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MSc Thesis Social, Health and Organisational Psychology

**Stimulating Pro-Environmental Behaviour by addressing  
altruistic and biospheric values or egoistic values**

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## Abstract

Climate change is one of the most pressing global issues and there are numerous ways to combat it. One of them is changing human behaviour. People are becoming more aware of their role in climate change, however the necessary change in behaviour to let the climate benefit does not occur. Currently, it is not established what the most effective approach is to influence an increase in pro-environmental behaviour. Research has shown that applying altruistic, biospheric and egoistic values in interventions show promise in affecting pro-environmental behaviour positively. Additional research theorized that applying altruistic and biospheric values to be more effective than egoistic values. This theory is being tested within the current study as a behaviour intervention. 110 participants read a piece of information framed in either an altruistic and biospheric way or in an egoistic way. After having read the information, the participants were instructed to track how often they turn off the light at home in the following 24 hours. Before and after the behaviour intervention the behaviour and pro-environmental attitudes are measured to conclude if these are affected by the values. The results were analysed by way of an independent T-test and a repeated measure ANOVA. The altruistic and biospheric group was not significantly more pro-environmental than the egoistic group and the pro-environmental attitudes did not change significantly. There were several limitations within the study, namely, the lack of a control group and an unreliable pre-measurement of behaviour. Future studies should consider these limitations.

Keywords: pro-environmental behaviour (PEB), pro-environmental attitudes, altruistic values, biospheric values, egoistic values, behaviour intervention, *framing manipulation*.

## Introduction

Despite public conviction of the opposite, climate change is not a new phenomenon. On the contrary, it is a natural reoccurrence that has happened before and will continue to happen as long as man walks the Earth. However, the current climate change is remarkable since it is not brought about by the usual triggers of climate change, but rather by humanity (Gardner & Stern, 1996; IPCC, 2007; Blois et al., 2013). The IPCC (2007) states that human behaviour and economic interests have affected the environment and triggered an increase in environmental destruction such as pollution of water, soil and air, burning of fossil fuels and loss of biodiversity. As of now, the climate is changing at an unparalleled pace in comparison to natural climate change events occurring in the past. The effects of the current climate change will be vast and include rising sea levels, melting ice caps and escalating occurrences of droughts, floods, heat waves and wildfires. These effects will be long lasting, more frequent and felt everywhere by communities around the globe (IPCC, 2007). According to a recent study, if the current trend of the climate crisis is unchanged over the next 50 years an estimate of 1 billion people will have to migrate or will have to learn to adapt to hotter living conditions (Xu et al., 2020). Their fate will be affected by climate change and it demonstrates why it is imperative to bring the current course of the changing climate to a halt. To combat climate change, scholars propose drastic changes in how we function as a society to prevent the negative effects of climate change. In short, it means that governments, industries and companies have to change their practices if we want to prevent the negative effects of climate change (IPCC, 2007; Hale, 2010). However, not just governments, industries and companies have to change, people's everyday behaviour also has to change (Incropera, 2016). This is why it is of paramount importance to understand how to influence human behaviour to help prevent climate change. In the current study a behaviour intervention is conducted to contribute to a better understanding on how to influence people to behave in a manner which is better for the climate.

### *The role of behaviour in climate change*

Solving the current climate crisis has to be realized in several ways (Hale, 2010), one of which is related to what caused it: human behaviour (IPCC, 2007; Gadenne et al., 2011). The first steps are being taken, since over the last few decades humanity has become increasingly aware of

the role of their behaviour in the current crisis (De Groot & Steg, 2009). However, this also presents the difficulty of this topic since this awareness of one's own behaviour did not trigger the required pro-environmental transition in behaviour (Vlek & Steg, 2007). This 'pro-environmental behaviour' (PEB) is defined by Stern (2000) as follows: "the extent to which behaviour changes the availability of materials or energy from the environment or alters the structure and dynamics of ecosystems or the biosphere itself in a positive way" (p. 408).

One of the reasons why more PEB did not occur is because PEB is perceived by many to be too effortful (Moore & Loewenstein, 2004). For instance, behaving in a pro-environmental way could be considered as taking more effort whilst travelling, since travelling by train instead of by plane is less polluting but currently more expensive, takes more of a person's time and impedes the range of distance travelled. Another example is recycling and separating waste which enables the invested resources to be reused. This action takes more personal effort and time compared to the alternative of throwing all the waste in the same bin without any further consideration. The transition to more PEB is only happening on a small scale and within an informed minority (Verplanken & Roy, 2015). Members of this informed minority are willing to act pro-environmental, despite it being more effortful (Steg et al., 2014). With climate change and the climate treaties in mind (e.g. Paris Agreement, 2015), it is essential that more people begin to exhibit more PEB in the foreseeable future (IPCC, 2007). To make this a reality it is important to understand the motivations behind PEB, why people exhibit PEB and how people can be moved to exhibit more PEB.

### *The motives for exhibiting PEB*

In general, people routinely act according to their short term individual interests (Vlek & Steg, 2007). The goal of PEB however is reflected in the long term betterment of other people or the environment, which can even be contradicting the short term individual interests of the person portraying the PEB (Steg, 2009). To explain why people actually do portray PEB, several researchers have pointed out the importance of human values (Naess, 1990; Fransson & Gärling, 1999; De Groot & Steg, 2008). According to Schwartz (1992), human values are relatively stable desirable goals which vary in importance to the individual and are a guiding basis in life. All of the values of an individual are important to him/her, however some have priority over others and

other values are even situation specific (Schwartz, 1992). Values are believed to form behavioural intentions and as such they can predict actual behaviour (Ajzen, 1991). In addition, values are also found to affect and predict the attitudes of people (De Groot & Steg, 2008; Stern, 2000; Stern & Dietz, 1994). Attitudes that are considered by an individual as relevant for the environment, are positively related to values that correspond with exhibiting PEB or negatively related to values that correspond with not exhibiting PEB. These values can affect the attitudes of such an individual and his/her willingness to behave in a pro-environmental way (Stern & Dietz, 1994; Steg et al., 2014).

The values that are considered most important for exhibiting or not exhibiting PEB are altruistic, biospheric and egoistic values (Stern, 2000; De Groot & Steg, 2009). People who see altruistic values as most important will behave in a pro-environmental way when it is prosocial and for the betterment of others. They take the costs and benefits of others into consideration and try to influence them positively (Karp, 1996). People who behave in a pro-environmental manner - based on biospheric values - will consider the costs and benefits of the natural world and its interests and try to affect these positively (Stern, 2000). Acting on either altruistic or biospheric values typically results in more PEB, since the behavioural outcomes of these two values are often compatible (Honkanen & Verplanken, 2004). However, egoistic values are typically not compatible with PEB (Stern, 2000). What is more, acting on egoistic values usually translates into the opposite of altruistic and biospheric (A&B) values and into not behaving pro-environmentally friendly. This is so because the person acting on egoistic values, values his/her own costs and benefits as most important and since the costs of PEB are weighed higher than not behaving pro-environmentally, the person will be unlikely to behave in conformity with PEB (Moore & Loewenstein, 2004).

