Leveraging self-conscious emotions of pride and guilt to mobilise pro-environmental behaviour

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Abstract

This study explores the relationship between anticipated self-conscious emotions of pride and guilt and pro-environmental behavioural intentions. Firstly, we explored whether individuals anticipate pride when they are asked to imagine that they have engaged in a sustainable behaviour and whether individuals anticipate guilt when they imagine engagement in an unsustainable behaviour. Then we explored whether individual differences in how much pride or guilt they anticipate following feedback is moderated by their personal biospheric values and their perceived group biospheric values and whether anticipating pride or guilt or both leads to pro-environmental behaviour intentions in the future. We found that individuals indeed anticipate pride following feedback about sustainable actions and guilt following feedback about unsustainable actions. Moreover, we found an interaction effect where anticipating pride following feedback about engaging in an hypothetical sustainable action leads to increased future pro-environmental behavioural intentions. However, this effect was not found for anticipating guilt. These findings suggest that interventions and campaigns interested in motivating people towards sustainability should utilise cues in feedback which elicits pride to leverage pro-environmental behaviours.

Keywords: self-conscious emotions, pro-environmental behavioural intentions, pride, guilt, biospheric values

Leveraging self-conscious emotions to mobilise pro-environmental behaviour

Anthropogenic climate change and human induced environmental degradation are the prominent universal issues of the century. Excessive greenhouse gas emissions as a result of human activities are leading to increased extreme weather events, pollution of land, air and water resources, and mass extinction (Braje & Erlandson, 2013). In terms of greenhouse gas emissions, energy use in the household, heating and transportation contributes the most to per capita emissions (Ritchie & Roser, 2020). Given that individual-level behaviour significantly contributes to climate change and unsustainable actions, self-reflection by all about their unsustainable behaviour is critically required to mitigate and adapt to climate change (Schnabel, 2020). This need to change individual-level energy behaviour provides an opportunity for environmental psychologists to apply their expertise and join the battle against climate change and environmental degradation.

Emotions play an important role in how people perceive and react to events such as climate change, and its consequences (Smith & Leiserowitz, 2014; Perlaviciute et al, 2018). Self-conscious emotions (i.e. guilt, shame, pride, warm-glow) appear particularly motivational for pro-social and moral actions (Davidson, 2006; Tracy & Robbins, 2009). Self-conscious emotions are self-reflective and self-evaluative in nature, and are able to engage individuals to adhere to their moral and pro-social standards. Research has demonstrated that anticipating the self-conscious emotions an individual may experience as a result of their decisions can engage individuals in giving a serious thought about the consequence of their behaviour prior to the actual behaviour. (Mellers & McGaw, 2001; Marroquin et al, 2018). For example, someone may recycle because they would feel proud about their actions, or, they may recycle because they would feel guilty if they do not. This shows that decisions about the future can be influenced by

how an individual expects to feel and anticipating future emotional states can influence decision making and behavioural intentions.

The current study focuses on anticipation of the self-conscious emotions of pride and guilt because these are mutually exclusive emotions that have shown to motivate individuals to engage in pro-environmental behaviour by means of self-reflection (Tangey et al, 2007; Shiplet et al, 2022) which can be influential in making individuals rethink their impact on the environment. Pride is experienced when individuals reflect upon an instance and behave congruently with their goals, moral compass and values. Anticipating the positive experiences of pride can motivate individuals to behave consistently with their goals, moral standards and values because doing so is accompanied by a positive emotional state and pleasant feelings associated with pride. Thus, pride anticipation can motivate individuals because they are inclined to pursue the positive emotional states in the future that comes from being consistent with their goals, moral compass and values and repeat such behaviour (Beer et al, 2003; Kotabe, 2019).

Conversely, guilt is experienced when individuals reflect upon a situation and behave incongruently with their goals, moral compass and values (Knez & Nordhall, 2017; Kotabe, 2019). Anticipating the negative experience of guilt can motivate individuals to behave consistently with their goals and moral standards because not doing so is accompanied by a negative emotional state and unpleasant feelings associated with guilt. Thus, guilt anticipation can motivate individuals because they are inclined to avoid the negative and unpleasant emotional states in the future that come from being inconsistent with one's goals, moral compass and values and avoid such behaviour (Onwenzen et al, 2014; Kotabe 2019).

Notably, the self-conscious emotions of pride and guilt are not only associated with an individual’s personal goals, moral compass and values but are also associated with societal goals,

societal morality and values (de Hoog et al, 2011; Szcynzer, 2018). In the context of environmental behaviour for instance, pride (and guilt) can motivate behaviour for intrapersonal reasons when an individual perceives themselves to be responsible for a positive (or a negative) outcome that is consistent (or inconsistent) with their personal environmental goals, and moral compass. Additionally, pride and guilt can also motivate behaviour for interpersonal reasons when an individual perceives themselves to be responsible for a positive (or a negative) outcome that is consistent (or inconsistent) with societal environmental goals, and moral compass.

Although self-conscious emotions of pride and guilt can be anticipated as a result of behaving congruently or incongruently with one's personal or societal environmental goals, moral compass and values, it is unclear what explains why individuals vary in how much pride or guilt they are likely to anticipate when engaging in environmentally relevant behaviour. Literature on universal values suggests that all individuals endorse environmental values to some extent and specifically biospheric values which reflect one's goals to care for nature (Bouman, 2018). This variation in the endorsement of biospheric values between individuals may explain the individual differences in pride and guilt anticipation prior to engaging in environmental behaviour. Therefore, the individual differences in the anticipated experience of these emotions is hypothesised to be explained by the individual's level of endorsement of personal biospheric values (hypothesis 2a). Additionally, since pride and guilt have an interpersonal dimension that is influenced by societal standards, it is expected that perceived group values of people close to the individual also influences their emotional anticipation. When perceived group values become salient, making the co-endorsed values more salient, individuals are more likely to be motivated to act upon their personal [biospheric] values and their pro-environmental engagement can become stronger (Bouman et al, 2020). Therefore, we will investigate whether the perceived

group values of significant others (i.e. partners, friends, family and/or colleagues close to an individual) moderates pride or guilt anticipation (hypothesis 2b) following environmental feedback.

