The Influence of Cognitive Support on Pro-Environmental Behaviour: Examining the Moderating Role of Locus of Control

Aida Mamedova

S3896749

Department of Psychology, University of Groningen

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Supervisor: dr. Elliot J. Sharpe

Second evaluator: Dr. Brian Wagner

In collaboration with: Khaled Alkhatib, Rixt Bootsma, Sophie Hofstra, Jeremi Korver, Stijn Landewe

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Abstract

The following research aims to investigate nuances behind behaviour that influence whether or not an individual participates in the joint effort that is necessary to combat climate change. Maio et al. (2001) hypothesised that the reason why people do not always act in alignment with their values is because values are treated as truisms. Values are often widely shared with little contemplation and reasoning backing up why they are so important, in other words, there is a lack in cognitive support (Maio et al., 2001). Additionally, a high internal locus of control in combination with self-transcendent values (such as biospheric values) have been linked to pro-environmental behaviour (Jonsson & Nilsson, 2014).

Therefore, the following study examines how increasing cognitive support influences pro-environmental behaviour and whether locus of control moderates this effect. This research uses methodology that replicates aspects of research conducted by Maio et al. (2001), specifically that of experiment two. 66 participants were deceived about the true nature of the experiment, and were assigned to either an experimental condition, where they wrote reasons for biospheric values (thus providing cognitive support), or a control condition where they rated these values. Pro-environmental behaviour was measured by the time volunteered for a fictitious litter-picking event. The results found that cognitive support within the experimental condition did not have significant effect on pro-environmental behaviour. Locus of control also did not moderate this relationship. These findings suggest that simply reflecting on environmental values may not be enough to drive action, and that locus of control does not moderate the effect of cognitive support on biospheric values. This highlights the need to explore other factors that may have a stronger influence on pro-environmental behaviour.

Introduction

As the human population develops, the reliance on natural resources is increasing at an alarming rate. Over the last 150 years, Earth's temperature has increased by 1.0°C, and is expected to have reached an increase of 1.5°C anywhere between 2030 and 2052 (IPCC, 2023). This rate of global warming will not be able to sustain the way human civilisation comfortably enjoys the world as we know it today. The implications of this temperature increase are drastic; it contributes to the rise of acidity levels in coral reefs creating an unhospitable environment for life, and rising sea-levels poses a larger threat of floods for land near the coast, as well as a heightened risk of tropical storms coinciding with extreme weather (IPCC, 2023).

Action is needed to mitigate the effects of climate change, but humanity's current efforts of reducing the impact of climate change aren't sufficient enough. There are ways in which through joint action, we are able to reduce the impact we have on the environment by engaging in more pro-environmental behaviour.

Biospheric values and Pro-environmental Behaviour

Generally, we assume the important decisions people make during their life are governed by the values they hold (Schwartz,1992). Values are enduring beliefs that guide individuals in deciding what is important in their actions and priorities. Schwartz (1992) defines them as, "desirable goals, varying in importance, that serve as guiding principles in people's lives". They are consistent, closely associated with one's identity, and are rarely questioned (Schwartz,1992). The values that are most relevant for pro-environmental behaviour can be categorized into hedonic values (focusing on pleasure and comfort), egoistic values (focusing on self-interest), altruistic values (focusing on the welfare of others), and biospheric values (focusing on the intrinsic worth of the environment). Among these, biospheric values are particularly significant, as they directly prioritize the well-being of the

environment and have been strongly linked to fostering pro-environmental behaviour (Steg & De Groot, 2012)

Biospheric values emphasize the importance of protecting the environment for its own sake and extend concern beyond human welfare to all living beings and ecosystems (Steg & De Groot, 2012) . These values can motivate behaviours such as reducing pollution (sorting/picking rubbish) even when these actions do not provide direct personal or social benefits (Steg & De Groot, 2012). Research has also shown that biospheric values are stronger predictors of pro-environmental behaviour than altruistic values, as they are more closely tied to individuals' environmental concern and commitment to taking action (Steg et al., 2014). This highlights the unique role biospheric values have in creating an intrinsic motivation to engage in pro-environmental behaviour.

