Exploring the Gender Dimension: Social Support, Doom-Scrolling, and Anxiety in Climate Change Discourse

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Abstract

Introduction: The interplay between climate change, a 21st-century issue of significant scholarly interest, and extensive news consumption, particularly through doom scrolling and mental health concerns such as anxiety has been established. Doom scrolling involves the compulsive consumption of negative news. Recognizing the significance of perceived social support in these dynamics, the current study integrates these insights to examine the influence of doomscrolling on mental health within the climate change context and exploring a buffering effect of the role of social support and gender.

Methods: 185 participants took part in an online survey investigating the relationship between heightened doom-scrolling on climate change and increased anxiety symptoms. The study hypothesized that perceived social support, moderated by gender, would influence this relationship. The scales 'Hamilton anxiety scale' to measure anxiety symptoms, the Doom-scrolling scale as well as the Doom-scrolling climate change scale to measure Doom-scrolling in general as well as in relation to climate change-related topics, and the F-SozU K-6 to measure Perceived social support were used for the various constructs. For the data analysis simple moderation and Moderated Moderation Analysis techniques with the PROCESS macro tool, aiming to reveal the intricate interplay of variables for a comprehensive understanding were used.

Results: Doom-scrolling about climate change-related topics positively explained anxiety symptoms (b= .23, SE = .52, t = 4.38, $p < .001$). Further, doom-scrolling also positively predicted anxiety symptoms (b=.25, SE = .03, t = 7.74, $p < .001$). Introducing perceived social support as a moderator strengthened the negative relationship between doom-scrolling on climate change topics (b = -.181, p = .016) and general doom-scrolling (b = -.15, p < .001), which are the independent variables on the dependent variable anxiety. Consistently across gender conditions, both males and females exhibited the same effect of perceived social support regarding doom-scrolling about climate change-related topics (b= .036, SE = .03, t = 1.42, p = .16). A similar effect was observed in doom-scrolling (b= .026, SE = .014, t = 1.82, p =.07).

Discussion: The results between general doom-scrolling and its climate change-related variant on anxiety symptoms are in line with the hypotheses and suggest a consistent psychological impact beyond COVID-19. However, the study's potential gender skew, with more female participants, may affect generalizability. Future research with a more balanced gender representation is crucial. Next to that, the study is limited culturally due to the

predominant sample of German and Dutch participants. Furthermore, the study's exploration beyond the COVID-19 context underscores the need for diversified research to understand doom-scrolling's implications across various domains.

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Introduction

Climate change, recognized as one of the most pressing issues of the 21st century, has garnered significant scholarly attention regarding its societal and individual implications (Intergovernmental Panel on Climate, 2022). The increasing frequency of climate change events amplifies its impact on various levels. The public interest in this subject can be partly attributed to the widespread adoption of media platforms, as evidenced by a substantial 90% surge in media coverage since 2015 (Boykoff, 2022; Watts et al., 2021). Moreover, the dissemination of climate change-related information has witnessed significant expansion within social media networks, with approximately 40% of users reporting encounters with climate change-related posts on at least one occasion (Statista, 2022).

1.1 Climate change and its consequences

Due to the higher frequency of climate change-related events and therefore a higher frequency of mentions in media, the attention and concern related to climate change-related topics have been increasing during the last years. In a survey involving nearly 77,000 Facebook users across 31 countries, the majority expressed varying degrees of worry about climate change (Leiserowitz et al., 2021). As the negative consequences of climate change will primarily affect people in the future, the number of individuals experiencing psychological distress related to the climate crisis continues to rise (Ojala et al., 2021; Pihkala, 2020). Fritze and colleagues (2008) suggest that people's mental health is more significantly affected when they directly experience the consequences of climate change, rather than when they learn about it through the media. Furthermore, it is essential to consider the immediate social, economic, and environmental consequences of climate change.

Climate change has social, economic, and environmental consequences. On a social level, climate change can highlight social inequalities and lead to increased vulnerability among lower-income communities (Hayes et al., 2019). Extreme weather events such as hurricanes, floods, and droughts affect populations who have a disadvantage, leading to loss of livelihoods and threats to personal safety (Hayes et al., 2019).

On an economic level, the impacts of climate change are significant. Extreme weather events can result in extensive damage to infrastructure, agriculture, and property, leading to costly repairs and reconstruction (Ciscar et al., 2010). Industries such as agriculture, tourism, and fishing can be severely affected, resulting in job losses and reduced economic productivity (Ciscar et al., 2010). Additionally, increased healthcare costs due to climate-related health issues further strain economies.

The environmental risks of climate change are disrupting ecosystems and have far-reaching environmental consequences. Rising global temperatures contribute to the melting of glaciers and polar ice caps, leading to sea-level rise (Ciscar et al., 2010). This, in turn, threatens coastal areas, increasing the risk of flooding. Temperature changes can impact biodiversity, leading to shifts in ecosystems and the potential loss of species (Ciscar et al., 2010).

1.2 Climate change and its consequences on Mental Health

For acute events, evidence has been found that there is a direct effect of being exposed to events and increased levels of anxiety, mood disorders, stress, sleep disruption, suicide/suicide ideation, and posttraumatic stress disorder (PTSD) (Palinkas & Wong, 2020). Furthermore, people with low social support are more likely to be affected by those effects when facing negative events related to direct climate change-related news. When facing news about long-term changes, the topic of uncertainty becomes evident (Cianconi, 2020). When being uncertain which climate-change events will happen in the near or late future, increases the likelihood of anxiety symptoms, sleep disturbances, depressive symptoms, post-traumatic stress and suicidal thoughts. Those effects can already be present before an extreme event but are increasing after being exposed to it (Cianconi, 2020). Evidence is found about possible relationships between climate change and depression, anxiety, posttraumatic stress disorder (PTSD), suicidal ideation, and substance abuse (Cianconi et al., 2020). Developing mental health issues depends on individual differences. The relationship between climate change and anxiety has been a prominent topic in scientific literature.