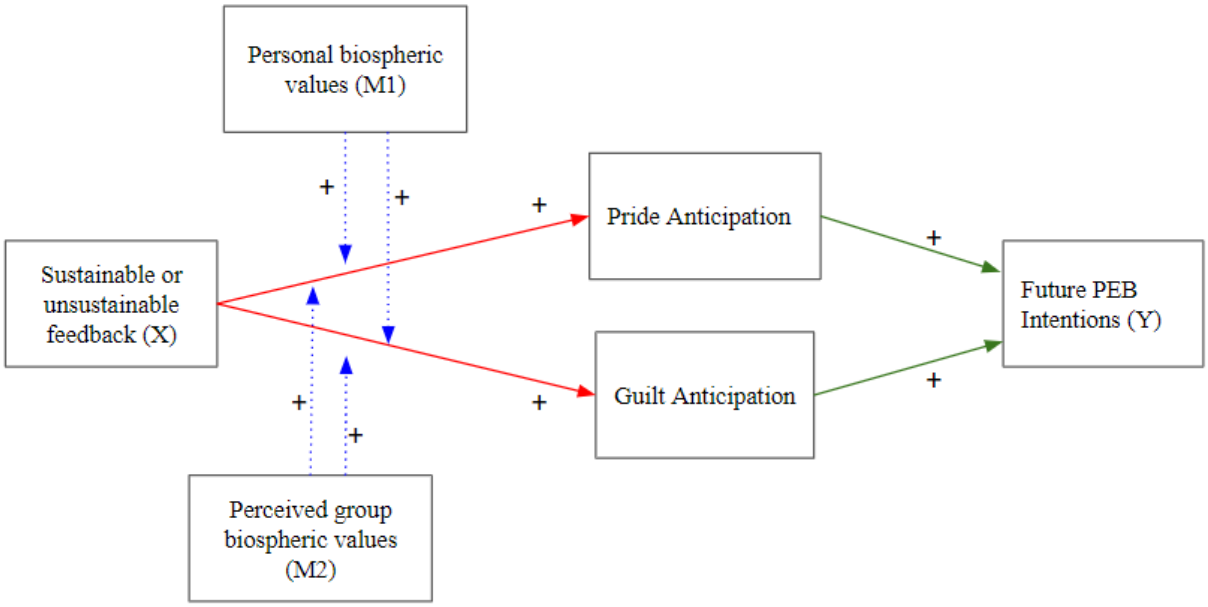
Lastly, we will explore whether anticipating feelings of pride following feedback about sustainable beaviour and feelings of guilt following unsustainable behaviour is associated with future pro-environmental behaviour intentions (hypothesis 3a/b). A study on pride and guilt anticipation predicting future pro-environmental behavioural intentions has demonstrated that making pride anticipation salient prior to making pro-environmental decisions leads to stronger pro-environmental behavioural intentions (Schneider et al, 2017). However, this effect was not found for guilt anticipation in their study. Conversely, other studies found that anticipated guilt directly mediated the relationship between environmental concern and recycling intentions (Elgaaied 2012) and demonstrated that anticipated guilt increased support for climate change policies (Lu et al, 2015). These mixed findings in the literature suggest that more research on anticipated pride and guilt in relation to pro-environmental behaviour is required in both an individual-level and group-level contexts. Accordingly, we will explore whether anticipating pride and guilt induced by feedback, leads to stronger PEB intentions.

To summarise, the purpose of this paper is to explore whether providing feedback about sustainable behaviour leads to the anticipation of pride (H1a) and whether providing feedback about unsustainable behaviour leads to the anticipation of guilt in individuals (H1b). Moreover, we will explore if individual differences in the anticipated experience of these emotions are explained or moderated by the participant's level of endorsement of personal biospheric values (H2a) and their perceived group biospheric values (H2b). Lastly, we explore whether anticipating pride or guilt following feedback about sustainable or unsustainable behaviour leads

to increased future pro-environmental intentions (H3a/H3b).

Figure 1

The process model depicts the relationship between the affect of pride and guilt following environmental feedback with the moderating role of personal and perceived group biospheric values (dashed lines) on future PEB intentions. Red arrows indicate hypothesis 1a/b, blue arrows indicate hypotheses 2a/b and the green arrows indicate hypotheses 3a/b.



Method

Participants

The sample was recruited by means of convenience sampling using social media (What's App, Facebook, and Discord), SONA and Amazon Mechanical Turk. The participants (N = 212) were from the Western, educated, industrialised, rich and democratic (WEIRD) demographics consisting of 55% males and 45% females. The average age of the sample was 30.9 (SD = 13.1) ranging from 17 to 69 years old and 77% percent of the participants self-reported to have attained at least a college education. An a-priori power analysis using G*Power was conducted

to determine the desired sample size to obtain a small to medium effect ($F^2 = .05$) in the hypotheses. The analysis indicated that the sample size necessary to achieve 80% power at a significance of $\alpha = .05$ was $N = 196$ participants (Faul et al, 2007).