According to De Groot and Steg (2009) altruistic, biospheric and even egoistic values can be used in interventions to promote stable PEB among people. In their article De Groot and Steg (2009) introduce two strategies. The first strategy is increasing the salience of A&B values in specific situations. It is especially important to emphasize the specific situation and provide exact instructions as to how someone should act on A&B values since by doing so it is more likely that the person will act accordingly (Maio & Olson, 1998). The second strategy is to reduce conflict between egoistic and A&B values. This can be done by addressing possible individual incentives

to behave pro-environmental and/or making negative environmental behaviour less attractive (Geller, 2002). De Groot and Steg (2009) theorized that the A&B strategy produces a more stable base for PEB than egoistic values; this is because egoistic values are based on self-interest and when the costs of PEB become higher compared to not acting pro-environmentally people considering egoistic values will not behave in a stable pro-environmental way. To test the validity of this theory a behavioural intervention in the form of an experiment will be conducted in this study.

### *Household energy saving behaviour studies*

The behaviour intervention in this study is based on previous studies aiming at developing a better understanding of PEB and how to stimulate PEB by studying household energy saving behaviours (e.g. Abrahamse et al., 2005; Abrahamse, 2007; Gadenne et al., 2011; Mizobuchi & Takeuchi, 2013; Kurz et al., 2015; Wells et al., 2016). The PEB or household energy saving behaviours that were monitored and reviewed were relatively simple; namely, recycling wastage, reducing water usage and turning off the lights. The PEB was encouraged through interventions which consisted of providing information, giving direct personal feedback, giving comparative feedback, showing public campaigns, setting goals and giving rewards. A comprehensive review of 38 field studies regarding stimulating energy saving behaviour concluded that these methods are all considered effective and have positive long term stable effects on PEB and pro-environmental attitudes (Abrahamse et al., 2005; Gadenne et al., 2011). What is more, studies within the review found that a combination of methods could be more successful in triggering an increase of PEB (Abrahamse et al., 2005). For example, an experiment on in-house energy use from Van Houwelingen and Van Raaij (1989) found that when specific information was provided on household energy saving behaviour and specific goals were set to increase this behaviour, an increase of PEB is likely. A different study on energy saving behaviour found that goal setting in a pro-social or pro-self way also had a positive effect on increasing energy saving behaviour (McCalley & Midden, 2002). Similar methods of applying two intervention methods and pro-self and pro-social goal setting will be used within this study to research the aforementioned theory by De Groot and Steg (2009).

### *Current study*

To test the theory that A&B values are more effective in stimulating PEB than egoistic values (De Groot & Steg, 2009), a behaviour intervention consisting of an information intervention, a framing manipulation, goal setting and a simple action task will be conducted in this study. This study set-up is based on previous household energy saving behaviour studies (e.g. Van Houwelingen and Van Raaij 1989; McCally & Midden, 2002; Abrahamse et al, 2005). The two aforementioned strategies of making A&B values more salient and making egoistic values compatible with PEB will be used within the behaviour intervention. The participants are instructed to do a simple act several times with a framed message in mind. Since values affect behaviour the following is expected to be the main outcome of this study: emphasizing A&B values will trigger more PEB in comparison to emphasizing egoistic values. Furthermore, since values also affect the person's attitudes it is important to expect whether that is the case in this behaviour intervention. It is expected that the participants assigned to the A&B values will develop more pro-environmental attitudes as they are congruent. No change in pro-environmental attitudes are expected in the egoistic condition since their long-term mind-set and behavioural outcome are not congruent. Thus, the following hypotheses are constructed:

*H1:* Participants who were brought into an A&B mind-set display more PEB than the participants who have been brought into an egoistic mind-set.

*H2a:* Participants in the A&B mind-set reported an increase in PEB compared to the pre-manipulation situation.

*H2b:* Participants in the egoistic mind-set reported an increase in PEB compared to the pre-manipulation situation.

*H3a:* The pro-environmental attitudes of participants in the A&B mind-set became more positive post-manipulation compared to the pre-manipulation situation.

*H3b:* The pro-environmental attitudes of participants in the egoistic mind-set did not change significantly post-manipulation compared to the pre-manipulation situation.

## Methods

### *Design & participants*

This study had a 2x2 between-and-within participants design (mixed design), in which participants were randomly assigned into two different *framing manipulation* conditions (A&B values or egoistic values) and were measured two times. The *framing manipulation* within the study gave it an experimental design. The study was designed in two parts, with the first part being the initial study with a questionnaire on pro-environmental attitudes, the *framing manipulation* and instructions for the behaviour intervention. The second part of the study, which was the follow-up part of the study, was distributed to the participants 24 hours after finishing the initial study. Here the results of the *framing manipulation* were reported and the study was concluded with the same questionnaire as the initial study to measure a potential difference in attitudes due to the *framing manipulation*.

The study was distributed online so that participants could participate with the study in a home setting. Conducting the study online improves the initial reach of the. Furthermore, the study was conducted during the first full month of quarantine measures of the COVID-19 pandemic which emerged in Europe early 2020. Because of the pandemic people were requested to stay at home by their national governments, this is why the natural setting for the participants was more homogenous than initially expected. The participants were approached through social media platforms like LinkedIn, WhatsApp and Facebook with an anonymous internet link (Appendix 1). In addition, Bachelor students from the Utrecht University (UU) were also recruited through the UU participant-system SONA.

A G-power analysis based on the Revised NEP Scale using G\*power analysis, 5% alpha level, 80% statistical power and medium to large effect size (0.08) showed that for this study 98 participants were required to be able to find an effect (Dunlap et al., 2000; Faul et al., 2007). A total of 177 people participated with the initial study. All of the participants were at least 18 years or older. 129 participants of these 177 people also partook with the follow-up part of the study 24 hours later, of which 19 participants were excluded since they did not complete the follow-up part in its entirety.



Of the remaining 110 participants, 47 were male and 63 were female. 40.9% of the participants were aged between 18-24 years, 37.3% were in between 25-34 years old, 7.3% were between the ages of 35-44, 0.9% were aged 45-54, 8.2% were aged 55-64 and 5.5% were aged 65-74. 86 participants originated from the Netherlands, 17 came from other European countries, 5 from Asian countries and 2 participants were from Australia. At the moment of participating with the study, the highest level of school the participants had completed or the highest degree that they have received was as follows: 0.9% of the participants had less than a high school degree, 11.5% had a high school degree as their highest level, 11.5% of the participants completed higher vocational education (HBO), 49.6% completed a scientific Bachelor's degree, 24.8% completed a scientific Master's degree and 1.8% completed a doctoral degree.

### *Materials*

The materials for this study consist of a questionnaire on demographics, a questionnaire on climate change attitudes, the *framing manipulation* for the study and the debriefing.

The study started with the demographics where age, gender, nationality, education level, employment status, profession field, information about income and information about how many people the participant is living with were recorded.

After the demographics the participants' attitudes towards climate change were measured through the *Climate Change Attitudes Survey (CCAS)* by Christensen and Knezek (2015). The CCAS consists of 15 questions which are subdivided into two constructs. The first construct is *Beliefs* and the second construct is *Intention*. *Beliefs* has a Cronbach's Alpha of .87 which gives it a 'very good' internal consistency and the second construct *Intention* has a Cronbach's Alfa of .70 which gives it a 'respectable' internal consistency (DeVellis, 2016). The questions are scored on a 5-point Likert scale from "Strongly disagree" up to "Strongly agree". A high score on the first construct *Beliefs* implies that the participant believes that the climate and our environment is changing and they can do something about it. Example item of the *Beliefs* construct are "*I believe the climate is changing*", "*Human activities cause global climate change*" and "*I can do my part to make the world a better place for future generations*". A high score on the second construct *Intentions* implies a willingness to take action and make a positive impact regarding climate change. Example items of the *Intentions* construct are "*We cannot do anything to stop climate*

change” and “*Things I do have no effect on the quality of the environment*”. The participant had to fill out the CCAS twice in the study. Once before the experiment and once after the experiment part of the study. This is done to have a pre-manipulation and post-manipulation measurement to conclude whether the *framing manipulation* has had an effect on the participant’s pro-environmental attitudes.

