

TO ENCOURAGE OR DISCOURAGE?

Investigating the interplay of normative framing, regulatory focus
and pro-environmental behaviour



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Abstract

The world's population has never been more concerned about the environment than it is today. Yet, a large proportion of the population expressing the desire to reduce their environmental impact, fail to translate these intentions into behaviour, resulting in a pro-environmental behaviour-intention gap. Although reasons for the existence of this phenomenon have been widely studied, solutions to bridge this gap remain relatively unexplored. Given that normative influence techniques have been shown to induce behavioural change, the present study aimed to investigate the effect of normative framing strategies on individuals' pro-environmental behaviour, while also examining the moderating role of individuals' regulatory focus. A laboratory experiment was conducted, in which participants (N = 93) completed a survey and were randomly assigned to one of three experimental conditions: prescriptive framing, proscriptive framing, or no framing. Each condition, except for the no framing condition, involved exposure to a normatively framed message suggesting pro-environmental behaviour. The resulting behaviour of the participants was observed and recorded. Both prescriptive framing and proscriptive framing were found to positively influence individuals' pro-environmental behaviour. As for the degree of effectiveness, no significant difference was found between the influence of prescriptive framing and proscriptive framing on individuals' pro-environmental behaviour. Finally, individuals' regulatory focus did not emerge as a moderator in the relationship between normative framing and pro-environmental behaviour. Altogether, the findings of this study highlight the potential of normative framing in encouraging individuals' pro-environmental behaviour. Furthermore, this research provides opportunities for future studies to investigate additional factors that may influence the relationship between normative framing and pro-environmental behaviour.

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1 Introduction

During the recent years, environmental concerns have grown rapidly. According to research by GlobeScan (2023), the world's population has never been more concerned about the environment than it is today. Climate change, in particular, has become a burning issue, with tangible impacts around the globe (GlobeScan, 2023). One glaring example of the impact of climate change is the rise in global temperatures. The summer of 2023, for instance, stands out as the hottest summer on Earth, marked by a rise in the average temperature of 0.23 degrees Celsius (NASA, n.d.). Though this increase might appear relatively modest, its consequences were substantial, leading to deadly wildfires, scorching heatwaves, and heavy rainfall (NASA, n.d.). Additionally, the effects extend to melting glaciers, rising sea levels and warming oceans, posing serious threats to both animal and human livelihoods (WWF, n.d.).

Given that many of the causes of environmental concerns are rooted in human behaviour (e.g. Amel et al., 2017; Grilli & Curtis, 2021; Steg & Vlek, 2009), it is crucial to modify relevant behaviour to reduce environmental impact. Pro-environmental behaviour can be defined as “behavior that consciously seeks to minimize the negative impact of one’s actions on the natural and built world” (Kollmuss & Agyeman, 2002, p. 240). It can encompass all possible actions directed at minimising environmental harm or even enhancing the environment (Steg & Vlek, 2009). Dimensions underlying pro-environmental behaviour include conservation lifestyle, social environmentalism, environmental citizenship, and land stewardship, in which the degree of behavioural action can range from making environmentally conscious household decisions, managing nature conservation, talking about relevant environmental issues, to initiating pro-environmental campaigns and so on (Larson et al., 2015).

Although a large proportion of the population expresses the desire to reduce their environmental impact, there exists a gap between intention and behaviour (GlobeScan, 2023). The contradiction between what people initiate and the behaviour they show is widely discussed in academic literature and can be referred to as the pro-environmental behaviour-intention gap (e.g. ElHaffar et al., 2020; Frank & Brock, 2018; Park & Li, 2020). While many scholars have addressed the reasons for the existence of this pro-environmental behaviour-intention gap, solutions to bridge it remain relatively understudied (ElHaffar et al., 2020).

Within the limited scope of reviews proposing solutions to bridge the pro-environmental behaviour-intention gap, researchers introduced the usage of normative influence techniques (e.g. Abrahamse & Steg, 2013; Bergquist & Nilsson, 2016; De Groot et al., 2021; Farrow et al., 2017; Nyborg et al., 2016). The increasing use of normative influence techniques stems from

evidence that behaviour of individuals is largely driven by social norms (e.g. Cialdini et al., 1990; Rimal and Lapinski, 2015; Tankard & Paluck, 2016). Social norms, defined as “standards, expectations, and rules held by a social group for what is “normal” and “appropriate” to feel, think, and do” (Sassenberg & Vliek, 2019, p. 95-96), are regarded as implicit, subject to conditional adherence, and driven by external rather than internal enforcement (Farrow et al., 2017). In other words, social norms especially drive behaviour when made salient (Cialdini et al., 1990). A common method for making social norms salient involves the use of normative messages (Schultz et al., 2008). Although extant research demonstrates that normative messages can prompt behavioural change (e.g. De Groot et al., 2013; Goldstein et al., 2008; Sussman et al., 2012), their effectiveness may depend on the way the message is framed (Bergquist & Nilsson, 2016). One approach to framing normative messages is to incorporate prescriptive norms or proscriptive norms (Bergquist & Nilsson, 2016). Prescriptive norms “encourage desirable actions” (Winter et al., 1998, p. 41), whereas proscriptive norms “discourage undesirable actions” (Winter et al., 1998, p. 41).

When examining the efficacy of normative framing strategies in influencing pro-environmental behaviour, a discrepancy emerges in literature (Farrow et al., 2017). While some researchers argue that prescriptive norms have a greater impact on behaviour (e.g. Gallagher & Updegraff, 2011; Winter et al., 2000), others find that proscriptive norms are more effective in inducing behavioural change (e.g. Cialdini et al., 2006; Pavey et al., 2018).

Building on these findings, extant research proposes that regulatory focus may moderate the effect of normative framing and may be a reason for the abovementioned inconsistency (Kim, 2006). Regulatory focus describes individuals’ motivation in pursuing goals and distinguishes between promotion focus and prevention focus (Higgins, 1997). Individuals with a promotion focus are “motivated by incentives seen as accomplishments” (Shah et al., 1998, p. 286). In contrast, prevention-focused individuals are “motivated by incentives seen as safety” (Shah et al., 1998, p. 286). Considering that individuals tend to be more responsive to messages tailored to their regulatory orientation, prescriptive framing may work better for promotion-focused individuals, while proscriptive framing may work better for individuals with a prevention focus (Kim, 2006).

In order to determine the most effective application of normative framing in shaping pro-environmental behaviour, and to determine whether the effect varies based on regulatory focus, the present study aims to explore the interplay between different strategies of normative framing, regulatory focus and pro-environmental behaviour. Through this investigation, the aim is to gain a deeper understanding of how these constructs interact and potentially inform

strategies aimed at promoting pro-environmental behaviour and mitigating environmental concerns.

1.1 Research questions

The key focus of this research is to investigate the different normative framing strategies, and their influence on individuals' pro-environmental behaviour. Given the potential influence of regulatory focus on the relationship between normative framing and pro-environmental behaviour, this construct is included as a moderator. This leads to the following research questions:

RQ1: How do prescriptive framing and proscriptive framing influence individuals' pro-environmental behaviour?

RQ2: To what extent does regulatory focus moderate the effect of prescriptive framing and proscriptive framing on individuals' pro-environmental behaviour?

1.2 Research relevance

The relevance of the present study is twofold, offering both scientific and practical insights.

First of all, within the extensive body of research addressing the pro-environmental behaviour-intention gap, this study responds to the call for a shift in research focus. Rather than studying the reasons for the existence of the pro-environmental behaviour-intention gap, the present study aims to explore solutions for bridging it. Furthermore, this research adds to the contradictory findings regarding the effectiveness of different normative framing strategies. By conducting an experiment that compares the influence of prescriptive framing and proscriptive framing against a control group, this research aims to shed light on the most effective application of normative framing in shaping pro-environmental behaviour. Additionally, this study delves into the moderating effect of individuals' regulatory focus on the relationship between normative framing and pro-environmental behaviour. This aspect is particularly relevant as it represents an underexplored area in extant literature and may offer an explanation for the inconsistent findings regarding the effectiveness of the different normative framing strategies.

The practical relevance of this study resides in enhancing the understanding of the motivational drivers of individuals to engage in pro-environmental behaviour. By identifying

the effect of the different normative framing strategies on shaping pro-environmental behaviour, the results of this study will assist marketing managers and policymakers in tailoring their communication strategies and social marketing initiatives. Moreover, by investigating whether individuals' regulatory focus influences their responsiveness to such strategies, these findings will further inform targeted approaches to effectively influence individuals' pro-environmental behaviour.

1.3 Structure of the research

The structure of this research is outlined as follows. Chapter 2 presents the theoretical background touching upon theories regarding social norms, normative influence techniques, normative framing and regulatory focus. Subsequently, chapter 3 outlines the research methodology. Chapter 4 delves into the analysis and results of the study, after which chapter 5 addresses the theoretical and practical implications. Finally, chapter 6 concludes the research and provides answers to the research questions posed.