In total, 49% of people living in the affected area of Hurricane Katrina developed an anxiety or mood disorder, even though they were not impacted directly (Manning & Clayton, 2018). Palinkas & Wong (2020) differentiate between several types of climate change-related events when discussing its impact on mental health. Namely, acute events such as hurricanes and floods, long-term changes such as drought, and the existential threat of long-lasting changes, such as high temperatures.

A new term has been coined to provide a more specific focus in this area: 'Climate anxiety', also known as 'eco-anxiety'. It refers to the emotional burden arising from environmental concerns that are perceived as potential threats (Pihkala, 2020). Climate anxiety can have wide-ranging effects on individuals' health, affecting both physical and psychological aspects. On the other hand, from a mental health perspective, climate change can contribute to depression, stress, anxiety, complicated grief, substance abuse, loss of

personal identity, and feelings of helplessness (Pihkala, 2020; Reser & Bradley, 2020). In addition to its impact on individuals, climate change also has significant social implications. It can exacerbate economic inequality, restrict access to healthcare, and weaken social cohesion (Pihkala, 2020, Satici et al., 2020). Taken together, these findings highlight the potential of climate change to induce threatening physical and psychological states in affected individuals. Not only directly affected people can potentially develop those symptoms, but the climate change-related news which are mostly negative can affect the psychological state of an individual.

1.3 Exposure to negative climate change-related news

A particularly interesting topic is exposure to social media, especially for young people as they spend more time on their smartphones and social media than on watching television (Stefanone et al., 2010). Authors such as Boykoff (2012) clarify, that there was a shift from searching news on traditional media to social media already in 2012. Stokols et al. (2009) indicate that exposure to environmental information through media can decrease well-being, although the evidence on this topic is mixed (Fernández-Llamazares et al., 2015). The level of attention paid to negative information plays a crucial role, with higher attention linked to negative well-being outcomes (Drew & Weaver, 1990). Additionally, social media algorithms contribute to the perpetuation of doom scrolling by showing more engaging or alarming content based on user interactions such as commenting, liking, and spending more time on specific content (Buchanan et al., 2021). Extensive media exposure can, based on individual differences and coping abilities, lead to doom-scrolling behavior (Satici et al., 2022; Ytre-Arne & Moe, 2021). When people are exposed to anxiety-provoking situations, they often excessively focus on the perceived threat, which can further contribute to the phenomenon of doom scrolling (Leiserowitz et al., 2021).

Some factors can be identified which either decrease or increase the likelihood of developing anxiety symptoms when facing negative news about climate change topics. Other factors that play a role in climate anxiety include coping ability, subjective interest in climate-change related topics, the amount of attention paid to the news, personality traits, fear of missing out (FOMO), social media addiction, and time spent on social media (Satici et al., 2020). Concluding, environmental stressors, challenges such as climate change and exposure to this negative news can be very distressing for individuals, as well as evoke anxiety symptoms.

1.4 Doom Scrolling

According to Statista (2022), most of the climate change-related news are negative. The exposure to adverse news poses significant challenges for individuals, particularly within the context of the COVID-19 pandemic spanning from 2019 to 2022. Research investigating the effects of negative news consumption via television has revealed a correlation between exposure to negative news and a decline in mental well-being (Boukes & Vliegenthart, 2017; Villi et al., 2021).

Doom-scrolling, an iterative and compulsive behavioural pattern, entails incessantly scrolling through negative or distressing news content across various platforms, such as social media and online news websites (Satici et al., 2022; Sharma et al., 2022). Doom-scrolling on social media, as opposed to actively searching for information on the internet where users can naturally conclude their search upon finding sufficient information, results in a greater time expenditure (Sharma et al., 2022).

1.5 Factors leading to doom-scrolling behaviour

Doom-scrolling is driven by factors such as discomfort in uncertain situations, a need for control, and a desire to bridge information gaps (Satici et al., 2022; Sharma et al., 2022; Anand et al., 2021). Neuroticism is positively linked to this behavior (Sharma et al., 2022). The constant influx of information on digital platforms, guided by sophisticated algorithms, contributes to the cycle of endless scrolling (Satici et al., 2022). This extreme form of scrolling, aimed at staying updated, may lead to heightened anxiety and stress, raising concerns about its impact on mental health (Anand et al., 2021; Kormelink & Gunnewiek, 2021).

Notably, its characteristics can be likened to the continuous 24/7 news coverage provided by television networks (Ytre-Arne & Moe, 2021). The social media algorithm is designed in a way that captures the previous scrolling behaviour. That is the reason why a doom-scrolling session does not have a termination point where it naturally ends (Buchanan et al., 2021). Information is presented via the algorithm.

1.6 Doom-scrolling and Mental Health

The exposure to negative news already has an impact on the mental health status of an individual. Specifically, exposure causes uncertainty, stress, depressive symptoms and feelings of powerlessness (Cianconi et al., 2020). Doom-scrolling has been found to have significant implications for mental health and behaviour, as indicated by various studies.

Satici et al. (2022) have highlighted that engaging in doom scrolling is associated with decreased levels of overall well-being, life satisfaction, and a decreased sense of harmony in life. Additionally, Ytre-Arne and Moe (2021) have posited a correlation between doom scrolling and news avoidance. Their research suggests that news avoidance can be perceived as a coping mechanism in response to the overwhelming amount of information and emotional distress caused by doom scrolling. This behaviour can be compared to other anxiety disorders, such as phobias where people either avoid or pay overly attention to an object.

An example of the mental health consequences of doom-scrolling has been mentioned by different researchers during the COVID-19 pandemic. The virus was continuously present on several social media platforms, exposing nearly everyone to negative news about it, as it received the highest frequency of mentions (Price et al., 2022). The exposure alone already affected individuals, why people engaged in doom-scrolling behaviours to search for positive news in order to decrease their anxiety and fear. This led to a cycle of searching for news and being exposed to unpleasant emotions and stress and increases their anxiety instead of decreasing it (Anand et al., 2020).