The *framing manipulation* is part of the behaviour intervention and was created specifically for this study. In addition, it was based on similar studies which used an information intervention (Abrahamse et al, 2005). The *framing manipulation* consisted of an informational piece which was framed in two ways and thus resulted in two different manipulation groups. The first manipulation group was A&B values and the second manipulation group egoistic values. When participants started with the behaviour intervention they were randomly assigned to one of the two *framing manipulation* groups and read the framed informational piece. First, the participants read about the current state of climate change and the effects daily human behaviour can have on climate change; this information was identical for both conditions. Next, the participants started to read the framed information. In each condition it was stated that research has shown that, depending on the condition, a focus on A&B values or egoistic values proves to be more effective when trying to increase PEB. The A&B group were told that it is good for their ecological footprint to exhibit PEB. The egoistic group read that it is better for their financial situation to exhibit PEB, because it would reduce their electricity bill. Then the participants were requested to pay attention to their frequent energy saving behaviour for the next 24 hours, namely, turning off the lights, whilst being motivated by their assigned value. To make the *framing manipulation* as evident as possible during the behaviour intervention, the participants were asked to recite to themselves the reason why they turn off the light every time. Lastly, to help the participants with their task, they were instructed to set a goal by making an implementation intention and repeat it to themselves (Gollwitzer & Brandstätter, 1997). This implementation intention helped the people to be aware of the instructions. Thus, they were requested to repeat the following phrase: “*When I leave a room and I see that the lights are on; I turn off the lights.*” The *framing manipulation* was checked in the post-measurement whether they were aware of the reason why they had to track their actions. The participants had to simply answer an open-ended question asking what the reason was why they have been turning off the lights for the last 24 hours.

After the follow-up part of the study the participants receive the debriefing. They are informed on the aim of the study, the *framing manipulation* and that the manipulations were randomly assigned. The complete initial study can be found in Appendix 6 and the complete follow-up study can be found in Appendix 7.

### *Procedure*

#### *Initial study*

To start the study, the participants first read the study-introduction and accepted or declined the informed consent (Appendix 2). The introduction included an estimation on the duration of the study and information on the study and participant privacy. After the study-introduction, students of the UU could supply information to receive participation-credits. Since the study was divided into two parts it was important for each participant to create an anonymous ID. This anonymous ID was created by using two pieces of information: the day of the month when the participant was born (e.g. 10, if the person was born on the 10<sup>th</sup>) and the first three letters of their mother's name (e.g. if their mother's name was Maxima, then they would fill in MAX). With both parts of the anonymous ID of the same person present, the datasets of the divided parts could later be combined in one dataset. Before the participants started with the behaviour intervention they completed a questionnaire on demographics and the *CCAS*. After the questionnaires the participants were randomly assigned to either the A&B values condition or the egoistic value condition through the *framing manipulation*. Here they were manipulated for the behaviour intervention. When the participants finished the *framing manipulation* part of the study they received instructions for the behaviour intervention and they had to estimate how often they usually turn off the lights on a regular day. When the participants were instructed what to do in the next 24 hours the behaviour intervention could start.

#### *Follow-up study*

After the 24 hours of having tracked their own behaviour the behaviour intervention ended. The respondents received an email which contained the follow-up part of the study to conclude their participation. First the participants were requested to report the amount of times they turned off the lights in the last 24 hours. In addition, a manipulation-check was done to validate the

*framing manipulation*. Next, the CCAS was filled in to create the post-measurement. This is done to be able to tell if the participants' pro-environmental attitudes have been influenced by the framing in the instructions. To be able to combine the dataset of the initial study and the follow-up study, the participants were once again requested to provide their anonymous ID. After the anonymous ID the participants were debriefed and informed on the content and the aim of the study they just participated with (Appendix 5).

### *Statistical analysis*

To answer the research question the first hypothesis will be analysed through an independent-samples T-test, this test is being used to determine whether there is a difference in behaviour between the two manipulated groups. To answer the other hypotheses about whether there was a difference pre-manipulation and post-manipulation in behaviour or attitudes the data was analysed by using a F-test: ANOVA repeated measures, between factors.

## **Analysis & Results**

### *Assumption check T-test*

The assumption check for the independent T-test revealed five outliers of which two were marked as extreme outliers. Including the two extreme outliers resulted into high Kurtosis and Skewness values for both conditions. Removing the two extreme outliers resulted into the A&B value with skewness of 1.14 ( $SE = .32$ ) and kurtosis of .94 ( $SE = .63$ ) and for the Egoistic value condition with skewness of .59 ( $SE = .33$ ) and kurtosis of -.44 ( $SE = .64$ ). These values are acceptable (Field, 2013). The test of homogeneity of variances showed equal variances for both A&B values and Egoistic values,  $F(1, 106) = .518, p = .473$  on the amount of times participants turned off the lights.

### *Analysis hypothesis 1*

After testing the assumptions an independent-samples T-test was conducted for the first hypothesis. On average, participants who were assigned to the A&B values condition turned off the lights more often ( $M = 10.42, SE = .90$ ) than the participants who were assigned to the Egoistic values condition ( $M = 9.85, SE = .71$ ). However, this difference .569, BCa 95% CI [-1.786, 2.924]

was not significant  $t(106) = .479, p = .633$  and it did not show a small-sized effect ( $r = 0.05$ ),  $d = 0.11$ . Effectively, this means that there was no significant difference between the two manipulated groups.

#### *Assumption check Repeated Measure ANOVA*

The assumption check for the Repeated Measure ANOVA revealed that all skewness and kurtosis values fell within the acceptable range. Except for the pre-manipulation estimation of the A&B condition. For this condition the following skewness 2.72 ( $SE = .32$ ) and kurtosis 8.06 ( $SE = .63$ ) values were found. Since this measurement was an estimation this was to be expected, hence the repeated measure ANOVA continued as normal. No assumption check for sphericity was conducted since there were less than three measurement moments. Thus, there was no indication of a violation of sphericity.

#### *Analysis hypotheses 2 & 3*

The Repeated Measure ANOVA for the second and third hypotheses was conducted to compare the main effects before and after the *framing manipulation* of the participants' PEB and pro-environmental attitudes (Table 1). The statistical analyses showed there was no main effect of A&B values on PEB  $F(1, 54) = .010, p = .920, \eta_p^2 = .000$ , or on pro-environmental attitudes  $F(1, 54) = .864, p = .357, \eta_p^2 = .016$ . This means that the *framing manipulation* with A&B values had no effect on the participants' PEB or attitudes. Next, the statistical analyses also showed there was no main effect of Egoistic values on PEB  $F(1, 52) = 1.52, p = .223, \eta_p^2 = .028$  or on pro-environmental attitudes  $F(1, 52) = .714, p = .402, \eta_p^2 = .014$ . This means that the *framing manipulation* with Egoistic values had no effect on the participants' PEB or attitudes. Only the absence of a main effect of egoistic values on pro-environmental attitudes was expected, the other main effects were not.