2 Theoretical background

2.1 Social norms

Social norms are commonly understood as the established standards, expectations, and rules within a social group dictating what is considered “normal” and “appropriate” in terms of thoughts, emotions, and actions (Sassenberg & Vliek, 2019). These norms, though often unwritten, are deeply ingrained within the group’s culture and are typically embraced and adopted by its members (Sassenberg & Vliek, 2019). The influence of social norms is widely acknowledged in literature and is considered to be one of the drivers of human behaviour (e.g. Cialdini et al., 1990; Rimal and Lapinski, 2015; Tankard & Paluck, 2016). According to the Theory of Normative Conduct by Cialdini et al. (1990), human behaviour in social situations is shaped by two different motivational sources: descriptive norms and injunctive norms. Whereas descriptive norms describe “what is the typical or usual thing to do” (Sassenberg & Vliek, 2019, p. 97), injunctive norms describe “what ought to be done” (Sassenberg & Vliek, 2019, p. 97). Furthermore, in situations where various social norms are present at the same time, human behaviour is shaped by the focal norm, which refers to the norm that is made salient and to which attention is drawn (Sassenberg & Vliek, 2019).

2.2 Normative influence techniques

Given the significant impact of social norms on human behaviour, researchers and practitioners across various domains increasingly leverage normative influence techniques to change behaviour in real-world contexts (Yamin et al., 2019). In the realm of environmental sustainability, normative influence has been found to foster pro-environmental behaviour, including reducing litter (Cialdini et al., 1990), conserving energy (e.g. Bergquist & Nilsson, 2016; Pellerano et al., 2016), opting for sustainable transportation (Kormos et al., 2014) and recycling (Schultz, 1999).

Normative influence can be deployed through various techniques, such as incorporating social norms into information and feedback provision, using block leaders and social networks, exercising public engagement, modelling desired behaviour, using social comparison, and providing feedback on group performance (Abrahamse & Steg, 2013). Among these techniques, one of the most commonly used methods involves the use of normative messages (Schultz et al., 2008). While extant research has shown that normative messages alone can bring about behavioural change (e.g. De Groot et al., 2013; Goldstein et al., 2008; Sussman et al., 2012), the content of the message may affect behavioural compliance (Bergquist & Nilsson, 2016). In

other words, the effectiveness of normative messages may depend on the way the message is framed, either prescriptively or proscriptively (Bergquist & Nilsson, 2016).

2.3 Normative framing

Normative framing can be understood as a strategic approach that incorporates normative influence into message framing (Khoa et al., 2021). With a view to encouraging pro-environmental behaviour, two primary forms of normative framing are often used: prescriptive framing and proscriptive framing (Winter et al., 2000). Prescriptive framing “emphasizes moral conduct by stating what people should do” (Song et al., 2023, p. 1).

It highlights desired behaviours and encourages individuals to conform to prevailing social norms (Winter et al., 2000). An example of a prescriptive-framed message would be “Please, turn off the tap”. On the other hand, proscriptive framing “highlights refraining from harm by specifying what people should not do” (Song et al., 2023, p.1). It emphasises behaviours that are discouraged by society (Winter et al., 2000). For instance, a proscriptive-framed message might state: “Please, do not leave the tap on”.

Given that normative framing makes social norms salient, and behaviour is particularly driven by social norms on which attention is focused (e.g. Cialdini et al., 1990; Kallgren et al., 2000), it is reasonable to expect that prescriptive framing and proscriptive framing increase the likelihood of exhibiting pro-environmental behaviour, as compared to a condition in which normative framing is absent. Hence, the following hypotheses are posed:

***H1a:** Exposure to a prescriptively framed message suggesting pro-environmental behaviour increases the likelihood of such behaviour, as compared to when no message is shown.*

***H1b:** Exposure to a proscriptively framed message suggesting pro-environmental behaviour increases the likelihood of such behaviour, as compared to when no message is shown.*

Although prescriptive framing and proscriptive framing may both bring about behavioural change, there exists a discrepancy in the literature regarding which normative framing strategy is more effective in influencing individuals’ pro-environmental behaviour (Farrow et al., 2017). Based on the notion that negative stimuli attract more attention than positive stimuli (Smith et al., 2003), one may expect that the salience and impact of the social norm will be increased, and proscriptive framing will thus be more effective in prompting action

than prescriptive framing. Several studies find support for this statement (e.g. Cialdini et al., 2006; Pavey et al., 2018). However, there is also a range of studies that indicates that prescriptive framing, which emphasises desired behaviours, is more influential than proscriptive framing (e.g. Gallagher & Updegraff, 2011; Winter et al., 2000).

In an attempt to unravel the contradicting results regarding the influence of different normative framing strategies on individuals' pro-environmental behaviour, the following hypothesis is put forward:

H1c: Exposure to a proscriptively framed message suggesting pro-environmental behaviour increases the likelihood of such behaviour more than exposure to a prescriptively framed message suggesting the same behaviour.

2.4 Regulatory focus

According to the regulatory focus theory proposed by Higgins (1997), individuals show distinct motivational orientations toward desired end-states. One may exhibit varying degrees of promotion-focused or prevention-focused tendencies (Higgins, 1997). Promotion-focused individuals typically prioritise the pursuit of positive outcomes and aspirations, whereas prevention-focused individuals are generally inclined towards avoiding negative outcomes and maintaining safety and security (Higgins, 1997).

Considering regulatory focus in the context of message framing, extant research shows that individuals tend to be more responsive to messages tailored to their regulatory orientation (e.g. Kim, 2006; Latimer et al., 2008; Shah et al., 1998). For instance, research by Kim (2006) on the role of regulatory focus in message framing of anti-smoking advertisements found that individuals had lower intentions to smoke when the fit between their regulatory focus and the anti-smoking message was congruent. Thus, individuals with a promotion focus were more receptive to the promotion-focused message: "If you do not smoke, you can obtain positive results, such as improving your respiratory system, enhancing your brain power, having fresh breath and whiter teeth (which is more attractive to dates), and more important, attaining greater energy for your everyday life" (Kim, 2006, p. 145-146), while prevention-focused individuals were more responsive to the message with a prevention focus: "If you do not smoke, you can avoid negative results, such as lung cancer, brain damage, bad breath and yellow teeth (which is less attractive to dates), and more important, you can protect your life" (Kim, 2006, p. 146). Similarly, research by Latimer et al. (2008) regarding the use of regulatory fit messages for

promoting physical activity showed that messages that matched individuals’ regulatory focus led to more physical activity than non-matching messages.

Following this line of reasoning, one might expect that individuals with a promotion focus are more responsive to prescriptive framing, aligning with their tendency to pursue positive outcomes. In contrast, those with a prevention focus may be more influenced by proscriptive framing, as it emphasises the avoidance of negative outcomes. Based on this knowledge, one might assume that the effect of normative framing strategies may be moderated by individuals’ regulatory focus. Hence, the following hypotheses are posed:

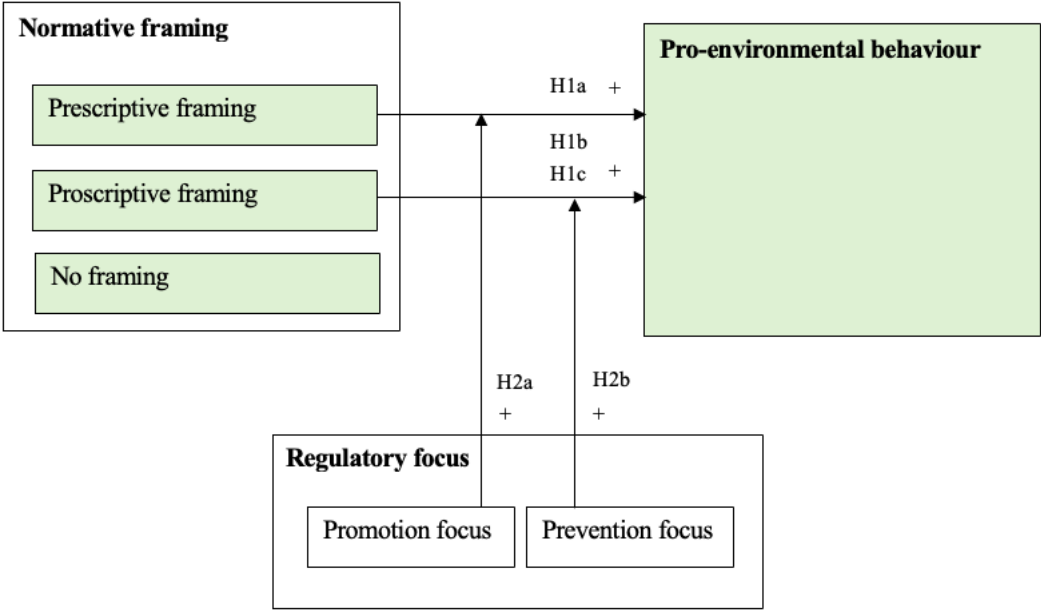
H2a: Promotion focus positively moderates the relationship between prescriptive framing and pro-environmental behaviour.

H2b: Prevention focus positively moderates the relationship between proscriptive framing and pro-environmental behaviour.

2.5 Conceptual model

The visual representation of this research is depicted in the conceptual model below.

Figure 1: Conceptual model



3 Methodology

3.1 Research strategy

To answer the research questions central to this study, a quantitative research method was used. Data was collected by means of a laboratory experiment with a 3x1 between-subjects design. The experimental design entailed that each experimental group received only one treatment – either prescriptive framing or proscriptive framing – and these group differences were compared against a control group in which the normative framing treatment was absent (Field & Hole, 2002). This method was chosen because, in order to investigate the effect of the distinct normative framing strategies on pro-environmental behaviour, there needed to be the possibility of isolating these causal relationships. Furthermore, opting for a laboratory experiment enabled the direct measurement of pro-environmental behaviour rather than self-reported intentions, which ensured a more accurate understanding of the actual influence of normative framing strategies. Additionally, the laboratory setting provided the opportunity to communicate with participants in case of questions or concerns, which ensured a smooth progress of the experiment.