Values as truisms

While values can be seen as a key guiding factor in how we behave, they can also operate as truisms. This means they are unquestioned and rarely contested (Maio et al. 2001), especially widely held beliefs such as the importance of helping behaviour. In fact, when altruistic beliefs like this are questioned, it can lead to social disapproval, further solidifying their dogmatic nature (Maio et al., 2001). However, the non-contemplative nature of truisms can result in a weakened ability to come up with supporting arguments for a strongly held value (Maio et al., 2001). This can reduce the value's impact on behaviour and makes subsequent behaviour more infrequent, since the pressure to act accordingly comes from weaker normative influences rather than cognitive support. For example, individuals who have biospheric values but have not actively reflected on their importance may struggle to resist external pressures or situational factors that discourage pro-environmental behaviour.

This lack of cognitive support for values is particularly evident when situational factors influence the extent to which someone acts in line with those values. Darley et al. (1973) demonstrated that participants who scored highly on altruism failed to help a person in need when under situational pressure. This is closely related to the idea of values being treated as truisms; in this case, the value of altruism was rarely consciously questioned or reinforced. The resulting consequence makes them more vulnerable to external pressures, further highlighting the fragility of values in such contexts. This connection is especially relevant to pro-environmental behaviour, as it suggests that without cognitive support, biospheric values may become more vulnerable to situational influences that decrease the likelihood of engaging in pro-environmental behaviour.

Similarly, Maio et al. (2001) found that when individuals reflect on the reasoning behind their values, it strengthens their cognitive support, making them more likely to act in ways that align with those values. For example, in their study, participants who reflected on reasons for their altruistic values were more likely to engage in helping behaviours, such as volunteering time for research. This demonstrates how cognitive reflection can increase commitment to values, thereby motivating pro social actions. Tapper et al. (2012) extended this idea, showing that when participants reflected on the reasons for maintaining a healthy lifestyle, they were more likely to engage in healthier behaviours, like eating fruits and vegetables. These findings suggest that reinforcing cognitive support for a value can strengthen its influence on behaviour across a variety of domains. In the context of the current study, this suggests that providing cognitive support for biospheric values, such as protecting the environment, could increase pro environmental behaviours, like volunteering for sustainability related activities. This adds on to the idea that reflecting on why holding certain values can translate into proactive behaviours aligned with those values.

In the case of biospheric values (which are strongly linked to pro-environmental behaviour), encouraging individuals to reflect on the reasons for protecting the environment could similarly increase the cognitive salience of these values. This means that individuals could form supporting arguments surrounding the importance of the biosphere, which will then be at the forefront when decision-making. This, in turn, may lead to an increased likelihood of pro-environmental actions, such as litter-picking or reducing waste, as individuals align their behaviour more closely with their environmental values.

Locus of control

In addition to cognitive support playing a key role in producing behaviour that aligns with important values, it can be moderated by an individual's belief system. According to Rotter's (1966) Locus of Control theory, there exists a unidimensional continuum with two polar perspectives: an internal or external locus of control. 'Locus of control' refers to the extent to which people attribute the consequences of what happens to them in life as either a result of their own actions or external factors (Rotter, 1966). For example, a person with a strong internal locus of control may believe that their academic success is due to their hard work and study habits, whereas someone with an external locus of control may attribute the same success to luck or an easy exam. Similarly, in the context of environmental behaviour, individuals with an external locus may feel that climate change is out of their control and that only governments or large corporations truly have power. In contrast, those with a stronger internal locus of control may feel more personally responsible and take direct action (Rotter, 1966), such as reducing waste or engaging in climate activism. Because of this sense of personal responsibility, individuals with an internal locus of control are more likely to engage in behaviours that support the environment, as they believe their actions can influence future outcomes.