#### *Exploratory research*

For exploratory research an additional Repeated Measures ANOVA was conducted to investigate the potential interaction effect between A&B and egoistic values and PEB and pro-environmental attitudes. The analysis showed no significant interaction effect on PEB  $F(1, 106) = .567, p = .453, \eta_p^2 = .005$  or pro-environmental attitudes  $F(1, 106) = 1.572, p = .213, \eta_p^2 = .015$ .

However, the interaction-plot (Figures 1 and 2) indicated a potential interaction effect of A&B and egoistic values on PEB and pro-environmental attitudes.

Table 1.

*Descriptive statistics pre- and post-manipulation*

	M	SD
<i>Pre-manipulation</i>		
PEB A&B	10.31	10.20
PEB Egoistic	8.98	6.47
Pro-E attitudes A&B	4.29	.44
Pro-E attitudes Egoistic	4.30	.42
<i>Post-manipulation</i>		
PEB A&B	10.42	6.86
PEB Egoistic	9.85	5.36
Pro-E attitudes A&B	4.33	.45
Pro-E attitudes Egoistic	4.32	.41

*N (total) = 108, N (A&B) = 55, N (Egoistic) = 53*

## Discussion

The aim of this study was to identify an effective way of positively influencing human behaviour which benefits climate change. Previous literature suggested the effectiveness of human values in influencing this behaviour (Naess, 1990; Fransson & Gärling, 1999; De Groot & Steg, 2008). Consequently, two human value strategies for behaviour interventions were proposed by De Groot and Steg (2009). Namely, one emphasizing A&B values and the other making egoistic values congruent with A&B values. They theorized that out of these two strategies the A&B strategy would be more effective than the egoistic strategy in stimulating PEB (De Groot & Steg, 2009). More research was needed to validate their theory. Previous studies on simple energy saving behaviour, like turning off the lights whilst being influenced by a behaviour intervention, showed promising results in increasing PEB (Abrahamse et al., 2005; Abrahamse, 2007; Gadenne et al., 2011; Mizobuchi & Takeuchi, 2013; Kurz et al., 2015). In order to research that the theory claiming

that the A&B strategy is more effective than the egoistic strategy to stimulate PEB, in this study an experiment was done by way of a behaviour intervention with a similar methodology as the aforementioned simple energy saving behaviour interventions.

### *Findings*

The results of the study did not reveal that the A&B values manipulation to being more effective in stimulating PEB than the egoistic value manipulation. Having said that, it was found that PEB and pro-environmental attitudes had become more positive for both conditions after the behaviour intervention. The analyses within the study however did not reveal any statistical significant increase of PEB and pro-environmental attitudes after the behaviour intervention in comparison to before the behaviour intervention. These findings imply that the effect of using human values have less impact than initially suspected and that there was no noticeable difference in results between using the two manipulation strategies. This undermines the consulted literature which states that values are effective in promoting PEB (Naess, 1990; Fransson & Gärling, 1999; De Groot & Steg, 2008), and that A&B values are more effective in promoting stable PEB than egoistic values (De Groot & Steg, 2009).

However, it is important to note that the exploratory research did find a potential significant interaction effect within the interaction-plot. This was between the A&B values and egoistic values on both PEB and pro-environmental attitudes. This implies that these values could still have a greater effect on stimulating PEB and pro-environmental attitudes than the separate strategies in the current study. Thus, it is plausible that the combination of both separate strategies by De Groot & Steg (2009) could have a greater effect when used combined in a behaviour intervention.

### *Limitations*

There are several limitations within the current study design which may have significantly affected the outcome of the behaviour intervention within the study.

The first limitation is that there was no control group in the study, meaning that there was no group not being influenced by either of the manipulations. As a consequence the effect of either manipulation could not be measured effectively. Also, the absence of a control group did not provide for information as to whether the *framing manipulation* was truly effective or not.

Secondly, the pre-measurement of participants' PEB was based on estimation without actual tracking beforehand. This made the pre-measurement less valid and reliable. As a consequence it is likely that the estimation of PEB affected the analyses and made the results of the change in PEB, due to the behaviour intervention, less meaningful. If during the pre-measurement of participants' PEB was tracked like the PEB during the study, then the data will be more robust and more useful in repeated measures testing. That is why it is more likely that a statistical and relevant effect will be found with the proper adjustments.

Finally, the participants within the study's sample were mostly highly educated and reported a high score in pro-environmental attitudes. These participants were most likely already conscious of the effects of their behaviour on climate change (Steg et al., 2014; Verplanken & Roy, 2015). Therefore the high score in pro-environmental attitudes likely could have rendered the behaviour intervention less effective than intended. By adding people with a lower level of education and more importantly a lower score in pro-environmental attitudes, the effects of the behaviour intervention could be more effectively researched.

### *Implications*

The findings in this study implicate that the outcome of the two different value strategies are not as different as initially expected (De Groot & Steg, 2009). The effects of the behaviour interventions, although minor, were positive for both separate strategies, suggesting that the strategies can interchangeably be used within behaviour interventions. However, the results found for using both strategies combined revealed a promising third option which seemed more effective than the two strategies separately. Perhaps the third option is suitable for more varying target groups than the separate strategies. For instance, combining the two strategies could be effective in triggering more PEB for both the people who consider A&B values as most important and those who find the egoistic values as most important (Karp, 1996; Stern, 2000; Honkanen & Verplanken, 2004; Moore & Loewestein, 2004).

In addition, the implications of the minor positive findings suggest that the behaviour intervention can achieve behaviour change within a short period of time. However, first it is required to significantly improve the behaviour intervention. Then it would be beneficial to do



further research on value based behaviour interventions. When the 24 hour behaviour intervention is improved its usefulness could be increased for more behaviour interventions and stimulate PEB.

### *Future research*

Future studies can use this study's experimental design for future research. However, due to the findings in this study and the limitations of the design it is required to make several adjustments to improve the behaviour intervention and find the expected results.

Firstly, due to the minor results of the current study it is unclear whether the *framing manipulation* had the desired effect on the participants. That is why, adding a control group next to the A&B values and the egoistic values groups could determine whether or not the *framing manipulation* has had an effect on the participants. The control group's participants will read a neutrally framed informative message resulting in an unmanipulated result which can be compared with the A&B and egoistic groups' results. Earlier household saving studies with behaviour interventions (Abraham et al., 2005), have demonstrated that a control group can produce results in this setting. When there are significant differences between the results of the control group and the manipulated groups, it can be observed whether the *framing manipulation* had an effect on the participants and – if so – it can be determined how big the effect of the *framing manipulation* was.

Secondly, due to the found potential interaction effect within the interaction-plot, it could be promising to add a manipulation group which combines A&B and egoistic values. Abrahamse and colleagues (2005) stated within their review that a combination of methods are more successful in triggering an increase of PEB. Taking this into consideration and the findings within the interaction-plot, it could mean that using all of the value manipulations together could construct a more effective *framing manipulation*. To determine whether a combined *framing manipulation* of altruistic, biospheric and egoistic values (ABE) would be effective, continued research is needed.