3.2 Research design

The experiment was conducted within an energy conservation context, aiming to simulate a real-life scenario where pro-environmental behaviour is relevant.

Participants were randomly assigned to one of the three main experimental conditions: prescriptive framing, proscriptive framing, or no framing. However, given that the experiment was developed to serve two theses, a fourth condition involving autonomous choice was included. It is important to note that this condition is beyond the scope of the present study and was therefore not included in the analysis.

The experiment was structured as follows. First of all, participants were invited to take part in the experiment by asking them to respond to a series of questions concerning their pro-environmental behaviour. Subsequently, they were briefly introduced to the purpose of the study, without elaborating on the normative framing manipulation to prevent biased responses. Additionally, they were informed about the duration of the experiment, which was estimated at 5-10 minutes. Finally, in view of privacy and confidentiality, participants were notified about the research ethics and the possibility to withdraw from the experiment at any given time.

In case of agreement, participants were led to a room in which they were presented with the series of questions on a desktop computer. All constructs measured, along with their

corresponding scales, can be found in Table 1. First, three questions were asked to evaluate participants' green identity, as previous studies have indicated that green identity can be a significant predictor of pro-environmental behaviour (Lalot et al., 2019). This construct was measured using the items established by Hornsey et al. (2015). Subsequently, to account for the role of environmental attitude in predicting individuals' pro-environmental behaviour (e.g. Bamberg & Möser, 2007; Kaiser et al., 1999), five questions were posed to assess participants' environmental attitude, using the New Ecological Paradigm (NEP) scale by Dunlap et al. (2000). Following this, seven questions were directed towards measuring participants' sense of autonomy. It is important to note that this variable is pertinent to the thesis of another researcher and is therefore beyond the scope of this study. Thereafter, twelve questions were presented to evaluate participants' regulatory focus, based on the General Regulatory Focus Measure (GRFM) developed by Lockwood et al. (2002) as well as the Composite Regulatory Focus Measure Scale established by Haws et al. (2010). Finally, four questions were asked regarding the demographic variables age, identity, education level and study programme. The details of the survey can be found in Appendix 2a.

Table 1: Overview of the constructs experiment

Construct	Item *	Scale origin	Type of scale
Green identity	1 Being environmentally friendly is an important part of who I am.	Hornsey et al. (2015)	1-7 Likert scale
	2 I think of myself as someone who is very concerned with environmental issues.		
	3 I identify with the aims of environmental groups such as Greenpeace and Friends of the Earth.		
Environmental attitude	1 Plants and animals have as much right as humans to exist.	Dunlap et al. (2000)	1-7 Likert scale
	2 Humans are severely abusing the environment.		
	3 The so-called "ecological crisis" facing humankind has been greatly exaggerated.		
	4 Humans were meant to rule over the rest of nature.		
	5 If things continue on their present course, we will soon experience a major ecological catastrophe.		
Regulatory focus - Promotion focus	1 In general I am focused on achieving positive outcomes in my life.	Lockwood et al. (2002)	1-7 Likert scale
	2 I often imagine myself experiencing good things that I hope will happen to me.		
	3 Overall, I am more oriented toward achieving success than preventing failure.		
	4 When I see an opportunity for something I like, I get excited right away.	Haws et al. (2010)	
	5 I frequently imagine how I will achieve my hopes and aspirations.		

	6 I see myself as someone who is primarily striving to reach my “ideal self” – to fulfil my hopes, wishes, and aspirations.		
Regulatory focus – Prevention focus	1 In general, I am focused on preventing negative events in my life.	Lockwood et al. (2002)	1-7 Likert scale
	2 I often imagine myself experiencing bad things that I fear might happen to me.		
	3 I am more oriented toward preventing losses than I am toward achieving gains.		
	4 I worry about making mistakes.	Haws et al. (2010)	
	5 I frequently think about how I can prevent failures in my life.		
	6 I see myself as someone who is primarily striving to become the self I “ought” to be – fulfil my duties, responsibilities and obligations.		
Demographics	What is your age?	Original	Multiple choice with 7 answers
	What is your identity?		Multiple choice with 4 answers
	What is your current level of education?		Multiple choice with 5 answers
	What programme do you study?		Open question

*All items are original and were not adapted from existing sources

After completing the series of questions, participants were exposed to one of the experimental conditions by means of a message on the door, informing them that the lights should be switched off after leaving the room. Inspired by the operationalisation of Bergquist & Nilsson (2016) the messages were formulated as follows. In the prescriptive framing condition, participants received the message: “Please switch off the lights after leaving the room to save energy”, initiating what should be done (Bergquist & Nilsson, 2016). Conversely, in the proscriptive framing condition, participants received the message: “Please do not leave the lights on after leaving the room to avoid wasting energy”, emphasising what should not be done (Bergquist & Nilsson, 2016). Except for the wording, the messages appeared entirely identical in terms of design, featuring Radboud University’s brand identity and a drawing of a lightbulb. In case of the control condition, no message was presented. Examples of the manipulation messages can be found in Appendix 2b.

Following the prompts, the researchers observed whether or not the participants switched off the lights upon leaving the room. In order to prevent social desirability bias, the researchers were outside the room for the duration of the experiment.

3.3 Pre-test

Prior to data collection, the experiment was pre-tested to check the manipulation, eliminate errors and resolve ambiguities. This involved administering an online pre-test among a small convenience sample (N = 35), consisting of students and acquaintances recruited via WhatsApp. The main purpose of the pre-test was to check whether the manipulation messages, intended for the experiment, corresponded sufficiently to their intended meaning. Moreover, the pre-test assessed whether the messages were perceived as realistic. It is important to note that the participants of the pre-test were excluded from participation in the experiment. The design of the pre-test can be found in Appendix 1.

The pre-test was structured as follows. First, the participants were randomly assigned to one of the experimental conditions by means of a scenario in which they were presented with one of the normative messages. After taking in the scenario, the participants were asked to answer three questions on prescriptiveness, three questions on proscriptiveness, and three questions on autonomous choice (e.g. part of another researcher's thesis), to find out whether the presented message matched the intended meaning. Following this, two questions were posed to check whether the presented message was considered realistic. Finally, three questions regarding demographics were asked to determine whether the sample was sufficiently randomised. An overview of the measured constructs, along with their corresponding scales can be found in Table 2.

Table 2: Overview of the constructs pre-test

Construct	Item	Scale origin	Type of scale
Manipulation check proscriptiveness	1 The message indicates what I should not do.	Original, inspired by theory (e.g. Winter et al. 2000)	1-7 Likert scale
	2 The message prohibits certain actions.		
	3 The message is limiting in terms of actions I can take.		
Manipulation check prescriptiveness	1 The message tells me what I should do.	Original, inspired by theory (e.g. Winter et al. 2000)	1-7 Likert scale
	2 The message encourages a specific course of action.		
	3 The message is directive in terms of what I am expected to do.		
Realism check	1 The message seems realistic to me.	Original	1-7 Likert scale
	2 It is plausible that I would encounter such a message in real life.		

Prior to interpreting the pre-test results, the validity and reliability of the construct measurements were assessed using confirmatory factor analysis (CFA) and Cronbach's Alpha. Given that the CFA validated the expected two-factor structure, and both the proscriptiveness scale ($\alpha = .628$) and the prescriptiveness scale ($\alpha = .690$) demonstrated acceptable levels of internal consistency ($\alpha > .60$), it was concluded that the construct measurements were both valid and reliable (Hair et al., 2019).

With the validity and reliability of the construct measurements established, the results of the manipulation check and realism check could be interpreted. To determine whether the manipulation messages were perceived significantly different by the two manipulation groups, independent samples t-tests were performed. The results showed significant differences in the mean proscriptiveness scores between the proscriptive manipulation group ($M = 4.6$, $SD = 1.3$) and the prescriptive manipulation group ($M=3.0$, $SD = 1.1$), $t(33) = -3.901$, $p = <.001$, indicating that the manipulation message exposed to the proscriptive manipulation group was indeed evaluated as more proscriptive than the manipulation message exposed to the prescriptive manipulation group. Similarly, significant differences were observed in the mean prescriptiveness score between the prescriptive manipulation group ($M = 6.0$, $SD = .64$) and the proscriptive manipulation group ($M = 5.2$, $SD = 1.4$), $t(33) = 2.213$, $p = .017$, suggesting that the manipulation message exposed to the prescriptive manipulation group was indeed judged as more prescriptive than the manipulation message exposed to the proscriptive manipulation group. Taking these findings into account, it may be concluded that the normative messages corresponded sufficiently to their intended meanings. As for participants' perceptions of the realism of the manipulation, both the proscriptive manipulation group and the prescriptive manipulation group generally found the messages to be realistic and plausible to encounter. Altogether, the analyses of the pre-test results supported the effectiveness of the manipulations.

3.4 Data collection

Participants for the experiment were obtained by means of convenience sampling and snowball sampling. Over a period of 3 days, attendees at Radboud University were personally asked to participate in the experiment. Subsequently, these participants were encouraged to share the opportunity to participate in the experiment with other attendees.

The desired sample size for the experiment included a minimum of 30 participants per condition. In the end, the total sample consisted of 123 participants.