Procedure

The current study research proposal was submitted to the University of Groningen Ethics Committee of the Faculty of Behavioural and Social Sciences and the research plan was approved on April, 13, 2022. Data collection on Qualtrics commenced on May 3rd and ended on June 24, 2022. The participants were first provided with general information about the current study and presented with informed consent on the Qualtrics survey platform. They were then asked to fill out three basic demographic queries about their age, gender and level of education. Then the participants filled out 8-items on the adapted E-PVQ personal values and another 8 items on the perceived group values scales adapted from Bouman and colleagues, 2018. Subsequently, the participants were asked to read some primer information about the Dutch energy system conveying the reliance on oil and gas to generate electricity in the Netherlands (see Appendix). Following the primer information presented to all participants, they were randomly assigned to either the sustainable feedback condition or the unsustainable feedback condition using the "randomizer" option on the Qualtrics survey platform.

Succeeding the feedback, they were asked to respond to the adapted version of *State shame and Guilt Scale* which measures guilt and pride using three items each. Lastly, the participants were asked to respond about their future pro-environmental behaviour intentions about energy-related behaviours on the PEB intentions scale.

The average completion time was 8.8 minutes while the median completion time was 4.58 minutes. Those who completed the survey in under 1 minute were excluded from data

analysis because it is highly unlikely for them to actually read and respond to all the items in such a short time.

Experimental manipulation

Those assigned to the sustainable condition were given the following feedback about a hypothetical weekend trip they were asked to imagine in which they took a train from Amsterdam to Paris:

> "Suppose you live in Amsterdam and you leave your home for a weekend for a vacation to Paris. You take a train from Amsterdam to Paris. Before leaving your home, you ensured that you turned off all of your appliances and lights. Also, you turned down your thermostat to the lowest setting to save energy.
>
> By taking the train, you prevented 300 kg of C02 emissions (equivalent to burning 124 liters of petrol). Additionally, you saved 10 kWh of electricity (enough to charge your phone 1000 times), preventing 20 KG of C02 emissions (saving 8.3 liters of petrol from burning) at home."

Those assigned to the unsustainable condition were provided with the following feedback about a hypothetical weekend trip they were asked to imagine in which they took a flight from Amsterdam to Paris:

> "Suppose you live in Amsterdam and you leave your home for a weekend for a vacation to Paris. You take a flight from Amsterdam to Paris. On the way to the airport, you realize that you left some of your appliances and lights on. Also, you left your home thermostat at the normal temperature.
>
> By taking the flight, you caused 300 kg of C02 emissions (equivalent to burning 124 liters of petrol). Additionally, you wasted 10 kWh of electricity (enough to charge your phone 1000 times), causing 20 KG of C02 emissions (equivalent to burning 8.3 liters of petrol) at home."

Materials

Personal and Perceived group biospheric values scale:

Personal environmental values were assessed using the validated 8-item Environmental Portrait Value Questionnaire (E-PVQ) (Bouman et al, 2018) and perceived group values were assessed by adapting the 8-item E-PVQ to measure the perceived values of people (i.e. friends, family and/or partners) close to the individual.

Personal biospheric values were measured using two items where the participants were asked to indicate to what extent a portrayed description of a person (1) "*This person believes that people should take good care of nature. Taking good care of the environment is important to this person*; 2) "*This person finds it important to respect nature. This person feels connected with nature*." matches them. They then responded on a 7-point Likert scale to convey how alike this portrayed person was to them (1 = *totally not like me*, 7 = *totally like me*). The intercorrelation according to the Spearman-Brown coefficient of the measure was strong (r = .65, M = 5.60 , SD = 1.20).

Perceived group biospheric values were measured using two-items where the participants were asked to indicate to what extent a portrayed description of a person matches individuals (i.e. partners, friends, family and/or colleagues) close to the respondent (1) "*People close to you believe that people should take good care of nature. Taking good care of the environment is important to them.* 2) *People close to you find it important to respect nature. They feel connected with nature"*). The participants then responded on a 7-point Likert scale to convey how alike this portrayed person was to people close to the respondent (1 = *totally not like people close to me* 2) *totally like people close to me*). The intercorrelation according to the Spearman-Brown coefficient for group biospheric values was strong (r = .67, M = 5.05 , SD = 1.18).

Pride and guilt scale

Anticipation of pride and guilt were measured using an adapted version of *State shame and Guilt Scale* (Marschall et al., 1994; Hurst & Sintov, 2022) to reflect guilt and pride. Following the presentation of a sustainable or unsustainable scenario that the participants were asked to imagine, they were asked *"How would you feel after learning this?"* on a 7-point Likert scale with 1 = *not likely at all* to 7 = being *totally likely*. To measure anticipation of pride, the following three statements were used (*I would feel proud, I would feel pleased. I would feel satisfied*). To measure guilt the following three statements were used (*I would feel remorseful, I would feel guilty. I would feel regretful.*). Two additional dummy statements were included to measure *anger* and *excitement* so the participants do not know the specific emotions we are trying to measure. Reliability analysis indicated that the 3-item pride subscale ($\alpha = .97$, $M = 4.09$, $SD = 2.10$) and 3-item guilt subscale ($\alpha = .83$, $M = 3.81$, $SD = 1.96$) both demonstrated good internal reliability.

Future pro-environmental behavioural intentions scale

The participants were asked about their intentions to engage in future energy based pro-environmental behaviour. This 7-point Likert scale initially had 9 items ($\alpha = .75$) with statements that the participants responded to indicating whether they are likely to engage in the described behaviour in the future from 1 being Extremely unlikely to 7 being Extremely likely. They were asked energy-related questions such as "How likely are you to lower your thermostat when you leave the house in the future?"; "How likely are you to upgrade to a smart thermostat that reduces your energy use and bill in the future?";"How likely are you to seek information to conserve your energy in the future?"

After conducting a reliability analysis among the items, we found that item-six was not correlated ($r = -.02$) with the others. The reliability of the scale when this item was removed was

better (α = .82). Therefore, item 6 was removed from the scale to do the analysis. The final scale consisting of 8 items was used to assess future pro-environmental behavioural intentions. (see Appendix for the list).