Thirdly, the current study's sample consisted of people reporting a high score in pro-environmental attitudes. This group is usually more conscious regarding the environment and generally behaves accordingly (Steg et al., 2014; Verplanken & Roy, 2015). To make the sample more representative and ordinary it is important to recruit participants who report a lower score in pro-environmental attitudes and are less conscious regarding climate change. This way, it can be

investigated whether the behaviour intervention has the same or a different effect when the sample is more representative.

Finally, it is feasible that there will be improvements when the study is transformed into a longitudinal format. In such a manner the pre-measurement can be done accurately and the value *framing manipulation* can take place after the pre-measurement has been done. In addition to the longitudinal format, the study will become more robust with a reliable and valid pre-measurement instead of an estimation done by the participants themselves. Moreover, the longer format could consist of a behaviour intervention over a longer period of time than 24 hours. This means also that there could be additional measurement opportunities during the experiment instead of only a pre- and post-manipulation measurement. This is important since values are considered stable over time (De Groot & Steg, 2009), and thus a study covering a longer period of time could find a significant effect.

### *Conclusions*

The aim of the current study was to determine which of two strategies is more effective to let people behave in a manner which is better for the climate. The first strategy was to make people extra mindful of values that benefit other people and nature. The second strategy was to make values that concern only themselves compatible with the values that benefit other people and nature. Testing the two strategies was done through a behaviour intervention where participants did a simple task with one of the strategies in mind. Findings revealed that there was no significant difference between the two strategies. However, adding an additional group in the study, which combines both strategies, could show promising results. More research is required to determine whether either strategy or combined is most effective to influence people's behaviour in a manner which is better for the climate. Information and recommendations for future research are provided within the current study.

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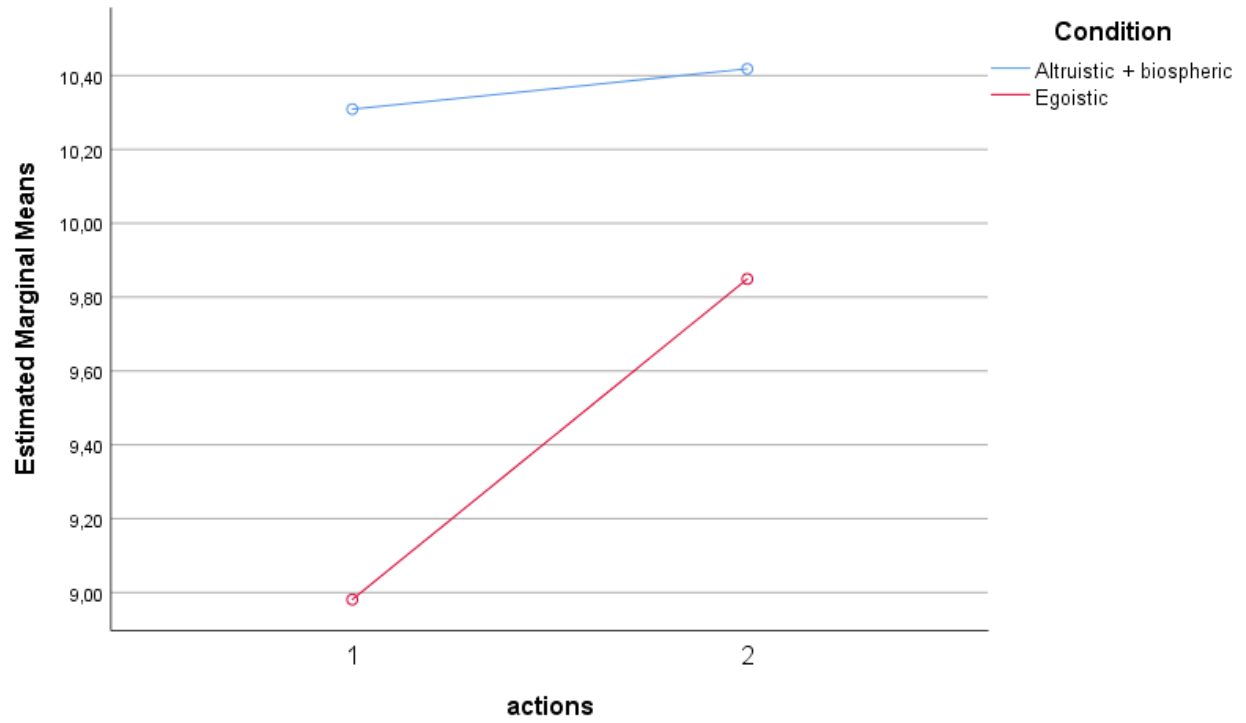


Figure 1. Interaction plot of A&B values and egoistic values on PEB.

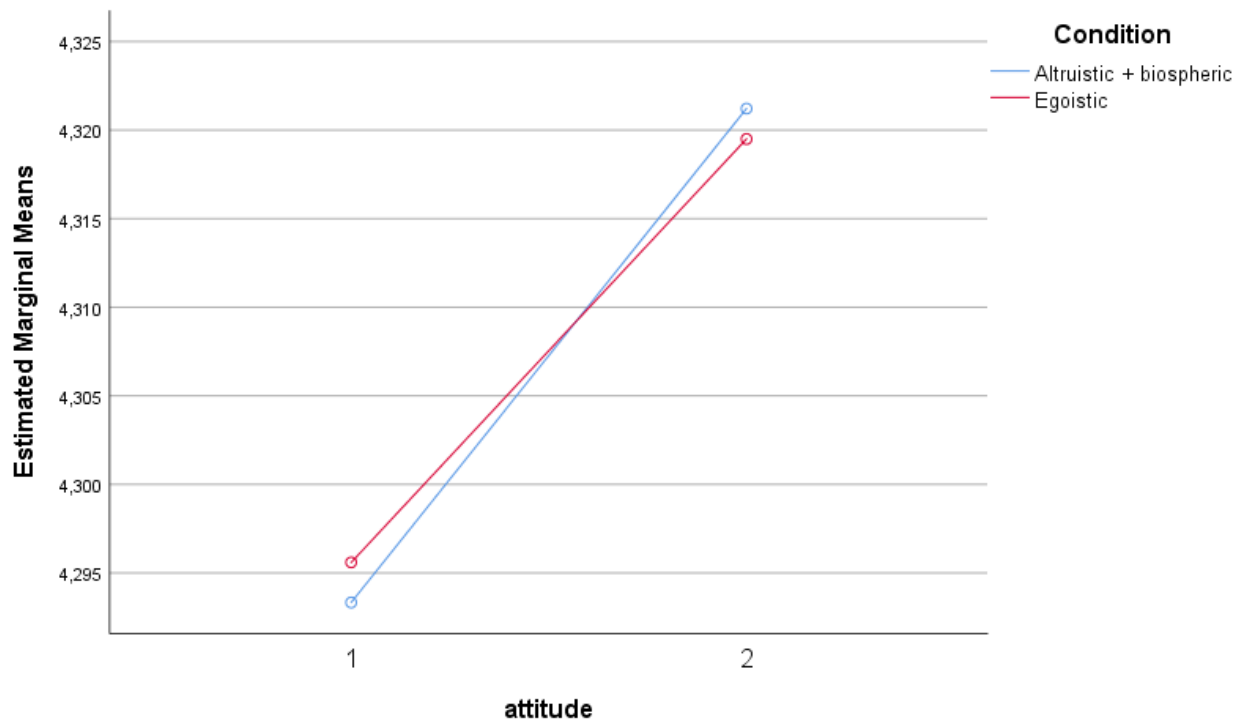


Figure 2. Interaction plot of A&B values and egoistic values on pro-environmental attitudes.