3.5 Data analysis procedure

To analyse the data resulting from the experiment, IBM SPSS 29 was used. First of all, the dataset was cleaned to ensure that any missing values or incorrect responses were appropriately handled. Descriptive statistics were then conducted to gain insight into the main characteristics of the dataset. Following this, a confirmatory factor analysis was performed to examine whether the scales measured the latent constructs as theorised. Reliability analysis was subsequently undertaken to check the internal validity of the scales used. Finally, to explore the relationships between the different variables and to test the established hypotheses, binary logistic regression analyses were conducted.

3.6 Research ethics

Given the importance of ensuring ethical standards in academic research, the following precautions were applied in the present study. Firstly, for the purpose of intellectual property, confidentiality and privacy, participants were informed that they will remain completely anonymous. In addition, they were notified that they could withdraw of the experiment at any given time. Participants were furthermore informed that the data they provide will solely be used for academic purposes. With a view to informed consent, participants were asked to agree to the drafted terms and conditions before participating in the experiment. Finally, participants were provided with the researchers' contact details in case of questions or remarks.

4 Results

4.1 Data cleaning

The final sample consisted of 123 participants, evenly distributed across the experimental conditions, as detailed in Table 3. To determine whether there were any missing values that could impact the data, a missing value analysis was performed. Ultimately, no missing data were found. This can be explained by the fact that the survey was designed in a way that forced the participant to fill in a response. Additionally, no incorrect responses were detected.

As the data collection served two theses, participants exposed to the fourth condition concerning autonomous choice were excluded from the dataset. Consequently, the total sample was narrowed down to 93 participants.

Table 3: Distribution experimental conditions

Condition	Message	Number of participants
1 Prescriptive	Please switch off the lights after leaving the room to save energy	31
2 Proscriptive	Please do not leave the lights on after leaving the room to avoid wasting energy	31
3 Autonomous choice	What actions can you take to save energy now?	30
4 Control	No message presented	31

4.2 Descriptives

4.2.1 Demographics

The age of the participants ranged from 18-54 years old, with the vast majority being 18-24 years old (91.4%). This overrepresentation among younger participants is likely due to the use of convenience sampling and snowball sampling within the university campus. Most of the participants identified themselves as female (66.7%). Additionally, 26.9% identified as male, while 3.2% identified as some other type of identity. 3.2% preferred not to disclose their gender. The higher representation of females in the sample may again be attributable to the sampling methods. With regard to participants' educational backgrounds, the majority pursued a Bachelor's degree (82.8%). Smaller proportions were engaged in a Master's degree (11.8%) or Pre-master's programme (3.2%). Furthermore, a few participants were enrolled in other levels of education (2.2%).

As for the demographic characteristics of the different manipulation groups, it can be said that the overrepresentation of 18–24-year-olds, females, and those pursuing a Bachelor’s degree is also reflected in the prescriptive manipulation group, proscriptive manipulation group and the control group. Although the similar demographic characteristics allow for comparison between the different manipulation groups, the overrepresentation of the respective demographic characteristics should be taken into account when interpreting the results and their potential generalisability.

4.2.2 Main variables

The main variables in this research included the dependent variable pro-environmental behaviour, operationalised as the act of turning off the lights, and the moderating variable regulatory focus, which comprised both prevention focus and promotion focus.

Overall, it can be concluded that 36.6% of the participants demonstrated pro-environmental behaviour by turning off the lights after leaving the room. Furthermore, initial observations suggest variations in behaviour between the different manipulation groups. For instance, the percentages indicating that the lights were turned off were remarkably higher in both normative framing groups than in the control group. However, the significance of these differences will be explored in detail in section 4.4.3 Hypotheses testing.

In terms of regulatory focus, participants’ mean prevention focus was 4.8 on a Likert scale of 1-7. The average promotion focus score of the participants was 5.3, also measured on a 1-7 Likert scale. At first glance, the values of the different manipulation groups did not appear to be very different from each other.

4.2.3 Control variables

Given their degree of predictability for individuals’ pro-environmental behaviour, both green identity and environmental attitude were included in the experiment as control variables. It is important to note that before conducting any statistical analyses, two of the five items measuring ‘Environmental attitude’ were reverse coded to ensure consistency in the interpretation of the responses across the construct.

On average, participants’ green identity was 5.1 on a Likert scale of 1-7. Furthermore, this value appeared to be relatively similar across the different manipulation groups. Participants’ environmental awareness was found to have an average score of 6.0 on a Likert scale of 1-7. Again, the average scores for each manipulation group initially appeared not to differ much from each other.

An overview of all relevant descriptive statistics can be found in Table 4.

Table 4: Descriptive statistics

Condition	Prescriptive	Proscriptive	Control	Total
N	31	31	31	93
Age group				
18 – 24 years old	28 (90.3%)	28 (90.3%)	29 (93.5%)	85 (91.4%)
25 – 34 years old	2 (6.5%)	2 (6.5%)	2 (6.5%)	6 (6.5%)
35 – 44 years old	1 (3.2%)	0 (0.0%)	0 (0.0%)	1 (1.1%)
45 – 54 years old	0 (0.0%)	1 (3.2%)	0 (0.0%)	1 (1.1%)
Identity				
Male	11 (35.5%)	5 (16.1%)	9 (29.0%)	25 (26.9%)
Female	20 (64.5%)	22 (71.0%)	20 (64.5%)	62 (66.7%)
Other	0 (0.0%)	2 (6.5%)	1 (3.2%)	3 (3.2%)
Prefer not to say	0 (0.0%)	2 (6.5%)	1 (3.2%)	3 (3.2%)
Level of education				
Bachelor's degree	26 (83.9%)	26 (83.9%)	25 (80.6%)	77 (82.8%)
Pre-master's degree	2 (6.5%)	1 (3.2%)	0 (0.0%)	3 (3.2%)
Master's degree	3 (9.7%)	3 (9.7%)	5 (16.1%)	11 (11.8%)
Other	0 (0.0%)	1 (3.2%)	1 (3.2%)	2 (2.2%)
Green identity	5.0	4.9	5.4	5.1
Environmental attitude	5.9	5.9	6.1	6.0
Regulatory focus				
Prevention focus	4.8	5.3	4.4	4.8
Promotion focus	5.4	5.2	5.1	5.3
Pro-environmental behaviour				
Lights off - yes	17 (54.8%)	13 (41.9%)	4 (12.9%)	34 (36.6%)
Lights off - no	14 (45.2%)	18 (58.1%)	27 (87.1%)	59 (63.4%)

4.3 Validity and reliability

4.3.1 Factor analysis

To ensure that the applied scales accurately measured the latent constructs as theorised, a confirmatory factor analysis (CFA) was conducted. In total, 20 variables were analysed and expected to load on four constructs: green identity, environmental attitude, promotion focus and prevention focus.

Prior to conducting the CFA, a number of assumptions had to be met. Firstly, according to Hair et al. (2019), the required sample size should be at least 4-5 times the number of variables in the factor analysis. Hence, with 20 variables, at least 80 observations were needed. Considering that the total sample consisted of 93 participants, it could be concluded that this assumption was met. Furthermore, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy should be at least $> .50$ and Bartlett's Test of Sphericity should be significant. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy resulted in a value of $.687$, which exceeded the acceptable threshold of $.5$. Additionally, Bartlett's Test of Sphericity was significant with a p -value of $< .001$, meaning that all assumptions for conducting the factor analysis were met.

Given that the primary objective of the factor analysis was to identify the latent constructs, principal axis factoring was used to extract the factors (Hair et al., 2019). Considering that the factor correlation matrix resulted in values lower than .30, varimax rotation was exercised (Hair et al., 2019). As there were no communalities below the threshold of .20, the following step in the factor analysis could be performed (Hair et al., 2019). Against expectations, a total of five factors were extracted that together explained 63.9% of the variance. Following this, the rotated factor matrix was checked for potential issues. First of all, three variables were found to be non-significant with a value below .5 (Hair et al., 2019). Therefore, ‘Preventionfocus6’, ‘Environmentalattitude1’, and ‘Promotionfocus3’ were deleted sequentially. After removing these variables and re-running the analysis, there still appeared to be a problem in the factor structure which concerned the existence of a cross-loader. A cross-loader is a variable that loads significantly on more than one factor and is deemed a candidate for deletion in case the difference between the highest and second-highest factor loading falls below .20 (Hair et al., 2019). Given that this was the case for ‘Preventionfocus1’, the variable was excluded, and the analysis was re-run. Once more, the rotated factor matrix resulted in one non-significant variable, ‘Promotionfocus1’, which was eventually deleted. After this, one more issue was identified, namely the loading of ‘Greenidentity3’ on the scale of ‘Environmental attitude’. This, however, is explainable as ‘Green identity’ seems to be closely related to ‘Environmental attitude’. Nevertheless, considering that the variable does not load on its original scale, it was decided to exclude it. In the end, as expected, four factors were extracted that together accounted for 65.7% of the total variance. The final factor structure can be found in Table 5.

