager approach strategy) and the other regarding intervention on greenhouse gas emissions (i.e. vigilant avoidance strategy). Both statements were manipulated according to two factors: outcome sensitivity and regulatory concern. In terms of outcome sensitivity, the statement varied in presenting either the achievement of positive outcomes (e.g. '…we will obtain better climatic conditions.') or the avoidance of negative outcomes (e.g. '…we will avoid worse climatic conditions.'). As to regulatory concern, the statement varied in its focus either on growth (e.g. '…we will obtain a positive return on the economic development.') or safety concerns (e.g. '…we will obtain a reduction of energy costs.').

The text of all the statements is reported in Table 1. The order of presentation of the two statements was randomised, and participants were equally and randomly assigned to the four

Table 1. Text of the policy messages employed in Study 1 and Study 2

	Goal-pursuit strategy			
	Eager approach strategy 'If we invest in renewable energy sources like solar and wind power…'		*Vigilant avoidance strategy* 'If we intervene on the emissions of greenhouse gases responsible of global warming…'	
	Outcome sensitivity		Outcome sensitivity	
Regulatory concern	*Achievement of positive outcomes*	*Avoidance of negative outcomes*	*Achievement of positive outcomes*	*Avoidance of negative outcomes*
Growth concern	'…we will obtain a positive return on the economic development.'	'…we will avoid a negative impact on the economic development.'	'…we will obtain better climatic conditions.'	'…we will avoid worse climatic conditions.'
Safety concern	'…we will obtain a reduction of energy costs.'	'…we will avoid an increase of energy costs.'	'…we will obtain a reduction of the negative effects of natural disasters.'	'…we will avoid an increase of the negative effects of natural disasters.'

experimental conditions resulting from the outcome sensitivity and regulatory concern manipulation of the two messages. Therefore, each participant read two messages (one for each topic) framed in the same way.

After reading each statement, participants were asked to express their agreement with the proposed policy ('To what extent do you agree with the statement you have just read?'), on a 7-point scale ranging from 1 (*not at all*) to 7 (*very much*). Participants were also asked to express their voting intention by asking 'Would you vote for a politician making this statement?' on a 7-point scale ranging from 1 (*probably not*) to 7 (*probably yes*).

Finally, participants were required to indicate their gender and age and to define their own political orientation, choosing one of the following: left, centre-left, centre-right, right or 'none of these definitions suits me' (if they did not wish to indicate a preference).

Results and Discussion

Preliminary Analyses

Participants' initial attitudes towards investment in renewable energy sources and intervention in the emission of greenhouse gas were positive ($M = 5.25$, $SD = 1.03$ and $M = 5.37$, $SD = 1.03$, respectively). They were also significantly and positively correlated, $r(93) = .611$, $p < .001$. Initial attitudes towards investment in renewable energy sources were significantly correlated with agreement with the experimentally manipulated policy statement, $r(93) = .512$, $p < .001$, and, to a lesser extent, voting probability, $r(92) = .258$, $p < .05$. Initial attitudes towards intervening in the emission of greenhouse gases were also correlated with agreement with policy statement, $r(93) = .336$, $p < .01$, and voting probability, $r(92) = .291$, $p < .01$.

A check for gender differences in baseline attitudes towards the two policies showed that male and female participants had similar attitudes towards investment in renewable energy sources ($M = 5.07$, $SD = 1.03$, and $M = 5.32$, $SD = 0.92$, respectively), $t(87) = 0.97$, $p = .337$, and intervening in greenhouse gas emissions ($M = 5.33$, $SD = 1.05$, and $M = 5.39$, $SD = 1.06$, respectively), $t(87) = 0.20$, $p = .845$. Age also had no effect on participants' attitudes towards either policy ($\beta = .04$, $t = 0.36$, $p = .719$, and $\beta = -.01$, $t = 0.10$, $p = .923$, respectively). To examine political orientation, we divided participants into three subgroups with similar political orientations: left and centre-left participants ($n = 45$), right and centre-right participants ($n = 19$) and unplaced participants ($n = 31$). Centre-right participants had less positive attitudes towards investments in renewable energy sources ($M = 4.79$, $SD = 1.03$) than centre-left participants ($M = 5.47$, $SD = 0.87$) and unplaced participants ($M = 5.23$, $SD = 1.18$), $F(1,92) = 3.02$, $p = .054$, $\eta^2 = .06$. The same trend was found for attitudes towards intervening in greenhouse gas emissions, with centre-right participants being less favourable ($M = 4.79$, $SD = 1.40$) than centre-left participants ($M = 5.49$, $SD = 0.95$) and unplaced participants ($M = 5.55$, $SD = 0.87$), $F(1,92) = 4.01$, $p < .05$, $\eta^2 = .08$. These results are consistent with previous research indicating that citizens supporting conservative parties tend to show less concern for global warming and less support for related policies than citizens supporting liberal, left-wing or green parties (Clements, 2012; McCright & Dunlap, 2011; O'Connor, Bord, Yarnal, & Wiefek, 2002; Tranter, 2011).