## Appendixes

### **Appendix I: Internet link study**

English below

Beste Netwerk

Voor mijn masterthesis voor Sociale, Gezondheids- en Organisatiepsychologie ben ik op zoek naar deelnemers voor mijn onderzoek. Het betreft een vragenlijst van 15 minuten en het 24 uur lang bijhouden van een simpele handeling. Het onderzoek wordt in het Engels afgenomen op computer of smartphone en is te vinden via de bijgevoegde link. Iedereen kan mee doen met de studie.

Alvast bedankt voor het meedoen!

Reinoud

-----

Dear Network,

I am currently searching for participants for my Master thesis for the Master's programme: Social, Health and Organisational Psychology.

The study will start with a questionnaire which will take roughly 15 minutes and is followed by monitoring a simple personal action for 24 hours. You can start the study by clicking on the link below. Everyone can participate, there are no restrictions.

Thanks in advance for your participation!

Reinoud

<https://lnkd.in/dYCFwiv>



## **Appendix 2: Informed consent and study-introduction**

Dear Sir / Madam,

### **Introduction**

Thank you for your interest in contributing to my research project for the Masters programme: Social, Health and Organisational Psychology at the Utrecht University. Through a survey and an experiment I would like to study energy consumption behaviour after you have read an informative piece of information on climate change.

### **What is expected of you as a participant?**

Following the initial survey you will be asked to carefully track your energy consumption behaviour in the next 24 hours. Clear instructions on what behaviour has to be tracked in this experiment will be given later in the study. The experiment will conclude after the 24 hours with another survey which you will receive through e-mail. In this e-mail you will be debriefed accordingly.

### **Possible advantages and disadvantages of the study**

This study involves no more risk to your physical or psychological health beyond those encountered in the normal everyday house-setting. You may benefit by gaining a better understanding of psychological research. No other risks or benefits are anticipated.

### **Compensation**

As a student of the UU you can receive one hour (1.0) of research credit for participating. If you want to obtain this credit, you should enter your student email address and student number after this form.

### **Confidentiality of data processing**

This study requires us to collect some of your personal data. We need this data in order to be able to answer the research question properly and to be able to contact you for follow-up research. This personal data will be stored on a different computer than the research data itself (the so-called raw data). The computer on which your personal details is stored is secured to the highest

standards, and only researchers involved will have access to this data. The data itself will also be protected by a security code.

Your data will be stored for at least 10 years. This is in accordance with the guidelines provided by the VSNU Association of Universities in the Netherlands. Please refer to the website of the Authority for Personal Data: <https://autoriteitpersoonsgegevens.nl/nl/onderwerpen/avg-europese-privacywetgeving>, for more information about privacy.

### **Voluntary participation**

Participation in this study is voluntary. You can end your participation in the study at any time, without any explanation and without any negative consequences. If you end your participation, we will use the data collected up to that point, unless you explicitly inform us otherwise. You also don't need to answer any questions that you do not want to.

### **Independent contact and complaints officer**

If you have any questions or comments about the study, please contact my supervisor (h.marien@uu.nl) or myself (j.r.d.moojen@students.uu.nl) through e-mail.

If you have an official complaint about the study, you can send an email to the complaints officer at klachtenfunctionaris-fetsocwet@uu.nl.

I would like to thank you in advance for participating.

With kind regards,

Reinoud Moojen

### **Appendix 3: Debriefing first part of the study**

Thank you for your contribution to the first part of the study.

Now, it is important that you will follow the instructions given to you within this study. If you have any further questions in the meantime, please send an email to:  
j.r.d.moojen@students.uu.nl.

In 24 hours you will receive an email with the follow-up of this study.

With kind regards,

Reinoud Moojen

#### **Appendix 4: Introduction of the follow-up study**

Welcome back Sir / Madam,

The last 24 hours you have paid close attention to turning the light switches off in your house. On the next page you are requested to inform us with the exact amount of times you have turned off the lights.

Next, you will once again be asked to complete the questionnaire on your Attitudes towards Climate Change.

When you have completed the questionnaire you will be de-briefed.

## **Appendix 5: Debriefing of the follow-up study**

Your contribution to the study is now complete.

### **Background of the study**

With this research project I study the effects of an informative message on pro-environmental behaviour. This message has been framed in two different ways. One message was aimed at altruistic and biospheric values and the other message aimed at egoistic values. The participants were randomly assigned to one of the two messages and are then requested to execute the same environmental behaviour. According to previous literature it is expected that one message is more effective than the other, which implies that one group will be more 'green' than the other. This will be studied and elaborated further within the Results section of this study.

Thank you for your time and your contribution to my research project.

With kind regards,

Reinoud Moojen

# A & E Framing Experiment

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## Start of Block: Informed Consent

IC Dear Sir / Madam,

### Introduction

Thank you for your interest in contributing to my research project for the Masters programme: Social, Health and Organisational Psychology at the Utrecht University. Through a survey and an experiment I would like to study energy consumption behaviour after you have read an informative piece of information on climate change.

### What is expected of you as a participant?

Following the initial survey you will be asked to carefully track your energy consumption behaviour in the next 24 hours. Clear instructions on what behaviour has to be tracked in this experiment will be given later in the study. The experiment will conclude after the 24 hours with another survey which you will receive through e-mail. In this e-mail you will be debriefed accordingly.

### Possible advantages and disadvantages of the study

This study involves no more risk to your physical or psychological health beyond those encountered in the normal everyday house-setting. You may benefit by gaining a better understanding of psychological research. No other risks or benefits are anticipated.

### Compensation

As a student of the UU you can receive one hour (1.0) of research credit for participating. If you want to obtain this credit, you should enter your student email address and student number after this form.

### Confidentiality of data processing

This study requires us to collect some of your personal data. We need this data in order to be able to answer the research question properly and to be able to contact you for follow-up

research. This personal data will be stored on a different computer than the research data itself (the so-called raw data). The computer on which your personal details is stored is secured to the highest standards, and only researchers involved will have access to this data. The data itself will also be protected by a security code.

Your data will be stored for at least 10 years. This is in accordance with the guidelines provided by the VSNU Association of Universities in the Netherlands. Please refer to the website of the Authority for Personal Data: <https://autoriteitpersoonsgegevens.nl/nl/onderwerpen/avg-europese-privacywetgeving>, for more information about privacy.

### **Voluntary participation**

Participation in this study is voluntary. You can end your participation in the study at any time, without any explanation and without any negative consequences. If you end your participation, we will use the data collected up to that point, unless you explicitly inform us otherwise. You also don't need to answer any questions that you do not want to.

### **Independent contact and complaints officer**

If you have any questions or comments about the study, please contact my supervisor (h.marien@uu.nl) or myself (j.r.d.moojen@students.uu.nl) through e-mail.

If you have an official complaint about the study, you can send an email to the complaints officer at klachtenfunctionaris-fetcsocwet@uu.nl.

I would like to thank you in advance for participating.

With kind regards,

Reinoud Moojen

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Page Break

Q52 You can leave the following questions blank if you are not a student at the UU.

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SUUE If you are a student at the UU and want to receive participation credits, then leave your student email address here.

---

---

SUUSN And your student number here.