Given the impact of doom-scrolling on mental well-being, as evidenced by Anand et al.'s (2020) study, it becomes crucial to consider its implications beyond the context of COVID-19. With pressing global issues such as climate change persistently requiring attention and action, the question arises: does engaging in doom-scrolling behavior concerning topics like climate change, replete with negative news, similarly exacerbate anxiety symptoms? This query prompts a broader exploration of the effects of doom-scrolling across various critical subjects. Further, as the exposure already has an effect on the mental health, it is expected that doom-scrolling will have a stronger effect. Next to that, some other variables can also influence the relationship. Bonnano and colleagues (2010) mention the importance of social support by people in the environment as a coping mechanism for news about environmental stressors as well as the event itself.

1.7 Social support

The impact of climate change on social relationships is not yet researched well enough (Manning & Clayton, 2018). Perceived social support refers to the act of offering aid or comfort to others in order to help them cope with physical, mental, or social challenges they may face. This kind of support can originate from any person within an individual's social circle, including family members, friends, neighbours, religious institutions, colleagues,

caregivers, or support groups. The assistance provided can take various forms, such as practical help in completing tasks or offering advice, direct material support like financial aid, or emotional support, which contributes to a sense of being valued, accepted, and understood (American Psychological Association, n.d.). Moreover, it is essential to note that perceived social support also encompasses the individual's perception of having such support available whenever it might be needed (Taylor, 2011). In other words, it not only involves the actual support provided but also the belief that individuals are willing to offer help when necessary. As previously highlighted, previous researchers indicate that participant with a research indicates that social support plays a significant role in mitigating the impact of exposure to climate change-related topics on various mental health issues, including anxiety (Cianconi et al., 2020). The question arises if social support also has a similar, stronger or weaker effect when doom-scrolling is involved.

1.8 Social support and Mental Health

Various forms of social support, particularly emotional help, impact mental health (Taylor, 2020). Communities facing extreme events exhibit greater resilience when tackling challenges together (Taylor, 2020). The literature consistently emphasizes the significance of social support in understanding mental health changes (Kilem et al., 2014). Perceived social support is linked to well-being in children and adolescents, reducing anxiety and feelings of isolation (Chu et al., 2010; Harandi et al., 2017). Positive social interactions lower anxiety symptoms, while negative interactions correlate with higher anxiety levels (DiNicola, 2013). However, the relationship between perceived social support and stress's impact on mental health varies across studies (Chao, 2012; Rodriguez et al., 2003; Shelton et al., 2017).

Negative news about climate change can influence social support, and those with higher anxiety symptoms may use less social support (Cianconi et al., 2020; Stout & Farooque, 2003). Post-disaster stressors negatively influence perceived social support, impacting mental health (Manning & Clayton, 2018). COVID-19 regulations affecting access to social support correlate with higher anxiety, depression, and stress (Villasanta et al., 2022). Social support can moderate the impact of climate change on anxiety (Manning & Clayton, 2018). There are several factors which strengthen the amount of social support, such as gender.

1.9 Gender differences in social support and anxiety

The assistance a person needs differs in various aspects. One example is the gender of an individual in regard to the social support needed to influence the mental health. Researchers have found that there are no gender differences in regard to the perceived social support (Fusilier, 1986; Zhang & Li, 2011). However, Milner et al. (2016) found, that especially women benefitted the most from actual higher social support when dealing with anxiety and depression, indicating that there is a difference between perceived social support and actual social support received. Therefore, different researchers found different results and more research is needed and be related to specific problems such as doom-scrolling, climate change and anxiety. Arnberg & Meli (2013) confirm these results, indicating that greater social support is available for women than for men.

A gender difference has been found in regard to anxiety. The prevalence and comorbidity of anxiety levels are higher in women and men, and there are approaches that take the gender into account when treating anxiety (Farhane-Medina, 2022). Further, according to some researchers, women tend to be more emotional and have less resilience in anxiety-provoking and stressful situations such as at the workplace, leading to anxiety symptoms (Farhane-Media, 2022). Next to that, women tend to be more prone to exposure to negative news especially at the COVID-19 pandemic and tend to believe the news which are presented faster, leading to severer anxiety symptoms (Lin, 2022).

1.10 Research question and research gap

Doom-scrolling about climate change-related topics is still at the beginning and most of the research has been conducted on COVID-19-related topics (YtreArne and Moe, 2021). Still, it is known that both exposure to negative news such as climate change as well as doom-scrolling behavior itself can have an effect on the Mental Health of an individual, such as anxiety. So far, no peer-reviewed paper has discussed the effects of doom-scrolling about climate change-related topics on the Mental Health of an individual.

Existing literature has shown the positive effect of social support on mental health and on exposure to negative events such as climate change. Further, social support is known to have a moderation effect in many mental health relationships. Existing literature does not emphasize the effect of social support on doom-scrolling or as a possible moderator in the relationship between doom-scrolling on mental health issues. In literature, contradictory results about the different gender perception of social support. Taking all this information into account, the following research question is formulated; *To what extent does gender moderate*

the relationship between the moderator social support on doom-scrolling about climate change related topics and anxiety symptoms? This research paper therefore fills the research gap of doom-scrolling in climate change-related topics on anxiety symptoms, and a possible moderation effect of perceived social support. The gender is included as additional variable, as contradictory results are found in literature regarding the perceived social support on anxiety. In order to answer the research question, the following hypotheses are investigated:

