

**Eco-anxiety in the Netherlands and Germany: An Investigation of the Relationship
between General Anxiety, Eco-anxiety, and the Exposure to the Climate Crisis Media**

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Abstract

Background: Emotions connected to the climate crisis, referred to as eco-emotions, can have significant negative consequences on the mental well-being of individuals. One of such eco-emotions is eco-anxiety, which, despite its significance, lacks scientific exploration. Two factors that are affecting its severity are general anxiety levels and exposure to the climate change media. This study explores the interplay of these variables in the German and Dutch population.

Method: To investigate the prevalence and relationships of general anxiety, eco-anxiety, and climate change-related media exposure, this study utilizes a quantitative cross-sectional study design that implements the questionnaires Eco-anxiety Questionnaire (EAQ-22), Generalized Anxiety Disorder 7 (GAD-7), and the media exposure part of the Media Exposure, Climate Anxiety, Mental Health (MECAMH) to assess the associated variables. 112 responses were collected, and linear and multiple linear regression analysis were conducted to test their relationships.

Results: A significant positive relationship was found between general anxiety and eco-anxiety ($p < .001$) and between climate change-related media exposure and eco-anxiety ($p < .001$). No relationship was found between general anxiety and the frequency of climate media exposure ($p = 0.49$). A multiple linear regression model was applied to test whether climate media exposure moderates the relationship of general anxiety and eco-anxiety, and the results indicated no relationship ($p = 0.59$). A positive relationship was found for one of the two subscales called negative consequences of eco-anxiety ($p < .001$).

Conclusion: General anxiety and climate media exposure were found to be predictors of eco-anxiety and can influence its severity. No relationship was found between general anxiety and the frequency of climate - related media exposure. Media exposure only had an interaction effect with general anxiety on the maladaptive effects of eco-anxiety but neither on the adaptive ones nor both scales combined.

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Introduction

Man-made climate change is one of the most concerning global health threats of the 21st century, giving rise to a variety of significant threats to the planet and humanity (Coffey et al., 2021). One of the most visible impacts of climate change is environmental degradation (Hrabok et al., 2020; Loll et al., 2023). Its direct physical effects, such as extreme weather events, rising sea levels, natural disasters, and food insecurity, are widely acknowledged global problems (Coffey et al., 2021; Hrabok et al., 2020). However, climate change does not only impact the environment and wider society, but also humans on an individual level, threatening human health and survival (Asgarizadeh et al., 2023). Individuals are affected through higher levels of air pollution, food insecurities or more directly, wildfires, floods, and droughts (Watts et al., 2019). Despite this significance, research has addressed the impact of climate change on the individual only in recent years (Hrabok et al., 2020), leaving the issue underrepresented in literature (Whitmarsh et al. 2022).

In the context of threats to human health, climate change can also impair the mental health of individuals. This issue has received especially limited academic attention (Asgarizadeh et al., 2023). The environmental degradation and associated problems can lead to uncertainties about the future, confrontation with loss, and an unstable environment, which can consequently evoke a range of emotional responses in the individual such as anger, sadness, and anxiety (Loll et al., 2023). The psychological burden of these emotional responses, when prolonged, can manifest in different ways. For instance, strong emotional and stressful responses to climate change can lead to mental health implications such as eco-anxiety (Loll et al., 2023).

General Anxiety and Eco-anxiety

Anxiety is a complex and multifaceted emotion that arises from a variety of triggers (Loll et al., 2023). It is defined as “a feeling of worry, nervousness, or unease about something with an uncertain outcome or a concern to do something or for something to happen” (Myles et al., 2020). Negative bodily reactions are often a somatic outcome of anxiety and can for instance result in muscle tension, faster breathing, or an increased heart rate (Asgarizadeh et al., 2023). If an individual experiences excessive anxiety levels, it often impairs their ability to function normally, affecting their social life, work, and sleep (Whitmarsh et al., 2022).

According to Loll et al. (2023), eco-anxiety is the most relevant emotion associated with climate change. In academic literature, eco-anxiety is operationalized differently across articles and its definition and related terminology is unclear. One frequently cited definition describes eco-anxiety as “a chronic fear of environmental doom” (Coffey et al., 2021; Hajek & König, 2022). Specifically, it can be understood as a reaction to a broad range of negative emotions that are stemming from distress caused by environmental threats and climate change. Through this experienced distress, individuals become anxious about their future (Coffey et al., 2021).

The literature on eco-anxiety is divided on whether it is a maladaptive response or an adaptive reaction to the climate crisis (Whitmarsh et al., 2022). An adaptive response to the climate crisis can be seen as obtaining information about climate change in order to improve decision making and to engage in more preventative behaviours, whereas maladaptive reactions can manifest in individuals not being able to cope with the climate crisis, leading to harms within the individual such as excessive anxiety levels (Whitmarsh et al., 2022). Whether eco-anxiety is adaptive or maladaptive is also determined by the degree to which an individual experiences it. One of the primary means by which eco-anxiety emerges is the individual being exposed to one

or more events related to the ecological crisis. Eco-anxiety is distinct from general anxiety (Whitmarsh et al., 2022) but not an official diagnosis (Asgarizadeh et al., 2023). Nonetheless, like anxiety, eco-anxiety also originates from uncertainty, unpredictability, and feelings of uncontrollability, which are commonly linked to existential anxiety (Loll et al., 2023). Moreover, eco-anxiety is often correlated with other mental health implications such as depression, insomnia, stress, post-traumatic stress disorder, grief, panic attacks, and hopelessness (Asgarizadeh et al., 2023), further highlighting the practical relevance of understanding eco-anxiety, in it showing the importance of recognizing and treating eco-anxiety. Studies indicate that higher general anxiety levels were found to be a predictor for higher eco-anxiety levels in individuals (Asgarizadeh et al., 2023; Whitmarsh et al., 2022). Eco-anxiety is prevalent and the number of individuals experiencing this emotion has been increasing in recent years (Asgarizadeh et al., 2023). Eco-anxiety is also influenced by individual psychological and external factors in the same way as anxiety. One important external factor influencing eco-anxiety is media exposure.

Eco-Anxiety and the Media

The media, such as newspapers, television, or social media play a crucial role in communicating climate crisis information to the public. Through interactions with the media, the individual's awareness of the climate crisis increases, and they can be confronted with climate change concerns, outcomes, risks, and environmental threats (Loll et al., 2023). However, exposure to the climate change-related media content cannot only be a conscious choice but also be induced indirectly (Maran & Begotti, 2021). For instance, when an individual watches TV, they are exposed to all kinds of information even if they did not actively search for the type of information, which is known as a phenomenon called incidental exposure (Lee & Kim, 2017).

That could be, an individual watches climate-related news merely because they are broadcasted on television after a movie they have watched. Both ways of being exposed to the media, consciously and incidentally, can lead to impacts on the individual.

Multiple studies indicate that the exposure to climate change related media content increases stress and eco-anxiety (Asgarizadeh et al., 2023; Loll et al., 2023; Maran & Begotti, 2021). However, Asgarizadeh et al. (2023) emphasize in their study that media exposure can either exacerbate or decrease the eco-anxiety level depending on the framing and interpretation of the provided information. There are a multitude of intervening variables on the relationship between media exposure and eco-anxiety, such as demographic aspects and the framing and type of media (Loll et al., 2023). The media and provided information are different for each country and can consequently have different effects on the eco-anxiety of their population (Hase et al., 2021).

Climate Change in Germany and the Netherlands

Germany and the Netherlands both face significant threats through the climate crisis. The rising sea levels especially affect the Netherlands and its coastal areas, as a big proportion of the country lies below sea level, making it more prone to floods which puts the Netherlands at high risk for the negative consequences that accompany the climate crisis (Van Alphen et al., 2022). Germany has also experienced severe climate change-related events, such as the floods in 2021 which originated from rivers not being able to dispose excessive rainwater quickly enough. In recent years, the heavier rainfall stemming from climate change increased the frequency and severity of these floods which destroyed living areas, the agriculture, and even led to the deaths of people (Dietze et al., 2022). In both countries, droughts and heatwaves also became more frequent in the past years, further affecting agriculture, forestry, water resources, the population,

and biodiversity. Climate change can affect different countries in different ways and intensities. Due to that, amongst other factors, eco-anxiety scores vary among countries. Generally, anxiety about the environment is prevalent amongst European citizens: in a study conducted by Niedzwiedz and Katikireddi (2023), 42.8% of Europeans indicated feeling very worried or extremely worried about climate change. Within Europe, the study found the highest eco-anxiety value in Germany, with 55.3% of German participants experiencing some level of climate anxiety, which indicates that Germans are especially concerned with climate issues.

Relevance of the Study

The literature on general anxiety, eco-anxiety, and media exposure is still developing and remains limited in some areas. Especially the understanding of the interaction of these factors is still unclear and existing studies indicate mixed results. For specific countries, such as the Netherlands and Germany, eco-anxiety and its variables are underexplored, and especially the influence of media exposure on the relationship between general anxiety levels and eco-anxiety lacks scientific exploration. Whether media exposure could act as moderator in the relationship between general anxiety levels and eco-anxiety has not been tested in scientific literature.

To address this gap in the literature, this study is conducted as part of a bigger project at the University of Twente by five bachelor students and one master student, exploring climate emotions and their effects on individuals in the Netherlands and Germany. Understanding the complex interaction between the variables ‘general anxiety’, ‘eco-anxiety’, and ‘exposure to climate change-related media’ is crucial, particularly given that environmental concern in Germany and the Netherlands is growing (Funk et al., 2020). Addressing this underexplored topic could contribute to a more nuanced understanding of how the exposure of climate change-related media evokes emotional reactions within individuals as a consequence to the climate

crisis. This paper attempts to address the aforementioned literature gap by exploring the following research question “*To what extent does exposure to climate change-related media content moderate the relationship between general anxiety and eco-anxiety in Germany and the Netherlands?*”

To that end, multiple hypotheses will be tested. As mentioned before, research found general anxiety as a predictor of eco-anxiety (Whitmarsh et al., 2022). Thus, the first hypothesis is: (H1) *General anxiety is positively related to eco-anxiety*. Further, Thayer et al. (1994) suggests that individuals with higher levels of general anxiety exert higher media consumption and may thus have higher media exposure related to climate change content. That is, assuming that individuals do not strongly control the type of content they consume, and that the content can sometimes be unpredictable due to incidental exposure (Lee & Kim, 2017). For instance, in a news show, content about climate change may appear, even if that news show is not explicitly about climate change. The same argument is made for the other types of media considered in this study. This leads to the following hypothesis: (H2) *General Anxiety is positively related to climate change-related media exposure*.