---

---

Page Break

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## ICC

I have read and understood the participant information sheet. I had enough time to decide whether I wanted to participate or not.

My participation in this study is entirely voluntary. I know that I can decide to withdraw from this study at any time.

The procedure regarding confidentiality has been clearly explained to me. I understand that all data is anonymous and no personal information is stored together with the data collected in this study. I know that my anonymized data may be featured in possible reports, publications or presentations resulting from this study.

- I want to participate. (1)
- I do not want to participate. (2)

*Skip To: End of Block If I have read and understood the participant information sheet. I had enough time to decide whether... = I want to participate.*

*Skip To: End of Survey If I have read and understood the participant information sheet. I had enough time to decide whether... = I do not want to participate.*

## End of Block: Informed Consent

---

## Start of Block: Demographics

FUDI Before we begin it is important to create an anonymous ID with some personal information. With this anonymous ID your data can later be connected to the follow-up part of this study.

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## DOM

What day of the month is your birthday? (If your birthday is on the tenth, then you would choose: 10.)

\_\_\_\_\_

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TLM What are the first three letters of your mother's name? (If your mother's name would be Maxima, then you would choose: MAX.)

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Page Break

---

Q0 Now we will start off the study with questions on demographical information.

---

Q1 How old are you?

- 18-24 (1)
  - 25-34 (2)
  - 35-44 (3)
  - 45-54 (4)
  - 55-64 (5)
  - 65-74 (6)
  - 75-84 (7)
  - 85 or older (8)
  - I'd rather not say. (9)
- 

Q2 What is your gender?

- Male (1)
  - Female (2)
  - Other (3)
- 



Q3 Which country are you from?

▼ Afghanistan (1) ... Zimbabwe (1357)

-----  
Page Break

Q4 What is the highest level of school you have completed or the highest degree you have received?

- Less than high school degree (1)
  - High school degree (2)
  - Bachelor's degree in Applied University (hbo) (3)
  - Bachelor's degree in University (4)
  - Master's degree (5)
  - Doctoral degree (6)
  - Other (7) \_\_\_\_\_
- 



Q5 Which statement best describes your current employment status?

- Working (paid employee) (1)
  - Working (self-employed) (2)
  - Not working (I am a student) (3)
  - Not working (temporary layoff from a job) (4)
  - Not working (looking for work) (5)
  - Not working (retired) (6)
  - Not working (disabled) (7)
  - Not working (other) (8) \_\_\_\_\_
-





Q6 Which of the following industries most closely matches the one in which you are employed?  
If you are unemployed you can leave this question blank.

- Forestry, fishing, hunting or agriculture support (1)
- Real estate or rental and leasing (2)
- Mining (3)
- Professional, scientific or technical services (4)
- Utilities (5)
- Management of companies or enterprises (6)
- Construction (7)
- Admin, support, waste management or remediation services (8)
- Manufacturing (9)
- Educational services (10)
- Wholesale trade (11)
- Health care or social assistance (12)
- Retail trade (13)
- Arts, entertainment or recreation (14)
- Transportation or warehousing (15)
- Accommodation or food services (16)
- Information (17)
- Other services (except public administration) (18)
- Finance or insurance (19)



Unclassified establishments (20)

---

Page Break

Q7 Information about income is very important to understand. Would you please give your best guess? Please indicate the answer that includes your entire household income in (previous year) before taxes.

- Less than €10.000 (1)
  - €10.000 to €19.999 (2)
  - €20.000 to €29.999 (3)
  - €30.000 to €39.999 (4)
  - €40.000 to €49.999 (5)
  - €50.000 to €59.999 (6)
  - €60.000 to €69.999 (7)
  - €70.000 to €79.999 (8)
  - €80.000 to €89.999 (9)
  - €90.000 to €99.999 (10)
  - €100.000 to €149.999 (11)
  - €150.000 or more (12)
-

Q8 How many people are you currently living with? INCLUDE everyone who is living or staying here for more than 2 months.

- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- More than 6 (7)

**End of Block: Demographics**

---

**Start of Block: Climate Change Attitudes**

SI Next, there will be a questionnaire on your Attitudes towards Climate Change. Please answer these questions according to your personal beliefs.

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Page Break

---

CCA1 I believe our climate is changing.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
- 

CCA2 I am concerned about global climate change.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
-

CCA3 I believe there is evidence of global climate change.

- Strongly disagree (1)
- Disagree (2)
- Neither agree nor disagree (3)
- Agree (4)
- Strongly agree (5)

-----  
Page Break \_\_\_\_\_

CCA4 Global climate change will impact our environment in the next 10 years.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
- 

CCA5 Global climate change will impact future generations.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
-

CCA6 The actions of individuals can make a positive difference in global climate change.

- Strongly disagree (1)
- Disagree (2)
- Neither agree nor disagree (3)
- Agree (4)
- Strongly agree (5)

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Page Break \_\_\_\_\_

CCA7 Human activities cause global climate change.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
- 

CCA8 Climate change has a negative effect on our lives.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
-



CCA9 We cannot do anything to stop global climate change.

- Strongly disagree (1)
- Disagree (2)
- Neither agree nor disagree (3)
- Agree (4)
- Strongly agree (5)

-----  
Page Break \_\_\_\_\_

CCA10 I can do my part to make the world a better place for future generations.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
- 

CCA11 Knowing about environmental problems and issues is important to me.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
-

CCA12 I think most of the concerns about environmental problems have been exaggerated.

- Strongly disagree (1)
- Disagree (2)
- Neither agree nor disagree (3)
- Agree (4)
- Strongly agree (5)

-----  
Page Break \_\_\_\_\_

CCA13 Things I do have no effect on the quality of the environment.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
- 

CCA14 It is a waste of time to work to solve environmental problems.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
-

CCA15 There is not much I can do that will help solve environmental problems.

- Strongly disagree (1)
- Disagree (2)
- Neither agree nor disagree (3)
- Agree (4)
- Strongly agree (5)

End of Block: Climate Change Attitudes

---

Start of Block: Manipulation 1 (Altruistic)

IE Thank you for answering the questionnaire. Now you will read an informational piece on climate change and instructions for the experiment.

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Page Break

---

MA1 Since the beginning of the Industrial Revolution man has been directly influencing the climate through their actions. Now, the global temperature is rising. This means that there will be changes in the coming decades and beyond. These changes include more extreme weather like heatwaves and storms, longer frost-free seasons and rising sea levels.

These climate changes affects directly and indirectly your immediate surroundings and your close ones. Our everyday behaviour has an impact on the environment. One of these everyday behaviours is regarding energy consumption. Concretely, turning off the lights in your room, turning off your devices and limiting the usage of the heater.

---

Page Break

MA2

These typical everyday behaviours can have positive economical effects for your own situation, but most importantly they are good for the ecological footprint.

Research has shown that people can change these everyday behaviours more effectively when they are motivated by reducing the impact of their ecological footprint.

---

Page Break

MA3

Now, for this experiment we want to ask you to pay attention to one of these energy consuming behaviours, namely, turning off the lights. Because this is one of the most frequent behaviours people forget and can have a big impact on your ecological footprint.

The next 24 hours you will monitor your own behavior and count how often you turn off the lights to reduce your ecological footprint. When you start, look at the clock and be sure to begin on the whole hour. For instance, when it is 14:15, please start at 15:00 with counting until 15:00 the next day. Be sure to note your counting result.