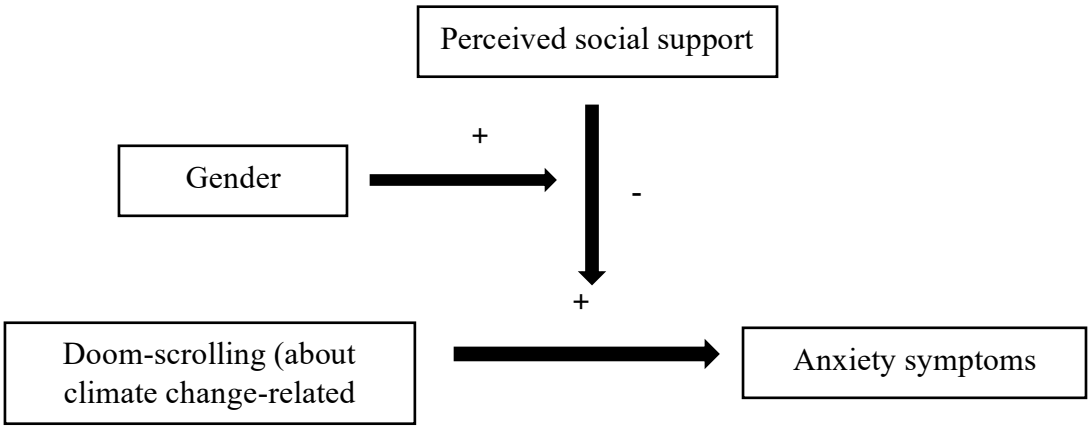
H1: *Doom-scrolling about climate change-related topics is associated with increased anxiety symptoms*. Specifically, it is expected that participants who doom-scroll more possess higher anxiety symptoms.

H2: *Higher perceived social support is linked to decreased anxiety symptoms in individuals who engage in doom-scrolling about climate change-related topics* Specifically, participants with a better perceived social support will have a weakener effect of doom-scrolling on anxiety symptoms.

H3: *The moderating effect of perceived social support on the relationship between doom-scrolling about climate change-related topics and anxiety symptoms is further moderated by gender*. It is predicted that females benefit from a stronger perceived social support compared to males.

Figure 1

Conceptual model hypotheses.



2. Methods

2.1 Participants

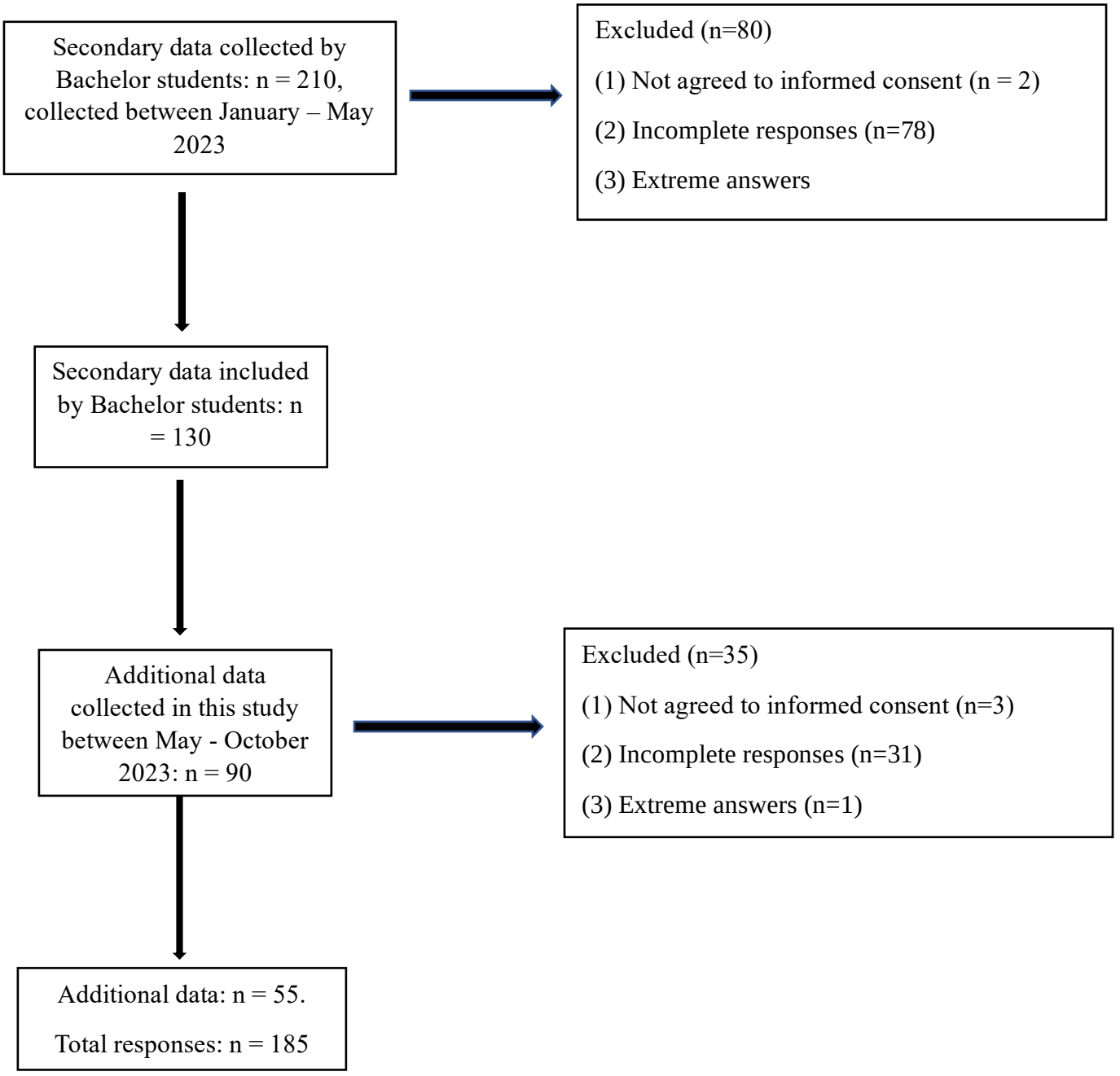
The participants in this study were selected using an opportunity/convenience sampling method. The inclusion criteria for participation were being over 18 years old.

Participants were excluded if they were under 18 years old and did not agree to the Informed Consent.

