Pride and Guilt as Mediators in the Relationship Between Connection to Nature and Pro-Environmental Intention

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Research Article

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Abstract

As a result of the environmental issues, different variables have been studied in relation to environmental concern and pro-environmental behavior. Among these are the connection to nature and moral emotions. In a first study (n = 95), pride and guilt were found to be emotions which can be explained by the perceived environmental impact of those rather than the behavior itself. In a second study, it was observed that pride and guilt play a mediating role in the relationship between connectedness to nature and pro-environmental behavioral intention (n = 244). On the other hand, in the relationship between love for nature and behavioral intention, pride, but not guilt, played a mediating role (n = 253). Thus, the importance of fostering both pride and guilt in attaining higher levels of environmentally conscious behavior, as well as of considering people's perceptions of the impact of their behaviors on the environment, is highlighted.

1. Introduction

In recent years, research about environmental issues has grown substantially due to the emergence of new problems, such as the deterioration of the ozone layer, pollution and deforestation, among others. Climate change currently represents one of the greatest threats to the planet and the present human way of life. In view of this, CO² emissions must be kept below 2900 billion tonnes (GtCO₂) by the end of the century. However, given the current trend, this level is expected to be exceeded in the coming years (Watts et al. 2015).

Due to this situation, people have become increasingly concerned about the environment. (Capstick et al. 2015), which is of great interest to Environmental Psychology. Within this field, several variables have been attributed to this concern and to pro-environmental behavior. Among them, great importance has been given to the study of human connections to nature, as well as to the emotions associated with environmental issues.

1.1 Emotions and pro-environmental behavior

A growing line of interest in the study of pro-environmental behavior is that of emotions (Carrus et al. 2008; Coelho et al. 2017). For example, in a study about ecological packaging it was found that both positive and negative emotions are related to pro-environmental behavioral intention (Koenig-Lewis et al. 2014). Thus, Bissing-Olson et al. (2013) found that higher levels of positive affect among a company's employees led to higher levels of pro-environmental behavior in those workers with less positive pro-environmental attitudes.

Within the scope of emotions lie the so-called moral emotions. These can be defined as "those emotions that are linked to the interests or welfare either of society as a whole or at least of persons other than the judge or agent" (Haidt 2003, p.853). As this author points out, emotions respond to situations that mostly directly affect the self, while moral emotions do not arise from situations that only directly affect the

person who experiences them, but rather from society or other entities, which can include nature. It is for this reason, as Liang et al. (2019) point out, that these types of emotions are especially pertinent to the study of pro-environmental behavior.

Such moral emotions include pride and guilt. In attempting to relate such emotions to pro-environmental behavior, Bissing-Olson et al. (2016) found that feelings of pride lead to higher levels of pro-environmental behavior in those who had reported others performing such behaviors. However, these were not related to guilt. For their part, Liang et al. (2019) found that pride explains pro-environmental behavioral intention as well as avoidance of environmentally harmful behaviors. Furthermore, their results showed that guilt explains, although to a lesser extent, pro-environmental behavioral intention, being unrelated to intention to avoid harmful behaviors. In other studies, guilt has been related to both pro-environmental behavioral intention and pro-environmental behavior (Mallett 2012; Rees et al. 2015; Tam 2019). In this way, Adams et al. (2020), found that guilt exerts a mediating role between the feedback provided to participants about their environmental impact and pro-environmental behavior, with no statistically significant results having been found for pride. Also considering guilt as a mediating variable, Ferguson and Branscombe (2010) noted that feelings of collective guilt about pollutant emissions mediate between beliefs about climate change and behavioral intention. Then if a person evaluates his behavior as positive he/she will feel pride and if he/she evaluates it as negative he/she will feel guilt.