Studies also suggest an effect of climate change-related media exposure on eco-anxiety (Asgarizadeh et al., 2023; Loll et al., 2023; Maran & Begotti, 2021). Therefore, the third hypothesis is (H3) *Climate change-related media exposure is positively related to eco-anxiety*. Lastly, a relationship between general anxiety and eco-anxiety has already been validated in studies by previous researchers. Individuals with heightened anxiety levels tend to worry more frequently about their surrounding and perceivable threats appear more amplified (Davey, 2021). Therefore, it is assumed that individuals with higher anxiety levels also perceive climate change-related media content as more threatening due to attention and information-processing biases

(Davey, 2021) and consequently, that the interaction of media exposure and general anxiety has an effect on eco-anxiety. Individuals with heightened anxiety levels that consume more climate change media content are expected to have higher eco-anxiety levels compared to individuals with heightened anxiety levels that consume less climate change media content. Hence, hypothesis four (H4) *Climate change-related media exposure moderates the relationship between general anxiety and eco-anxiety.*

Method

Design

This study follows a quantitative cross-sectional design exploring the relationship between eco-anxiety, general anxiety and effects of the media on individuals in the Netherlands and Germany. The study measures the effects of general anxiety and climate change-related media exposure as the independent variables on the dependent variable eco-anxiety. Furthermore, whether general anxiety predicts the frequency of climate change-related media exposure, and the effect of climate change-related media exposure as a moderator variable are assessed on the relationship of general anxiety levels on eco-anxiety. Prior to the execution of the research, BMS ethical committee / Domain Humanities & Social Sciences has assessed this study from an ethical perspective and gave their consent to conduct the research with the approval number: 240862.

Participants

Power analysis

To calculate the required sample size for the main data collection, the software G*Power (Version 3.1.9.7; Faul et al., 2007) was used to conduct an a priori power analysis for a linear multiple regression: fixed model, R^2 deviation from zero with a standard medium effect size ($f^2 =$

0.15) and three predictors. An alpha value of 0.05 and a power of 0.95 was used to minimize type one and type two errors. The results indicated that for this study, a minimum sample size of $N = 119$ participants is required. G*Power was used, as it is an easy and freely available software that provides sound results for social and behavioural research (Faul et al., 2007).

Inclusion criteria and exclusion criteria

For the participation in this study, participants had to be above the age of 18. In addition, participants had to either have a Dutch or a German nationality and lived in one of these two countries. Due to the sensible nature of the topic and the questionnaires, only participants who were not currently in treatment for a mental disorder and that did not suffer from suicidal ideation in the past year were allowed to participate. Participants that did not meet the inclusion criteria or did not give their informed consent were removed from the study. Additionally, participants that did not complete the survey or filled it out multiple times were also removed from the study.

Recruitment

For the data collection, the participants were recruited between the 19th of October and the 29th of November 2024. The participants were recruited through non-probability sampling methods such as convenience sampling, snowball sampling, purposive sampling (to reach groups of individuals needed for other studies within the umbrella project), and voluntary response sampling via social media posts (on WhatsApp, Instagram, LinkedIn, and Facebook).

In addition to the aforementioned recruiting procedure, psychology students at the University of Twente were reached through the participant recruitment platform of the University of Twente: Sona systems. Students that signed up for the study via Sona-Systems

received a reward. Those students were granted Sona points, which are necessary for psychology students at the University of Twente to graduate with their bachelor's degree.

Materials

The materials utilized in this study consist of three posters and a message as calls for participants, and an online survey, for which a laptop or computer with an internet connection is required. The software programs Qualtrics, RStudio, and G*Power were used for data collection and analysis.

Participant recruitment

A call for participants in the form of a message was created to invite friends, family members, and acquaintances through WhatsApp and Instagram (see Appendix A). Furthermore, three social media posters were created to advertise the study in social media stories and posts (see Appendix B). Three posters were created in German and Dutch to reach as many people as possible. The posters entailed a headline and a picture about climate change to draw the attention of potential participants, a call for action, and the requirements to participate in the study. Moreover, in all posters, a QR code was integrated that directly led to the study.

Online Survey

The survey utilised in this study was implemented online using the survey and data collection software Qualtrics. The survey was available both in German and in Dutch. The first two pages of the survey consisted of a welcoming screen (see Appendix C) and an informed consent form (see Appendix D). Four questions of the questionnaire concern demographic variables, namely the gender, age, level of education, and nationality of the participant. The remaining part of the questionnaire relates directly to the research question, which implements established questionnaires from extant literature to measure eco-anxiety, general anxiety, and

media consumption. Some questions were not related to this research but to one of the other projects within the overarching research project such as other eco emotions, pro environmental behaviour, and activism, thus they will not be described here in detail.

Eco-Anxiety Questionnaire: EAQ-22

The Eco-Anxiety Questionnaire EAQ-22 was developed by Ágoston et al. in 2022. It entails 22 items which could be answered on a four-point Likert-scale with the four selection options: “strongly disagree”, “disagree”, “agree”, and “strongly agree”. Two factors are measured using this questionnaire, which both show high internal consistency, namely “habitual ecological worry” with a Cronbach’s Alpha of 0.91 and “negative consequences of eco-anxiety” with a Cronbach’s Alpha of 0.86 (Ágoston et al., 2022). An example item for habitual ecological worry is “It really upsets me to see how animals are suffering because of environmental pollution”, while negative consequences of eco-anxiety include items such as “I am so anxious about climate change that I cry.”

General Anxiety Questionnaire: GAD-7

The second questionnaire is the GAD-7 (General Anxiety Disorder, 7 items) by Spitzer et al. (2006). It measures the experienced anxiety levels of the participants from the past two weeks. Seven items are included in the questionnaire asking for symptoms which can be answered by the participant with “Not at all”, “Several days”, “More than half the days”, and “Nearly every day”. These include, for instance, “Over the last two weeks, how often have you been bothered by not being able to stop or control worrying?” The internal consistency of the questionnaire is high, with $\alpha = 0.92$ (Spitzer et al., 2006).

Media Exposure, Climate Anxiety and Mental Health Questionnaire: MECAMH

A sub section entailing four questions from the MECAMH questionnaire was used in this research which evaluate the frequency and nature of climate change-related media consumption of the participants. The MECAMH was created by Ogunbode et al. (2019).

The first question asks for the perceived attention that is paid to climate change-related media content and can be answered on a four-point Likert scale with the options "None", "A little", "Some", and "A lot". The frequency of climate change-related media content is assessed through different media channels (nine items) on a nine-point scale from "Never" to "More than 10 times a day", with the item "Facebook" altered to "Instagram and Facebook" to reach the younger generation who typically uses Instagram rather than Facebook. The questionnaire also includes questions about the type of content consumed and emotional responses to climate change-related media content. The scale demonstrates good internal consistency ($\alpha = .82 - .88$) and construct validity (CFI = .92).

Translation of the questionnaires

After identifying research gaps regarding the topic of eco-emotions, suitable questionnaires were identified to measure the associated variables. For this paper, the EAQ-22, the GAD-7, and the media exposure part of the MECAMH were considered adequate. As not all these questionnaires have been translated into Dutch and German, this was done subsequently in accordance to the back translation method. The EAQ-22 has already been translated into Dutch by previous researchers at the University of Twente (Doyle, 2024; Gökoglan, 2024). The previously translated versions were translated back into English to check their validity and to identify possible translation or understanding issues. Following the back translation process of

the Dutch version, the scale options were changed from “mee oneens” and “mee eens” to “helemaal mee oneens” and “helemaal mee eens” as it is more accurate to the original version.

The German versions of the EAQ-22 and the GAD-7 were already translated and validated by Zeier & Wessa (2024). The media exposure questions of the MECAMH were translated in the scope of this research into German and Dutch by native speakers and additionally translated back into English by different researchers to test the validity of the translations.

Pilot test

At the beginning of the data collection phase, a pilot test was carried out between the 19th and the 23rd of October 2024 with 32 participants. The pilot test was conducted to further ensure that the translated questionnaires are clear to participants and feedback could be given through the last two questions of the questionnaire. The received feedback was used to identify understanding and comfort issues with the questionnaires (Tsang et al., 2017). The sample size of the pilot test was in line with the minimum sample size of 30 participants. The feedback of the pilot test indicated that no issues were present in the used questionnaire, except for one question of the Pro-Environmental Behaviour Scale (PEBS) that was not used in this research. Thus, no changes were made to the study, and therefore, the sample of the pilot test was also included in the total sample of this study.

Procedure

The participants either received the link/QR-code via Sona Systems, on WhatsApp or via the social media advertisements which directed the participants to the online survey in Qualtrics. The participants had to follow the structure of the online survey. The participants started by reading the welcoming screen which explained the topic of the research, inclusion/ exclusion

criteria, and the fact that participation was voluntary. After the welcoming screen, the participants were forwarded to the informed consent form. The informed consent form notified the participants about their right to withdraw at any time without consequences, about the anonymization of their data, and about possible negative effects of the participation in this research, as it concerned a sensitive topic that could have been triggering to some individuals. Next, the participants had to fill in the questionnaire as described in the material section. After the questionnaire, the debriefing screen was shown (see Appendix E) to provide information for participants that experienced psychological problems during the participation, in form of helplines which they could call in case of an emergency. A second consent was also integrated there, to give participants the chance to withdraw from the survey again if they felt uncomfortable or did not want to share their anonymized data. Furthermore, the participants were informed to not talk about the research with others, which ensured that the information did not influence the results. At the end of the survey, two questions were implemented with open text boxes to assess whether participants felt uncomfortable with questions or did not understand the content of a question.

Data Analysis

The data was extracted from Qualtrics as a .xlsx format, cleaned, and imported in RStudio (Version 4.4.0) which was used for the subsequent data analysis. The R-script can be seen in Appendix F.

Data cleaning

First, all participants that did not meet the eligibility criteria, abandoned the study before finalizing the questionnaire, or did not give their informed consent were omitted. Second, all questions that were not used to answer this research question were removed, such as all

questionnaires that were not used to answer any of the hypotheses. All items of the second question of the MECAMH questionnaire were reverse coded as the original scale ranged from 1 “very often” to 9 “never”. For the variable frequency of climate-change related media exposure, the nine items of the second question were synthesized into one overall score.