Recruitment efforts were focused on various channels such as SONA, Instagram, LinkedIn, Facebook and WhatsApp (Appendix A). Participants were invited to take part in the study through advertisements and announcements that provided information about the research objectives and requirements. Secondary data was included in the analysis, which was collected by Bachelor students with the same questionnaires, although different research questions (Apprich, 2023; Grossekemper, 2023; Hau, 2023; te Pas, 2023). The data was collected between January to May 2023.

Figure 2.

Study Flowchart.



2.2 Materials

The research question consisted of four variables. Namely, perceived social support, anxiety symptoms, gender, and doom-scrolling (about climate change-related topics). Some questionnaires were not used in the analysis, including the Coping Competence questionnaire (12 items) to measure resilience against helplessness and the Beck Depression Inventory (21 items) to measure depressive symptoms.

2.2.1 Anxiety symptoms

The Hamilton anxiety scale (13 items) was used to measure anxiety. On this questionnaire, the participants had to answer different anxiety symptoms questions such as ("Fears of dark, of strangers, of being left alone, of animals, of traffic, of crowds") on a scale of 0 indicating "not present" symptoms, and 4 "very severe" symptoms. The reliability as well as the convergent reliability were proven to be sufficient (Maier et al., 1988). The questions were asked on a self-report basis and covered both psychological and somatic symptoms. The items covered anxious mood, tension (startle response, fatigability, restlessness), fears (dark/strangers/crowds), insomnia, intellectual (poor memory, difficulty concentrating), depressed mood (including anhedonia), somatic symptoms (aches and pains, stiffness, bruxism), sensory (tinnitus, blurred vision), cardiovascular (tachycardia and palpitations), respiratory (chest tightness, choking), gastrointestinal (irritable bowel syndrome – type symptoms), genitourinary (urinary frequency, loss of libido) and autonomic (dry mouth, tension headache). According to Thompson (2015), <17 points of 52 was considered as mild anxiety, 18-24 mild/moderate severity whereas 25-30 was considered as moderate/severe anxiety.

2.2.2 Doom-scrolling

To measure doom-scrolling, a validated 15-item scale developed by Satici et al. (2022) was used, with proven reliability (Cronbach's alpha = .960) and validity. The questionnaire, tested on 500 participants of diverse nationalities, established the behavior's general prevalence. Convergent validity was confirmed by higher correlations with social media addiction and online vigilance concepts, though remaining below the .7 threshold.

Sharma et al. (2022) asserted that doom-scrolling, not exclusive to COVID-19 topics, was adequately captured by their scale. Participants responded to 15 Likert scale questions (1-7) indicating the extent of doom-scrolling behavior, with higher scores reflecting increased engagement.

2.2.3 Climate Change doom-scrolling scale

In order to answer the research question as specific as possible, a scale tailored to doom-scrolling about climate change-related topics scale had been developed (Apprich, 2023; Grossekemper, 2023; Hau, 2023; te Pas, 2023). The survey had been developed by student researchers during their Bachelor thesis at the University of Twente. The reliability was sufficiently graded by the researchers (α = .75), so laying over the cut-off point of Cronbach's alpha .7.

As in the general doom-scrolling scale, the participants had to answer 11 questions on a 7-point Likert scale, with 1 indicating "strongly disagree", and 7 "strongly agree". Items 3, 4 and 10 were coded reverse, and had to be changed for further analysis. Again, if participants scored higher, a higher amount of doom-scrolling in climate change related topics occurs. Items 3, 4 and 10 were coded in reverse (Appendix D).

2.2.4 Social support

F-SozU K-6 was a self-reported questionnaire comprising six items, designed to assess participants' perceived social support. Using a five-point Likert scale, ranging from "not true at all" to "very true" (Kliem et al., 2015), the questionnaire calculates scores by summing up responses for each question, yielding a total score. Higher scores reflected greater levels of perceived social support, while lower scores indicated lower levels.

The internal consistency of the scale, assessed through Cronbach's alpha (α = .90) in a German sample, demonstrated excellent reliability. Additionally, the factor loadings (.70 - .84) suggested meaningful item representation of the latent construct (Kliem et al., 2015). Lin and colleagues (2019) validated the scale cross-culturally, encompassing student samples from the United States, Russia, and China. Their research attested to psychometric properties across all samples.

2.3 Procedure

This study was approved by the BMS Ethics Committee of the University of Twente in May 2023, with the approval number (230202)**.** When participants decided to take part in the study, they were informed about the purpose, content, and data acquisition (Appendix B). Further, they received the information that the data is treated confidential, and all data was anonymized. After providing active informed consent about this information (Appendix C),

the guidelines and procedure of this study were provided and demographic questions like gender, age, and nationality were asked.

The order of the questionnaire was the following: doom-scrolling about climate change scale, doom-scrolling scale, F-SozU K-6, BDI, Hamilton anxiety scale, and Coping Competence questionnaire. At the end of the questionnaire, the participant was debriefed and thanked for participation, and the contact details of the researcher as well as the supervisors were provided.

2.4 Data Analysis

The software 'SPSS.27' (IBM Corp., 2019) was utilized for data analysis. Further, the 'PROCESS' package for SPSS was used following the guidelines of (Hayes, 2012). Initially, incomplete responses were excluded from further analysis, followed by the exclusion of extreme answers such as answering every question with the same points on the scale, such as 'not at all' whereas the rest of the participants scored higher. This was mainly done to prevent analysis distortion. Statistical measures such as means, and standard deviations were computed to detect any anomalies. Additionally, the data was assessed against four assumptions: linearity, independence, equality of variance, and normality. To examine normality, a histogram was generated to assess its bell-shaped and symmetric nature. Scatter plots were employed to examine irregularities for the remaining assumptions.