Nevertheless, people demonstrate difficulties and biases in estimating the extent to which performing a behavior has negative consequences for the environment (Holmgren et al. 2018; Hoogendoorn et al. 2019; Kusch & Fiebelkorn, 2019). As Grinstein et al. (2018) have shown, people commit more mistakes when estimating the amount of CO₂ emitted when performing a behavior than when estimating other quantities such as calories or distances. Therefore, it is possible that it is not the behaviors (both pro-environmental and harmful) themselves that lead to pride or guilt, but rather the perception of their consequences, i.e., their impact on the environment (**Hypothesis 1**).

1.2 Subjective connections between people and nature

On the other hand, the literature shows how people's connection to nature is related to pro-environmental behavior (e.g., Richardson et al. 2020), which is the reason why great efforts are made to foster it (Church 2018; Restall & Conrad 2015).

The mechanism of connection between humans and nature has been conceptualized by various different authors, who refers to it as “emotional affinity toward nature” (Kals et al. “Inclusion of Nature in Self” (Schultz 2001), “connectedness to nature” (Mayer & Frantz 2004), “connectivity with nature” (Dutchert et al. 2007), “nature relatedness” (Nisbet et al. 2009) and “love and care for nature” (Perkins 2010), among others. However, despite the different concepts and measures, these are all expressions of the same construct: a subjective connection to nature (Capaldi et al. 2014; Tam 2013), focusing in some cases on the cognitive dimension and in others on the affective dimension (Amérigo et al. 2012). These relations

between nature and human beings refer not only to how nature forms part of an individual's identity, but also to the way in which individuals perceive themselves to be a part of nature (Dutcher et al. 2007).

A widely used concept when relating people's connections to nature to pro-environmental behavior is that of connectedness to nature (Barbaro & Pickett 2016; Gkargkavouzi et al. 2021; Navarro et al. 2020; Rosa et al. 2018), proposed by Mayer and Frantz (2004). This concept, these authors point out, is based on Leopold's idea that human beings have a need to feel part of the natural world, which means that they see themselves as equal members of the natural community, conceiving a relationship of kinship with it. It consists of a bidirectional relationship in which people see themselves as belonging to the natural world just as much as the natural world belongs to them and consider the well-being of both to be interdependent. Although this concept was originally proposed as an affective connection, later, Perrin and Benassi (2009) conducted a study using the same data gathered by the original authors, and found that Connectedness to Nature, or at least the way in which it is measured, exhibits characteristics of a cognitive character.

On the other hand, pro-environmental behavior has also been related to emotional connections to nature (Dong et al. 2020; Perkins 2010; Wu & Zhu 2021). These have been defined as a deep love for nature, an acknowledgement of its intrinsic value (Perkins 2010). It can be understood as a benevolent attachment towards nature, whose presence brings pleasant feelings to the people involved (Pasca et al. 2020).

The study of these relationships, both cognitive and emotional, has recently been reported in the meta-analysis conducted by Whitburn, Linklater and Abrahamse (2020). In this report, the authors analyzed several studies that linked related different conceptualizations of connection to nature to pro-environmental behavior as a whole. These concepts have been found to be strongly related, however, as Tam (2013) illustrates, when comparing the correlations of each measure with the different criterion variables traditionally related to connectedness, such as personality variables, well-being or pro-environmental behavior, it is observed that their magnitudes are not the same. In other words, it could be said that all these concepts have a shared element that comprises the nature-human being relationship, but that they also have a specific element that causes them to correlate differently with other related variables.

1.3 Connections to nature and feelings of pride and guilt

People's connections to nature, as described above, lead to higher levels of concern and pro-environmental behavior, as well as feelings of pride and guilt. Considering both factors, it is proposed that people more cognitively and emotionally linked to nature will feel higher levels of both pride and guilt regarding their behavior in relation to the environment, as the environment is more relevant to these people. In relation to this argument, Bösehans et al. (2020) found that guilt exerts a mediating role in the relationship between biospheric values and pro-environmental behavior (specifically, with the choice of train as a means of travel instead of airplane). In other research, Tam (2019) concluded that anthropomorphism of nature - related in turn to connectedness to nature (Tam et al. 2013) - leads to greater pro-environmental behavioral intention through the mediating effect of guilt. On the other hand,

the study conducted by Barthel et al. (2018) illustrated how children, after an experience in nature to enhance connectedness, reported higher levels of pride. However, no studies have been found that analyze the mediating effect of both emotions on the relationship between connection to nature and pro-environmental behavioral intention.