In Jonsson and Nilsson's (2014) paper discussing locus of control being a moderating factor for pro-environmental behaviour, they found that this internal locus of control can manifest itself into pro-environmental action. This can be explained by a heightened risk of cognitive dissonance, individuals with an internal locus of control are more likely to evaluate whether their behaviour aligns with their personal values. If it does not align, they would be more likely to take action to change this. This is because someone with an internal locus of control has a higher likelihood of taking it upon themselves to translate their cognitive dissonance into behaviour that will align with their self-transcendent beliefs, resulting in pro-environmental action (Jonsson & Nilsson, 2014).

The link between cognitive support and locus of control helps to clarify how an individual's sense of control can influence their engagement with pro environmental behaviours. For those with a highly external locus of control, reflecting on reasons for the importance of biospheric values may have limited impact. Since they perceive outcomes as primarily governed by external forces like governmental policies or corporations, they might feel that individual actions are insignificant in the face of these larger systems. This external attribution of responsibility can diminish their motivation to act on these values, even when they are made cognitively salient.

On the other hand, individuals with an internal locus of control who believe they are in charge of their own outcomes are likely to experience a stronger reinforcement of their personal responsibility to act in alignment with their values. Self-determination theory (Deci & Ryan, 1985) supports this idea, suggesting that individuals who perceive control over their actions are more likely to engage in autonomous motivation. These individuals are motivated by intrinsic factors like personal growth and alignment with their values, which increases their willingness to provide cognitive support for their values and actions. This interaction implies

that cognitive salience may be more effective for individuals with an internal locus of control, as they are motivated by their belief that their actions can influence outcomes.

Hypotheses

The current study aims to explore the extent to which pro-environmental behaviour is affected by cognitive salience surrounding biospheric values, and how this effect is moderated by locus of control. The three resulting hypotheses are as follows:

H1: People who provide reasons for their biospheric values will be more likely to behave pro-environmentally than those who do not.

H2: The effect of reflecting on reasons for biospheric values on pro-environmental behaviour will be moderated by locus of control, such that the effect will be stronger for individuals with a more internal locus of control and weaker for individuals with a more external locus of control.

In the current research, we look at how thinking about the reasons behind biospheric values can influence pro-environmental behaviour. We also explore whether this effect is stronger or weaker depending on a person's locus of control. Specifically, we expect that people with an internal locus of control will be more likely to act on these values, while those with an external locus of control might not be as influenced by reflecting on their reasons. This study aims to build on previous work around cognitive salience and locus of control on how people are motivated to partake in pro-environmental action.

Methods

This study aimed to investigate the impact of cognitive support on pro-environmental behaviour, with a particular focus on how locus of control moderates this relationship. Based on previous research, it was hypothesised that providing reasons for biospheric values would increase the likelihood of pro-environmental behaviour, particularly for those with an internal

locus of control. The experiment aimed to replicate methods used in Maio et al. (2001) to assess the role of cognitive salience in shaping environmental behaviour.

Participants

124 responses were collected using convenience sampling, mainly by recruiting people from various study spaces within the University of Groningen, as well as via large student group chats on Whatsapp. The data from 58 participants were removed from the analyses due to two main reasons: four participants did not consent to the questionnaire, and 54 did not complete it (either they did not fully complete the experimental condition, or they did not select any option for the dependent variable). This leaves 66 responses after data pruning (25 male, 37 female, two other, and two preferred not to say). Of these remaining participants, 52 were between the ages 18-25, 13 were between the ages 26-38, and one was between the ages 56-65. The majority of the sample comprised of students at the University of Groningen, with 40 people being students, and 26 people being non-students. Specifying this information is important, as the dependent variable is more relevant to those who are currently enrolled at the University of Groningen. 28 participants were assigned to the experimental condition and 38 participants were assigned to the control condition by using random assignment.

Procedure

The study was conducted following ethical guidelines and was submitted to the fast-track procedure by the ethics committee. On the basis of a set of questions developed by the ethics board, the study was exempt from formal review. Relevant research documents (research plan, data management plan, participant information form, consent form) were registered prior to the study's commencement but not formally reviewed. The principal

investigator confirmed that the study conformed to the guidelines for conducting a low-risk study.