Descriptive statistics

After the data set was cleaned, the descriptive statistics were computed. The mean, standard deviations, minimum, and maximum scores were calculated for general anxiety, eco-anxiety including its two subscales, and climate change-related media exposure. In order to conduct the necessary analysis for the hypotheses testing, first, the data was checked for the assumptions of normality, homoscedasticity, multicollinearity, and independence of residuals.

Standardisation of scores

Prior to testing the hypotheses, the scores for general anxiety, eco-anxiety and exposure to climate change-related media content were standardised into z-scores. This was done because the scales of the EAQ-22 and GAD-7 range from one to four, whereas media exposure is measured on a scale from one to nine in the MECAMH. Standardising the scores increases the comparability between these variables within this study and additionally, it can enhance the comparability with future studies that focus on eco-anxiety, general anxiety, and media exposure and also use z-scores (Field et al., 2012, p. 174). This is important in this area of research because researchers often use different questionnaires and scales to measure these constructs. Furthermore, standardisation may improve the accessibility of this research topic for researchers that are new to the field of eco-emotions by lowering entry barriers to it which is especially important as the area is currently under-researched.

Hypothesis testing

For the three hypotheses, different analyses were conducted. To answer the first hypothesis (**H1**), linear regression was applied to test whether general anxiety is positively related to eco anxiety levels.

The data of the second hypothesis did not meet the criteria of normality of residuals. Therefore, the data was logarithmically transformed after which the assumption was met. For the second hypothesis (**H2**) a simple linear regression was applied to test whether general anxiety is predicting climate change-related media exposure.

A linear regression analysis was conducted to test the third hypothesis (**H3**), which is that climate change-related media exposure is positively related to eco-anxiety levels.

For hypothesis four (**H4**), three multiple linear regression analysis were conducted to examine whether climate-related media exposure acts as a moderator in the relationship between general anxiety levels and eco-anxiety levels including its two subscales. The predicted relationships can be seen in **Figure 1-3**.

Figure 1

Visualization of the first analysis of hypothesis 4 (H4)

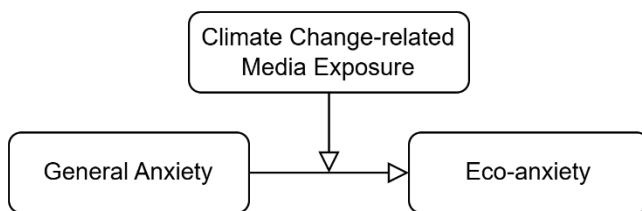
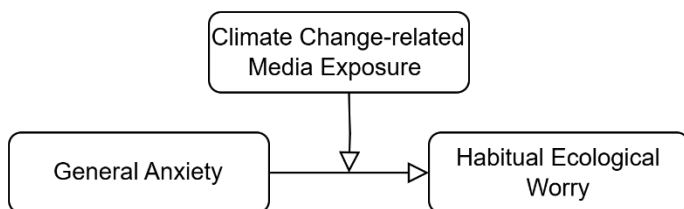
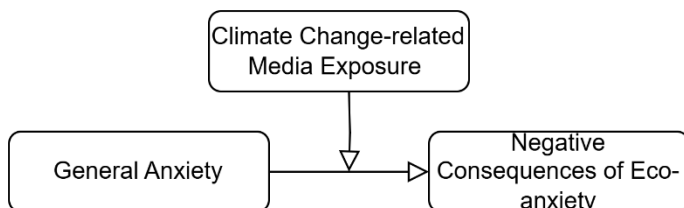


Figure 2

Visualization of the second analysis of hypothesis 4 (H4)

**Figure 3**

Visualization of the third analysis of hypothesis 4 (H4)



Results

A total of 153 responses were collected in Qualtrics, of which 41 had to be omitted as the participants did not give their informed consent or dropped out prior to finalizing the survey, which reduced the sample size to $N = 112$. The age of the participants ranged from 18 to 75 years with a mean age of $M = 30.82$ ($SD = 14.82$). The gender distribution, level of education, and nationality of the sample can be seen in Table 1.

Table 1

Demographics

Characteristics	n	%
Gender		
Female	74	66
Male	35	31.3
Non-binary	3	2.7

Level of Education		
Secondary Education	47	42
College	16	14.3
Apprenticeship	9	8
Bachelor's Degree	22	19.6
Master's Degree	14	12.5
Other	4	3.6
Nationality		
German	55	49.1
Dutch	57	50.9

Descriptive Statistics

For the descriptive statistics, the mean, standard deviation, minimum, and maximum score were calculated for eco-anxiety, including its two subscales, general anxiety, and exposure to climate change-related media content (see Table 2). Furthermore, the same measures were calculated for each of the media channels tested in the MECAMH questionnaire and can be found in Table 3.

Table 2

Descriptive statistics (eco-anxiety, general anxiety, and climate change-related media exposure)

Measurement	Mean	SD	Min	Max
Eco-anxiety	2.45	0.48	1.27	3.73
Habitual ecological worry	3.11	0.56	1.38	4
Negative consequences of eco-anxiety	1.49	0.5	1	3.34
General anxiety	1.88	0.7	1	4
Climate change-related media exposure	2.9	1.15	1	7.22

Eco-anxiety scale 1-4, General anxiety 1-4, Media exposure 1-9

Table 3*Descriptive statistics for different media channels*

Media Channel	Mean	SD	Min	Max
TV news and other TV programmes	3.79	2.08	1	9
Printed and online newspapers	3.24	2.07	1	9
Radio news and other radio programmes	2.81	1.96	1	9
Instagram and Facebook	3.99	2.36	1	9
Twitter	1.69	1.54	1	8
YouTube	2.48	1.81	1	8
Books and magazines	2.08	1.52	1	9
Scientific articles, journals, blogs	2.59	1.83	1	9
Family, friends and colleagues	3.38	1.72	1	9

*Scale 1-9***Assumption testing**

To conduct a linear regression between general anxiety and eco-anxiety, general anxiety and media exposure, as well as climate change-related media exposure on eco-anxiety, and a moderation analysis with the moderator climate change-related media exposure on the relationship of general anxiety on eco-anxiety, the data set was checked for the assumptions of normality, homoscedasticity, multicollinearity, and independence of residuals. The assumptions were individually tested for each analysis, and the dataset for hypothesis 1, 3, and 4 was suitable for the subsequent analysis as all assumptions were met (see Appendix G). The Shapiro-Wilk test indicated that the assumption of normality was not met for the second hypothesis ($p < 0.05$). Therefore, a logarithmic transformation was applied to the variable exposure to climate change-related media content. Following the transformation, the Shapiro-Wilk test was conducted again, and the assumption of normality was met for the transformed data ($p = 0.6$).

Hypotheses testing

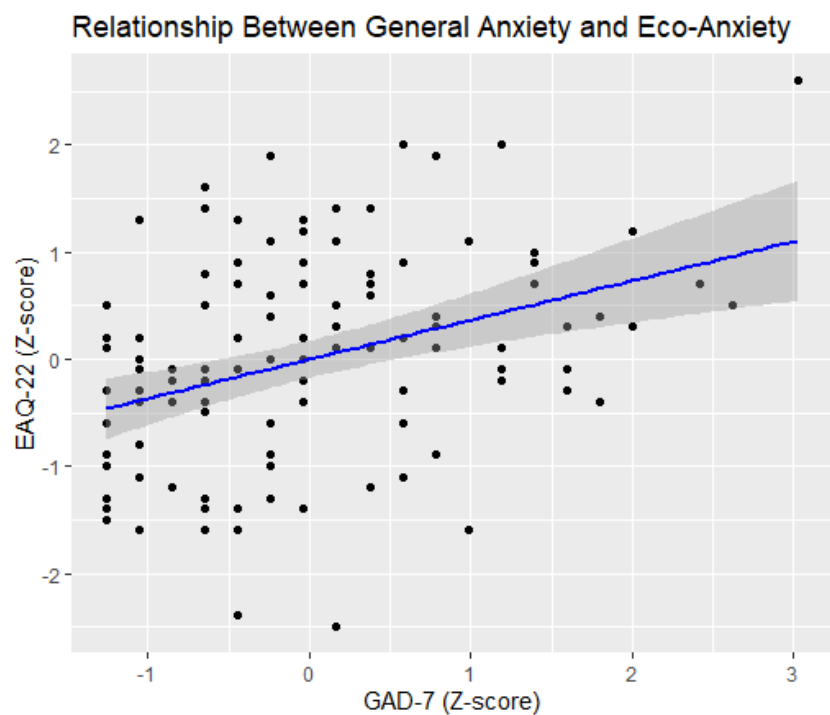
Prior to testing the hypotheses, the scores were standardised and transformed into z-scores.

Hypothesis 1:

A simple linear regression was applied to measure the effect of general anxiety on eco-anxiety. A significant positive relationship was found between the variables ($b = 0.37$, $t(110) = 4.14$, $p < .001$). Therefore, hypothesis 1 was accepted. General anxiety explained 13 % of the variance of eco-anxiety ($R^2 = .13$). The relationship can be seen in Figure 4.

Figure 4

Relationship Between General anxiety (GAD-7) and Eco-anxiety (EAQ-22)

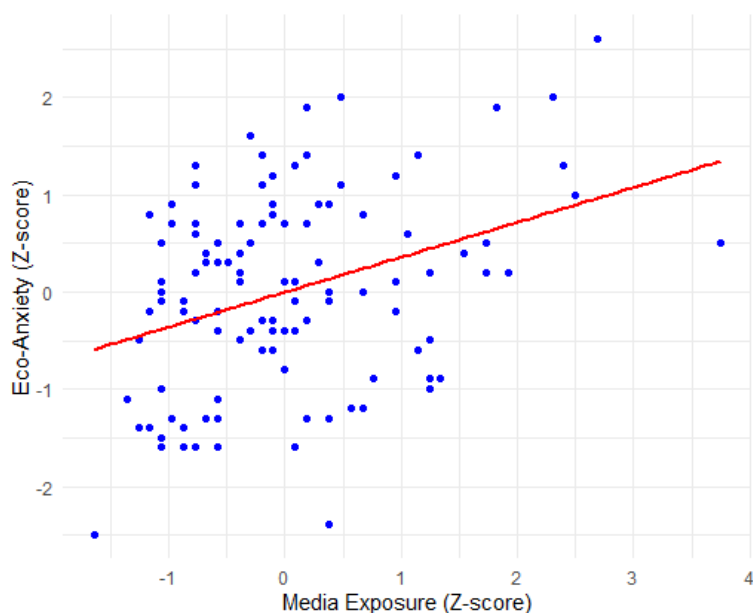


Hypothesis 2:

To test the second hypothesis, a simple linear regression was applied to test whether general anxiety predicts the transformed variable of climate change-related media exposure. No significant effect was found ($b = 0.036$, $SE = 0.052$ $t(110) = 0.69$, $p = .49$) and the second hypothesis was rejected.