Table 5: Factor structure experiment

Factors	1	2	3	4
Variables				
Greenidentity1				.894
Greenidentity2				.792
Environmentalattitude2	.662			
Environmentalattitude3R	.885			
Environmentalattitude4R	.589			
Environmentalattitude5	.515			
Preventionfocus2		.714		
Preventionfocus3		.722		
Preventionfocus4		.589		

Preventionfocus5				.757
Promotionfocus2				.622
Promotionfocus4				.527
Promotionfocus5				.755
Promotionfocus6				.682
Eigenvalue	2.982	2.821	2.055	1.345
% Variance explained	21.3%	20.1%	14.7%	9.6%

4.3.2 Reliability analysis

Following the CFA, further analyses were performed to examine the reliability of the scales. According to Hair et al. (2019), a scale is deemed reliable if its Cronbach's Alpha exceeds the threshold of .70. With a Cronbach's Alpha value of .840, it could be inferred that the scale measuring 'Green identity' was reliable. Similarly, the scale measuring 'Environmental attitude' could also be considered reliable with a Cronbach's Alpha of .732. Finally, the scales measuring 'Prevention focus' and 'Promotion focus' demonstrated reliability as well, with Cronbach's Alpha values of .787 and .738. The results of the reliability analysis can be found in Table 6.

Table 6: Reliability analysis

Construct	Number of items	Cronbach's Alpha
Green identity	2	.840
Environmental attitude	4	.732
Prevention focus	4	.787
Promotion focus	4	.738

4.4 Binary logistic regression

To investigate the main effects of normative framing, the moderating effects of regulatory focus, and the additional effects of the control variables, on individuals' pro-environmental behaviour, binary logistic regression analyses were conducted. For the categorical independent variable, normative framing, to be included in the analyses, dummy coding was used. The reference category was determined based on the hypothesis to be tested.

4.4.1 Assumptions binary logistic regression

Prior to performing binary logistic regression analysis, several assumptions had to be checked. First of all, the dependent variable should be measured on a binary scale (Hair et al., 2019). Given that the dependent variable, pro-environmental behaviour, was measured by the two

categories ‘yes’ and ‘no’, this assumption was met. Secondly, independence of observations should exist, which was the case as participants were approached individually from each other, and participated only once in one of the experimental conditions (Hair et al., 2019). Third, there should exist little to no multicollinearity among the predictor variables (Field, 2018). To test for multicollinearity, a linear regression analysis was run to obtain the collinearity diagnostics (Field, 2018). As can be seen in Table 7, none of the predictor variables resulted in tolerance values less than .1 and VIF values greater than 10, indicating no issues regarding multicollinearity (Field, 2018).

Table 7: Collinearity diagnostics

	Model	Tolerance	VIF
1	Green identity	.812	1.231
	Environmental attitude	.718	1.392
	ManipulationD_Prescriptive	.662	1.511
	ManipulationD_Proscriptive	.682	1.467
	AgeD_2534	.842	1.187
	AgeD_3544	.803	1.245
	AgeD_4554	.595	1.681
	IdentityD_Male	.810	1.234
	IdentityD_Other	.823	1.215
	IdentityD_Prefer	.910	1.099
	EducationD_Premaster	.627	1.594
	EducationD_Master	.725	1.380
	EducationD_Other	.959	1.043

Finally, a linear relationship should exist between each of the continuous predictor variables and the logit of the dependent variable (Field, 2018). In the present study, there exist only two predictor variables that are of a continuous measurement level, green identity and environmental attitude. For both variables, an interaction term with the logit of the dependent variable were created, after which binary logistic regression analysis was performed (Field, 2018). As can be noted in Table 8, both the interaction term of ‘Green identity’ and ‘Environmental attitude’ were non-significant with p-values greater than .05, indicating that the assumption of linearity of the logit of the dependent variable was met.

Table 8: Linearity of the logit of the dependent variable 'Pro-environmental behaviour – lights off'

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1	Green identity	2.716	3.674	.547	1	.460	15.123
	Environmental attitude	-1.605	7.201	.050	1	.824	.201
	Green identity * Ln_Greenidentity	-.910	1.443	.397	1	.528	.403
	Environmental attitude * Ln_Environmental attitude	.546	2.662	.042	1	.838	1.726
	Constant	-1.898	15.543	.015	1	.903	.150

Given that all assumptions for binary logistic regression analysis were met, the hypotheses could be tested.

4.4.2 Model construction

The binary logistic regression models were constructed as follows. In all analyses, the first model included the control variables: green identity, environmental attitude, age, identity, and education level. Given that 'Age', 'Identity' and 'Education level' are categorical variables, these were dummy coded. For each variable, the category with the highest number of participants served as the reference category. These were: '18-24 years old', 'Female' and 'Bachelor's degree'. Depending on the hypothesis being tested, the second model added the main independent variable (i.e. prescriptive framing or proscriptive framing). Finally, the third model incorporated the relevant moderators (i.e. prevention focus or promotion focus) and their interaction effect with the corresponding normative framing condition (i.e. prescriptive framing or proscriptive framing).

4.4.3 Hypotheses testing

4.4.3.1 Hypothesis H1a

As described in hypothesis H1a, exposure to a prescriptively framed message is expected to increase the likelihood of exhibiting pro-environmental behaviour, as compared to when no message is shown. To test this hypothesis, observations from the proscriptive framing condition were excluded from the analysis.

Initially, a binary logistic regression model was constructed, including the control variables. However, this model did not achieve statistical significance ($X^2(10, N = 62) = 11.209$, $p = .341$). Subsequently, the model was refined using backward elimination, removing variables with the highest p-value one by one and checking the model's significance after each removal.

Ultimately, none of the control variables - green identity, environmental attitude, age, identity, and education level - were found to be significant predictors of individuals' pro-environmental behaviour ($p > .05$). With the control variables excluded, the refined model included only the prescriptive framing condition as the main independent variable, with the control condition serving as the reference category. This final model showed significant results ($X^2(1, N = 62) = 12.856, p = .001$), suggesting that the prescriptive framing condition significantly contributes to explaining variance in the dependent variable.

Table 9: Final binary logistic regression model for H1a with 'Control condition' as reference category

Model 1	B	S.E.	Wald	Df	Sig.	Exp(B)
ManipulationD_Prescriptive	2.104	.646	10.605	1	.001	8.196
Constant	-1.910	.536	12.703	1	<.001	.148

Based on the final binary logistic regression model in Table 9, it can be concluded that prescriptive framing has a significant positive effect on individuals' pro-environmental behaviour, compared to a condition in which normative framing was absent ($B = 2.104, p = .001$). Specifically, the probability of individuals turning off the lights in the prescriptive framing condition was 8.196 times higher than the probability of individuals turning off the lights in the control condition. Therefore, hypothesis H1a, which states that "*Exposure to a prescriptively framed message suggesting pro-environmental behaviour increases the likelihood of such behaviour, as compared to when no message is shown*", cannot be rejected.

4.4.3.2 Hypothesis H1b

According to hypothesis H1b, exposure to a proscriptively framed message is also expected to increase the likelihood of exhibiting pro-environmental behaviour, as compared to when no message is shown. To evaluate this hypothesis, the data was restricted to exclude the observations in the prescriptive framing condition.

As with testing the previous hypothesis, the initial binary logistic regression model incorporated the control variables. However, once more, this model proved non-significant ($X^2(9, N = 62) = 7.555, p = .580$). Following this, backward elimination was executed. Again, none of the control variables were found to contribute significantly to explaining variance in the dependent variable, after which they were excluded from the model. The final model, consisting of the proscriptive framing condition as the main independent variable, with the

control condition acting as the reference category, was statistically significant ($X^2(1, N = 62) = 6.829, p = .009$).

Table 10: Final binary logistic regression model for H1b with 'Control condition' as reference category

Model 1	B	S.E.	Wald	Df	Sig.	Exp(B)
Variables						
ManipulationD_Proscriptive	1.584	.648	5.982	1	.014	4.875
Constant	-1.910	.536	12.703	1	<.001	.148

Consulting the final binary logistic regression model, to be found in Table 10, it can be deduced that proscriptive framing has a significant positive effect on individuals' pro-environmental behaviour, compared to a condition in which normative framing was absent ($B = 1.584, p = .014$). More precisely, the odds of turning off the lights in the proscriptive framing condition were 4.875 times higher than the odds of turning off the lights in the control condition. Consequently, hypothesis H2b "*Exposure to a proscriptively framed message suggesting pro-environmental behaviour increases the likelihood of such behaviour, as compared to when no message is shown*", cannot be rejected.

4.4.3.3 Hypothesis H1c

Hypothesis H1c concerns the difference between the influence of prescriptive framing and proscriptive framing on individuals' pro-environmental behaviour. Specifically, exposure to a proscriptively framed message is expected to increase the likelihood of exhibiting pro-environmental behaviour more than exposure to a prescriptively framed message. In order to test this hypothesis, observations from the control condition were excluded from the analysis.

Similar to testing the abovementioned hypotheses, the control variables were included in the first logistic regression model. Despite the model being significant ($X^2(11, N = 62) = 20.070, p = .044$), several control variables were non-significant. Consequently, backward elimination was performed to refine the model. Almost all control variables were found not to be significant, except for 'Green identity' 'Environmental attitude and 'Identity: Male'. The significance of these control variables implies that having a green identity, being environmentally aware, or identifying as male compared to female, may partially explain the variance in individuals' pro-environmental behaviour. Ultimately, the refined first model resulted in a significance of $X^2(3, N = 62) = 13.525, p = .004$. The second logistic regression

model, which added the proscriptive framing condition as the main independent variable, also resulted in a significant model fit ($X^2(4, N = 62) = 14.018, p = .007$).