The original procedure of the current study was meant to be conducted as a lab experiment that would sample first year psychology students that would participate in exchange for course credit. However, due to unforeseen time constraints, the study was converted to an online questionnaire; preserving as much of the original design as possible. As a result, this online Qualtrics questionnaire was taken by anyone, regardless of whether they were a first year psychology student or not.

The study was conducted individually online, where participants were deceived about the true purpose of the questionnaire. During the consent process, they were falsely informed that they were taking part in tasks measuring their cognitive ability. This was done to mitigate any demand characteristics and prevent participants from guessing the true aim of the study, ensuring that their responses were not influenced by knowledge of the research objectives. This was followed by asking participants for their demographic information (age, gender, and whether or not they were a student at the University of Groningen). Then they were asked to complete a set of preliminary questionnaires, assessing their agreeableness, locus of control, and climate anxiety.

Participants then engaged in a filler task, where they had 2 minutes to highlight adjectives in a neutral excerpt from two literary works. This was done in order to disguise the true purpose of the study, thereby reducing demand characteristics as well as providing a mental separation between the preliminary questionnaires from main aspect of the research. At this point, Participants were randomly assigned to either the experimental, or control condition (cognitive support, or no cognitive support respectively). The following section of the procedure replicates aspects of Experiment Two from Maio et al.'s (2001) research.

In the experimental condition, the objective was to induce cognitive salience surrounding biospheric values. The participants were to write about two different values: tradition (filler value), and biospheric values (target value), with five minutes allotted for each. First, participants were asked to write about why they thought the value of tradition was important. This value is purposefully unrelated to the biosphere in order to prevent participants from immediately recognising the study's focus on environmental values. This helps to minimise demand characteristics and ensures that participants engage with the task more naturally, rather than responding in a way they believe aligns with the study's objective. Secondly, participants were asked to write as many reasons as they could (within the timeframe) for why they thought protecting the environment and respecting nature were important to them, thus providing cognitive support for biospheric values.

In the control condition, participants were given 2 minutes to rate how they felt about the same two values (tradition and biospheric values) in the experimental condition using a 7-point semantic-differential scale instead of writing out reasons for them. There were six items; two of which were allocated to the filler value of tradition (devotion, and modesty), and four were allocated for values surrounding the biosphere (preventing environmental pollution, protecting the environment, respecting nature, and being in unity with nature). Participants were asked to rate each item three times, once for whether they thought it was unpleasant or pleasant, bad or good, and negative or positive (ranging from -3 to +3 for each), resulting in 18 ratings in total. Theoretically, rating the values should not provide as much cognitive support as writing out reasons for them.

After completing either the control or experimental condition, participants proceeded to the deceptive section of the questionnaire. Unlike Maio et al.'s (2001) study on helpfulness, the dependent variable in the current research is instead pro-environmental behaviour. This was operationalised similarly, with participants being asked how much time they would like

to donate to a fictitious litter picking event, guised as a flyer advertising an event hosted by the Green office in the University of Groningen. Using this flyer as a form of deception was necessary to separate the association between the dependent variable and the experiment, deceiving participants into thinking that their response was entirely unrelated to the questionnaire. It was an important step in avoiding demand characteristics, preventing participants from guessing the true purpose of the research.

The flyer presented participants with the options to choose between, zero minutes, ten minutes, thirty minutes, one hour, two hours, of volunteering for the event. The length of time selected by participants served as the dependent variable. This same scale was used in Maio et al.'s (2001) Experiment Two, where participants indicated how much time they would like to spend volunteering for a confederate's research project, thereby maintaining the replicative aspect of the current study. Litter-picking was chosen as the dependent variable because it is a viable pro-environmental activity and, like in Maio et al.'s (2001) Experiment Two, can be measured in terms of time. After selecting how much time they'd like to spend volunteering, they were asked five follow-up questions about how they felt about the volunteering event they had just seen (which was also guised as being for the benefit of the Green Office to maintain the benefits of deception as mentioned previously). Each item was measured using a 7-point semantic-differential scale, measuring how acceptable, good, positive, or necessary the event was, with one being the negative extreme, and seven being the positive. The final question asked about how much the participant supports the litter-picking event, with one being very much against, and seven being very much for.