To investigate how many participants were needed in order to be statistically sufficient, a G*Power analysis was conducted (Faul et al., 2007). According to this, a minimum sample size of 81 participants was required (Appendix E). Since G*Power does not feature a specific option for moderated moderation analysis, an F-test with multiple predictors was selected as an alternative analysis method. The first part, after excluding data was, to conduct a basic statistical analysis to describe the sample. Additionally, descriptive statistics in comparison to the cut-off scores were described.

Additionally, each hypothesis underwent subdivision into two partial hypotheses. This division was necessary due to the thesis's central focus on the phenomenon Climate Change doomscrolling (CCD), necessitating separate investigations distinct from the phenomenon of doomscrolling (DS). It was noteworthy that DS was assessed using a validated instrument (the DSS), while CCD was appraised using items developed by the Bachelor students (CCD) (Apprich, 2023; Grossekemper, 2023; Hau, 2023; te Pas, 2023). To preserve the integrity of the DS and prevent compromise by merging it with the CCD, two distinct analyses were

conducted for each original hypothesis. Subsequent analyses were dedicated to testing hypotheses specifically related to CCD. The adapted hypotheses were:

H1-A: CCD increases anxiety symptoms.

H1-B: DS increases anxiety symptoms

H2-A: Perceived social support decreases the effect of CCD on anxiety symptoms.

H2-B: Perceived social support decreases the effect of DS on anxiety symptoms.

H3-A: The moderation effect of social support on the relationship between CCD and anxiety symptoms are stronger in females than in males.

H3-B: The moderation effect of social support on the relationship between DS and anxiety symptoms are stronger in females than in males.

The simple moderation effect analysis was conducted to answer when independent variables affect dependent variables (Hayes, 2013). Moderated moderation analysis, also known as higher-order moderation analysis, is a statistical technique used in the field of research, particularly in social sciences, to explore the interaction between two or more moderating variables. In a moderated moderation analysis, it is investigated how the strength or direction of the moderation effect itself is influenced by additional moderating variables. It essentially involves examining whether the moderating effect of one variable on the relationship between two other variables is dependent on different conditions. This analysis will reveal whether the impact of perceived social support on the relationship between doom-scrolling and anxiety symptoms is consistent across different genders or if there are variations.

2.4.1 Hypothesis 1

To test hypothesis H1-A and H2-B, a multiple linear regression model was employed, with ‘CCD’ and ‘DS’ as the independent, numeric variables, and ‘anxiety symptoms’ as the dependent numeric variable. The means of both variables were calculated. A significant effect of ‘CCD’ on ‘anxiety symptoms would support the acceptance of hypothesis H1-A, whereas a significant effect of ‘DS’ on ‘anxiety symptoms’ would support the acceptance of H1-B.

2.4.2 Hypothesis 2

To investigate hypotheses H2-A and H2-B, the study incorporated the numeric moderator variable 'perceived social support.' The mean of the total score of each participant for this variable was calculated. For H2-A, 'CCD' served as the independent numeric variable,

and 'anxiety symptoms' was the dependent numeric variable. Similarly, for H2-B, 'DS' was the independent numeric variable, and 'anxiety symptoms' remained the dependent numeric variable.

To explore moderation effects, the study utilized the PROCESS macro tool installed in SPSS, selecting 'model 1' for the analysis (Hayes, 2012). This ensured the conduct of a moderation analysis in SPSS. The incorporation of this macro tool facilitated a systematic examination of the relationships between variables and the identification of moderation effects. The analysis ran with model 3, 95 confidence intervals and 5000 bootstrap samples. Further, the specific options ‘Generate code for visualizing interactions’ for specific graphs, ‘mean centre for construction of products’ ‘the conditional value of -1SD, M, +1SD’ and the ‘Johnson-Neyman output’ was selected. To create the resulting graphs of the analysis, the code in the output ran in the Syntax. A significant moderation effect of 'perceived social support' would lend support to both hypotheses, offering valuable insights into the interplay between the independent variables ('CCD' and 'DS'), the moderator ('perceived social support'), and the dependent variable ('anxiety symptoms').

2.4.3 Hypothesis 3

To test hypothesis H3-A, the study incorporated the dichotomous moderator variable 'gender' in the analysis, with 'Male' coded as the reference group. 'CCD' was designated as the independent numeric variable, while 'anxiety symptoms' served as the dependent numeric variable. Following the approach used for H2, 'perceived social support' was employed as the moderator variable. It was anticipated that 'gender' would further moderate the effect of social support on the relationship between 'CCD' and 'anxiety symptoms.' To measure this effect, the study utilized the PROCESS macro tool developed by Hayes (2012), following the steps outlined in model 3. The corresponding Syntax was downloaded and executed in SPSS. In literature, the process of a ‘moderated moderation’ is also called ‘Conditional Process analysis’ (Hayes & Rockwood, 2020; Zhou et al., 2017). This analysis specifies, if and how the effect changes under different levels of perceived social support.

Similarly, the same procedure was conducted for H3-B, but ‘DS’ was used as the independent numeric variable. Acceptance of both hypotheses would be indicated by the presence of a significant gender difference on the moderator 'perceived social support.'

3. Results

3.1 Participants

In total, the sample of participants resulted in 185 participants, with an age range between 18 and 62, with a mean age of 26.34. Regarding the highest degree, 84 participants had a high school diploma that qualifies for university (Abitur, voorbereidend wetenschappelijk oderwijs), 73 participants had a Bachelor's degree, four had a Master's degree, seven possessed a Ph.D., one had less than a diploma and four people conveyed an alternative degree (for example a financial degree). The sample consisted of 113 Germans, 39 Dutch, and 35 held different nationalities. Among them, 61 identified as male, 123 identified as female, and one identified as non-binary/third gender.

3.2 Descriptive Statistics

The mean score on the doom-scrolling about climate change-related scale (DSCC) was 43.8 (SD = 10.1) in this sample, whereas the mean score on the doom-scrolling scale (DS) was 33.7 (SD = 14.7). The general level of anxiousness was rather low, with a mean of 21.9 (SD = .7.4), and a high mean level of social support. Specifically, the mean is 25.4 (SD = 5).