Based on this approach, **Hypothesis 2** has been established: Feelings of both pride and guilt exert a mediating role in the relationship between subjective connection to nature and pro-environmental behavioral intention.

In addition, it is hypothesized (**Hypothesis 3**) that different types of human-nature connections will relate differently - based on these emotions - to pro-environmental behavior.

2. Overview

In order to test the hypotheses, two studies were carried out. In the first study, the aim was to analyze the variables that explain pride and guilt, hypothesizing that it is not the behavior itself that leads to these emotions, but the perception of the consequences of the behavior (hypothesis 1).

The second study analyzed the mediating role of both pride and guilt in the relationship between connection to nature and pro-environmental behavioral intention (hypothesis 2). This role was analyzed in two different samples: one in which connection was measured at the cognitive level and the other at the affective level, with the aim of observing whether there are differences in the role of both emotions (hypothesis 3).

3. Study 1

In order to analyze the variables that explain people's feelings of pride or guilt, a first study was carried out.

3.1 METHOD

3.1.1 Participants

G*power software (Faul et al. 2007) was used to calculate the necessary sample size to carry out the analyses. To obtain a power of 0.95, at least 89 participants were necessary, so the sample was made up of 95 people from the general population. The mean age was 35.24 (SD = 14.51) and 64.2% were women.

3.1.2 Instrument and procedure

An online questionnaire was developed. It was distributed with the collaboration of 10 Psychology Degree students, who sent the link to people of different age ranges. The database can be found at:

<https://osf.io/fd234/>

The questionnaire first included a Likert-type scale of eight items referring to different pro-environmental behaviors, such as recycling or saving water. With the instruction "First, a set of pro-environmental behaviors will be presented. To what extent do you perform each of them?" the participants had to respond to each of the items on a six-point continuum, from "never" to "always". This was followed by a ten-point Likert-type item on the perception of the negative environmental impact of one's own pro-environmental behaviors ("Taking into account the frequency with which you perform these behaviors, to what extent do you consider that you have a negative impact on the environment when you perform them?"). This was followed by a nine-point Likert-type item asking about the degree of pride felt in performing the above pro-environmental behaviors.

On the second page of the questionnaire, similarly to the first, a list of behaviors was initially shown. Here, eight environmentally harmful behaviors were presented. With the instruction "Now a series of environmentally harmful behaviors will be presented. To what extent do you perform each of them?" participants had to respond to each of the items by placing themselves on a six-point continuum, from "never" to "always." Then an item on the perception of the negative environmental impact of one's own behaviors was included, this time referring to the previous harmful behaviors. Next, a nine-point Likert-type item was included, asking about the degree of guilt felt for engaging in these behaviors.

3.2 RESULTS

First, a hierarchical linear regression analysis was carried out in which the four variables - pro-environmental behavior, harmful behavior, environmental impact attributed to pro-environmental behaviors, and environmental impact attributed to harmful behaviors - were analyzed as explanatory variables of pride. The results show that when the environmental impact of pro-environmental behaviors ($B = -0.457$, $t = -5.462$; $p < .001$; 95% CI $[-0.623, -0.291]$) and the performance of pro-environmental behaviors ($B = 0.649$, $t = 2.892$; $p < .01$; 95% CI $[0.203, 1.095]$) are included in the equation, the model explains 37.8% of the variance of feelings of pride. This model implies a change in R^2 of 0.057 with respect to the model that only includes the environmental impact of pro-environmental behaviors ($B = -0.540$, $t = -6.632$; $p < .001$; 95% CI $[-0.702, -0.379]$).