Participants were then debriefed about the true intent of the research. They were told that reasoning ability was not the focus of the study, and that in actuality, the purpose was to examine the effects of reflecting on biospheric values on how much time an individual would volunteer for a pro-environmental event. Afterwards, the participants were given the

opportunity to withdraw their consent after learning they were deceived, after which the questionnaire concluded.

Materials

Locus of control

Locus of control was measured using the Internal–External Locus of Control Short Scale–4 (IE-4) (Nießen et al. 2022). The IE-4 is a brief measure designed to assess the extent to which individuals perceive life events as being under their own control (internal locus) or influenced by external forces such as fate (external locus), in line with Rotter's (1966) social learning theory framework. The scale consists of four items, two of which measuring internal locus of control (e.g., "If I work hard, I will succeed") and two items measuring external locus of control (e.g., "Fate often gets in the way of my plans"). Participants responded to each item on a five-point Likert-scale, ranging from one (does not apply at all) to five (Applies completely)

In the present study, the IE-4 demonstrated a subpar internal consistency, with a Cronbach's alpha of ($\alpha = .465$), showing a low internal consistency. The mean score for internal locus of control was ($M = 3.43$, $SD = 0.92$), while the mean score for external locus of control was ($M = 2.29$, $SD = 0.75$). For clarity, an overall mean score for locus of control was calculated by including reverse-coded values from the items measuring external locus of control, resulting in a mean of ($M = 3.57$, $SD = 0.65$). These values represent the overall locus of control for all participants on a scale from one to five, with five indicating a high internal locus of control and one indicating a low internal locus of control. These descriptives suggest that, overall, participants exhibit a slight tendency towards an internal locus of control rather than an external one.

Dependent Variable scale: Volunteering Time for Litter Picking

The dependent variable in this study was participants' willingness to volunteer for a pro-environmental activity, operationalized as the amount of time they were willing to donate to a fictitious litter-picking event. A flyer advertising the event was presented to participants, featuring several response options regarding how much time they would like to volunteer. The options were: 10 minutes, 30 minutes, one hour, two hours, or "I am not willing to help" (denoted as zero minutes). All response options were later converted to minutes as the main unit of time for ease of analysis. This conversion was made to simplify the interpretation of the data and because it aligns with the methodology used in Maio et al. (2001), which also used time as a quantitative measure of pro-environmental behaviour. Calculating the average time all participants volunteered for the litter-picking event (regardless of condition) resulted in an overall mean of 37.88 minutes (SD = 34.89).

Litter picking was chosen as the pro-environmental behaviour because it is a straightforward activity that participants could easily envision themselves participating in, while also representing a direct environmental contribution. Furthermore, using time as the measurement allows for an easily quantifiable, scalable assessment of pro-environmental behaviour, consistent with the experimental design of Maio et al. (2001). Their study measured volunteering time for a similar reason, which made it a fitting comparison for the current study's purpose of investigating the effect of cognitive salience on environmental behaviour.

Results

All analyses were conducted using SPSS. A power analysis was conducted to determine the required sample size for detecting an effect of cognitive salience on pro-environmental behaviour. This resulted in a Cohen's d of 0.23 as a measure of effect size. This implies that there is a low chance of detecting an effect with a sample size of 66. The

assumptions of normality, linearity, and homoscedasticity were assessed. Given that the dependent variable scale does not involve a standard psychometric questionnaire, the focus was on how participants' volunteer time choices varied across experimental conditions.

The Effect of Cognitive Support on Pro-environmental Behaviour

H1: People who provide reasons for their biospheric values will be more likely to behave pro-environmentally than those who do not.