Table 11: Final binary logistic regression model for H1c with 'Prescriptive condition' as the reference category

Model 1	B	S.E.	Wald	Df	Sig.	Exp(B)		Model 2	B	S.E.	Wald	Df	Sig.	Exp(B)
Green identity	-.542	.275	3.868	1	.049	.582		-.564	.280	4.049	1	.044	.569	
Environmental attitude	.829	.402	4.255	1	.039	2.291		.864	.415	4.334	1	.037	2.373	
IdentityD_Male	2.372	.840	7.968	1	.005	10.722		2.322	.849	7.470	1	.006	10.192	
ManipulationD_Proscriptive								-.411	.586	.491	1	.484	.663	
Constant	-2.841	2.353	1.457	1	.227	.058		-2.723	2.381	1.308	1	.253	.066	

As shown in the final binary logistic regression model in Table 11, it can be inferred that the proscriptive framing condition does not have a significant influence on individuals' pro-environmental behaviour, when set against the prescriptive framing condition and controlling for 'Green identity', 'Environmental attitude', and 'Identity: Male' ($p = .484$). More specifically, the probability of individuals turning off the lights in the proscriptive framing condition was .663 times lower than the probability of individuals turning off the lights in the prescriptive framing condition. Therefore, the results contradict the hypothesis, meaning that hypothesis H1c "Exposure to a proscriptively framed message suggesting pro-environmental behaviour increases the likelihood of such behaviour more than exposure to a prescriptively framed message suggesting the same behaviour", can be rejected.

4.4.3.4 Hypothesis H2a

Hypothesis H2a posits that promotion focus positively moderates the relationship between prescriptive framing and pro-environmental behaviour. To test this hypothesis, observations from the proscriptive framing condition were excluded from the analysis. Moreover, promotion focus was centred to ensure meaningful interpretation.

Initially, as with testing the foregoing hypotheses, all control variables were included in the binary logistic regression model. Given that this initial model was not significant ($X^2(10, N = 62) = 11.209, p = .341$), the model was refined using backward elimination. Eventually, none of the control variables were found to be significant and were thus excluded from the model. The subsequent model, consisting of the prescriptive framing condition was statistically significant ($X^2(1, N = 62) = 12.856, p = <.001$). The final model, incorporating the moderator

(i.e. promotion focus), and the interaction term (prescriptive framing * promotion focus), was also found to be significant ($X^2(3, N = 62) = 13.525, p = .004$).

Table 12: Final binary logistic regression model for H2a with 'Control condition' as the reference category

Variables	Model 1						Model 2					
	B	S.E.	Wald	Df	Sig.	Exp(B)	B	S.E.	Wald	Df	Sig.	Exp(B)
ManipulationD_Prescriptive	2.104	.646	10.605	1	.001	8.196	2.233	.688	10.524	1	.001	9.326
Promotion focus_c							-.377	.526	.515	1	.473	.686
ManipulationD_Prescriptive * Promotion focus_c							.194	.697	.078	1	.781	1.214
Constant	-1.910	.536	12.703	1	<.001	.148	-2.013	.582	11.974	1	<.001	.134

As can be noted in the final binary logistic regression model in Table 12, there exists no significant direct effect of promotion focus on individuals' pro-environmental behaviour ($p = .473$). Furthermore, the interaction effect between promotion focus and prescriptive framing on pro-environmental behaviour is also not significant ($p = .781$). Despite the lack of statistical significance, the unstandardised regression coefficient for the interaction term ($B = .194$) suggests a positive moderating relationship, which is in line to what has been hypothesised. Nevertheless, based on the abovementioned results, hypothesis H2a "*Promotion focus positively moderates the relationship between prescriptive framing and pro-environmental behaviour*" can be rejected.

4.4.3.5 Hypothesis H2b

Following hypothesis H2b, prevention focus positively moderates the relationship between proscriptive framing and pro-environmental behaviour. To evaluate this hypothesis, the data was restricted to exclude the observations in the prescriptive framing condition. Additionally, prevention focus was centred to guarantee meaningful interpretation of the results.

As in the previous sections, all control variables were initially included in the binary logistic regression model. However, as the resulting model was found to be non-significant ($X^2(9, N = 62) = 7.555, p = .580$), backward elimination was executed. Once again, none of the control variables were found to be significant, after which they were excluded from the model. The subsequent model, comprising the proscriptive framing condition, was statistically significant ($X^2(1, N = 62) = 6.829, p = .009$). The final model, adding the moderator (i.e. prevention focus) and the interaction term (proscriptive framing * prevention focus), resulted

in a non-significant model fit ($X^2(3, N = 62) = 7.648, p = .054$). Despite the non-significant values, the moderator and interaction term were retained in the model to test the hypothesis.

Table 13: Final binary logistic regression model for H2b with 'Control condition' as the reference category

Model 1							Model 2					
Variables	B	S.E.	Wald	Df	Sig.	Exp(B)	B	S.E.	Wald	Df	Sig.	Exp(B)
ManipulationD_Proscriptive	1.584	.648	5.982	1	.014	4.875	1.406	.677	4.314	1	.038	4.078
Prevention focus_c							.179	.383	.219	1	.640	1.196
ManipulationD_Proscriptive * Prevention focus_c							.089	.520	.030	1	.863	1.094
Constant	-1.910	.536	12.703	1	<.001	.148	-1.855	.542	11.723	1	<.001	.156

Considering the results of the final binary logistic regression model in Table 13, there appears to be no significant direct effect of prevention focus on individuals' pro-environmental behaviour ($p = .640$). Also, the effect of the interaction term, comprising prevention focus and proscriptive framing, on exhibiting pro-environmental behaviour does not prove to be significant ($p = .863$). In spite of this non-significance, the unstandardised regression coefficient for the interaction term ($B = .089$) suggests a positive moderating relationship, as predicted. Yet, based on the aforementioned results, hypothesis H2b "*Prevention focus positively moderates the relationship between proscriptive framing and pro-environmental behaviour*" can be rejected.

5 Discussion

This thesis aimed to explore the influence of the different normative framing strategies, prescriptive framing and proscriptive framing, on individuals' pro-environmental behaviour, while also examining whether regulatory focus moderates this effect.

Overall, the results of the present study indicate that both prescriptive framing and proscriptive framing had a positive effect on pro-environmental behaviour, operationalised as the act of turning off the lights. In other words, individuals who were exposed to a normative message that was either prescriptively framed or proscriptively framed, were more inclined to turn off the lights than individuals who were not exposed to a normative message. These findings support the established hypotheses (H1a – H1b) and are consistent with various studies demonstrating that making social norms salient through normative messages can lead to desired behavioural changes such as displaying pro-environmental behaviour (e.g. Cialdini et al., 1990; De Groot et al., 2013; Farrow et al., 2017).

In an attempt to contribute to the conflicting findings regarding the effectiveness of the different normative framing strategies on pro-environmental behaviour, this study found no significant difference between the influence of prescriptive framing and proscriptive framing on individuals' behaviour of turning off the lights. Contrary to what has been hypothesised (H1c), exposure to a proscriptively framed normative message did not result in significantly more individuals exhibiting pro-environmental behaviour than exposure to a prescriptively framed normative message. These results question existing theories that suggest either prescriptive framing or proscriptive framing has a stronger effect on shaping individuals' pro-environmental behaviour (e.g. Cialdini et al., 2006; Gallagher & Updegraff, 2011; Pavey et al., 2018; Winter et al., 2000). The non-significant difference between the two normative framing strategies highlights the complexity of the relationship between normative framing and pro-environmental behaviour and suggests that there may be additional factors, such as character traits or situational context, that account for its effect. However, in order to draw meaningful conclusions about this matter, further research is required.

In view of additional factors that may explain the effect of different normative framing strategies on shaping individuals' pro-environmental behaviour, the present study investigated the role of regulatory focus, comprising promotion focus and prevention focus. Against theoretical expectations (H2a - H2b), regulatory focus did not significantly moderate the relationship between normative framing and pro-environmental behaviour. Specifically, the hypothesis stating that promotion focus positively moderates the relationship between

prescriptive framing and pro-environmental behaviour was not supported (H2a). The extent of promotion focus among individuals did not account for significantly more or less pro-environmental behaviour in response to a prescriptively framed message. Likewise, the hypothesis that indicated that prevention focus positively moderates the relationship between proscriptive framing and pro-environmental behaviour could not be accepted (H2b). The level of prevention focus among individuals did not lead to a significant increase or decrease in pro-environmental behaviour when exposed to a proscriptively framed message. These findings contradict the claims made in previous research, where a tendency was found for individuals to be more responsive to messages tailored to their regulatory orientation (e.g. Higgins, 1997; Kim, 2006; Latimer et al., 2008; Shah et al., 1998). A possible explanation for the deviating results could be that there exist some contextual differences between the previous studies, conducted in the health domain (e.g. Kim, 2006; Latimer et al., 2008), and the present study, executed in the environmental domain. Given that health-related behaviours, such as giving up smoking or increasing physical activity, typically lead to immediate and personally relevant consequences, whereas pro-environmental behaviours usually result in more long-term and collective consequences, it is plausible that this could have led to the divergent influence of regulatory focus on the relationship between normative framing and behaviour. Another possible reason could be the different methods used to measure regulatory focus across the studies. For example, in Latimer et al.'s (2008) study, individuals' regulatory focus was assessed by having participants evaluate their past experiences of promotion and prevention success. Additionally, in the study by Kim (2006) participants were primed with promotion or prevention focus to investigate the influence of regulatory focus. In contrast, the present study relied solely on participants' self-reported assessments of their promotion and prevention focus, which could have led to variations in the findings. Although these explanations provide insight into the observed discrepancies, further research is recommended to validate and extend these findings.