Hypothesis 3:

A simple linear regression was conducted for the relationship between climate change-related media exposure and eco-anxiety. It revealed a significant positive relationship between the independent variable media exposure and the dependent variable eco-anxiety ($b = 0.36$, $SE = 0.09$ $t(110) = 4.04$, $p < .001$). Thus, hypothesis 3 was accepted. Climate change-related media exposure explained 12.9% of the variance of eco-anxiety ($R^2 = 0.129$, R^2 adjusted = .12). The relationship between climate change-related media exposure and eco-anxiety can be seen in Figure 5.

Figure 5***Relationship Between Climate Change-related Media Exposure and Eco-anxiety***

Hypothesis 4:

For the fourth hypothesis, three moderation analysis were conducted. The first one was a moderation analysis with the moderator climate change-related media exposure moderating the relationship of general anxiety on eco-anxiety. The effect of media exposure ($b = 0.326$, $t(108) = 3.92$, $p < .001$) and general anxiety ($b = 0.342$, $t(108) = 3.89$, $p < .001$) were independently significantly positively related to eco-anxiety. However, the interaction effect between climate change-related media exposure and general anxiety was not statistically significant ($b = 0.036$, $t(108) = 0.54$, $p = 0.59$), consequently, hypothesis 4 was rejected.

The second and third moderation analyses had the same moderator and independent variable but investigated the relationship between the subscales of eco-anxiety, namely factor 1, “Habitual ecological worry,” and factor 2, “Negative consequences of eco-anxiety.”

The second moderation analysis that investigated whether exposure to climate change-related media content moderates the relationship between general anxiety and habitual ecological worry found that both general anxiety and climate change-related media exposure had a significant positive effect on habitual ecological worry ($b = 0.32$, $t(108) = 3.43$, $p < 0.001$; $b = 0.27$, $t(108) = 3.12$, $p = .002$). The interaction effect between general anxiety and exposure to climate change-related media content showed no significant impact on the relationship ($b = -0.044$, $t(108) = -0.62$, $p = .536$). The model explained 17.6 % of the variance ($R = 0.176$).

The third moderation analysis investigating how climate change-related media exposure moderates the relationship of general anxiety on negative consequences of eco-anxiety showed that there were three significant positive effects (see Table 4). General anxiety ($b = 0.29$, $t(108) = 3.44$, $p = 0.001$), Climate change related media exposure ($b = 0.33$, $t(108) = 4.06$, $p < .001$) and their interaction effect ($b = 0.16$, $t(108) = 2.41$, $p = 0.018$) all had a significant positive effect on

negative consequences of eco-anxiety. This model explained 29.8 % of the variance in negative consequences of eco-anxiety ($R^2 = 0.298$).

Table 4

Moderation analysis for factor 2 of Eco-anxiety (negative consequences of eco-anxiety)

Predictor	Estimate	Std. Error	t-value	p-value
Intercept	-0.01	0.08	-0.134	0.89
General Anxiety	0.29	0.085	3.435	< .001
Media Exposure	0.33	0.08	4.057	< .001
Interaction effect	0.16	0.07	2.409	.02

Discussion

This study measured general anxiety, eco-anxiety, and exposure to climate change media in the German and Dutch populations and investigated to what extent exposure to climate change-related media content moderates the relationship between general anxiety and eco-anxiety in Germany and the Netherlands. To answer this research question, the relationships between general anxiety and eco-anxiety, general anxiety and exposure to the climate change media, and exposure to the climate change media and eco-anxiety were examined. Additionally, whether exposure to the climate change media moderates the relationship between general anxiety and eco-anxiety was tested in this study. Two positive relationships have been identified between general anxiety and eco-anxiety, and between climate change-related media exposure and eco-anxiety. No relationship was found between general anxiety and climate change-related media exposure. No moderation was found of climate change-related media exposure on the relationship between general anxiety and eco-anxiety, and neither on the relationship between general anxiety and habitual ecological worry. However, a significant interaction effect was

found between climate change-related media exposure and general anxiety on the negative consequences of eco-anxiety. Thus, climate change-related media exposure acts as a moderator on the relationship between general anxiety and negative consequences of eco-anxiety.

The eco-anxiety level in the Dutch and German population identified in this study is in line with scores from previous studies conducted at the University of Twente. Gökoglan (2024) and Doyle (2024) identified a mean eco-anxiety score of $M = 2.55$ ($SD = 0.52$) in their sample and Wrana (2024) and Mania (2024) a mean score of $M = 2.45$ ($SD = 0.58$). The mean eco-anxiety score in this sample is with 2.45 equal to the one that was found in the previous study by Wrana (2024) and Mania (2024) and shows only minimal differences when comparing it to the score of the study by Gökoglan (2024) and Doyle (2024). There are no official norm scores for evaluating the eco-anxiety mean. However, Niedzwiedz and Katikireddi (2023) concluded that the German mean of eco-anxiety was higher in comparison to other EU countries, therefore it can be assumed that the identified eco-anxiety score of 2.45 is relatively high. The two subscales of eco-anxiety *habitual ecological worry*, which according to Zeier and Wessa (2024) reflects an adaptive response to the climate change crisis, and negative consequences of eco-anxiety, which represents maladaptive responses to the climate crisis, differed significantly in their extent to which they were experienced in the sample. The adaptive first factor, habitual ecological worry, was relatively high, and the maladaptive response, as represented in the second factor of eco-anxiety, was significantly lower. This suggests that many individuals in this sample are concerned about the climate crisis and exhibit signs of adaptive worry, while maladaptive responses are less frequently experienced. Thus, the manifestation of eco-anxiety in this sample of individuals from the German and Dutch population can be seen predominantly as an adaptive

response to the climate crisis, while excessive worrying that leads to dysfunction of the day-to-day life of individuals is only experienced by very few individuals.

The descriptive statistics of the climate change-related media exposure variable suggest that the main media channels through which individuals in the sample are usually confronted with information about climate change are, in descending order: Instagram and Facebook; TV news and other TV channels; family, friends, and colleagues; and printed and online newspapers. These four media channel categories were the only ones through which individuals consumed climate change-related media content on average between one and three times per week, while other channels were only consumed less than once a week on average.

This study found a positive relationship between general anxiety levels and eco-anxiety levels. Previous studies by Asgarizadeh et al. (2023) and Whitmarsh et al. (2022) identified the same effect in their studies, further strengthening the evidence for the relationship. In this study, general anxiety was able to predict 13% of the variance in eco-anxiety. This indicates that general anxiety is only able to predict a rather small part of eco-anxiety and suggests that there is a difference between anxiety and eco-anxiety, and consequently that eco-anxiety is not just one part of anxiety but rather a different construct, as indicated by Whitmarsh et al. (2022).

While general anxiety predicts eco-anxiety and is correlated with higher levels of media consumption, it cannot predict the frequency of consumed climate change media content. This suggests that other factors, such as personal interest in ecological sustainability or sociopolitical factors, may be responsible for predicting climate media exposure. It is assumed that people with a stronger interest in the environment, climate change, activism, politics, and generally consume media content more frequently, subsequently also consume more information about the climate

crisis. Thus, these variables might act as a stronger predictor for the extent of exposure to climate change-related media content.

This study found a positive relationship between climate change-related media exposure and eco-anxiety. The same relationship was also found in multiple other studies (Asgarizadeh et al., 2023; Loll et al., 2023; Maran & Begotti, 2021). This relationship can be explained by the representation of the narrative of climate change information in the media and the subsequent interpretation of the content by the individual. Especially when the content is perceived as threatening or harmful, it can increase the eco-anxiety level (Clayton & Karazsia, 2020; Asgarizadeh et al., 2023). This relationship emphasizes the importance of the narrative in the climate change media because the media has a double effect in raising awareness while also possibly intensifying emotional responses (Leiserowitz, 2007). However, like general anxiety, climate change-related media exposure was also only able to predict 12.9% of the variance of eco-anxiety, further highlighting the number of facets and the complexity of the construct eco-anxiety.

The three moderation analyses conducted to test the fourth hypothesis generated nuanced insights into the relationship between general anxiety, media exposure, and eco-anxiety, including its two subscales. Media exposure was not found to be a significant moderator for the relationship between general anxiety and eco-anxiety. However, when investigating the subscales of eco-anxiety more closely, the results indicated that media exposure acts as a moderator for the relationship of general anxiety on the second factor representing the maladaptive consequences of eco-anxiety but not on the adaptive habitual ecological worry that is associated with eco-anxiety. This insight is important, as general anxiety and media exposure individually influence the adaptive as well as the maladaptive subscale of eco-anxiety, but a

significant interaction effect that amplifies the working mechanism was only found for the maladaptive subscale of eco-anxiety. This suggests that habitual ecological worry as an adaptive response is more resistant to the interplay of the two variables and aligns with the idea that habitual ecological worry is a function to constructively process and react to the climate crisis by Zeier & Wessa (2024). On the other side, the maladaptive consequences of eco-anxiety are stronger influenced by anxiety, media exposure and their interaction effect. This can also be seen by the variance that is explained by these factors. For the adaptive response, only 17.6 % of the variance was explained by general anxiety and media exposure, while 29.8% of the variance of the maladaptive response of eco-anxiety was explained by general anxiety, media exposure, and their interaction effect. This suggests that the media mainly amplifies the maladaptive consequences of eco-anxiety while the more resilient adaptive responses are less affected.

This effect can be explained by a variety of biases that are associated with heightened levels of general anxiety such as threat-related information-processing and attentional biases. Individuals with heightened anxiety levels tend to interpret, attend to, store or recall daily events and information as more threatening which subsequently increases their anxiety and associated negative consequences (Davey, 2021, p. 190). Furthermore, when a situation or event is ambiguous, they tend to select the more threatening and negative interpretation which is known as a threat-interpretation bias (Davey, 2021, p. 190). These negative biases may give rise to dysfunctional and maladaptive thinking and behaving. Thus, it can be assumed that individuals with higher anxiety when consuming more climate change-related media content, tend to focus and interpret the media information as more negative, leading to higher levels of negative consequences of eco-anxiety. This explains their interaction effect, while climate change-related media exposure does not have such an effect on the adaptive responses to the climate crisis.