When split for condition, participants within the control group chose a mean litter-picking time of 41.32 minutes (*SD* = 37.57), while those in the experimental condition selected a mean time of 33.21 minutes (*SD* = 30.92). This means that participants in the control condition (value salient) volunteered more time than those in the experimental condition (reasons salient).

Levene's test for equality of variances was not significant, $F(1, 64) = 0.69$, $p = .411$, indicating that the assumption of homogeneity of variance was met. An independent samples *t*-test showed that this difference was not statistically significant, $t(64) = 0.93$, $p = .822$, $d = 0.23$, 95% CI [-25.48, 9.27].

The Moderating Effect of Locus of Control

H2: The effect of reflecting on reasons for biospheric values on pro-environmental behaviour will be moderated by locus of control, such that the effect will be stronger for individuals with a more internal locus of control and weaker for individuals with a more external locus of control.

A multiple linear regression was conducted to assess the moderating role of locus of control on the relationship between cognitive salience and pro-environmental behaviour.

Initially, without the inclusion of the moderating effect (locus of control × experimental condition), the R^2 value was .017, indicating that only 1.7% of the variance in pro-environmental behaviour could be explained by locus of control and experimental condition combined. When the interaction effect was included, R^2 increased slightly to .02, representing a 0.3% increase in the variance explained by the model. This resulted in an overall model of $R^2 = .02$, $F(3, 62) = 0.41$, $p = .744$. This shows that the overall model explains a very small amount of variance in the dependent variable.

Further analysis of the moderation revealed no significant moderating effect of locus of control, $\beta = -0.304$, $t(3, 62) = -0.43$, $p = .673$. Additionally, there were no significant direct effects for either the experimental condition or locus of control on pro-environmental behaviour. The main effect of the experimental condition was non-significant, $\beta = 0.181$, $t(3, 62) = 0.256$, $p = .799$. Similarly, the main effect of locus of control was non-significant, $\beta = -0.120$, $t(3, 62) = 0.62$, $p = .535$. This means that locus of control did not significantly moderate the relationship between cognitive salience and pro-environmental behaviour, and neither the experimental condition nor locus of control independently predicted pro-environmental behaviour in this study.

To conclude, the results showed that providing reasons for biospheric values did not lead to more pro-environmental behaviour. Locus of control also did not have a significant effect on this relationship or independently predict pro-environmental behaviour. These findings suggest that thinking about why the environment is important does not necessarily result in pro-environmental action.

Discussion

The aim of this study was to examine whether providing cognitive support (by having participants reflect on why biospheric values are important) would lead to more pro-

environmental behaviour. We also predicted that locus of control would play a role in how cognitive support influenced behaviour. The results showed that those in the experimental group, (who wrote reasons for why biospheric values were important to them) did not volunteer more time for a pro-environmental activity than those in the control group. Additionally, locus of control did not appear to have any significant effect on how cognitive support influenced pro-environmental behaviour. These results did not align with our original hypotheses.

The Effect of Cognitive Support on Pro-environmental Behaviour

When observing how much time people volunteered for the litter-picking event, those in the experimental group (who wrote reasons for biospheric values) did not volunteer more time than those in the control group (who rated the values). This differed from our hypothesis, since the expected outcome was that reflecting on biospheric values would lead to more pro-environmental behaviour, when this in fact did not happen.

This result contrasts with findings from other studies, such as Maio et al. (2001), which found that increasing the cognitive salience (reasoning the importance of a value) of the helping value altruism increased helpful behaviour. However, while both biospheric values and altruistic values are self-transcendent values, there are differences between prosocial behaviour such as helpfulness, and pro-environmental environmental behaviour such as litter-picking. Biospheric values are more responsible for pro-environmental behaviour (Katz-Gerro et al., 2017) than altruistic behaviour. It's possible that environmental actions are more difficult to trigger because they are influenced by different factors, such as social norms (Chwialkowska et al., 2020) or the perceived feasibility of taking action (Jugert et al., 2016). Therefore, simply reflecting on why the environment is important may not be sufficient to encourage behavioural change in environmental contexts.