We then tested whether political orientation had an influence on differences in the agreement with the two manipulated message statements regarding renewable energy and greenhouse gas emissions. After including initial attitude towards investment in renewable energy sources as a covariate, $F(1,91) = 26.71$, $p < .001$, $\eta^2 = .23$, we found no effect of political orientation on agreement with the energy policy message, $F(2,91) = 1.82$, $p = .169$, $\eta^2 = .03$. Similarly, after including initial attitude towards intervention on greenhouse gas emissions as a covariate, $F(1,91) = 9.63$, $p < .01$, $\eta^2 = .09$, we found no effect of political orientation on agreement with the climate policy message, $F(2,91) = 0.23$, $p = .79$, $\eta^2 = .01$. This indicated that initial ideological differences in attitudes towards the issues also accounted for differences in the agreement with the manipulated policy messages. Therefore, we decided to include initial attitudes towards the issues as covariates in the main analyses, to account for ideological differences among participants.

Effects of Message Framing on Agreement with Policy Messages

We ran separate regression analyses on the agreement with each policy message, namely the message focused on investment in renewable energy sources and the message focused on intervention on greenhouse gas emissions. In each regression model, we entered the main predictors in Step 1, namely outcome sensitivity (contrast-coded by assigning -1 to messages presenting avoidance of negative outcomes and +1 to messages presenting the achievement of positive outcomes) and regulatory concern (contrast-coded by assigning -1 to messages with a safety concern and +1 to messages with a growth concern). Initial attitude towards the respective policy was also entered in Step 1, as a control variable. In Step 2, we entered the interaction term between outcome sensitivity and regulatory concern, computed as the product of the two contrast-coded variables.

Results of the regression model on agreement with the renewable energy message showed, in Step 1, a significant effect of prior attitude towards the policy, $B = .603$, standard error (SE) $= 0.108$, $t = 5.61$, $p < .001$, indicating that participants who already had a positive attitude towards the topic were more likely to agree with the policy statement. No significant effect of outcome sensitivity, $B = .170$, $SE = 0.109$, $t = 1.56$, $p = .123$, or regulatory concern, $B = .053$, $SE = 0.110$, $t = 0.48$, $p = .630$, was found. In Step 2, the interaction between the two variables was entered as an additional predictor, and a significant effect was found, $B = .267$, $SE = 0.107$, $t = 2.50$, $p < .05$. Separate follow-up regression analyses were conducted to test the effect of outcome sensitivity for messages with a growth concern and messages with a safety concern. As expected, when the regulatory concern of the message was growth, agreement with the message presenting the achievement of a positive outcome was higher than agreement with the message presenting the avoidance of a negative outcome, $B = .440$, $SE = 0.150$, $t = 2.91$, $p < .01$. No difference in the agreement with messages presenting a positive or negative outcome emerged when the regulatory concern was safety, $B = -.095$, $SE = 0.149$, $t = 0.63$, $p = .529$. Agreement with the

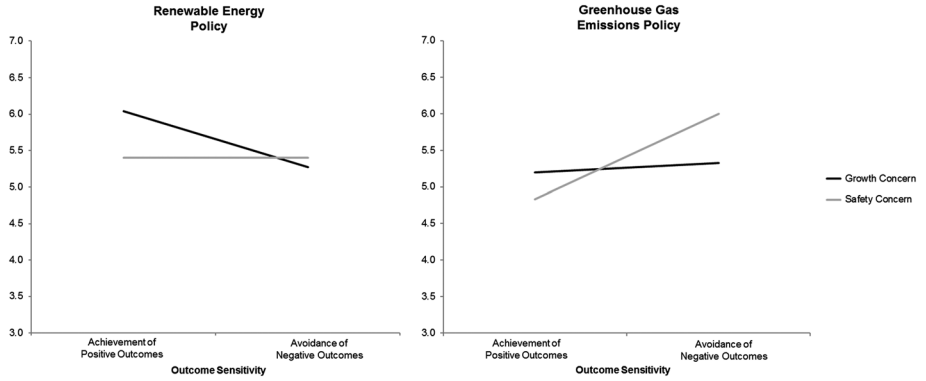

Figure 1. Agreement with investment in renewable energy sources and intervention on greenhouse gas emissions as a function of outcome sensitivity and regulatory concern of the message (Study 1)

energy policy message was therefore highest when the policy was framed in terms of achievement of growth-related positive outcomes, as shown in Figure 1 (left-hand side).