Results & Data Analysis

Preliminary descriptives analysis

Table 1 presents the mean scores, standard deviation and 95% confidence intervals for all variables used in the study for each group by feedback condition type. As expected, anticipated pride was much higher in the sustainable feedback condition compared to the unsustainable condition feedback. Conversely, anticipated guilt was much higher in the unsustainable feedback condition compared to the sustainable feedback condition. Personal and perceived group biospheric values were similar among both conditions suggesting that the participants had similar values between both conditions and that the groups were well randomised and comparable to each other. Lastly, PEB intentions were similar between the sustainable and unsustainable feedback conditions as both had the same mean scores.

Table 1

Preliminary Descriptive Statistics

Variable	Condition	N	Mean	S.D.	95% C.I. Lower	95% C.I. Upper
Pride	Unsustainable	105	3.04	2.24	2.61	3.48
	Sustainable	107	5.13	1.31	4.88	5.38
Guilt	Unsustainable	105	4.93	1.57	4.63	5.24
	Sustainable	107	2.70	1.66	2.39	3.02
P-Bio-Values	Unsustainable	104	5.61	1.17	5.39	5.84
	Sustainable	106	5.65	1.13	5.43	5.86
G-Bio-Values	Unsustainable	104	4.95	1.28	4.70	5.20
	Sustainable	107	5.14	1.07	4.93	5.35
PEB Intentions	Unsustainable	101	4.84	1.06	4.66	5.02
	Sustainable	102	4.84	.98	4.64	5.05

The bivariate correlations were tested between all variables of interest (see Table 2 & 3) by feedback condition type to investigate the strength of the relations between the variables in both of the groups respectively. The analyses were split by feedback condition type since the independent variable is a dichotomous categorical variable (0-unsustainable condition and 1-sustainable condition).

In the unsustainable feedback group, guilt was significantly positively correlated with personal biospheric values and perceived group biospheric values. Moreover, guilt was significantly positively correlated with future pro-environmental intentions. In the sustainable feedback group, pride was significantly positively correlated with personal biospheric values but not perceived group biospheric values. Moreover, pide was significantly positively correlated with future PEB intentions. Personal and perceived group biospheric values were significantly positively correlated with each other in both conditions. Personal biospheric values and perceived group biospheric values were significantly positively correlated with future PEB intentions in the sustainable feedback group. Only perceived group biospheric values and not personal biospheric values were significantly correlated with future PEB intentions

Table 2

Bivariate Correlations for unsustainable feedback group

Variable	1	2	3	4	5
1) Pride	-	-.097	.069	.-024	.151
2) Guilt	-	-	.267**	.295**	.210*
3) P-Bio-Values	-	-	-	.429**	.079
4) G-Bio-Values	-	-	-	-	.322**
5) PEB Intentions	-	-	-	-	-

Note: Two tailed correlation coefficients (= p<.05, ** = p<.01)*

Table 3

Bivariate Correlations among sustainable feedback group

Variable	1	2	3	4	5
1) Pride	-	.027	.259**	.189	.331**
2) Guilt	-	-	036	.160	-.001
3) P-Bio-Values	-	-	-	.561**	.286**
4) G-Bio-Values	-	-	-	-	.195*
5) PEB Intentions	-	-	-	-	-

Note: Two tailed correlation coefficients (= p<.05, ** = p<.01)*

Hypothesis testing

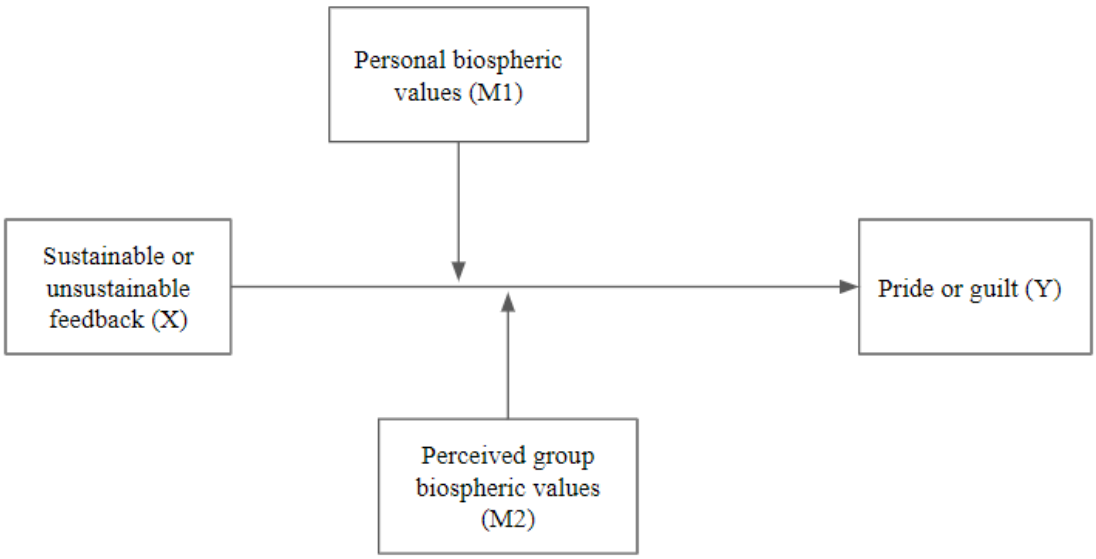
In order to examine hypothesis 1a, whether feedback about sustainable or unsustainable behaviour leads to individuals reporting pride anticipation, the independent samples t-test was conducted. The t-test indicated was statistically significant with a large Cohen's effect size, t (167) = -8.27, p = <.001, d = 1.83. Levene's test indicated unequal variances, so the degrees of freedom were adjusted from 210 to 167. The test revealed that pride anticipation was much higher in the sustainable feedback group than in the unsustainable feedback group suggesting that feedback about engaging in an imagined sustainable behaviour significantly induces pride anticipation in individuals.