5.1 Theoretical implications

The present study contributes to the literature in several ways. First of all, this research addresses the call for exploring solutions to overcome the pro-environmental behaviour-intention gap. Based on examining the impact of two distinct normative framing strategies on individuals' pro-environmental behaviour, it can be concluded that both prescriptive framing and proscriptive framing may serve as successful solutions to convert pro-environmental intentions into pro-environmental behaviour. These findings are consistent with extant research

and further validate the effectiveness of normative messages in encouraging pro-environmental behaviour (e.g. Cialdini, 2003; Schultz et al., 2008). Furthermore, this study adds a new outlook to the discussion regarding the effectiveness of prescriptive framing and proscriptive framing in shaping individuals' pro-environmental behaviour. Where several studies have suggested that one normative framing strategy may be more effective than the other (e.g. Cialdini et al., 2006; Gallagher & Updegraff, 2011; Pavey et al., 2018; Winter et al., 2000), this research found no significant difference between the two approaches. Finally, this thesis contributes knowledge to the relatively understudied role of regulatory focus in environmental research. Although no significant effect was found for the moderating role of regulatory focus on the relationship between normative framing strategies and individuals' pro-environmental behaviour, this study was one of the first to examine the interaction between normative framing, regulatory focus and pro-environmental behaviour, to the researcher's knowledge.

5.2 Practical implications

As well as contributing to theory, the present study also has some practical implications. First and foremost, this research has provided more insight into the motivational drivers of individuals to engage in pro-environmental behaviour. Specifically, it can be concluded that exposing individuals to normatively framed messages can increase compliance with pro-environmental behaviour. Marketing managers and policymakers that aim to encourage pro-environmental behaviour can make use of this insight to tailor their communication strategies and social marketing initiatives accordingly. For instance, prescriptive framing or proscriptive framing strategies could be used to design appealing campaigns that promote energy conservation. Additionally, the results of this study suggest that while using normative framing strategies to influence individuals' pro-environmental behaviour, there might be no need for marketing managers and policymakers to differentiate messaging based on individuals' regulatory focus. Finally, a practical implication in itself is the fact that small behavioural changes such as, in this case, turning off the lights, appear to make a valuable contribution to the environment on a global level (e.g. Bator et al., 2013; Dietz et al., 2009).

5.3 Limitations and directions for future research

While the current research has led to some valuable theoretical and practical implications, it is essential to also acknowledge its limitations.

As is the case with many studies of an experimental nature, the research design was subject to a few constraints. Given that the manipulation occurred only after the participant had taken the survey questions, no manipulation check was included in the experiment. Consequently, it was not possible to check whether the manipulation worked as intended. While it is most plausible that the significant difference in behaviour between the normative framing conditions (i.e. prescriptive framing and proscriptive framing) and the control condition (i.e. no framing) is attributable to the normative message, this cannot be said with certainty, and it may be the case that other factors influenced the participants' behaviour. To ensure the validity of any future experiments concerning the relationship between normative framing and pro-environmental behaviour, it is recommended to incorporate an appropriate manipulation check in the research design. A further limitation concerns the controlled setting in which the experiment was conducted. Considering that the participants were led to a room in which they were presented with the survey on a desktop computer, this setting may not accurately reflect real-world conditions and could have influenced participants' behaviour. To gain more insight into the natural behaviour that results from exposure to the normative messages, future research could be conducted in non-controlled contexts, such as home environments or work settings. The final constraint of the research design is the fact that the data obtained are cross-sectional in nature. This means that conclusions can only be drawn about the short-term effects of the normatively framed messages on individuals' pro-environmental behaviour. To address this limitation, future research should consider employing longitudinal research designs to gain a better understanding of how normatively framed messages influence pro-environmental behaviour over time.

The following limitations concern the sample of the present study. Given that the sample size was rather low, and participants of the experiment were obtained through convenience sampling and snowball sampling, the sample may not be representative of the wider population. As a consequence, findings may be less generalisable. Furthermore, the conduct of the experiment in a university environment may have caused the sample characteristics to be less evenly distributed. To ensure more representative and generalisable results, further research should attempt to obtain a sample with more diverse demographic characteristics.

Finally, although this research has taken the first steps in exploring the relationship between normative framing, regulatory focus and pro-environmental behaviour, the influence of regulatory focus was found to be non-significant. While these findings may be accurate, it is also possible that they were influenced by the context, or the measures used in this study. Using alternative measures of regulatory focus and broadening the study scope may provide more in-

depth insights into how regulatory focus influences pro-environmental behaviour, potentially revealing significant effects that were not detected in this first study.

6 Conclusion

This thesis aimed to gain insight into the different normative framing strategies, their influence on individuals' pro-environmental behaviour, and the effect of regulatory focus on this relationship.

Based on the analysis of individuals' pro-environmental behaviour in response to exposure to one of the normative framing conditions, the first research question: "How do prescriptive framing and proscriptive framing influence individuals' pro-environmental behaviour" can be answered as follows. Overall, both prescriptive framing and proscriptive framing have a positive influence on individuals' pro-environmental behaviour. More specifically, the results of the experiment demonstrated that participants exposed to either prescriptive framing or proscriptive framing were more inclined to turn off the lights than those who were not exposed to such framing. This suggests that both normative framing strategies are feasible solutions to encourage environmentally friendly actions. Given that the study did not find any significant differences in the effectiveness of the normative framing strategies, one could argue that prescriptive framing and proscriptive framing may both be equally effective in influencing individuals' pro-environmental behaviour.

Having examined the influence of regulatory focus on the relationship between the normative framing strategies and individuals' pro-environmental behaviour, the answer to the second research question: "To what extent does regulatory focus moderate the effect of prescriptive framing and proscriptive framing in shaping individuals' pro-environmental behaviour" implies that regulatory focus does not serve as a moderator in this study context. Although this finding initially suggests that the degree of regulatory focus does not influence the effect of prescriptive framing and proscriptive framing on individuals' pro-environmental behaviour, the relationship between the constructs may be a bit more nuanced given the limitations of this study. Further research is warranted to fully understand the complex relationship between normative framing, regulatory focus and pro-environmental behaviour.

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Appendices

Appendix 1 Pre-test

Dear participant,

Thank you very much for participating in this pre-test. We, Konstantina and Sjuul, are two students at Radboud University Nijmegen, and for our Master Thesis Marketing we are conducting research on pro-environmental behaviour.

This pre-test will take approximately 5 minutes. Your data will remain completely anonymous and will solely be used for academic purposes. As a participant in this study, you have the right to withdraw from the pre-test at any given time.

In case of any questions or remarks related to this pre-test, please do not hesitate to contact us.

Thank you in advance for your participation!

Kind regards,

Konstantina Romanidou and Sjuul Kurvers

By selecting ‘Yes I agree to participate in this pre-test as described above’, you indicate that:

- You have read and understood all the information;
- You voluntarily agree to participate in the pre-test;
- You are aware of the fact that you can withdraw from the pre-test at any given time.

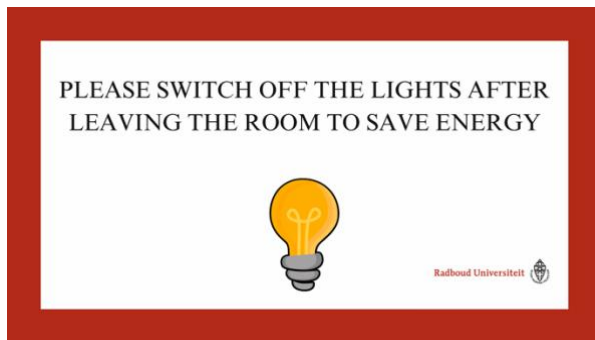
If you do not wish to participate in this pre-test, you may decline participation by selecting ‘No, I do not agree to participate in this pre-test as described above’.

O Yes, I agree to participate in this pre-test as described above.

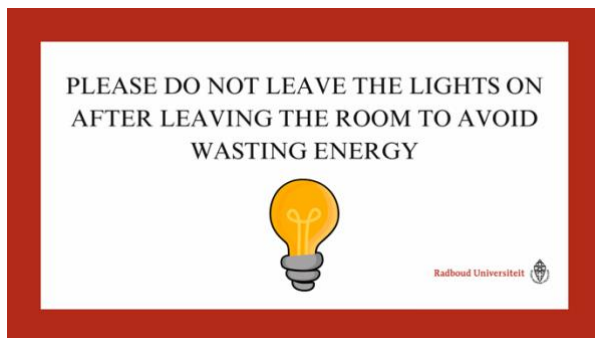
O No, I do not agree to participate in this pre-test as described above.

