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# Environmental Self-Identity and Pro-Environmental Behavior in Climate Change Issue: Mediation Effect of Belief in Global Warming and Guilty Feeling

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**Abstract.** There are several arguments about the role of identity factors behind someone's pro-environmental behavior (PEB) encountering climate change. The authors assumed other factors might explain the correlation between identity factors and PEB. This study aims to examine the mediating effect of belief in global warming and guilty feeling on the correlation between environmental self-identity and pro-environmental behavior related to climate change issues. We conducted a cross-sectional survey involving 202 university students selected using the purposive sampling method. Using multiple mediators of model 4 from PROCESS Macro Hayes, the result shows that environmental self-identity is the most decisive variable in predicting PEB. Belief in global warming is also a significant PEB predictor, while the guilty feeling is insignificant. The mediation model analysis showed that belief in global warming partly mediated the correlation between environmental self-identity and PEB, and the guilty feeling was not a significant mediator. This finding explains that self-identity as an environmentalist is directly related to PEB, or it could also be mediated through the belief in global warming. This study implies that encouraging students to be pro-environmentalist and developing the belief in current climate change is essential to increase students' PEB.

## 1. Introduction

For these past few years, climate change has triggered various natural disasters. The Intergovernmental Panel on Climate Change (IPCC) report in February 2022 shows biological evidence of earth damage caused by human behavior that leads to climate change [1]. Survey data of the You Gov-Cambridge Globalism Project in 2019 found that Indonesia had the highest proportion of people who did not believe the role of humans in causing climate change [2]. Convincing the deniers that global warming is real is essential to promote pro-environmental action [3]. In psychology, one of the fascinating topics explaining human behavior regarding climate change is Pro-Environmental Behavior (PEB) [4]. PEB is considered an action to attempt as hard as possible to reduce harm or provide a benefit to the environment [5]. There are internal and external factors affecting PEB [6]. Among them is the self-identity factor in the environmental self-identity concept [7]. Research shows that environmental self-identity is one of the strongest PEB predictors [8,9]. However, this factor is insignificant to other kinds of PEB [8]. For instance, anything related to one-off home energy conservation, traveling behavior, and environmental-political action [8].

### 1.1. Environmental Identity in Climate Change Issue

Dan P. McAdams, a personality psychologist, explained that self-identity is how a person sees himself/herself, including all self-aspects [10]. A meta-analysis study concluded that individual (self) identity was more substantial than social identity-PEB associations [9]. Another meta-analysis study on climate change issues found that environmental self-identity plays a significant role in climate-friendly action [11]. Numerous scientific findings found a strong correlation between environmental self-identity and PEB [7,8,12], where the identity factor plays a vital role in forming climate change beliefs [13]. A previous study also found a connection between environmental self-identity and climate change beliefs [14]. In this study, we use the term 'belief in global warming to explain climate change belief. We select guilty feeling as an emotional factor associated with environmental self-identity. This variable selection aligns with research associating environmental self-identity with a global and environmental guilty feeling [15]. We assume that people with a courageous environmental self-identity tend to behave pro-environmentally, believe in facts about climate change, and feel guilty for causing climate change. Therefore, we suggest it hypothesizes as follows: H1: Environmental self-identity has a positive effect on PEB; H2: Environmental self-identity has a positive effect on belief in global warming; and H3: Environmental self-identity has a positive effect on guilty feelings.

### 1.2. Belief, Emotion, and PEB

The belief in global warming has become one of the defining factors of environmental concern and increasing ecocentrism [16]. To people who are not concerned about climate change issues, changing their beliefs (from unconcerned to concerned) may threaten their identity [17]. We assume that those with an environmentalist identity will find it easier to behave pro-environmentally (without feeling threatened) and be supported by a belief that global warming is undoubtedly happening. Findings of the meta-analysis study concluded two significant emotions regarding PEB: pride and guilt. However, compared to pride, the guilty feeling is more consistent in explaining the varieties of PEB [18]. Truelove et al. study on the significant mediation effect of guilty feeling and PEB became our base to determine guilty feeling as a mediator variable [15]. In this research, we add novelty of findings to present internal factors of PEB from 3 classification factors at once: self, emotion, and belief.

H4: Belief in global warming has a positive effect on PEB; H5: Guilty feeling has a positive effect on PEB; H6: Belief in global warming mediates correlation between environmental self-identity and PEB; and H7: Guilty feeling mediates correlation between environmental self-identity and PEB.