Results of the regression on agreement with the greenhouse gas emissions policy message as the dependent variable again showed, in Step 1, a significant effect of prior attitude towards the policy, $B = .442$, $SE = 0.122$, $t = 3.62$, $p < .001$. In this second analysis, a significant negative effect of outcome sensitivity also was found, $B = -.316$, $SE = 0.125$, $t = 2.52$, $p < .05$. Messages focused on the avoidance of negative outcomes were more persuasive than messages focused on the achievement of positive outcomes. Regulatory concern did not have an independent effect on the agreement with the message, $B = -.119$, $SE = 0.126$, $t = 0.95$, $p = .345$. In Step 2, the interaction between outcome sensitivity and regulatory concern was included as a predictor, and a significant effect was found, $B = .261$, $SE = 0.123$, $t = 2.12$, $p < .05$. Separate follow-up regression analyses for messages with a safety and messages with a growth concern were performed. Results were similar to those obtained in the previous regressions, and fully confirmed our expectation (Figure 1, right-hand side). When the regulatory concern was growth, no difference between conditions emerged, $B = -.051$, $SE = 0.175$, $t = 0.30$, $p = .768$. When the regulatory concern was safety, agreement with the message focused on the avoidance of negative outcomes was significantly higher than agreement with the message focused on the achievement of positive outcomes, $B = -.574$, $SE = 0.173$, $t = 3.32$, $p < .01$. The agreement with the greenhouse gas emissions message was therefore highest when the policy was framed in terms of the avoidance of safety-related negative outcomes.

Effects of Message Framing on Voting Probability

After determining that the framing of policy statements influenced participants' agreement with them in the predicted way, we ran two separate regression models with the probability of voting for the candidate proposing each policy as the dependent variable. The same two-step procedure used in the first regressions on the agreement with the policies was used in these new regressions.

In the first regression, participants' probability of voting for the candidate who proposed the renewable energy policy was used as the dependent variable. Results were similar to those revealed by the analyses of agreement with the policy message. In Step 1, the prior attitude towards the policy had the predicted effect on voting intention, $B = .297$, $SE = 0.139$, $t = 2.13$, $p < .05$, but no significant effect of outcome sensitivity, $B = .226$, $SE = 0.142$, $t = 1.59$, $p = .114$, or regulatory concern, $B = .187$, $SE = 0.143$, $t = 1.30$, $p = .196$, was found. In Step 2, the interaction between the two variables was found to have a significant effect, $B = .377$, $SE = 0.138$, $t = 2.74$, $p < .01$. Separate follow-up regression analyses for messages with a growth concern and messages with a safety concern replicated the findings regarding the agreement with the message. When the regulatory concern of the message was growth, the probability of voting for the candidate was higher if the message presented the achievement of positive outcomes than if the message presented the avoidance of negative outcomes, $B = .606$, $SE = 0.195$, $t = 3.11$, $p < .01$. When the regulatory concern of the message was safety, the outcome sensitivity had no significant effect on voting intention, $B = -.147$, $SE = 0.197$, $t = 0.76$, $p = .449$.

Participants' probability of voting for the candidate who proposed the greenhouse gas emissions policy was used as the dependent variable in the second regression analysis. Results were similar to those found for the corresponding agreement measure. In Step 1, the effect of prior attitude towards the policy was significant, $B = .416$, $SE = 0.136$, $t = 3.06$, $p < .01$, as was the effect of outcome sensitivity, $B = -.349$, $SE = 0.138$, $t = 2.52$, $p < .05$. Messages focusing on the avoidance of negative outcomes resulted in a higher voting probability than messages focusing on the achievement of positive outcomes. Regulatory concern did not have a main effect on voting probability, $B = -.171$, $SE = 0.139$, $t = 1.24$, $p = .220$. In Step 2, the interaction between outcome sensitivity and regulatory concern had a significant effect on voting probability, $B = .276$, $SE = 0.136$, $t = 2.02$, $p < .05$. Separate regression analyses replicated the corresponding findings regarding the agreement with the greenhouse gas emissions message. When the message had a growth concern, the effect of outcome sensitivity on voting probability was not significant, $B = -.073$, $SE = 0.193$, $t = 0.38$, $p = .704$. When the message had a safety concern, the probability of voting for the candidate was higher if the message presented the avoidance of negative outcomes than if it presented the achievement of positive outcomes, $B = -.624$, $SE = 0.193$, $t = 3.25$, $p < .01$.