Theoretical and Practical Implications

The findings of this research yield useful theoretical and practical implications for the understanding of eco-anxiety and might help to shape future interventions and policies.

The conceptualization of eco-anxiety is still not completely clear, and differs among studies (Coffey et al., 2021). The results of this study contribute four important points to the understanding of eco-anxiety. Firstly, eco-anxiety is a complex and multi-faceted term and cannot easily be predicted by a few factors as there are a lot of different variables predicting eco-anxiety. Secondly, general anxiety and climate change-related media exposure are two of these predictors but together only explain less than 30% of the variance of eco-anxiety scores in this sample. Thirdly, the low predictive power of general anxiety on eco-anxiety reinforces the necessary distinguishment between generalized anxiety and eco-anxiety. Fourthly, the two subscales of eco-anxiety show to be differently affected by variables and the adaptive response habitual ecological worry seems to be more resilient to the media than the maladaptive negative consequences of eco-anxiety, which are especially amplified by climate change-related media exposure. This suggests that the ambiguous conceptualization of eco-anxiety may have a profound impact on research results.

From a practical perspective, these insights can be relevant for media policies and public health strategies that focus on mitigating the psychological impacts of the climate crisis in order to shape climate change crisis communication in a manner that informs, instead of overwhelms. The findings emphasize the important role of the narrative of the media as it both has a direct and indirect effect on the experienced eco-anxiety and can especially intensify the maladaptive aspects of the emotion. Thus, the narrative of the media should be carefully designed to raise awareness, but at the same time, it should consider the emotional well-being of the viewers and

mitigate catastrophizing, which may intensify the negative consequences of eco-anxiety.

Furthermore, the results could also be beneficial for mental health practitioners and educational measures that focus on eco-anxiety, by helping individuals to process the emotion in a more adaptive than maladaptive manner.

Limitations

This study has some limitations that should be considered when interpreting and generalizing the results. The intended sample size was missed by seven participants and the diversity of the sample was rather low specifically with regards to the education level as it mainly consisted of university students, lowering the generalizability of the findings to the broader population of Dutch and German individuals.

This study is also prone to a variety of biases that might influence the results. For instance, a response bias called social desirability bias which frequently occurs in cross-sectional studies might have led some individuals to choose more socially accepted answers (Tellis & Chandrasekaran, 2010). Another form of bias that might influence the comparability of this study to other findings is seasonal bias. Eco-anxiety scores may be affected by the seasons and are higher when people experience more environmental threats (Loll et al., 2023). For instance, during the summer, the heat affects individuals more directly, therefore it is assumed that individuals tend to show higher levels of eco-anxiety during summer than during fall when this data collection took place because the perception and distance to climate change varies during the seasons as suggested by McDonald et al. (2015).

Another key limitation of the study is the measurement of exposure to climate change-related media content using the MECAMH, as it does not measure media exposure as a whole but synthesizes the different media channel categories in one variable. It utilises broad and the

most relevant media channels. However, when people use different channels that were not mentioned in this questionnaire, that usage will not count towards the media exposure score of the individual. Moreover, when people are not exposed to some of the media channels at all but very frequently interact with one channel, their overall usage will also be scored as rather low.

Strengths

This study provides new information about the role of eco-anxiety in the German and Dutch population and is the first one to adapt the media exposure part of the MECAMH and the EAQ-22 in Dutch and German language after finishing the backtranslation method. The questionnaires were used for the first time to collect data in Germany and the Netherlands. The participants indicated that they did not have any understanding issues with the translated questionnaires that were used in this study, suggesting that the questionnaires are adequately translated. Furthermore, the identified theoretical and practical implications add to the literature and to the broader understanding and prediction of eco-anxiety, which is underexplored in current literature.

Generally, this study tackles an important area of research, as the climate crisis is quickly developing and sufficient information to adequately prepare for the mental health implications that come with it are not yet available. Thus, this study helps to shed light into important risk factors contributing to stronger eco-emotions, delivers cues how to mitigate negative effects of eco-anxiety, and gives new insights for future research to further explore the topic. Another strength of this study is the standardization process of the scores, making the findings more comparable when using other questionnaires to measure eco-anxiety.

Implications for Future Research

The findings and limitations identified in this research, provide a sound basis for future research suggestions. One area identified for future research is that there are no existing norm scores for eco-anxiety, wherefore comparing the results can be difficult. Norm scores would help the comparability of the results of the EAQ-22. Furthermore, it is important to investigate the adaptive and the maladaptive responses in eco-anxiety and to identify the threshold when an eco-anxiety score is considered to be a maladaptive and harming response to the climate crisis in order to help these individuals cope with their negative consequences that are associated with heightened levels of eco-anxiety. This information would also be useful for mental health interventions and mental health practitioners.

The descriptive statistics of the frequency of the media channels utilized in the MECAMH suggest that only through a few of the media channels the participants in this sample were exposed to information about the climate crisis. Therefore, questionnaires in future research should also entail other questions to measure exposure to climate change-related media content as a whole when using this variable or compare and look at specific media channels.

Another suggestion would be to conduct longitudinal studies or qualitative research to further explore eco-emotions. Cross-sectional studies like this can only identify correlation, not causation. Therefore, longitudinal studies would be necessary to investigate causality and how eco-anxiety changes over time, especially because of the aforementioned seasonal bias. Qualitative research would be beneficial to further investigate the concept and predictors of eco-anxiety in an in-depth design where interviews with individuals that experience eco-anxiety are conducted.

Conclusion

This study implemented a cross-sectional design to investigate general anxiety, eco-anxiety, and exposure to climate change-related media content in the German and Dutch population. Two significant relationships were found between general anxiety and eco-anxiety, and between climate change related media exposure and eco-anxiety. The general anxiety scores were not able to predict media exposure. Furthermore, media exposure did not act as a moderator in the relationship between general anxiety and eco-anxiety. However, when investigating the two subscales of eco anxiety, climate change-related media exposure acted as a moderator in the relationship between general anxiety and the maladaptive subscale of eco-anxiety, negative consequences of eco-anxiety, but not for the adaptive subscale, habitual ecological worry. The findings suggest that the adaptive response of eco-anxiety to the climate crisis is more resilient to strengthening effects of the media than the maladaptive response, which can be explained by the threat-related information-processing and attention biases that are associated with high levels of general anxiety. Thus, an objective narrative in the media is important as media raises awareness but at the same time can intensify emotional distress in individuals. Furthermore, the findings of this study emphasize that eco-anxiety is different to general anxiety and a complex construct with many different predictors. Lastly, it is important to create eco-emotion interventions that help individuals to process the climate crisis in an adaptive way, while mitigating maladaptive effects.

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Appendix

During the preparation of this work the author used Grammarly and ChatGPT in order to receive feedback on the structure and flow of the text. After using these tools/services, the author reviewed and edited the content as needed and takes full responsibility for the content of the work.

Appendix A

Call for participants

Hallo zusammen! 😊

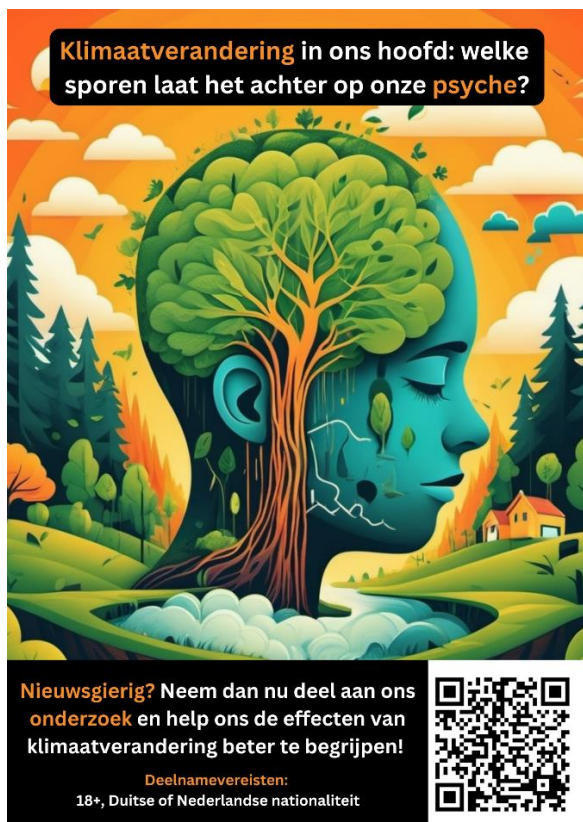
Ich suche Teilnehmer:innen für eine Online-Umfrage im Rahmen meiner Bachelorarbeit über den Klimawandel und dessen Auswirkungen auf die psychische Gesundheit. Die Umfrage dauert ca. 20 Minuten und richtet sich an Menschen in Deutschland und den Niederlanden. Wir untersuchen Emotionen wie Eco-Angst und deren Zusammenhang mit umweltfreundlichem Verhalten. Eure Teilnahme wäre eine große Hilfe! 🌍💚

Hier geht's zur Umfrage: [link](#)

Vielen Dank im Voraus!

Appendix B


Advertisements for Social Media Platforms



Klimaatverandering in ons hoofd: welke sporen laat het achter op onze **psyche?**

Nieuwsgierig? Neem dan nu deel aan ons **onderzoek** en help ons de effecten van klimaatverandering beter te begrijpen!

Deelnamevereisten:
18+, Duitse of Nederlandse nationaliteit



Klimawandel im Kopf: Welche Spuren hinterlässt er in unserer **Psyche?**

Neugierig? Dann nimm jetzt teil an unserer **Studie** und hilf uns die Auswirkungen des Klimawandels besser zu verstehen

Teilnahmebedingungen:
18+, Deutsche oder Niederländische Staatsangehörigkeit



**WELCHE FOLGEN DES KLIMAWANDELS
SIND FÜR DAS AUGE WENIGER
SICHTBAR?**



Sie können uns helfen diese Frage zu beantworten in dem Sie an unserer Studie zu den **psychologischen Auswirkungen** des **Klimawandels** teilnehmen.


Teilnahmebedingungen: 18+, Deutsche oder Niederländische Staatsangehörigkeit.

**WELKE GEVOLGEN VAN
KLIMAATVERANDERING ZIJN MINDER
DUIDELIJK MET HET OOG TE ZIEN?**



U kunt ons helpen deze vraag te beantwoorden door deel te nemen aan ons onderzoek naar de **psychologische gevolgen** van **klimaatverandering**.