Table 1

Descriptives Doom-scrolling about climate change-related topics, Doom-scrolling Scale, Anxiety scale and Social Support

	M	SD
CCD	43.8	10.1
DS	33.7	14.7
HAM-A	21.9	7.4
F-SozU K-6	25.4	5.0

Note: M = Mean. SD = Standard Deviation. CCD = Climate change-related topics doom-scrolling. DS = Doom-scrolling. HAM-A = Hamilton anxiety scale. F-SozU K-6 = Social support scale.

According to Thompson (2015), >17 points of 52 was considered as no anxiety, 17 points as mild anxiety, 18-24 was considered as mild/moderate anxiety whereas 25-30 was considered as moderate/severe anxiety. According to this, 36 people were below the cut-off score of 17 and did not have anxiety symptoms (Table 2). 19 people had mild anxiety, 79 had mild/moderate anxiety symptoms and 51 people had moderate/severe anxiety symptoms.

Table 2

Descriptives anxiety symptoms total scores

	M	SD	No AS	Mild AS	Mild/ Moderate AS	Moderate/ severe AS	Min score	Max score
Anxiety symptoms	21.9	7.4	36	19	79	51	0	49

Note: M = Mean. SD = Standard Deviation. No AS = No anxiety symptoms, Score <17. No AS = No anxiety symptoms, Score = >17. Mild AS = Mild anxiety symptoms, Score = 17. Mild/Moderate AS = Mild/Moderate anxiety symptoms, Score = 18-24. Moderate/severe AS = Moderate/severe anxiety symptoms, score = 25-52. N = 185.

3.3 Assumptions

Additionally, it was essential to examine four key assumptions for the subsequent analysis. These assumptions pertained to the independence of residuals, equal variance of residuals, normality of residuals, and linearity. These criteria were evaluated taking the dependent variable, 'anxiety symptoms,', the moderator variable 'perceived social support' and the independent variable ‘doom-scrolling about climate change-related topics’ into account. To assess the independence of residuals, equal variance of residuals, and linearity, scatter plots were generated in SPSS and scrutinized for any deviations (Appendix J, Appendix K, Appendix L). For the normality assumption of residuals, a histogram was constructed and assessed for a symmetric, bell-shaped curve (Appendix F, Appendix G, Appendix H, Appendix I). Notably, all assumptions remained unviolated. With all four assumptions satisfied, no further analysis of assumptions is needed and the data analysis can proceed and be further examined.

3.4 The effect of doom-scrolling (about climate change-related topics) on anxiety

Doom-scrolling about climate change-related topics positively predicted anxiety symptoms (b= .23, SE = .52, t = 4.38, $p < .001$). Further, doom-scrolling also positively predicted anxiety (b=.25, SE = .03, t = 7.74, $p <.001$, suggesting that increased doom-scrolling (about climate change-related topics) correlates with heightened anxiety symptoms and supported the acceptance of hypotheses H1-A (Table 3) and H1-B (Table 4). Both, table 3 and table 4, are designed according to the conditional process model describe in the data analysis section (Hayes & Rockwood, 2020; Zhou et al., 2017).

3.5 Perceived social support as the first moderator variable

Upon introducing perceived social support as the first moderator variable, the relationship between doom-scrolling about climate change-related topics and anxiety was attenuated (b= -.181, SE = .01, t = -2.87, p = .016). The same effect occurs for doom-scrolling (b= -.15, SE = .06, t = -2.43, p < .001). Thus, hypotheses H2-A and H2-B are validated, meaning that participants were affected less by doom-scrolling on their anxiety symptoms when they had higher perceived social support.

Turning to the conditional analyses for H2-A, perceived social support had significant effects on the relationship between doom-scrolling about climate change-related topics on anxiety. Specifically, at -1sd (score = 22) in the conditional process analysis, indicating low social support, the relationship was positive and significant (b=.29, SE = .05, t = 5.59, p < .001). Similarly, at the mean on the centered social support variable (score = 27), the relationship remained positive and significant (b= .19, SE= .05, t = 3.69, p < .001). At +1sd (score = 30) on the social support variable, indicating high social support, the relationship was also positive and significant (b= .16, SE= .06, t = 2.72, p < .001). Additionally, the R-Square change of +.371 when adding the interaction effect of perceived social support further underscores the significant role of social support in the relationship (Figure 3, Table 3).