### 1.3. Current Study

We chose this province of South Kalimantan, Indonesia, because of data from the Central Agency on Statistics (BPS) in 2015, which placed South Kalimantan in the third highest maximum temperature in Indonesia or the first place on the Kalimantan island [19]. We collected a student sample because, in 2018-2019, there was the #savemeratus student action. The Meratus Mountains have an essential role in climate change issues [20]. This research will provide novelty findings on alternative variables from identity-PEB associations, especially in the countries not included in WEIRD (Western, Educated, Industrialized, Rich, and Developed) [21].

## 2. Method

This study uses a quantitative approach. We conducted a cross-sectional survey technique using measuring instruments in an online questionnaire. We investigated PEB as a critical variable (Y), environmental self-identity as a predictor (X), and the mediator variables (M) were belief in global warming and guilty feeling. This study has received ethical clearance from the Faculty of Medicine in Universitas Lambung Mangkurat [227/KEPK-FK ULM/EC/VIII/2022].

## 2.1. Participant

We have collected the data from 221 participants, yet screening results showed 19 people are identified as data outliers (according to Mahalanobis, Cook's, and Leverage). According to this matter, only 202 participants made it to the final analysis. All samples are university students aged 18—25 (Mean=21.34, SD=1.28). The majority of samples are 158 women (78.2%) and 193 Moslems (95.5%).

## 2.2. Measurements

We used *surveymonkey.com* and distributed it online. We used an attention check question to measure participants' sincerity in responding to the questionnaire. We also used a valid and reliable measurement in Bahasa Indonesia, starting with giving information about climate change to explain the research context. Pro-environmental behavior scale [22] was used to determine the frequency of conducting activities to support environmental improvement (α=.858, eight items, 1=never – 5=very often, e.g., "recycled newspaper"). We determined self-image regarding the identification of someone who behaves pro-environmentally using an environmental self-identity scale [23] (α=.810, three items, e.g., "I am the type of person who acts environmentally-friendly"). The guilt scale, our self-developed questionnaire, was used to measure guilty feelings as human beings for current environmental conditions (α=.860, three items, e.g., "I feel guilty about the way humanity treats the environment"). Additionally, we measured belief on global warming scale [16] to determine someone's belief of the fact that climate change or global warming is happening (α=.756, four items, e.g., "I noticed several signs of global warming"). These three measurements used responding options of 1=strongly disagree – 7=strongly agree.

## 2.3. Statistical Analysis

We performed mediation regression analysis with Model 4 of PROCESS Macro Hayes [24] to test whether the predictor variable of the PEB can be through mediation variables (guilt and belief in global warming). To complete the description of the results, we analyzed the bivariate correlation among variables using the Pearson correlation. The entire analysis uses the assistance of SPSS.

## 3. Result and Discussion

Before analysis, we scored the participant answers to the questionnaire and calculated the mean score. Before conducting the correlation test and mediation regression model, we found that all data satisfied assumption tests (normality, linearity, multicollinearity, and heteroscedastic test).

## 3.1. Result

The result of bivariate correlation (table 1) shows that environmental self-identity (r=.442, p<.01), belief in global warming (r=.366, p<.01), and guilty feelings (r=.377, p<.01) are significantly correlated to PEB.

**Table 1.** Bivariate correlation between variables

| | Scale | α | Mean | SD | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| 1. Environmental self-identity | 1-7 | .810 | 5.384 | .869 | 1 | .440** | .545** | .442** |
| 2. Belief in Global Warming | 1-7 | .756 | 6.003 | .740 | | 1 | .523** | .366** |
| 3. Guilty Feeling | 1-7 | .860 | 5.540 | .965 | | | 1 | .377** |
| 4. PEB | 1-5 | .858 | 1.744 | .799 | | | | 1 |