Voorwaarden: 18+, Nederlandse of Duitse Nationaliteit.



Machen wir uns auf eine **gesunde**
Weise **Sorgen** um das **Klima**?



Sie können uns helfen diese Frage zu beantworten in dem Sie an unserer Studie zu den **psychologischen Auswirkungen** des **Klimawandels** teilnehmen.

Teilnahmebedingungen: 18+, Deutsche oder Niederländische Staatsangehörigkeit.



Maken we ons op een **gezonde**
manier **zorgen** over het **klimaat**?



U kunt ons helpen deze vraag te beantwoorden door deel te nemen aan ons onderzoek naar de **psychologische effecten** van **klimaatverandering**.

Voorwaarden: 18+, Nederlandse of Duitse nationaliteit.

Appendix C

Welcoming Screen



Willkommen

Das Ziel dieser Studie ist es, den Zusammenhang zwischen Klimawandel, psychischen Störungen und umweltfreundlichem Verhalten in der deutschen und niederländischen Bevölkerung zu untersuchen. Die Studie wird von zwei Bachelor- und einer Masterstudierenden der Psychologie an der Universität Twente durchgeführt und die gesammelten Daten werden für ihre Bachelor- und Masterarbeit analysiert.

Teilnahme

Um an dieser Studie teilnehmen zu können, müssen Sie mindestens 18 Jahre alt sein und entweder die deutsche oder

niederländische Staatsangehörigkeit besitzen, eine der beiden Sprachen sprechen und in einem der beiden Länder wohnen. Personen, die derzeit in Behandlung einer psychischen Krankheit sind oder in dem letzten Jahr suizidale Gedanken hatten, können nicht an dieser Studie teilnehmen, um sie vor möglichen Schäden durch die Teilnahme zu schützen. Ihre Teilnahme an dieser Studie ist vollkommen freiwillig, und Sie haben das Recht, jederzeit ohne Angabe von Gründen oder ohne Konsequenzen zurückzutreten. Alle bis dahin von Ihnen bereitgestellten Daten werden von weiteren Analysen ausgeschlossen. Nach Abschluss des Fragebogens werden jedoch alle Daten anonymisiert und sind daher nicht identifizierbar, was eine Löschung der Daten unmöglich macht. Die Verwendung Ihrer Daten erfolgt ausschließlich unter vertraulichen Umständen. Nach der Zustimmung zur Teilnahme werden demografische Fragen gestellt. Um Anonymität zu gewährleisten, werden keine identifizierbaren Informationen gesammelt. Auch ihre IP-Adresse und Standortdaten werden nicht erfasst. Der Fragebogen dauert etwa 25-30 Minuten. Ihre Teilnahme an dieser Studie wird sehr psychologischen Auswirkungen des Klimawandels zu vertiefen.

Kontakt Daten

Diese Studie wurde von der Ethikkommission der Universität Twente geprüft und genehmigt. Für zusätzliche Informationen oder bei Fragen wenden Sie sich bitte an die Forscher:

Michele Petkovski (c.m.petkovski@student.utwente.nl)

Mark Kalisvaart (m.kalisvaart@student.utwente.nl)

Finn Zolitschka (f.t.zolitschka@student.utwente.nl)

Alternativ können Sie sich an den Mentor Dr. Alejandro Dominguez Rodriguez (a.dominguezrodriguez@utwente.nl) wenden.



Appendix D

Informed Consent Form



Deutsch ▾

Indem ich unten auf JA klicke, bestätige ich das Folgende:

Ich habe alle Informationen gelesen und erfülle alle Teilnahmebedingungen. Ich bestätige, dass meine Teilnahme völlig freiwillig ist. Ich erkenne auch mein Recht an, meine Einwilligung jederzeit ohne Angabe von Gründen zu widerrufen, insbesondere wenn ich Unbehagen oder Stress jeglicher Form empfinde. Solch Widerruf wird keine Konsequenzen nach sich ziehen.

Darüber hinaus verstehe ich Folgendes:

- Alle vom Forscher erhobenen Daten bleiben völlig anonym und können nicht auf meine Identität zurückgeführt werden. Ein Rücktritt ist daher nach Beendigung der Umfrage nicht mehr möglich.

- Mir ist bekannt, dass die von mir zur Verfügung gestellten Informationen in Forschungsberichten verwendet werden, deren Ziel es ist, die Auswirkungen des Klimawandels auf die psychische Gesundheit darzustellen.
- Ich befinde mich derzeit in KEINER medizinischen oder therapeutischen Behandlung aufgrund einer psychischen Störung.
- Ich habe in dem letzten Jahr KEINE Selbstmordgedanken erfahren.
- Mir ist bewusst, dass die Teilnahme an der Studie aufgrund der Diskussion der sensiblen Thematik des Klimawandels zu psychischem Unbehagen führen kann.
- Ich erkläre mich damit einverstanden, keine Informationen über den Ablauf und die Einzelheiten der Studie zu teilen, da dies die Ergebnisse der Studie beeinträchtigen könnte.
- Ich erkläre mich damit einverstanden, dass meine Antworten in der Umfragedatenbank für mögliche zukünftige Forschungs- und Ausbildungszwecke genutzt werden.

Ich bin mit der Teilnahme an der Studie einverstanden:

- JA, ich habe den Inhalt dieser Einverständniserklärung verstanden und erkläre
- mich bereit, an dieser Studie teilzunehmen. Ich verpflichte mich auch, die Einzelheiten der Studie nicht an Dritte weiterzugeben.
 - NEIN (Sie werden zum Ende der Studie weitergeleitet)



Appendix E

Debriefing Screen



Sie haben fast das Ende der Umfrage erreicht. Bitte fahren Sie mit den letzten Fragen fort, bis Sie die Meldung "Vielen Dank für Ihre Teilnahme" sehen.

Wenn Sie sich unwohl fühlen oder unter psychischen Problemen leiden, können Sie sich an den folgenden Hilfsdienst für psychische Gesundheit wenden: Suizid- und Krisentelefon Deutschland: 0800 1110111

Für zusätzliche Informationen oder bei Fragen wenden Sie sich bitte an die Forscher:

Michele Petkovski (c.m.petkovski@student.utwente.nl)

Mark Kalisvaart (m.kalisvaart@student.utwente.nl)
Finn Zolitschka (f.t.zolitschka@student.utwente.nl)

Mentor: Dr. Alejandro Dominguez Rodriguez
(a.dominguezrodriguez@utwente.nl)

Alle Informationen, die zu Ihnen zurückführen können, werden anonymisiert. Alle eingegebenen Daten sind nur für Mitglieder des Forschungsteams zugänglich und werden zwei Jahre lang gespeichert. Nachdem Sie diesen Fragebogen ausgefüllt haben, werden Ihre Daten ausgewertet und es ist nicht mehr möglich, Ihre Daten zu löschen.

Ich erkläre mich damit einverstanden, dass meine Daten für die Studie verwendet werden dürfen.

Ich erkläre mich damit einverstanden, dass meine Daten für die Studie verwendet werden dürfen.

Ja

Nein



Appendix F

R Script

```
#install and load necessary packages
```

```
install.packages("readxl")
```

```
install.packages("lmtest")
```

```
install.packages("car")
```

```
install.packages("ggplot2")
```

```
install.packages("dplyr")
```

```
library(dplyr)
```

```
library(ggplot2)
```

```
library(readxl)
```

```
library(lmtest)
```

```
library(car)
```

```
R.version.string
```

```
#load data
```

```
# Define file path
```

```
file_path <- "C:/Users/finn-/Desktop/Bachelor thesis/Data 112/data.xlsx"
```

```
data <- read_excel(file_path)
```

```
#clean dataset
```

```
data_cleaned <- data[data$`2nd consent` == 1 & !is.na(data$`2nd consent`), ]
```

```
columns_to_keep <- c(
```

```
  "Geschlecht", "Alter", "Bildungsabschluss", "Bildungsabschluss_7_TEXT", "nationality",
```

```
  "EAQ-22_1", "EAQ-22_2", "EAQ-22_3", "EAQ-22_4", "EAQ-22_5", "EAQ-22_6", "EAQ-22_7",
```

```
  "EAQ-22_8", "EAQ-22_9", "EAQ-22_10", "EAQ-22_11", "EAQ-22_12", "EAQ-22_13",
```

```
  "EAQ-22_14",
```

```
  "EAQ-22_15", "EAQ-22_16", "EAQ-22_17", "EAQ-22_18", "EAQ-22_19", "EAQ-22_20",
```

```
  "EAQ-22_21",
```

```
  "EAQ-22_22", "GAD-7_1", "GAD-7_2", "GAD-7_3", "GAD-7_4", "GAD-7_5", "GAD-7_6",
```

```
  "GAD-7_7",
```

```
  "Q62", "Q63_1", "Q63_2", "Q63_3", "Q63_4", "Q63_5", "Q63_6", "Q63_7", "Q63_8",
```

```
  "Q63_9",
```

```
  "Q64_1", "Q64_2", "Q64_3", "Q64_4", "Q64_5", "Q64_6", "Q68_1", "Q68_2", "Q68_3")
```

```
data_cleaned1 <- data_cleaned[, columns_to_keep]
```

```
#calculate descriptives
```

```
#gender
```

```

gender_summary <- data_cleaned1 %>%
  group_by(Geschlecht) %>%
  summarise(count = n())
#age
data_cleaned1$Alter <- as.numeric(as.character(data_cleaned1$Alter))
mean_age <- mean(data_cleaned1$Alter, na.rm = TRUE)
sd_age <- sd(data_cleaned1$Alter, na.rm = TRUE)
min_age <- min(data_cleaned1$Alter, na.rm = TRUE)
max_age <- max(data_cleaned1$Alter, na.rm = TRUE)
cat("Mean Age:", mean_age, "\n")
cat("Standard Deviation of Age:", sd_age, "\n")
cat("Age Range:", min_age, "-", max_age, "\n")
#level of education
education_summary <- data_cleaned1 %>%
  group_by(Bildungsabschluss) %>%
  summarise(count = n())
#nationality
nationality_summary <- data_cleaned1 %>%
  group_by(nationality) %>%
  summarise(count = n())
#eco-anxiety (EAQ-22), factor 1 and factor 2
eqq_columns <- c("EAQ-22_1", "EAQ-22_2", "EAQ-22_3", "EAQ-22_4", "EAQ-22_5",
  "EAQ-22_6", "EAQ-22_7", "EAQ-22_8", "EAQ-22_9", "EAQ-22_10",
  "EAQ-22_11", "EAQ-22_12", "EAQ-22_13", "EAQ-22_14", "EAQ-22_15",
  "EAQ-22_16", "EAQ-22_17", "EAQ-22_18", "EAQ-22_19", "EAQ-22_20",
  "EAQ-22_21", "EAQ-22_22")
data_cleaned1[eqq_columns] <- lapply(data_cleaned1[eqq_columns], function(x)
  as.numeric(as.character(x)))
factor_1_items <- c("EAQ-22_1", "EAQ-22_2", "EAQ-22_4", "EAQ-22_6", "EAQ-22_7",
  "EAQ-22_9", "EAQ-22_11", "EAQ-22_12", "EAQ-22_14", "EAQ-22_15",
  "EAQ-22_17", "EAQ-22_19", "EAQ-22_20")
factor_2_items <- c("EAQ-22_3", "EAQ-22_5", "EAQ-22_8", "EAQ-22_10", "EAQ-22_13",
  "EAQ-22_16", "EAQ-22_18", "EAQ-22_21", "EAQ-22_22")

eqq_descriptives <- data.frame(
  Item = eqq_columns,
  Mean = sapply(data_cleaned1[eqq_columns], mean, na.rm = TRUE),
  SD = sapply(data_cleaned1[eqq_columns], sd, na.rm = TRUE),
  Min = sapply(data_cleaned1[eqq_columns], min, na.rm = TRUE),
  Max = sapply(data_cleaned1[eqq_columns], max, na.rm = TRUE))