To examine hypothesis 1b, whether getting feedback about engagement in an imagined sustainable or unsustainable behaviour leads to guilt anticipation in individuals, the independent samples t-test was conducted and found to be statistically significant with a large Cohen's effect size, t (210) = 10.03, p <.001, d = 1.61. The test revealed that guilt anticipation was much higher in the unsustainable feedback group than the sustainable feedback group suggesting that feedback about engaging in an imagined unsustainable behaviour significantly induces guilt anticipation in individuals.

To test the second set of hypotheses of whether feedback about sustainable or unsustainable scenarios (X) elicits stronger anticipated pride or guilt respectively, the more someone endorses biospheric values and perceives others to endorse biospheric values, we conducted two separate regression analysis using PROCESS (Hayes multiple moderator model 2) as displayed in Figure 2 below.

Figure 2

Conceptual diagram of the proposed multiple moderator model



Firstly, the overall model with feedback condition type, personal biospheric values and perceived group biospheric values to predict pride was significant, $F(5, 203) = 16.16$, $p < .001$, $R^2 = .29$. There was a direct effect of the sustainable feedback condition on reported anticipated pride ($b = 2.06$, 95% C.I. = 1.57, 2.56, $t = 8.24$, $p < .001$). The moderation analysis revealed an interaction effect close to being significant for feedback type and personal biospheric values on anticipated pride ($b = .49$, 95% C.I. = -.0128, .9819, $t = 1.92$, $p = .056$). There was also a direct effect of perceived group biospheric values on anticipated pride ($b = .36$, 95% C.I. = .05, .66, $t =$

2.32, p = .02). However, perceived group biospheric values did not have any interaction effect on the relationship of sustainable feedback type and anticipated pride (p = .88).

Secondly, the overall model with feedback condition type, personal biospheric values and perceived group biospheric values for guilt was significant, $F(5, 203) = 24.19$, $p < .01$, $R^2 = .37$. There was a direct effect of the unsustainable feedback condition on reported anticipated guilt (b = -2.30, 95% C.I. = -2.73, -1.87, t = -10.54, p <.001). The moderation analysis here revealed that there was no significant interaction effect of personal biospheric values nor perceived group biospheric values on unsustainable feedback condition and guilt ($p > .05$). There was however a significant direct effect of perceived group biospheric values on guilt anticipation (b = .30, 95% C.I. = .01, .53, t = 2.00, p =.046).

Next the third set of hypotheses of whether pride and guilt anticipation following feedback type (sustainable or unsustainable) is associated with future pro-environmental behavioural intentions, two separate PROCESS Macro regression analyses (model 1) were conducted with the dichotomous variable (0-unsustainable and 1-sustainable) feedback type as a moderator. The overall model with pride anticipation following feedback influencing future pro-environmental behavioural intentions was significant, F (3, 199) = 4.76, p = .003 , R^2 = 0.07. Neither pride nor feedback condition type had a direct effect on future PEB intentions. The interaction between feedback type and pride significantly affected future PEB intentions (b = .30, t = 3.55, 95% CI = .13, .46, $p < .001$). Particularly, anticipating pride following feedback about the sustainable condition significantly leads to increased future PEB intentions (b = .26, t = 3.71, 95% CI = .12, .40, $p < .001$). Figure 3 below graphs the association between sustainable feedback and pride anticipation on future PEB intentions.

The overall model with guilt anticipation following feedback influencing future PEB intentions was not significant, F (3, 199) = 1.23, p = .29, R^2 = 0.02. There was no significant direct effect of feedback type or pride anticipation on future PEB intentions found. Additionally, the interaction effect between feedback type and guilt was also insignificant (b = .-.12, t = -1.41, 95% CI = -.29, .05, p = *.16).* Figure 4 below graphs the association between unsustainable feedback and guilt anticipation of future PEB intentions.

Figure 3

Scatter plot of the interaction between feedback type and pride anticipation on future pro-environmental behavioural intentions