Our results confirm our expectation that the persuasiveness of policy messages is higher when the outcome sensitivity and

the regulatory concern of the message fit with the respective goal-pursuit strategy of the policy. In the case of the renewable energy policy (i.e. the eager approach strategy), participants' agreement was higher when the message presented the achievement of growth-related positive outcomes than when it presented the avoidance of negative growth-related outcomes (H1), whereas this effect of outcome sensitivity was not found for messages that addressed a safety concern. Conversely, in the case of the greenhouse gas emissions policy (i.e. the vigilant avoidance strategy), participants' agreement was higher when the message presented the avoidance of negative safety-related outcomes than when it presented the achievement of positive safety-related outcomes (H2). Unexpectedly, such difference partially extended also to messages addressing a growth concern. This is probably because the negative outcomes of global warming are commonly discussed by the media citing both safety-related (e.g. natural disasters endangering human and natural life) and growth-related matters (e.g. negative effects on the economy, such as damage to production assets).

As expected, the effects of message framing extended to participants' attitude towards the source of the messages, influencing their likelihood of voting for the candidate proposing the policy. In the case of the renewable energy policy (i.e. the eager approach strategy), participants' probability of voting for the candidate was higher when the message presented the achievement of positive outcomes and addressed a growth concern than when it presented the avoidance of negative outcomes and addressed a growth concern (H3). In the case of the greenhouse gas emissions policy, participants' probability of voting for the candidate was higher when the message presented the avoidance of negative outcomes and addressed a safety concern than when it presented the achievement of negative outcomes and addressed a safety concern (H4). Overall, therefore, the results of Study 1 suggest that the careful framing of policy messages according to the three investigated levels may result in higher support for policies and for the candidates proposing them.

STUDY 2

After assessing the effects of outcome sensitivity and regulatory concern on the persuasiveness of messages in support of the two policies in Study 1, in Study 2, we extended our analysis to the interactions of the various framing levels with individual regulatory focus. We expected to replicate the significant effects found in Study 1. In addition, we expected individual differences in regulatory focus to moderate the effect of outcome sensitivity on agreement with policy messages. In particular, we expected that predominantly promotion-focused individuals would be more easily persuaded by messages presenting the achievement of positive outcomes than by messages presenting the avoidance of negative outcomes (H5). Conversely, we expected that predominantly prevention-focused individuals would be more easily persuaded by messages presenting the avoidance of negative outcomes than by messages presenting the achievement of positive outcomes (H6).

Method

Participants

Sixty-six university students (age $M = 23.62$, $SD = 6.13$, 76.9% female) participated in the study. As in Study 1, students were asked to join an online study on 'green economy issues', and their participation was anonymous and on a voluntary basis.

Research Design

The design of the experiment was 2 (regulatory focus: promotion versus prevention) × 2 (outcome sensitivity: presence of positives versus absence of negatives) × 2 (regulatory concern: growth versus safety) for each policy message.

Procedure and Measures

As in Study 1, each participant read the same two policy messages (on renewable energy and greenhouse gas emissions policies), manipulated in terms of outcome sensitivity and regulatory concern. Participants were equally and randomly assigned to the four resulting experimental conditions, namely policies presented in terms of achievement of positive, growth-related outcomes ($n = 17$), avoidance of negative, growth-related outcomes ($n = 16$), achievement of positive, safety-related outcomes ($n = 17$) and avoidance of negative, safety-related outcomes ($n = 16$). As in Study 1, each participant read two messages framed in the same way, and the order of presentation of the messages was randomised.

Agreement with the two messages was measured using the same 7-point scale as that employed in Study 1. In addition, participants' regulatory focus was measured using the 18-item scale developed by Lockwood, Jordan, and Kunda (2002), employed by several past studies on dispositional regulatory focus (e.g. Uskul, Sherman, & Fitzgibbon, 2009; Yi & Baumgartner, 2009; Zacher & de Lange, 2011). Participants were asked to rate on a 7-point scale ranging from 1 (*not at all*) to 7 (*completely*) to what extent they identified themselves in a series of brief statements. An example of an item measuring promotion regulatory focus is 'Overall, I am more oriented towards achieving success than preventing failure.' An example of an item measuring prevention regulatory focus is 'I am more oriented towards preventing losses than I am towards achieving gains.' A single index of participants' prevalent regulatory focus was computed, subtracting the mean ratings of the prevention focus subscale (Cronbach's $\alpha = .790$) from the mean ratings of the promotion focus subscale ($\alpha = .828$), with higher values representing the prevalence of a promotion focus.