```

```

data_cleaned1$EcoAnxiety_Total <- rowSums(data_cleaned1[eq_columns], na.rm = TRUE)
data_cleaned1$EcoAnxiety_Mean <- data_cleaned1$EcoAnxiety_Total / length(eq_columns)
#mean score all items
data_cleaned1$Factor_1_Total <- rowSums(data_cleaned1[factor_1_items], na.rm = TRUE)
data_cleaned1$Factor_1_Mean <- data_cleaned1$Factor_1_Total / length(factor_1_items)
#mean score factor 1
data_cleaned1$Factor_2_Total <- rowSums(data_cleaned1[factor_2_items], na.rm = TRUE)
data_cleaned1$Factor_2_Mean <- data_cleaned1$Factor_2_Total / length(factor_2_items)
#mean score factor 2

```

```

eco_anxiety_summary <- data.frame(
  Measure = c("EcoAnxiety_Mean", "Factor_1_Mean", "Factor_2_Mean"),
  Mean = c(mean(data_cleaned1$EcoAnxiety_Mean, na.rm = TRUE),
           mean(data_cleaned1$Factor_1_Mean, na.rm = TRUE),
           mean(data_cleaned1$Factor_2_Mean, na.rm = TRUE)),
  SD = c(sd(data_cleaned1$EcoAnxiety_Mean, na.rm = TRUE),
         sd(data_cleaned1$Factor_1_Mean, na.rm = TRUE),
         sd(data_cleaned1$Factor_2_Mean, na.rm = TRUE)),
  Min = c(min(data_cleaned1$EcoAnxiety_Mean, na.rm = TRUE),
          min(data_cleaned1$Factor_1_Mean, na.rm = TRUE),
          min(data_cleaned1$Factor_2_Mean, na.rm = TRUE)),
  Max = c(max(data_cleaned1$EcoAnxiety_Mean, na.rm = TRUE),
          max(data_cleaned1$Factor_1_Mean, na.rm = TRUE),
          max(data_cleaned1$Factor_2_Mean, na.rm = TRUE)))

```

```

cat("\nDescriptives for Mean Scores:\n")
print(eco_anxiety_summary)

```

```
#GAD-7
```

```

gad_columns <- c("GAD-7_1", "GAD-7_2", "GAD-7_3", "GAD-7_4", "GAD-7_5", "GAD-7_6", "GAD-7_7")
data_cleaned1[gad_columns] <- lapply(data_cleaned1[gad_columns], function(x)
  as.numeric(as.character(x)))
data_cleaned1$GAD7_Total <- rowSums(data_cleaned1[gad_columns], na.rm = TRUE)
data_cleaned1$GAD7_Mean <- data_cleaned1$GAD7_Total / length(gad_columns)
gad7_summary <- data.frame(
  Measure = c("GAD7_Mean (average per item)"),
  Mean = c(mean(data_cleaned1$GAD7_Mean, na.rm = TRUE)),
  SD = c(sd(data_cleaned1$GAD7_Mean, na.rm = TRUE)),
  Min = c(min(data_cleaned1$GAD7_Mean, na.rm = TRUE)),

```

```

Max = c(max(data_cleaned1$GAD7_Mean, na.rm = TRUE)))
print(gad7_summary)

#Media exposure (MECAMH)
columns_to_numeric <- c("Q62", "Q63_1", "Q63_2", "Q63_3", "Q63_4", "Q63_5", "Q63_6",
                        "Q63_7", "Q63_8", "Q63_9", "Q64_1", "Q64_2", "Q64_3", "Q64_4",
                        "Q64_5", "Q64_6", "Q68_1", "Q68_2", "Q68_3")
data_cleaned1[columns_to_numeric] <- lapply(data_cleaned1[columns_to_numeric], function(x)
as.numeric(as.character(x)))

#reverse code
data_cleaned1$Q68_1 <- 7 - data_cleaned1$Q68_1
data_cleaned1$Q68_3 <- 7 - data_cleaned1$Q68_3
columns_to_reverse <- c("Q63_1", "Q63_2", "Q63_3", "Q63_4", "Q63_5", "Q63_6",
                        "Q63_7", "Q63_8", "Q63_9", "Q64_1", "Q64_2", "Q64_3",
                        "Q64_4", "Q64_5", "Q64_6")
data_cleaned1[columns_to_reverse] <- 10 - data_cleaned1[columns_to_reverse]

descriptives_individual <- data.frame(
  Column = columns_to_numeric,
  Mean = sapply(data_cleaned1[columns_to_numeric], function(x) mean(x, na.rm = TRUE)),
  SD = sapply(data_cleaned1[columns_to_numeric], function(x) sd(x, na.rm = TRUE)),
  Min = sapply(data_cleaned1[columns_to_numeric], function(x) min(x, na.rm = TRUE)),
  Max = sapply(data_cleaned1[columns_to_numeric], function(x) max(x, na.rm = TRUE)))

q68_columns <- c("Q68_1", "Q68_2", "Q68_3")
data_cleaned1$Q68_Combined <- rowMeans(data_cleaned1[q68_columns], na.rm = TRUE)

descriptives_q68 <- data.frame(
  Measure = "Q68_Combined",
  Mean = mean(data_cleaned1$Q68_Combined, na.rm = TRUE),
  SD = sd(data_cleaned1$Q68_Combined, na.rm = TRUE),
  Min = min(data_cleaned1$Q68_Combined, na.rm = TRUE),
  Max = max(data_cleaned1$Q68_Combined, na.rm = TRUE))

q63_columns <- c("Q63_1", "Q63_2", "Q63_3", "Q63_4", "Q63_5", "Q63_6", "Q63_7",
                "Q63_8", "Q63_9")
data_cleaned1$Q63_Combined <- rowMeans(data_cleaned1[q63_columns], na.rm = TRUE)

descriptives_q63 <- data.frame(

```

```

Measure = "Q63_Combined",
Mean = mean(data_cleaned1$Q63_Combined, na.rm = TRUE),
SD = sd(data_cleaned1$Q63_Combined, na.rm = TRUE),
Min = min(data_cleaned1$Q63_Combined, na.rm = TRUE),
Max = max(data_cleaned1$Q63_Combined, na.rm = TRUE))

```

```

q64_columns <- c("Q64_1", "Q64_2", "Q64_3", "Q64_4", "Q64_5", "Q64_6")
data_cleaned1$Q64_Combined <- rowMeans(data_cleaned1[q64_columns], na.rm = TRUE)

```

```

descriptives_q64 <- data.frame(
  Measure = "Q64_Combined",
  Mean = mean(data_cleaned1$Q64_Combined, na.rm = TRUE),
  SD = sd(data_cleaned1$Q64_Combined, na.rm = TRUE),
  Min = min(data_cleaned1$Q64_Combined, na.rm = TRUE),
  Max = max(data_cleaned1$Q64_Combined, na.rm = TRUE))

```

```

#give output
cat("Descriptive Statistics for Individual Columns:\n")
print(descriptives_individual)

```

```

cat("\nDescriptive Statistics for Q68 Combined:\n")
print(descriptives_q68)

```

```

cat("\nDescriptive Statistics for Q63 Combined:\n")
print(descriptives_q63)

```

```

cat("\nDescriptive Statistics for Q64 Combined:\n")
print(descriptives_q64)

```

```

#check for assumptions

```

```

# calculate means

```

```

eco_anxiety <- rowMeans(data_cleaned1[, c("EAQ-22_1", "EAQ-22_2", "EAQ-22_3", "EAQ-
22_4", "EAQ-22_5",
                                     "EAQ-22_6", "EAQ-22_7", "EAQ-22_8", "EAQ-22_9", "EAQ-
22_10",
                                     "EAQ-22_11", "EAQ-22_12", "EAQ-22_13", "EAQ-22_14", "EAQ-
22_15",

```

```

"EAQ-22_16", "EAQ-22_17", "EAQ-22_18", "EAQ-22_19", "EAQ-
22_20",
"EAQ-22_21", "EAQ-22_22"))))

media_exposure <- rowMeans(data_cleaned1[, c("Q63_1", "Q63_2", "Q63_3", "Q63_4",
"Q63_5",
"Q63_6", "Q63_7", "Q63_8", "Q63_9"))

general_anxiety <- rowMeans(data_cleaned1[, c("GAD-7_1", "GAD-7_2", "GAD-7_3", "GAD-
7_4",
"GAD-7_5", "GAD-7_6", "GAD-7_7"))

# EAQ-22 factors means
factor1 <- rowMeans(data_cleaned1[, c("EAQ-22_1", "EAQ-22_2", "EAQ-22_4", "EAQ-22_6",
"EAQ-22_7",
"EAQ-22_9", "EAQ-22_11", "EAQ-22_12", "EAQ-22_14", "EAQ-
22_15",
"EAQ-22_17", "EAQ-22_19", "EAQ-22_20"))

factor2 <- rowMeans(data_cleaned1[, c("EAQ-22_3", "EAQ-22_5", "EAQ-22_8", "EAQ-
22_10", "EAQ-22_13",
"EAQ-22_16", "EAQ-22_18", "EAQ-22_21", "EAQ-22_22"))

# z-scores
eco_anxiety_z <- scale(eco_anxiety)
media_exposure_z <- scale(media_exposure)
general_anxiety_z <- scale(general_anxiety)
factor1_z <- scale(factor1)
factor2_z <- scale(factor2)

# Linear regression
model3 <- lm(media_exposure_z ~ general_anxiety_z, data = data_cleaned1)
model1 <- lm(eco_anxiety_z ~ general_anxiety_z, data = data.frame(eco_anxiety_z,
general_anxiety_z))
model2 <- lm(eco_anxiety_z ~ media_exposure_z, data = data.frame(eco_anxiety_z,
media_exposure_z))

#moderation
interaction <- general_anxiety_z * media_exposure_z
moderation_model <- lm(eco_anxiety_z ~ general_anxiety_z * media_exposure_z,