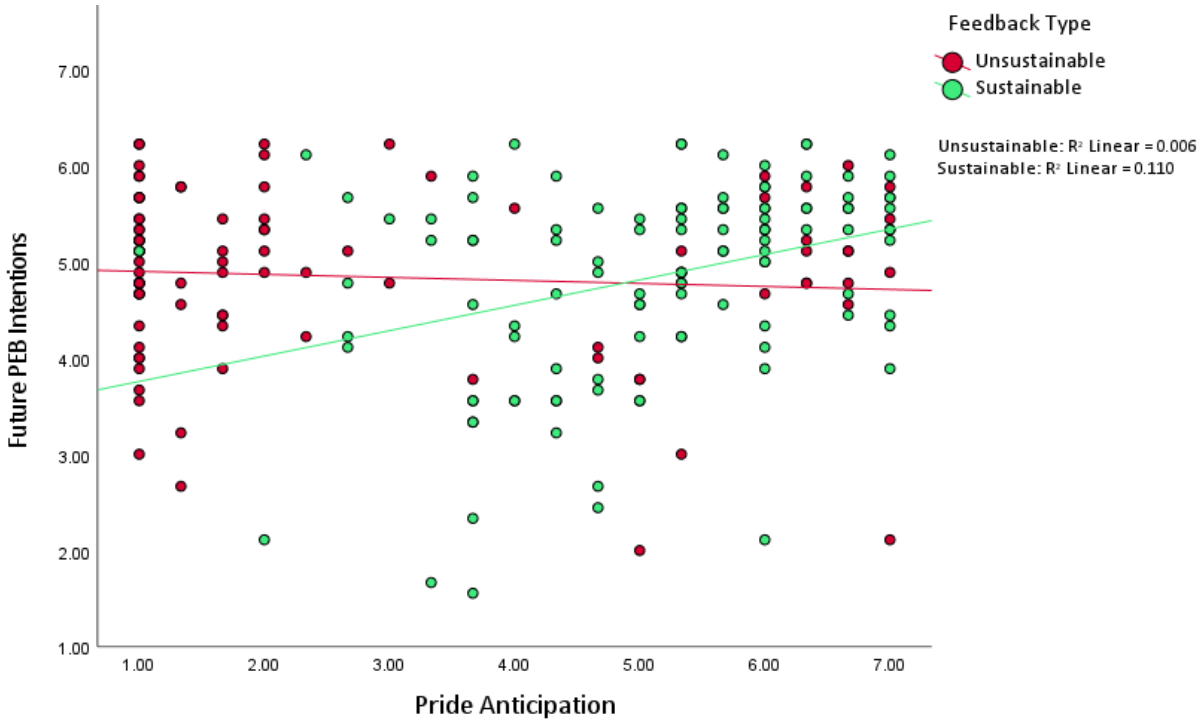
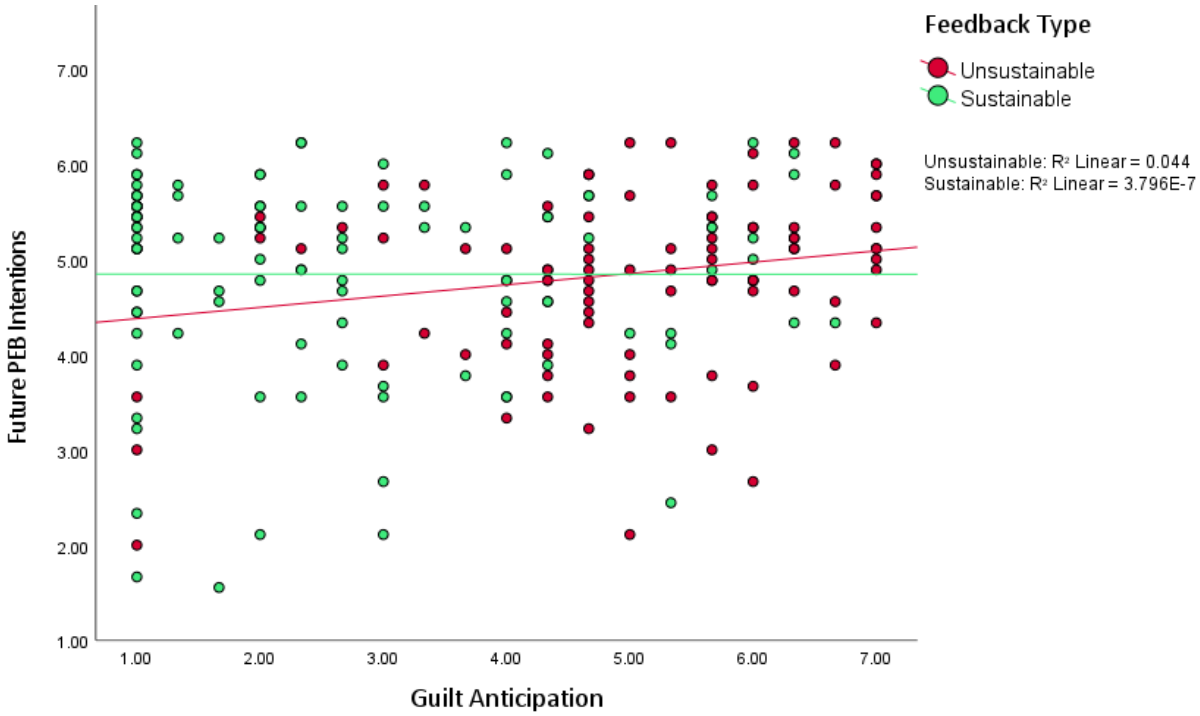


Figure 4

Scatter plot of the interaction between feedback type and guilt anticipation on future

pro-environmental behavioural intentions



Discussion

This study aimed to test whether learning about engaging in sustainable or unsustainable behaviour elicits feelings of pride and guilt. We found that people indeed self-report that they would anticipate feeling pride when they find out via feedback that they have engaged in a sustainable action and anticipate feeling guilt when they find out via feedback that they have engaged in an unsustainable behaviour supporting the hypotheses 1a and 1b. This suggests that providing feedback following engagement in sustainable behaviour induces pride in individuals while providing feedback following engagement in unsustainable behaviours induces guilt in individuals. This finding is in line with literature (Han etl al, 2017;) that suggests that pride is anticipated when individuals behave consistently with their pro-environmental goals and moral compass whereas guilt is anticipated when individuals behave incongruently with their pro-environmental goals and moral compass.

Moreover, we explored whether anticipating pride or guilt after engagement in an hypothetical sustainable or unsustainable behaviour depends on how much an individual endorses biospheric values and the perceived biospheric values of people close to the individual It was hypothesised that personal biospheric values and perceived group biospheric values of individuals may moderate how much pride or guilt individuals report they would feel following feedback about environmental behaviour. We found that stronger personal biospheric values in individuals is likely to increase pride anticipation following feedback about sustainable behaviour. However, the effect of personal biospheric values on the relationship of sustainable behaviour feedback and pride was rather weak to modest; suggesting that something other than personal biospheric values explains why people vary in how much pride they would feel after learning about their engagement in a sustainable action. Additionally, how much pride is anticipated following a sustainable behaviour was not found to depend on reported perceived group biospheric values of individuals.