On the other hand, the same analysis was performed again, this time with guilt as the criterion variable. The results show that the environmental impact of harmful behaviors explains 34.3% of the variance of guilt feelings ($B = 0.565$, $t = 6.972$; $p < .001$; 95% CI $[0.404, 0.726]$). Thus, Hypotheses 1 would appear to be supported.

3.3 DISCUSSION

The results of the present study show that feelings of pride and guilt are explained by different variables. On the one hand, people feel pride when performing pro-environmental behaviors and not due to the fact that they do not perform harmful behaviors. However, the percentage of variance explained by these behaviors is much lower than that explained by the environmental impact attributed to them.

On the other hand, feelings of guilt have been explained exclusively by people's perception of the environmental impact of their behaviors on the environment. Therefore, it seems that it is not the behaviors themselves that produce feelings of pride or guilt, but the perception of their consequences.

4. Study 2

After conducting the first study in which it was observed that feelings of pride and guilt could be explained by the perception of the consequences of behaviors - rather than the behavior itself - a second study was carried out. Considering these results, this paper aims to study the role of pride and guilt in the relationship between connection to nature and pro-environmental behaviour. Considering Hypothesis 3, the analyses will be carried out on two different samples. On the one hand, cognitive connections will be taken into account. On the other, affective connections will be considered.

4.1 METHOD

4.1.1 Participants

A total of 497 people participated in the study, recruited from the general Spanish population. They were divided into two samples. The first ($n = 244$) had a mean age of 35.96 ($SD = 15.48$) and 66.8% were women. The second ($n = 253$) had a mean age of 35.67 ($SD = 15.20$) and 56.9% were women. The sample size was estimated with G*Power software (Faul et al. 2007) and following the recommendations of Fritz and MacKinnon (2007), so that the analyses could be performed with a statistical power above 0.80.

4.1.2 Instrument and procedure

Two versions of an online questionnaire were developed. These were distributed with the help of 43 Psychology Degree students, who sent the link to people of different age ranges. Approximately half of the participants responded to one of the versions and the other half to the other. The databases can be found at: <https://osf.io/fd234/>

The two versions of the questionnaire differed only in the measure of connection to nature. In the first version of the questionnaire, the Connectedness to Nature Scale, in its seven-item version (CNS-7; Pasca et al. 2017), was included. In the second version, the Love for Nature Scale (LNS; Pasca et al. 2020) was included instead.

On the second page of the questionnaire, a measure of pride and guilt was included in both versions. To this end, Bissing-Olson et al. (2016) adaptation of the State Shame and Guilt Scale was used. This measure included the instruction "Considering your level of impact on the environment, to what extent do you feel...?", followed by the choice of six adjectives on a seven-point Likert-type scale.

Finally, a pro-environmental behavioral intention scale was included, which asked to what extent they were willing to carry out each of the pro-environmental behaviors. The behaviors included were extracted

from the work of Wynes and Nicholas (2017), in which they proposed a list of recommended actions to mitigate climate change based on their degree of effectiveness. This measure is composed of nine items with a six-point Likert-type response format, with participants having to respond to each item from "not at all" to "completely".

4.2 RESULTS

Two mediation analyses were conducted to find out whether feelings of pride and guilt exert a mediating effect between connection to nature (cognitive -CNS- and emotional -LNS-) and pro-environmental behavioral intention. For this purpose, the SPSS macro Process was used (Hayes 2013) with 5,000 bootstrap samples to estimate 95% bias-corrected confidence intervals (BC 95% CI). A BC 95% CI that does not include zero provides evidence of a significant indirect effect (MacKinnon et al. 2000; Preacher & Hayes 2008). The first mediating analyses (figure 1) revealed significant indirect effects of CNS on pro-environmental intention through pride ($B = .03$; $SD = 0.01$; BC 95% CI = 0.01 to 0.06) and guilt ($B = .05$; $SD = 0.02$; BC 95% CI = 0.02 to 0.08), therefore, the data support Hypothesis 2.