Results and Discussion

Preliminary Analyses

Participants' initial attitudes towards investment in renewable energy sources and intervention on greenhouse gas emissions were positive ($M = 5.30$, $SD = 1.04$, and $M = 4.80$, $SD = 1.21$, respectively). The two attitudes were also significantly and positively correlated, $r(64) = .511$, $p < .001$. Initial attitudes

were correlated with agreement with the corresponding experimentally manipulated policy messages, $r(64) = .434$, $p < .001$, for the attitude towards investments in renewable energy sources and $r(64) = .288$, $p < .05$, for the attitude towards intervention in greenhouse gas emissions.

We then checked for differences in baseline attitudes towards the two environmental policies based on participants' gender, age and political orientation, and the results were similar to those found in Study 1. Men and women had similar initial attitudes towards investment in renewable energy sources ($M = 5.00$, $SD = 1.56$, and $M = 5.40$, $SD = 0.83$, respectively), $t(63) = 0.95$, $p = .354$, and towards intervention in greenhouse gas emissions ($M = 4.60$, $SD = 1.68$, and $M = 4.86$, $SD = 1.07$, respectively), $t(63) = 0.72$, $p = .476$. Age did not affect participants' attitudes towards either issue ($\beta = -.10$, $t(65) = 0.76$, $p = .448$, and $\beta = .01$, $t(63) = 0.05$, $p = .96$ respectively). As in Study 1, participants were subdivided according to their political orientation into three groups, namely left and centre-left participants ($n = 28$), right and centre-right participants ($n = 11$) and unplaced participants ($n = 27$). Left and centre-left participants had more positive attitudes towards renewable energy sources ($M = 5.74$, $SD = 0.62$) than unplaced ($M = 5.27$, $SD = 0.91$) and centre-right participants ($M = 4.96$, $SD = 1.32$), $F(1,65) = 3.15$, $p < .05$, $\eta^2 = .09$. Similarly, left and centre-left participants had a more positive attitude towards intervention on the emissions of greenhouse gases ($M = 5.21$, $SD = 0.92$) than unplaced ($M = 4.91$, $SD = 1.04$) and centre-right participants ($M = 4.33$, $SD = 1.41$), $F(1,65) = 3.98$, $p < .05$, $\eta^2 = .11$. Differences in the agreement with the two policy messages based on participants' political orientation were tested, using the initial attitudes towards each policy as covariates. The initial attitude towards renewable energy sources had a significant effect on the agreement with the renewable energy policy message, $F(1,62) = 16.05$, $p < .001$, $\eta^2 = .21$, whereas political orientation did not, $F(2,62) = 0.68$, $p = .51$, $\eta^2 = .02$. Likewise, the initial attitude towards intervention in greenhouse gas emissions had a significant effect on agreement with the greenhouse gas emissions policy message, $F(1,62) = 7.20$, $p < .01$, $\eta^2 = .10$, but no effect of political orientation was found, $F(2,62) = 0.793$, $p = .46$, $\eta^2 = .03$. Therefore, as in Study 1, we included the initial attitudes towards the two issues as covariates in the main analyses. Participants with different political orientations did not differ in their predominant regulatory focus, $F(2,63) = 0.22$, $p = .80$, $\eta^2 = .01$.

Effects of Message Framing and Regulatory Focus on Agreement with Policy Messages

We performed two separate regressions on agreement with the renewable energy message and agreement with the greenhouse gas emissions message. The regressions were conducted in three steps, with outcome sensitivity, regulatory concern and participants' regulatory focus entered as the main predictors in Step 1, their two-way interactions entered as additional predictors in Step 2 and the three-way interaction entered in Step 3. Prior attitudes towards both topics were included in the respective regression models as control variables.