Note: ** p < .01

We tested a multiple-mediation regression model using PROCESS Macro Hayes with bootstrapping 5,000 (figure 1). Result of the regression coefficient from direct effect shows that environmental self-identity significantly predicts positively on PEB ($\beta$=.300, t=3.969, p<.001, H1 is accepted). A similar finding also is found in one of the mediator variables, belief in global warming,

which significantly predicts positively PEB ($\beta$=.168, t=2.264, p<.01, H4 is accepted). Nevertheless, the guilty feeling does not significantly predict PEB ($\beta$=.125, t=1.566, p=.119, H5 is rejected).
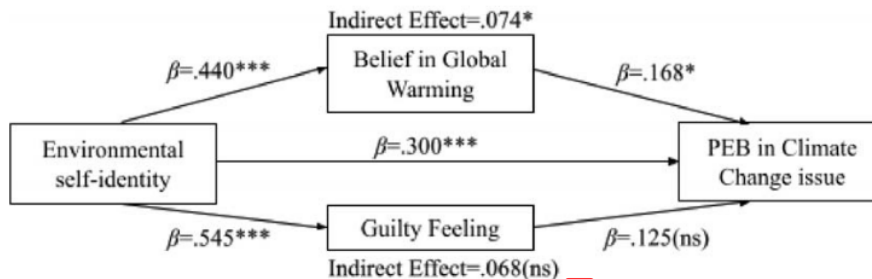


**Figure 1**. The result of the Mediation Model Regression Analysis
*Note: *p<.05, **p<.01, ***p<.001, ns=no significant*

Another result finds that environmental self-identity significantly predicts belief positively in global warming ($\beta$=.440, t=6.930, p<.001, H2 is accepted) and guilty feelings ($\beta$=.545, t=9.204, p<.001, H3 is accepted). In hypothesis 6, we find a significant mediation effect of belief in global warming on the correlation between environmental self-identity and PEB $\beta$=.074, Boot of CI [.017, .140], p<.05, H6 is accepted). This regression model has a determination coefficient value of $R^2$=.241 (F(3, 198)=21.013, p<.001). In summary, the predictor and mediators effectively contribute 24,1% to PEB.

### 3.2. Discussion

Based on the statistical analysis, environmental self-identity is the most vital factor in predicting pro-environmental behavior related to climate change issues. This finding is in line with several other findings [7,8,12]. People who strongly consider themselves environmentalists tend to behave pro-environmentally because they want to show who they are [25]. One of the approaches to establishing prior knowledge is to directly experience the effects caused by climate change [26]. This approach can also form an environmental self-identity in someone [26].

This research shows that belief in global warming may correlate positive to PEB. This is in line with some previous studies [27,28]. The belief in global warming also mediates the correlation between self-identity and PEB. The influence of belief in global warming on PEB can be related to global warming issue literacy through media use [29]. The flow of information drives most of the world's population to agree with climate change. Hence it is necessary to take a real solution, one of which is to establish PEB. The power of belief in global warming as a mediator can be seen through the perspective of the research sample's criteria, which all originated from South Kalimantan in Indonesia. Local warming takes a vital role in forming a belief in climate change [30], as data from Central Agency on Statistics (BPS) placed South Kalimantan in third place for the highest maximum temperature in Indonesia in 2015 [19], and ten provinces with highest maximum temperature in Indonesia in 2019 [31]. Additionally, human belief in climate change is supported by the direct effect they can experience, such as temperature increase.

There are exciting findings discovered in this study, which is also supported by the second study by Truelove et al. [15]. People with high environmental self-identity tend to feel guilty about humans' behavior toward the climate change issue. However, the guilty feeling does not predict PEB significantly either as a regression model's direct effect or mediation effect. This finding contradicted the previous study [18,32]. A meta-analysis study found that guilty feeling is not significantly correlated to PEB in a sample of university students [32]. Due to external attribution or influence from the descriptive norm from a group of students, university students have less guilty feelings and

responsibility [33]. In this study, all samples are university students with a social norm that rules how they think, behave, and feel. Rather than being responsible, we believe that for students, the social norm that prevailed in their group establishes a perspective in which human guilty feeling creates responsibility for all humanity.

### 3.3. Limitation and Future Research Recommendations

This research is only restricted to a correlational approach. In the future, we suggest expanding the research sample not to be limited to one province only. Longitudinal research may investigate the mechanism of alteration of human belief and emotion regarding climate change. Researchers in the future can also consider experimenting with manipulating belief, emotion, or strengthened self-identity to find influence (cause and effect) on PEB.

## 4. Conclusion

The main finding of this research shows that people who identify as environmental-friendly will tend to conduct PEB to reduce the effect of climate change. Belief in global warming is also essential in driving people to act PEB, mediating the Identity-PEB associations, or directly predicting PEB. On the other hand, the emotional factor, a guilty feeling, is not a significant determining factor for someone to behave pro-environmentally. This finding encourages improving pro-environmental behavior by establishing self-identity and individual belief in their positive roles in climate change issues.

## Acknowledgments

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