[[FIGURE 1]]

Fig. 1 Mediation model, showing the effect of CNS on pro-environmental intention through pride and guilt. * $p < .05$; ** $p < .01$

The second mediating analyses (figure 2) revealed significant indirect effects of LNS on pro-environmental intention through pride ($B = .04$; $SD = 0.01$; BC 95% CI = 0.01 to 0.07), while the effect of guilt was not statistically significant ($B = .05$; $SD = 0.01$; BC 95% CI = -0.00 to 0.02). Thus, the data only partially supports Hypothesis 2, in turn supporting Hypothesis 3 about differences between cognitive and emotional connections.

[[FIGURE 2]]

Fig. 2 Mediation model, showing the effect of LNS on pro-environmental intention through pride and guilt. * $p < .05$; ** $p < .01$

On the other hand, the Pearson correlation between the two mediating variables was calculated, showing an inverse correlation in both the first sample ($r = -.21$; $p < .001$) and the second ($r = -.19$; $p < .01$).

4.3 DISCUSSION

The present study analyzed the mediating role of moral emotions such as pride and guilt in the relationship between - cognitive and emotional - connection to nature and pro-environmental behavioral intention. The results of the mediation analyses show, firstly, that both pride and guilt exert a mediating effect between connectedness to nature (cognitive measure) and the intention to carry out pro-environmental behaviors. When the analysis was performed with an affective measure, however, it was observed that pride does exert a mediating effect, although this effect was not present in the case of guilt.

On the other hand, the two mediating variables are inversely related. That is, people who feel more proud of their levels of environmental impact feel less guilty, and vice versa. Taking into account the result of the first mediational analysis, in which was observed that both variables are positively related to connectedness, it can be concluded that the levels of pride and guilt are reported differentially. That is, there are people who feel proud to a greater extent and others who feel guilty to a greater extent, and both feelings lead to greater pro-environmental behavioral intention.

5. General Discussion

Due to the environmental problems which the lives of human beings have led to, there is a need to study the factors involved in engaging in the behaviors that help to solve it. In the study of prosocial behavior, it has been observed that people tend to help in emergency situations, in which the other party requires it (McGinley et al. 2021), such as the current situation the planet is suffering. However, these authors found that there are different profiles of helpers, and therefore not all individuals will act in a pro-environmental manner to the same extent. Thus, although people are aware that their ways of life are having higher levels of environmental impact than is acceptable (Pasca & Poggio 2021), there are variables that explain the fact that they decide to act (or not). Among them, we find the connections of human beings to nature and moral emotions, factors on which the present work has focused.

In this research, the relationship between human connections to nature and pro-environmental behavioral intention has been studied in a differentiated way, based on whether the former is of a cognitive or emotional nature. To this end, the mediating role of moral emotions, specifically pride and guilt, has been analyzed.

First of all, the results of the first study have shown that the degree to which people perceive that their behavior has a negative impact on the environment explains whether they feel proud or guilty about it. In particular, people feel proud when they engage in pro-environmental behaviors, but to a greater extent when they perceive that these behaviors also have a low impact on the environment. Thus, people will feel guilty when they perceive that their behaviors which are not pro-environmental also have a highly negative impact on the environment.