In the first regression, which analysed participants' agreement with the renewable energy message, a significant effect of initial attitude was found, $B = .642$, $SE = 0.169$, $t = 3.81$, $p < .001$, showing that participants with highly positive attitudes towards renewable energy sources were more likely to agree with the policy message. No other main effects were found in Step 1 (outcome sensitivity, $B = .200$, $SE = 0.173$, $t = 1.15$, $p = .254$; regulatory concern, $B = .152$, $SE = 0.173$, $t = 0.88$, $p = .384$; and regulatory focus, $B = -.147$, $SE = 0.165$, $t = 0.89$, $p = .378$). When the two-way interactions were added to the model in Step 2, two significant effects emerged. As in Study 1, the interaction between outcome sensitivity and regulatory concern was significant, $B = .309$, $SE = 0.158$, $t = 1.96$, $p = .05$. Follow-up regression analyses showed that when the regulatory concern was growth, agreement with the message presenting the achievement of positive outcomes was higher than agreement with the message presenting the avoidance of negative outcomes, $B = .533$, $SE = 0.200$, $t = 2.67$, $p < .05$. When the regulatory concern was safety, no significant effect of outcome sensitivity was found, $B = -.088$, $SE = 0.318$, $t = 0.49$, $p = .627$.

The interaction between outcome sensitivity and regulatory focus was also significant, $B = .531$, $SE = 0.160$, $t = 3.31$, $p < .01$. Given the continuous nature of the regulatory focus index, simple slope analyses were performed. Results showed that when the message presented the achievement of positive outcomes, the effect of regulatory focus was positive, although it did not reach significance, $B = .198$, $SE = 0.228$, $t = 0.87$, $p = .393$. Participants with a promotion regulatory focus were slightly more inclined to agree with the energy policy message than participants with a prevention focus. When the message presented the avoidance of negative outcomes, regulatory focus had a strong significant negative effect on participants' agreement with the energy policy message, $B = -.839$, $SE = 0.198$, $t = 4.24$, $p < .001$. This indicates that participants with a prevention focus agreed with the message more than participants with a promotion focus (Figure 2, left-hand side). The interaction between regulatory concern and regulatory focus was not significant, $B = .226$, $SE = 0.154$, $t = 1.47$, $p = .148$. When the three-way interaction was entered in Step 3, no significant effect was found, $B = -.176$, $SE = 0.162$, $t = 1.09$, $p = .280$. The inclusion of the three-way interaction did not increase its predictive power of the model, R^2 change $= .01$, $F(1,57) = 1.19$, $p = .28$, indicating that the fit among multiple levels of message framing and recipients' regulatory focus did not further increase the persuasiveness of the message.

In the second regression, which analysed agreement with the greenhouse gas emissions message, significant effects of the initial attitude, $B = .420$, $SE = 0.143$, $t = 2.93$, $p < .01$, and outcome sensitivity were found, $B = -0.387$, $SE = 0.173$, $t = 2.24$, $p < .05$. As in Study 1, messages presenting the avoidance of negative outcomes were more persuasive than messages presenting the achievement of positive outcomes. No main effects of regulatory concern, $B = -.09$, $SE = 0.169$, $t = 0.53$, $p = .596$, or regulatory focus, $B = .082$, $SE = 0.161$, $t = 0.51$, $p = .610$, were found in Step 1. When the two-way interactions were added in Step 2, a significant effect of the interaction between outcome sensitivity and regulatory concern was also found, $B = .483$, $SE = 0.129$, $t = 3.74$, $p < .01$, replicating our findings from Study 1. Separate follow-up regression analyses showed that when the regulatory concern of the message was growth, the effect of outcome sensitivity was not significant, $B = .094$, $SE = 0.245$, $t = 0.53$, $p = .604$.

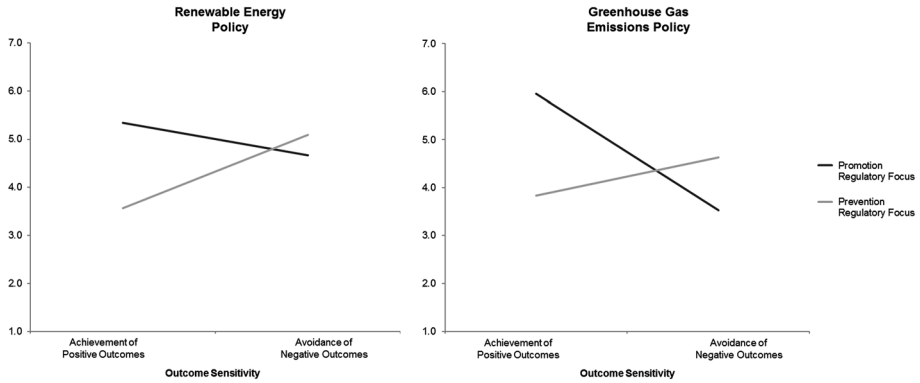

Figure 2. Agreement with investment in renewable energy sources and intervention on greenhouse gas emissions as a function of outcome sensitivity of the message and participants' regulatory focus (Study 2)