Please, try to imagine the following situation. You have worked in a workspace all day and upon leaving the room you come across the following message.*

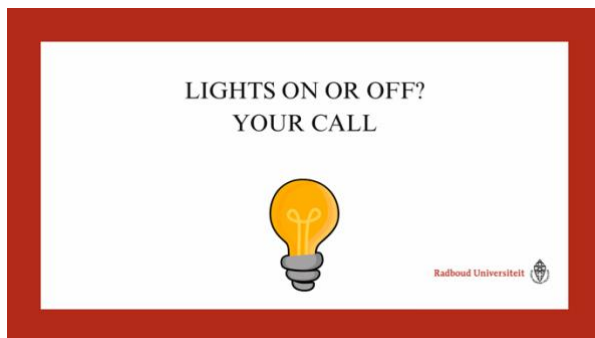
Experimental condition 1: Prescriptive framing



Experimental condition 2: Proscriptive framing



Experimental condition 3: Autonomous choice



**Respondents will be randomly assigned to one of the presented messages.*

Now, take in the message and indicate the extent to which you agree with the following statements:

- 1) The message indicates what I should not do.
 - a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree

- e. Somewhat agree
 - f. Agree
 - g. Strongly agree
- 2) The message prohibits certain actions.
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree
- 3) The message is limiting in terms of actions I can take.
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree
- 4) The message tells me what I should do.
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree
- 5) The message encourages a specific course of action.
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree

- g. Strongly agree
- 6) The message is directive in terms of what I am expected to do.
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree
- 7) The message allows me to make my own decisions.
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree
- 8) The message gives me autonomy in choosing my actions.
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree
- 9) The message enables me to decide for myself.
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree

10) The message seems realistic to me.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree
- f. Agree
- g. Strongly agree

11) It is plausible that I would encounter such a message in real life.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree
- f. Agree
- g. Strongly agree

12) What is your age?

- a. Below 18 years old
- b. 18 – 24 years old
- c. 25 – 34 years old
- d. 35 – 44 years old
- e. 45 – 54 years old
- f. 55 – 64 years old
- g. 65 years old or over

13) What is your identity?

- a. Male
- b. Female
- c. Other _____
- d. Prefer not to say

14) What is the highest level of education you have completed? In case you are still studying, please indicate your current level of education.

- a. Secondary school
- b. Secondary vocational education (MBO)

- c. Higher professional education (HBO)
- d. University education (WO)

Again, thank you for participating in this pre-test. In case of any questions or remarks, please contact us.

Appendix 2 Experiment

Appendix 2a Experimental survey

Dear participant,

Thank you very much for participating in this study. We, Konstantina and Sjuul, are two students at Radboud University Nijmegen, and for our Master Thesis Marketing we are conducting research on pro-environmental behaviour.

The questionnaire will take approximately 5-10 minutes. Your data will remain completely anonymous and will solely be used for academic purposes. As a participant in this study, you have the right to withdraw from the study at any given time.

In case of any questions or remarks related to this study, please do not hesitate to contact us.

Thank you in advance for your participation!

Kind regards,

Konstantina Romanidou and Sjuul Kurvers

By selecting 'Yes I agree to participate in this study as described above', you indicate that:

- You have read and understood all the information;
- You voluntarily agree to participate in the study;
- You are aware of the fact that you can withdraw from the questionnaire at any given time.

If you do not wish to participate, you may decline participation by selecting 'No, I do not agree to participate in this study as described above'.

Yes, I agree to participate in this experiment as described above.

No, I do not agree to participate in this experiment as described above.

The first section of questions is about your environmental attitude. Please indicate to what extent the following statements apply to you.

- 1) Being environmentally friendly is an important part of who I am.
 - a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree
- 2) I think of myself as someone who is very concerned with environmental issues.
 - a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree
- 3) I identify with the aims of environmental groups such as Greenpeace and Friends of the Earth.
 - a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree
- 4) Plants and animals have as much right as humans to exist.
 - a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree

- g. Strongly agree
- 5) Humans are severely abusing the environment.
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree
- 6) The so-called “ecological crisis” facing humankind has been greatly exaggerated.
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree
- 7) Humans were meant to rule over the rest of nature.
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree
- 8) If things continue on their present course, we will soon experience a major ecological catastrophe.
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree

The next sections of questions are about your perspective on life. Please indicate to what extent the following statements apply to you.

9) In my daily life, I have to do what I am told.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree
- f. Agree
- g. Strongly agree

10) I feel like I am free to decide for myself how to live my life.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree
- f. Agree
- g. Strongly agree

11) There is not much opportunity for me to decide for myself how to do things in my daily life.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree
- f. Agree
- g. Strongly agree

12) I generally feel free to express my ideas and opinions.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree

- f. Agree
- g. Strongly agree

13) I feel pressured in my life.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree
- f. Agree
- g. Strongly agree

14) Hearing the opinions of other people often makes me change my mind.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree
- f. Agree
- g. Strongly agree

15) I feel dependent on others.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree
- f. Agree
- g. Strongly agree

Please indicate to what extent the following statements apply to you.

16) In general, I am focused on preventing negative events in my life.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree

- f. Agree
 - g. Strongly agree
- 17) In general, I am focused on achieving positive outcomes in my life.
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree
- 18) I often imagine myself experiencing bad things that I fear might happen to me.
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree
- 19) I often imagine myself experiencing good things that I hope will happen to me.
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree
- 20) I am more oriented toward preventing losses than I am toward achieving gains.
- a. Strongly disagree
 - b. Disagree
 - c. Somewhat disagree
 - d. Neither agree nor disagree
 - e. Somewhat agree
 - f. Agree
 - g. Strongly agree

21) Overall, I am more oriented toward achieving success than preventing failure.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree
- f. Agree
- g. Strongly agree

Please indicate to what extent the following statements apply to you.

22) When I see an opportunity for something I like, I get excited right away.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree
- f. Agree
- g. Strongly agree

23) I worry about making mistakes.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree
- f. Agree
- g. Strongly agree

24) I frequently imagine how I will achieve my hopes and aspirations.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree
- f. Agree
- g. Strongly agree

25) I frequently think about how I can prevent failures in my life.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree
- f. Agree
- g. Strongly agree

26) I see myself as someone who is primarily striving to reach my 'ideal self' – to fulfil my hopes, wishes, and aspirations.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree
- f. Agree
- g. Strongly agree

27) I see myself as someone who is primarily striving to become the self I 'ought' to be – fulfil my duties, responsibilities, and obligations.

- a. Strongly disagree
- b. Disagree
- c. Somewhat disagree
- d. Neither agree nor disagree
- e. Somewhat agree
- f. Agree
- g. Strongly agree

28) What is your age?

- a. Under 18 years old
- b. 18-24 years old
- c. 25-34 years old
- d. 35-44 years old
- e. 45-54 years old
- f. 55-64 years old

g. 65 years or older

29) What is your identity?

a. Male

b. Female

c. Other_____

d. Prefer not to say

30) What is your current level of education?

a. Bachelor's degree

b. Pre-master's degree

c. Master's degree

d. Doctorate (PhD)

e. Other_____

31) What programme do you study? (e.g. Business Administration)

Again, thank you for participating in this study. In case of any questions or remarks, please contact us.

Appendix 2b Manipulation messages

The messages used for the purpose of the prescriptive framing and proscriptive framing manipulation were printed out in colour on A4 format. Following this, the messages were stuck to the inside of the door, so that the participant would be exposed to the message upon leaving the room.

Figure 1: Manipulation message prescriptive framing

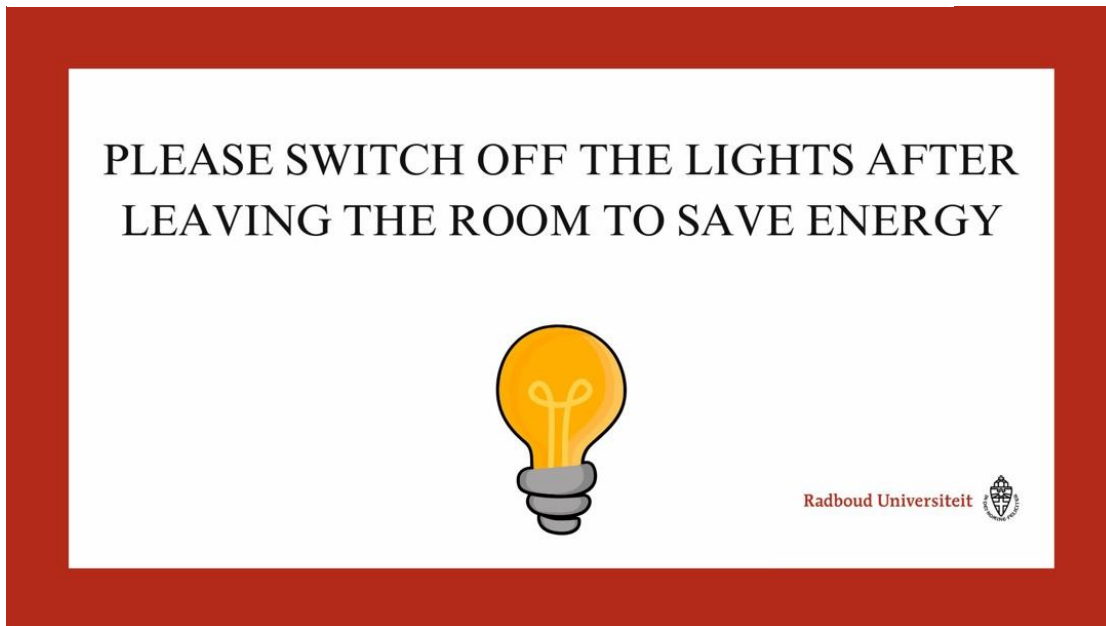


Figure 2: Manipulation message proscriptive framing