Furthermore, the results of the second study have shown that connection to nature is related to pro-environmental behavioral intention, as had already been highlighted in the literature (e.g., Otto & Pensini 2017). Hence, the importance of fostering human-nature connections is again highlighted, as it would entail people recognizing the intrinsic value of nature rather than promoting pro-environmental behavior through external rewards (Ives et al. 2018), the effect of which has been observed not to persist in the long term (Van Der Linden 2015). In addition, this work has differentiated between two different forms of connection. As mentioned above, Tam (2013) conducted a review about the different concepts and measures of these connections, finding that, although they all have a common base, these have particularities that were observed from correlations with different variables. Mediation analyses have

shown that pride and guilt exert a mediating role in the relationship when the connection to nature is cognitive in nature. However, when the connection is emotional, pride exerts a mediating role but not guilt.

Therefore, taking the results of both studies into consideration, people who consider that they are connected to nature to a greater extent will feel more proud if they perceive that their environmental impact is low, and more guilty if they perceive that their impact on the environment is high. Thus, by experiencing one emotion or the other, they will have a greater intent to act in a pro-environmental way. On the other hand, when people feel emotionally connected to nature, they will feel more proud if they perceive that their impact on the environment is low. However, emotional bonding to nature is not related to feelings of guilt.

As pointed out by Böhm (2003), guilt is an emotion characterized by individual contributions. According to study 1, guilt is explained by the perception of the environmental impact of one's own behaviors, i.e., the individual contribution to environmental degradation. In the aforementioned work, the author concluded that guilt is an emotion that is not very intense in relation to environmental consequences, due to the fact that little personal responsibility is assumed. In this vein Pasca and Poggio (2021) found that, despite the fact that people consider their environmental impact to be higher than is acceptable, the environmental impact of others is even higher. In other words, responsibility is placed on others to a greater extent than on the individual. Cognitive connections to nature refer to the person conceiving of him/herself as being a part of nature, as an element of the natural world. Being part of it, the individual is therefore responsible for its state. In fact, it has been observed that responsibility is a mediating variable between connectedness to nature (measured by CNS) and green purchasing behavior (Jaiswal & Bihari 2020). Nevertheless, affective bonds with nature have been described as feelings "towards" nature (Kals et al. 1999; Perkins 2010), in which the person would be an external element.

In addition, it has been observed that feelings of pride and guilt are inversely related to each other. That is, people feel either proud or guilty to a greater extent, but not both. Still, both emotions predict behavioral intention. Therefore, the present work shows that pro-environmental behavioral intention can be fostered by both feelings of pride and guilt, and the intervention could be adapted to two kinds of people: those who feel proud of the low environmental impact of their pro-environmental actions, and those who feel guilty about the high environmental impact of their environmentally damaging actions.

5.1 Limitations and future research

To finish, it is necessary to point out some of the limitations of the study. Firstly, the sample was intended to be as heterogeneous as possible in order to provide an adequate representation of the population. However, using an online format meant that people who are not familiar with new technologies, such as the elderly, have been largely excluded.

On the other hand, pro-environmental behavioral intention has been measured in a global way, including behaviors such as recycling, saving water, reducing meat consumption, etc. However, a recent study by Martin et al. (2020) has shown that connection to nature is differently related to household pro-

environmental behavior and nature conservation pro-environmental behavior. Such differentiation would be interesting to take into account in future research and could provide more information on the relationship between connectedness and pro-environmental behavior.

Declarations

Interest statement:

I confirm that there are no conflicts of interest associated with this publication.

Ethical Statement:

I consciously assure that the manuscript was conducted following the ethical principles of psychologists and code of conduct laid out by the American Psychological Association (APA). The study also complied with Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April on the protection of personal data.

The research was approved by the deontological commission of the Faculty of Psychology of the Complutense University of Madrid (ref. 2020/21-031).

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Data availability:

The datasets generated during and/or analysed during the current study are available in the OSF repository, <https://osf.io/fd234/>

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Figures

Figure 1

Mediation model, showing the effect of CNS on pro-environmental intention through pride and guilt. * $p < .05$; ** $p < .01$

Figure 2

Mediation model, showing the effect of LNS on pro-environmental intention through pride and guilt. * $p < .05$; ** $p < .01$