When the regulatory concern was safety, the effect was significant. Agreement with the message presenting the avoidance of negative outcomes was higher than agreement with the message presenting the achievement of positive outcomes, $B = -.608$, $SE = 0.268$, $t = 2.27$, $p < .05$. As expected, the interaction between outcome sensitivity and participants' regulatory focus was also significant, $B = .717$, $SE = 0.131$, $t = 5.46$, $p < .001$. Simple slope analyses showed that when the message presented the achievement of positive outcomes, a significant positive effect of regulatory focus emerged, $B = .523$, $SE = 0.208$, $t = 2.51$, $p < .05$. The message was more persuasive for participants with a promotion focus than for participants with a prevention focus. The opposite was true when the message presented the avoidance of negative outcomes. In this case, a significant negative effect of regulatory focus was found, $B = -1.004$, $SE = 0.191$, $t = 5.27$, $p < .001$, indicating that this message was more persuasive for participants with a prevention focus than for participants with a promotion focus (Figure 2, right-hand side). The interaction between regulatory concern and regulatory focus did not have a significant effect on participants' agreement with the message, $B = .202$, $SE = 0.124$, $t = 1.63$, $p = .109$. In Step 3, the three-way interaction was added as a predictor in the model. No significant effect, $B = -.021$, $SE = 0.134$, $t = 0.16$, $p = .875$, nor a significant increase of the predictive power of the model was found, R^2 change $< .01$, $F(1,57) = 0.25$, $p = .88$, indicating that the fit among multiple levels of message framing and participants' regulatory focus did not further increase the persuasiveness of the message.

To sum up, the results of Study 2 replicated those of Study 1 regarding the fit among outcome sensitivities, regulatory concerns and goal-pursuit strategies of the messages. In addition, we found that participants' agreement with the policy message increased when the outcome sensitivity of the message 'fit' with individual regulatory focus. Promotion-focused participants agreed more with messages presenting the achievement of positive outcomes than with messages presenting the avoidance of negative outcomes (H5). Conversely, prevention-focused participants agreed more with messages presenting the avoidance of negative outcomes than with messages presenting the achievement of positive outcomes (H6). This was the case regardless of the goal-pursuit strategy of the policy and the regulatory concern of the message. The effect was especially evident among prevention-focused participants. This is consistent with previous findings on the stronger sensitivity of predominantly prevention-focused individuals to messages fitting with their prevalent focus (e.g. Cesario et al., 2004, Study 2; Holler et al., 2008, Study 1).

Overall, the findings of Study 2 suggest that the persuasiveness of messages highlighting different outcomes of environmental policies depends not only on the correspondence between different levels of message framing (namely outcome sensitivity, regulatory concern and goal-pursuit strategies) but also on their correspondence with recipients' individual orientation towards promotion or prevention.

GENERAL DISCUSSION

Our research shows that messages relating to climate change policies are most persuasive when different levels of message framing fit with each other and with the regulatory focus of the recipient. We showed that a policy message focused on renewable energy sources is more persuasive when it is framed in terms of the positive outcomes that may be achieved by adopting the policy and when the content of the message emphasises growth as the primary concern. Conversely, a message focused on greenhouse gas emissions is more persuasive when it is framed in terms of the negative outcomes that may be avoided by adopting the policy and when the content of the message emphasises safety as the primary concern. Individual regulatory focus further moderates these effects, because messages framed in terms of achievement of positive outcomes are more persuasive for promotion-focused participants, whereas messages framed in terms of the avoidance of negative outcomes are more persuasive for prevention-focused participants.

Our results are consistent with the self-regulatory framework of persuasion proposed by Cesario et al. (2013). They confirm the usefulness of considering—beyond the 'simple' distinction between gain framing and loss framing—other levels of message framing, such as the goal-pursuit strategy and the regulatory concern implied in the messages. At the same time, our results enrich and extend the framework of Cesario et al. in three ways.

Firstly, by including both the regulatory concern addressed by the message and the predominant regulatory focus of

recipients in the same regression model, we found that the moderating effects of these two factors are substantially independent. According to the model of Cesario et al. (2013), the regulatory concern of a message induces a promotion focus or a prevention focus in receivers. Our results suggest that this message-induced focus does not necessarily interact with dispositional preference for promotion or prevention in influencing the persuasiveness of a message. It should be mentioned, however, that in our research, the small sample size of Study 2 might have made the interaction between dispositional regulatory focus and situational regulatory focus harder to detect. The specific measure of dispositional regulatory focus used in the study might also have contributed to this pattern of findings (see Summerville & Roese, 2008). Future research might therefore investigate the interaction between regulatory focus and regulatory concern using larger samples or different measures of dispositional focus.