When you turn off the lights, remind yourself of what the effect is of your energy-saving behaviour.

---

Page Break



MA4

To summarize, in the next 24 hours you are going to turn off the lights as frequently as possible. When you do this remind yourself of reducing the impact of your ecological footprint.

---

Page Break

MA5

First we want to have a general impression of how often you turn off the light on a daily basis right now. Please give an estimate of how often you turned off the light in the past 24 hours.

---

---

Page Break

---

## MA6

To measure the behaviour of turning off the lights more reliably we ask you to monitor how often you turn off the lights in the next 24 hours. So try to keep track and keep count of these instances and every time you do this, remind yourself of reducing the impact of your ecological footprint.

---

Page Break

MA7 In order to help you with this task, research has shown that when people implement their intentions into plans they are more successful. To install this plan for yourself repeat the following phrase.

"When I leave a room and I see that the lights are on; I turn off the lights."

**End of Block: Manipulation 1 (Altruistic)**

---

**Start of Block: Objective**

EAFU Please fill in your email address here so we can send you an email with the next part of the study. The next part will be send to you after 24 hours. The email address will not be connected to your data, it is only used to send you a link for the second survey.

---

**End of Block: Objective**

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**Start of Block: Manipulation 2 (Egoistic)**

IE Thank you for answering the survey according to your own personal beliefs. Now you will read an informational piece on climate change and instructions for the experiment.

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Page Break

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ME1 Since the beginning of the Industrial Revolution man has been directly influencing the climate through their actions. Now, the global temperature is rising. This means that there will be changes in the coming decades and beyond. These changes include more extreme weather like heatwaves and storms, longer frost-free seasons and rising sea levels.

These climate changes affects directly and indirectly your immediate surroundings and your close ones. Our everyday behaviour has an impact on the environment. One of these everyday behaviours is regarding energy consumption. Concretely, turning off the lights in your room, turning off your devices and limiting the usage of the heater.

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Page Break

ME2 These typical everyday behaviours can have positive effects on the environment, but most importantly also affect your own financial situation.

Research has shown that people can change these everyday behaviours more effectively when they are motivated by reducing costs of their electrical bill.

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Page Break

### ME3

Now, for this experiment we want to ask you to pay attention to one of these energy consuming behaviours, namely, turning off the lights. Because this is one of the most frequent behaviours people forget it can have a big impact on spending too much money on your energy bills.

The next 24 hours you will monitor your own behavior and count how often you turn off the lights to reduce the costs of your energy bills. When you start, look at the clock and be sure to begin on the whole hour. For instance, when it is 14:15, please start at 15:00 with counting until 15:00 the next day. Be sure to note your counting result.

When you turn off the lights, remind yourself of what the effect is of your energy-saving behaviour.

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Page Break

ME4 To summarize, in the next 24 hours you are going to turn off the lights as frequently as possible. When you do this remind yourself of reducing the costs of your electrical bill.

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Page Break



ME5 First we want to have a general impression of how often you turn off the light on a daily basis right now. Please give an estimate how often you turn off the light in the past 24 hours.

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Page Break

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ME6 To measure the behaviour of turning off the lights more reliably we ask you to monitor how often you turn off the lights in the next 24 hours. So try to keep track and keep count these instances and every time you do this, remind yourself of reducing the costs of your electrical bill.

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Page Break

ME7 In order to help you with this task, research has shown that when people implement their intentions into plans they are more successful. To install this plan for yourself repeat the following phrase.

**"When I leave a room and I see that the lights are on; I turn off the lights."**

End of Block: Manipulation 2 (Egoistic)

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Thank you for your contribution to the first part of the study.

Now, it is important that you will follow the instructions given to you within this study. If you have any further questions in the meantime, please send an email to: [j.r.d.moojen@students.uu.nl](mailto:j.r.d.moojen@students.uu.nl).

In 24 hours you will receive an email with the follow-up of this study.

With kind regards,

Reinoud Moojen

# A & E Framing Experiment - Follow-up

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## Start of Block: Follow-up

IC Welcome back Sir / Madam,

The last 24 hours you have paid close attention to turning the light switches off in your house. On the next page you are requested to inform us with the exact amount of times you have turned off the lights.

Next, you will once again be asked to complete the questionnaire on your Attitudes towards Climate Change.

When you have completed the questionnaire you will be de-briefed.

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Page Break

NOA How many times have you turned off the lights in the last 24 hours?

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MC We also asked you to remind yourself of the effect of this action. Namely, turning off the lights reduces my ... (Fill in your answer below.)

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**End of Block: Follow-up**

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**Start of Block: CCA Intro**

CCAI Please answer the questionnaire on Attitudes towards Climate Change according to your personal beliefs.

**End of Block: CCA Intro**

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**Start of Block: Climate Change Attitudes**

FCCA1 I believe our climate is changing.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
-

FCCA2 I am concerned about global climate change.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
- 

FCCA3 I believe there is evidence of global climate change.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
- 

Page Break

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FCCA4 Global climate change will impact our environment in the next 10 years.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
- 

FCCA5 Global climate change will impact future generations.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
-

FCCA6 The actions of individuals can make a positive difference in global climate change.

- Strongly disagree (1)
- Disagree (2)
- Neither agree nor disagree (3)
- Agree (4)
- Strongly agree (5)

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Page Break



FCCA7 Human activities cause global climate change.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
- 

FCCA8 Climate change has a negative effect on our lives.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
-

FCCA9 We cannot do anything to stop global climate change.

- Strongly disagree (1)
- Disagree (2)
- Neither agree nor disagree (3)
- Agree (4)
- Strongly agree (5)

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Page Break

FCCA10 I can do my part to make the world a better place for future generations.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
- 

FCCA11 Knowing about environmental problems and issues is important to me.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
-

FCCA12 I think most of the concerns about environmental problems have been exaggerated.

- Strongly disagree (1)
- Disagree (2)
- Neither agree nor disagree (3)
- Agree (4)
- Strongly agree (5)

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Page Break \_\_\_\_\_

FCCA13 Things I do have no effect on the quality of the environment.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
- 

FCCA14 It is a waste of time to work to solve environmental problems.

- Strongly disagree (1)
  - Disagree (2)
  - Neither agree nor disagree (3)
  - Agree (4)
  - Strongly agree (5)
-

FCCA15 There is not much I can do that will help solve environmental problems.

- Strongly disagree (1)
- Disagree (2)
- Neither agree nor disagree (3)
- Agree (4)
- Strongly agree (5)

**End of Block: Climate Change Attitudes**

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**Start of Block: FUD**

FUDI To be able to connect your previous data to the follow-up data and make the study complete it is required to supply the following information:

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DOM What day of the month is your birthday?

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TLM What are the first three letters of your mother's first name?

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**End of Block: FUD**

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Your contribution to the study is now complete.

### **Background of the study**

With this research project I study the effects of an informative message on pro-environmental behaviour. This message has been framed in two different ways. One message was aimed at altruistic and biospheric values and the other aimed at egoistic values. The participants were

randomly assigned to one of the two messages and are then requested to execute the same environmental behaviour. According to previous literature it is expected that one message is more effective than the other, which implies that one group will be more 'green' than the other. This will be studied and elaborated further within the Results section of this study.

Thank you for your time and your contribution to my research project.

With kind regards,

Reinoud Moojen