```

```

    data = data.frame(eco_anxiety_z, general_anxiety_z, media_exposure_z,
interaction))

#h2 assumption testing
general_anxiety <- rowMeans(data_cleaned1[, c("GAD-7_1", "GAD-7_2", "GAD-7_3", "GAD-
7_4", "GAD-7_5", "GAD-7_6", "GAD-7_7")])
media_exposure <- rowMeans(data_cleaned1[, c("Q63_1", "Q63_2", "Q63_3", "Q63_4",
"Q63_5", "Q63_6", "Q63_7", "Q63_8", "Q63_9")])
data_h2 <- data.frame(general_anxiety, media_exposure)
model_h2 <- lm(media_exposure ~ general_anxiety, data = data_h2)
residuals_h2 <- residuals(model_h2)
#hsapiro-wilk
shapiro_test_h2 <- shapiro.test(residuals_h2)
print(shapiro_test_h2)
#breuschpegan
bp_test_h2 <- bptest(model_h2)
print(bp_test_h2)
#durbin watson
dw_test_h2 <- durbinWatsonTest(model_h2)
print(dw_test_h2)

summary(model_h2)

# logarhythmic transformation of media exposure
data_h2$log_media_exposure <- log(data_h2$media_exposure)
model_h2_log <- lm(log_media_exposure ~ general_anxiety, data = data_h2)

#shapiro-wilk with transformed variable
shapiro_test_h2_log <- shapiro.test(residuals(model_h2_log))
print(shapiro_test_h2_log)
#summary of model
summary(model_h2_log)

# Shapiro-Wilk Test

shapiro_test1 <- shapiro.test(residuals(model1))
shapiro_test2 <- shapiro.test(residuals(model2))
shapiro_test3 <- shapiro.test(residuals(model3))
shapiro_test_mod <- shapiro.test(residuals(moderation_model))

```



```

cat("Shapiro-Wilk Test p-Wert (Model 1):", shapiro_test1$p.value, "\n")
cat("Shapiro-Wilk Test p-Wert (Model 2):", shapiro_test2$p.value, "\n")
cat("Shapiro-Wilk Test p-Wert (Model 3):", shapiro_test3$p.value, "\n")
cat("Shapiro-Wilk Test p-Wert (Moderation Model):", shapiro_test_mod$p.value, "\n")

#Breusch-Pagan Test
bp_test1 <- bptest(model1)
bp_test2 <- bptest(model2)
bp_test_mod <- bptest(moderation_model)

cat("Breusch-Pagan Test p-Wert (Model 1):", bp_test1$p.value, "\n")
cat("Breusch-Pagan Test p-Wert (Model 2):", bp_test2$p.value, "\n")
cat("Breusch-Pagan Test p-Wert (Moderation Model):", bp_test_mod$p.value, "\n")

# VIF (Variance inflation factor)
vif_model <- vif(moderation_model)
cat("VIF (Moderation Model):\n")
print(vif_model)

#Durbin-Watson test
dw_test_model1 <- durbinWatsonTest(model1)
dw_test_model2 <- durbinWatsonTest(model2)
dw_test_mod <- durbinWatsonTest(moderation_model)

print(dw_test_model1)
print(dw_test_model2)
print(dw_test_mod)

#hypothesis testing
#testing hypothesis 1: General anxiety is positively related to eco-anxiety levels among German
and Dutch individuals.
gad_columns <- c("GAD-7_1", "GAD-7_2", "GAD-7_3", "GAD-7_4", "GAD-7_5", "GAD-
7_6", "GAD-7_7")
data_cleaned1$GAD7_Mean <- rowMeans(data_cleaned1[gad_columns], na.rm = TRUE)
eqq_columns <- c(
  "EAQ-22_1", "EAQ-22_2", "EAQ-22_3", "EAQ-22_4", "EAQ-22_5", "EAQ-22_6",
  "EAQ-22_7", "EAQ-22_8", "EAQ-22_9", "EAQ-22_10", "EAQ-22_11", "EAQ-22_12",
  "EAQ-22_13", "EAQ-22_14", "EAQ-22_15", "EAQ-22_16", "EAQ-22_17", "EAQ-22_19",
  "EAQ-22_20", "EAQ-22_21", "EAQ-22_22")

```

```

data_cleaned1$EAQ22_Mean <- rowMeans(data_cleaned1[eqq_columns], na.rm = TRUE)

data_cleaned1$GAD7_Standardized <- scale(data_cleaned1$GAD7_Mean, center = TRUE,
scale = TRUE)
data_cleaned1$EAQ22_Standardized <- scale(data_cleaned1$EAQ22_Mean, center = TRUE,
scale = TRUE)

lm_model_standardized <- lm(EAQ22_Standardized ~ GAD7_Standardized, data =
data_cleaned1)
summary(lm_model_standardized)

# Visualization
ggplot(data_cleaned1, aes(x = GAD7_Standardized, y = EAQ22_Standardized)) +
  geom_point() +
  geom_smooth(method = "lm", color = "red") +
  labs(
    title = "Relationship Between General Anxiety and Eco-Anxiety",
    x = "GAD-7 (Z-score)",
    y = "EAQ-22 (Z-score)")
#hypotesis 2 :D

Q63_columns <- c("Q63_1", "Q63_2", "Q63_3", "Q63_4", "Q63_5", "Q63_6", "Q63_7",
"Q63_8", "Q63_9")
data_cleaned1$Q63_Mean <- rowMeans(data_cleaned1[Q63_columns], na.rm = TRUE)

data_cleaned1$general_anxiety_z <- scale(data_cleaned1$GAD7_Mean, center = TRUE, scale =
TRUE)
data_cleaned1$media_consumption_z <- scale(data_cleaned1$Q63_Mean, center = TRUE, scale
= TRUE)

# Conduct linear regression
lm_media_consumption <- lm(media_consumption_z ~ general_anxiety_z, data =
data_cleaned1)

# Summary of the regression model
summary(lm_media_consumption)

#hypothesis 3

```

```

data_cleaned1$Q63_Standardized <- scale(data_cleaned1$Q63_Mean, center = TRUE, scale =
TRUE)
model_media_exposure <- lm(EAQ22_Standardized ~ Q63_Standardized, data = data_cleaned1)

summary(model_media_exposure)

# visualization
ggplot(data_cleaned1, aes(x = Q63_Standardized, y = EAQ22_Standardized)) +
  geom_point(color = "blue") +
  geom_smooth(method = "lm", color = "red", se = FALSE) +
  labs(title = "Relationship Between Media Exposure and Eco-anxiety",
       x = "Media Exposure (Z-score)",
       y = "Eco-Anxiety (Z-score)") +
  theme_minimal()

#hypothesis 4
#ecoanxietymoderation

summary(moderation_model)

#factor 1 and 2 eco-anxiety moderation

factor1_columns <- c("EAQ-22_1", "EAQ-22_2", "EAQ-22_4", "EAQ-22_6", "EAQ-22_7",
                    "EAQ-22_9", "EAQ-22_11", "EAQ-22_12", "EAQ-22_14", "EAQ-22_15",
                    "EAQ-22_17", "EAQ-22_19", "EAQ-22_20")
data_cleaned1$factor1_Mean <- rowMeans(data_cleaned1[factor1_columns], na.rm = TRUE)

factor2_columns <- c("EAQ-22_3", "EAQ-22_5", "EAQ-22_8", "EAQ-22_10", "EAQ-22_13",
                    "EAQ-22_16", "EAQ-22_18", "EAQ-22_21", "EAQ-22_22")
data_cleaned1$factor2_Mean <- rowMeans(data_cleaned1[factor2_columns], na.rm = TRUE)

data_cleaned1$eco_anxiety_factor1_z <- scale(data_cleaned1$factor1_Mean, center = TRUE,
scale = TRUE)
data_cleaned1$eco_anxiety_factor2_z <- scale(data_cleaned1$factor2_Mean, center = TRUE,
scale = TRUE)

data_cleaned1$general_anxiety_z <- scale(data_cleaned1$GAD7_Mean, center = TRUE, scale =
TRUE)

```

```
data_cleaned1$media_exposure_z <- scale(data_cleaned1$Q63_Mean, center = TRUE, scale = TRUE)
```

```
# moderation analysis factor1
```

```
mod_factor1 <- lm(eco_anxiety_factor1_z ~ general_anxiety_z * media_exposure_z, data = data_cleaned1)
```

```
summary(mod_factor1)
```

```
#Moderation analysis Factor 2
```

```
mod_factor2 <- lm(eco_anxiety_factor2_z ~ general_anxiety_z * media_exposure_z, data = data_cleaned1)
```

```
summary(mod_factor2)
```

Appendix G

Assumption testing

Assumption	Test	Hypothesis 1	Hypothesis 2	Hypothesis 3	Hypothesis 4	Indication
Normality of residuals	Shapiro-Wilk test	p = 0.63	p < .001	p = 0.14	p = 0.928	Residuals are normally distributed (p > 0.05)
Homoscedasticity	Breusch-Pagan test	p = 0.9	p = 0.84	p = 0.65	p = 0.8	No heteroscedasticity (p > 0.05)
Multicollinearity	Variance inflation factor (VIF)				General anxiety: 1.12, Media exposure: 1.01, Interaction: 1.12	No multicollinearity (VIF scores < 10)
Independence of residuals	Durbin Watson Test	D-W = 2.15, p = 0.39	D-W = 1.94, p = 0.79	D-W = 2.02, p = 0.94	D-W = 2.11, p = 0.6	Residuals are independent (p > 0.05)