Secondly, although the framework of Cesario et al. (2013) considers goal-pursuit strategy as a level of framing, the interaction of this level with the other levels of framing had not previously been tested. In the current research, we investigated the framing of two messages that differed in their goal-pursuit strategies, promoting renewable energy policies and greenhouse gas emissions policies. In both cases, we showed that when the outcome sensitivity and the regulatory concern of the messages 'fit' the goal-pursuit strategy underlying the policy, the message is more persuasive. A policy based on an 'eager approach' strategy is better supported by a positively framed, growth-concerned message. Conversely, a policy based on a 'vigilant avoidance' strategy is better supported by a negatively framed, safety-concerned message. This confirms the value of including goal-pursuit strategy as one of the layers of complexity in the self-regulatory framework of message framing.

Thirdly, our findings indicate that the self-regulatory framework can be extended to domains where message framing is used to influence people's attitudes towards relevant political and economic issues. Previous research on message framing and regulatory focus was mostly limited to messages advocating health-related individual behaviours (see Cesario et al., 2008, for a review). Government policies addressing a worldwide threat, such as global warming, obviously differ in scope and importance from physicians' recommendations to prevent cardiovascular disease, but our results show that similar processes can be observed in both cases. This finding provides a substantial addition to our knowledge of the effects of framing on attitudes and behaviours, as it indicates that regulatory concern and regulatory focus affect not only individual behavioural intentions but also individual support for societal-level changes, such as the decision to adopt a government policy on climate change.

A possible limitation to the generalisability of our results is that participants had a generally positive prior attitude towards the matters concerned (investment in renewable energy sources and intervention on greenhouse gas emissions), making the messages we tested rather attitude-consistent. Future research might examine the effects of message framing of climate policies on 'climate sceptics' (McCright & Dunlap, 2011; Poortinga, Spence, Whitmarsh, Capstick, & Pidgeon, 2011), in order to investigate which formulation may be more appealing to this specific audience. As sceptics deny the consequences of global warming and human responsibility for it, framing policies in terms of the achievement of potential benefits might be an effective way to overcome their resistance and gain their support for climate policies (similar to what happens with individual behaviours, see Cooke and Fielding, 2010).

It is also desirable to investigate how the persuasiveness of messages promoting energy and climate policies can be influenced by the source of the message and by the actors involved in the adoption of such policies. Our results show that agreement with policy messages was closely related to the probability of voting for the candidates that proposed them, suggesting that message framing might also have an effect on electoral choices. Although assimilation effects between political attitudes towards issues and candidates are well known (Granberg, 1993; Heider, 1958), they might also be a double-edged sword. Prior attitudes towards candidates could moderate the effectiveness of message framing, because recipients might be less interested in and less attentive to the subtle features of messages from a candidate or a party they already dislike (Druckman, 2001).

Future research on the communication of environmental policies should test the effects of message framing using different textual stimuli from the ones we used here. These could include messages describing the 'pains of not adhering' to climate change policies (Cesario et al., 2013), which we did not include in our experiments. This would expand our understanding of how the self-regulatory framework of message framing can be applied to the domain of environmental communication. Presenting participants with longer texts than the ones we used in our experiments would also be interesting, because this would allow researchers to test further ways of manipulating the different levels of framing involved in policy messages. Furthermore, additional measures of recipients' attitudes should be considered besides the simple agreement measure used in the present studies.

In sum, our research shows that message framing influences attitudes towards different policies addressing the issue of climate change. What we observe may inform suggestions to policy makers and opinion formers on how the text of a policy should be formulated in order to adequately reflect the goal strategy underlying the advocated policy. In addition, our results suggest the opportunity to consider possible differences in the predominant regulatory focus of the target audience to which the policy message is addressed. We can rely on a considerable amount of information regarding the sociodemographic features that are more likely to be related to a promotion-versus-prevention regulatory focus (Fellner, Holler, Kirchler, & Schabmann, 2007; Gorman et al., 2012). Therefore, a policy maker has some possibility of knowing in advance what the prevalent regulatory focus of a given target audience is and can adjust the policy message accordingly. More generally, an increased awareness of the dynamics underlying the persuasiveness of policy messages about climate change might be helpful for international organisations, governments and other social and political actors in their efforts to convince citizens of the best course of action on an issue of crucial importance for the survival and growth of the world community.

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