The Moderating Effect of Locus of Control

Locus of control did not moderate the relationship between cognitive salience and pro-environmental behaviour. This was unexpected, as we predicted that people with an internal locus of control would be more likely to show pro-environmental action when providing cognitive support for biospheric values. However, locus of control did not have a significant effect. One possible explanation is that environmental issues, such as litter-picking, may not feel like a big enough event for the individual to feel the responsibility to make a significant impact, regardless of their perceived control over other situations. Perceived effectiveness could be another factor. Arias and Trujillo (2020) found that when individuals perceive their actions as effective, they are more likely to engage in simple behaviours like using reusable bags, which can lead to more complex behaviours like recycling.

Research on locus of control generally suggests that individuals with an internal locus are more likely to take action (Jonsson & Nilsson, 2014), but our results did not support this idea in the context of pro-environmental behaviour. This may be because environmental behaviours are often influenced by external factors, such as societal norms, public policies, uncertainty avoidance (Tam & Chan, 2017), rather than individual perceptions of control (Chwialkowska et al., 2020).

The results of this study suggest that simply reflecting on the importance of biospheric values may not be enough to encourage pro-environmental behaviour. This has implications for policymakers and organisations aiming to promote sustainable actions. Rather than relying solely on cognitive reflection, interventions should consider the broader social and structural factors that influence behaviour. Making pro-environmental actions more accessible, reinforcing social norms around sustainability, and providing incentives may be more effective ways to encourage action. Since external influences such as perceived feasibility and

social expectations play a key role in environmental behaviour (Chwialkowska et al., 2020), policies should focus on integrating environmental initiatives into daily life. This could involve introducing more community-based sustainability programmes, financial incentives for environmentally friendly behaviour, or regulatory measures such as stricter waste management policies. Future research should explore how cognitive engagement strategies can be combined with practical policy changes to create environments where pro-environmental behaviours become the default choice

As for limitations, the dependent variable being a flyer for the green office at the University of Groningen poses an issue of applicability. The consequence of using a dependent variable that was extremely specific to being a student at the University of Groningen meant that those who were not a student at the University could not answer accurately since they know they would not be able to participate. This issue was further escalated by the fact that this questionnaire was able to be completed online, and didn't depend on where you were in the world. Thus, this similarly meant that for those who knew they wouldn't be able to attend, it would not matter how much time they said they would donate for the event.

Another issue is that the dependent variable could have been primed due to the preliminary questionnaire about climate anxiety formulated by Clayton and Karazsia (2020). This is because some of the items on the climate anxiety scale were very clearly associated with feelings surrounding climate change, such as "I find myself crying because of climate change" (Clayton & Karazsia, 2020). This means that participants may have been influenced by a part of the experiment that was not the independent variable, which in turn, undesirably affects the response of the dependent variable. A filler task was indeed implemented in order to prevent this from happening, however after shifting the experiment from a lab study to an online questionnaire the mask that this filler task provides may not be as effective.

A further limitation that may have arose due to changing the experiment from an in-person lab experiment to an online questionnaire is that participants no longer were required to handwrite all the reasons in the experimental condition. According to research done by Smoker et al. (2009) and Seyll et al. (2021), they found that the complex motor task of handwriting improved memory consolidation and cognitive engagement more than typing on a keyboard. This means that participants may not have experienced as much cognitive salience as they could have if they were able to complete the experiment in the intended manner.

Overall, this study aimed to investigate the effect of cognitive support on pro-environmental behaviour and whether locus of control moderated this relationship. The findings did not support our initial hypotheses, as reflecting on biospheric values did not significantly increase pro-environmental behaviour, nor did locus of control influence this effect. These results highlight the complexity of environmental decision-making and suggest that individual cognitive engagement alone may not be enough to drive behavioural change. Instead, external factors such as social norms (Chwialkowska et al., 2020), perceived feasibility (Jugert et al., 2016), and policy structures likely play a stronger role in shaping pro-environmental actions. Future research should explore how cognitive interventions can be combined with structural and societal support to create more effective strategies for promoting sustainable behaviour.

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