Although anticipated guilt was strongly correlated with both personal and perceived group biospheric values, the relationship between feedback about unsustainable behaviour and guilt anticipation did not depend on an individual's level of personal biospheric values nor perceived group biospheric values. This implies that there may be another untested variable which may explain the individual differences in how much guilt an individual anticipates after learning about engaging in unsustainable behaviour. Interestingly, we found that perceived group biospheric values had a direct effect on anticipated pride and guilt. Those who perceive people close to them to strongly endorse biospheric values are generally more likely to anticipate pride and guilt regardless of the feedback condition they were exposed to. This was consistent with the literature that suggests that pride and guilt are social emotions with an interpersonal dimension

and that these are directly influenced by societal morality and social standards (Sznycer, 2018; Nunney et al, 2022).

Lastly, we investigated whether anticipating pride and guilt – following feedback about engaging in sustainable or unsustainable behaviour, respectively – leads to increased future pro-environmental behavioural intentions. We found that higher anticipated pride after engaging in a hypothetical sustainable behaviour is associated with increased future pro-environmental behavioural intentions, while this is not the case when individuals anticipate guilt following sustainable behaviour. These results replicated the initial study that was cited in the introduction that demonstrated that pride, not guilt predicts future pro-environmental behaviour intentions (Bissing-Olsen et al, 2016).

Unexpectedly, anticipation of guilt did not lead to increased future pro-environmental behavioural intentions. This finding was inconsistent with the recent literature that found anticipated guilt consistently explained the relationship between feedback and future pro-environmental behavioural intentions (Hurst & Sintov, 2022). One potential reason for this inconsistency is the type of feedback that was given to induce these emotions in the current study. The feedback that was provided in the current study conveyed how much direct impact the personal actions of the participant would have on the environment in terms of emissions whereas the aforementioned study provided feedback by comparing the individual's impact with the average impact person's impact in their neighbourhood. It is possible that comparing the self with a group or a social comparison is more likely to induce guilt. When an individual feels that they are responsible for more negative outcomes than the average person, they are more likely to feel guilt and thus be motivated to mitigate their impact on the environment to avoid feeling guilty.

Studies have suggested that comparing the self with others who have done pro-social behaviour increases guilt affectivity and thus increase future pro-environmental intentions (Hynes & Wilson, 2016; Adams et al, 2020). More studies are required to explore whether guilt anticipation is higher in social and interpersonal contexts while pride anticipation is higher in intrapersonal context. There is some evidence for this distinction that suggests that guilt strengthens the influencing effects of injunctive social norms–which convey what is socially approved or disapproved in a society (Jacobson, et al, 2021). The researchers found that people feel increased guilt when they violate social moral standards and thus are more likely to remedy future behavioural intentions to be consistent with social moral standards. On the other hand, it is possible that pride anticipation is stronger when personal standards are pursued and reinforced as opposed to social standards whereas guilt is more influential in reinforcing social standards. Since, self-conscious emotions of pride and guilt have both an intrapersonal and interpersonal dimension influenced by social environmental goals and moral compass, it would have been interesting to explore the influence feedback which evoked guilt or pride by means of social comparison.

Practical implications

The findings from this study suggest that interventions and campaigns that use feedback as a strategy to motivate pro-environmental behaviour in individuals should use feedback that induces the anticipation of positive self-conscious emotions such as pride rather than feedback that induces negative self-conscious emotions such as guilt. The positive and pleasant feeling associated with feeling pride following a sustainable action can help in motivating individuals in the future and thus increase their pro-environmental intentions and behaviours. A recent study

demonstrated that pride following an environmental behaviour (i.e. green technology adoption) leads to positive environmental spillover into increased sustainable behaviour and intentions in the future (Manika et al, 2021). This shows that when people feel pleasantly and satisfied about their environmental behaviour– triggering pride, they are more likely to engage in more pro-environmental behaviour to pursue these positive feelings associated with pride.

Although, anticipating pride alone was found to motivate future PEB intentions to some extent, this effect overall was weak to modest. This suggests that eliciting pride alone would not be sufficient for motivating pro-environmental intentions and behaviour. The mechanisms of pride anticipation and future sustainable behaviour would have to be paired with other influencers such as social norms or nature connectedness that have also shown to exert an influence of pro-environmental intentions (Bissing-Olson et al, 2016; Krettenauer et al., 2020).

Limitations and future research

In our manipulation of the sustainable and unsustainable scenarios we used a single-time behaviour rather than a pattern of behaviour. A single time behaviour has been demonstrated to differ from a pattern of behaviour in how much emotional reactivity it induces. Literature suggests that people are more emotionally responsive to their pattern of behaviour rather than a one time occurrence that the current study used (Hurst & Sintov, 2022). Future research could provide feedback about behavioural patterns that the participants engage in to elicit the emotions. This would likely result in increased pride and guilt reactivity thus increased future pro-environmental behavioural intentions.

Another limitation of this study was that we did not use a control group. Although feedback of unsustainable behaviour indeed led to self-reported guilt anticipation and sustainable behaviour led to self-reported pride anticipation as a result of the feedback manipulation, not

having a control group hinders the external validity of the findings. It cannot be particularly deduced whether it was our manipulation of the conditions that led to the effects that we found or whether these effects were due to the primer information that we provided to both conditions or whether it was due to their participation in the study itself. Having a control group would have allowed us to present these results with a greater degree of certainty.

These findings cannot be generalised to demographics beyond WEIRD since the participants were from Europe and North America. Future research in non-western countries can also be beneficial to generalise these findings across cultures and globally. Eastern cultures which tend to be more collectivist societies may have different responses, perhaps that leads to increased guilt anticipation to the scenarios compared to western societies which tend to be more individualistic and more responsive to pride. A recent study indeed found this where American participants had more individualistic and collective pride compared to participants in China (Liu et al, 2021).

Lastly, future research should also consider whether anticipating self conscious emotions, particularly pride following environmental behaviours results in positive spill over and thus increased future pro-environmental behaviour. If people feel satisfied, pleased and proud when they behave consistently with their pro-environmental moral goals and standards, they would be more likely pursue other pro-environmental behaviours that elicits these positive feelings. This effect was found in a study where the researchers found pride triggered by adopting green technology spillover into other pro-environmental behaviours such as energy saving and recycling (Manika et al, 2021).

Conclusion

In general, anticipating pride for engaging in sustainable behaviour can motivate individuals to have increased pro-environmental intentions and consequently pro-environmental behaviour in the future, yet this effect was not found for anticipating guilt following unsustainable actions. When people anticipate that they would feel pleased, satisfied and proud for doing a sustainable deed towards nature, they are more likely to have stronger pro-environmental intentions in the future. This implies that a potential strategy for environmental campaigns and interventions can be to provide feedback which elicits pride and a positive affect can be beneficial to strengthen the motivation of individuals to behave pro-environmentally. Moreover, the findings suggest that the positive affect of pride is more influential than the negative affect of guilt to motivate future PEB intentions and behaviour. Therefore, we recommend providing cues and feedback which elicits feelings of pride as opposed to guilt to motivate environmental intentions and behaviours in people.

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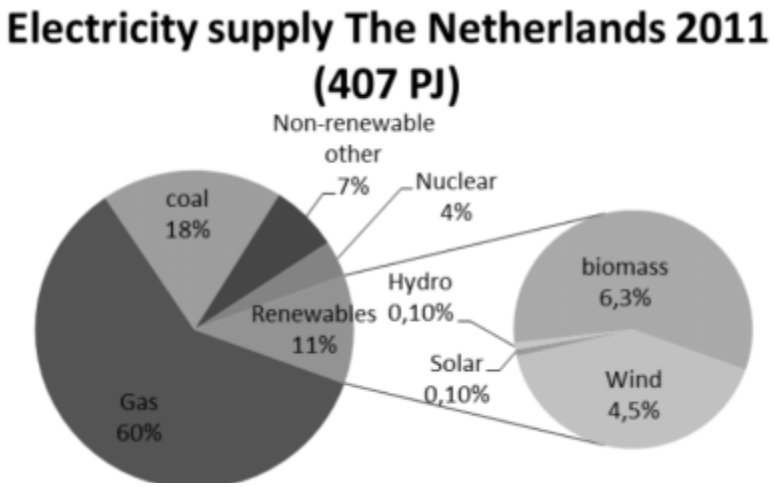
Appendix

Primer Information about the Netherlands energy sources

Please read: *85% of electricity used in the Netherlands comes from burning coal and gas mostly imported from countries like Russia, and Saudi Arabia. Burning coal and gas for energy is among the highest contributors to greenhouse gas emissions. This leads to climate change and has a detrimental environmental impact on Earth's plants, animals and freshwater resources as well as puts people at risk due to droughts, pollution, floodings and extreme weather events.*



Adapted state shame and guilt scale

…. *How would you feel after learning this? (1 = Not likely at all, 7 = Totally likely)*

For PRIDE:
I would feel remorseful

I would feel guilty

I would feel regretful

For GUILT:

I would feel proud

I would feel pleased

I would feel satisfied

Added dummy items:

I would feel excited

I would feel angry

Future PEB intentions questionnaire items:

(Responded on a 7-point Likert scale from Extremely Unlikely to Extremely Likely)

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
1) How likely are you to unplug your appliances (where you can) in the future when you leave your home?	42.85	64.525	.556	.349	.703
2) How likely are you to turn off all your lights when you leave the house in the future?	41.72	67.786	.604	.507	.705
3) How likely are you to lower your thermostat when you leave the house in the future?	42.40	63.265	.610	.501	.694
4) How likely are you to turn off the TV when it is not in use or in stand by in the future?	42.01	65.791	.582	.457	.703
5) How likely are you to turn down the thermostat when you go to sleep?	42.83	63.494	.542	.456	.704
6) How likely are you to leave any lights on when you go to sleep in the future?	**43.50**	**77.216**	**-.021**	**.197**	**.822**
7) How likely are you to upgrade to a smart thermostat that reduces your energy use and bill in the future?	43.25	66.446	.405	.275	.728
8) How likely are you to use ¨energy saving mode¨ on your computer, laptop or TV in the future?	42.73	65.194	.461	.375	.718
9) How likely are you to seek information to conserve your energy in the future?	42.64	69.773	.435	.384	.724

INDEPENDENT SAMPLES T-TEST OUTPUT:

Group Statistics

	IVCond2	N	Mean	Std. Deviation	Std. Error Mean
Guilt	Unsustainable	105	4.9333	1.56784	.15301
	Sustainable	107	2.7040	1.66498	.16096
Pride	Unsustainable	105	3.0413	2.24070	.21867
	Sustainable	107	5.1308	1.31254	.12689

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Guilt	Equal variances assumed	1.702	.194	10.033	210	<.001	<.001	2.22928	.22220	1.79125	2.66732
	Equal variances not assumed			10.038	209.646	<.001	<.001	2.22928	.22208	1.79149	2.66708
Pride	Equal variances assumed	71.190	<.001	-8.304	210	<.001	<.001	-2.08957	.25165	-2.58565	-1.59349
	Equal variances not assumed			-8.265	167.226	<.001	<.001	-2.08957	.25282	-2.58870	-1.59045

Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
Guilt	Cohen's d	1.61760	1.378	1.077	1.677
	Hedges' correction	1.62341	1.373	1.073	1.671
	Glass's delta	1.66498	1.339	1.013	1.661
Pride	Cohen's d	1.83195	-1.141	-1.430	-.849
	Hedges' correction	1.83852	-1.137	-1.425	-.846
	Glass's delta	1.31254	-1.592	-1.934	-1.246

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

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