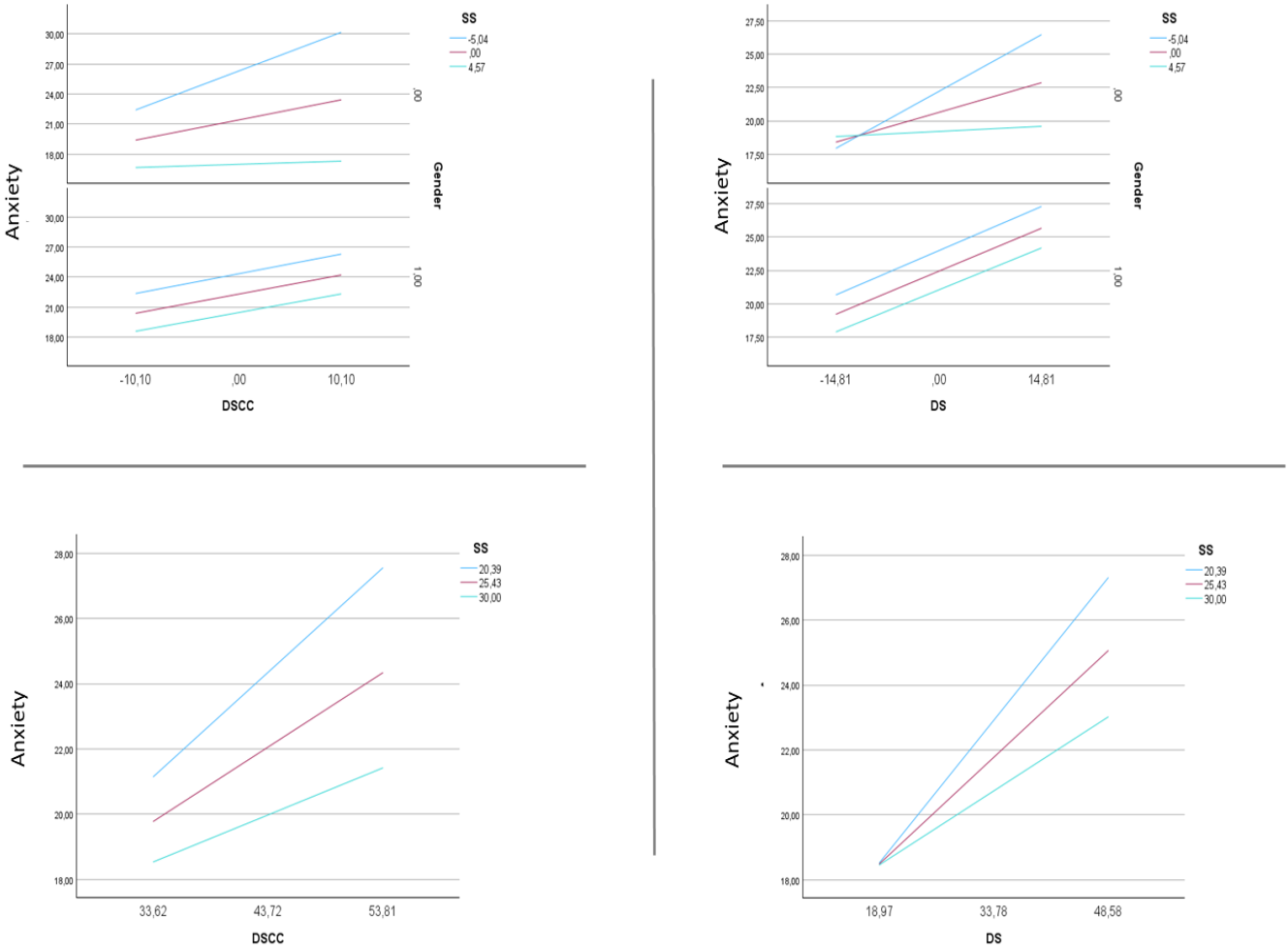
Turning to the conditional analyses for hypothesis H2-B, the results supported the validation of perceived social support as a moderator in the relationship between doom-scrolling and anxiety. At -1sd (score = 22) in the conditional direct effect analysis for H2-B (b=.297, SE = .39, t = 7.53, p < .001), at the mean (score=25.43) (b= .222., SE= .33, t = 6.73, p < .001), and at +1sd (score=30) (b= .154, SE = .05, t = 3.20, p = .002), positive and significant effects were observed (Figure 3, Table 4).

3.6 Gender as a moderated moderator variable

Importantly, this relationship exhibited consistency across gender conditions, indicating that both males and females experienced the same effect of perceived social support, leading to the rejection of hypothesis H3-A (b= .036, SE = .03, t = 1.42, p = .16). The same effect was observed in doom-scrolling behaviour (b= .026, SE = .014, t = 1.82, p =.07), leading to the rejection of hypothesis H3-B. The p-values in the conditional indirect effect analysis were all above .05, indicating a non-significant effect (Figure 3, Table 3, Table 4), which supported the rejection of hypotheses H3-A and H3-B.

Figure 3

Graphic Representation of Conditional Process analysis



Note: Effect sizes of doom-scrolling topics (DS), doom-scrolling about climate change-related topics (DSCC) on anxiety with the moderator social support (SS), moderated by gender. .00 = Male, 1.00 = Female

Table 3

Conditional Process Analysis for doom-scrolling about climate change-related topics

Variable	**b**	**SE**	**t**	***p***	**95%CI**
Constant	11.97	2.33	5.13	<.001	
CCD	.23	.52	4.38	<.001	
Moderator-Model					
Constant	3.59	6.56	.55	.59	[-9.36,16.5]

CCD	.69	.16	4.3	<.001	[.37,1.00]
SS	.34	.26	1.28	.20	[-.18,.86]
CCD x SS	-.181	.01	-2.87	.005	[-.03,-.01]
Moderated-Moderation Model					
Constant	-3.36	7.21	-.47	.64	[-17.5,10.8]
CCD	1.13	.24	4.73	<.001	[.66,1.6]
SS	.63	.32	1.99	.05	[.01,1.26]
CCD x SS	-.04	.01	-3.69	<.001	[-.06, -.02]
Gender	26.49	31.84	.83	.41	[-36.35,-89]
CCD x Gender	-.92	.68	-1.34	.18	[-2.27, .44]
CCD x SS x Gender	-.99	1.15	-.86	.39	[-3.27,1.29]
Cond. direct effect analysis	Effect	SE	t	p	95%CI
(1A = M(SS) +- 1SD)					
M – 1 SD (22)	.29	.05	5.59	<.001	[.19, .39]
M (27)	.19	.05	3.69	<.001	[.09, .30]
M + 1 SD (29)	.16	.06	2.72	<.001	[.04, .28]
Cond. indirect effect analysis					
(1A = M(SS) +- 1SD)					
M – 1 SD (20.4)	.30	.04	7.53	.07	[.22, .37]
M (25.4)	.22	.03	6.73	.12	[.16, .29]
M + 1 SD (30)	.15	.05	3.21	.14	[.06, .25]

Note. Total = 185. M = Mean. SE = Standard Error. CI = Confidence Interval [Lower limit, Upper limit]. CCD = Doom-scrolling about climate change-related topics. SS = Social support. SD = Standard Deviation.

Table 4

Conditional Process Analysis for doom-scrolling

Variable	**b**	**SE**	**t**	***p***	**95%CI**
Constant	13.48	1.19	11.31	<.001	
DS	.25	.03	7.74	<.001	
Moderator-Model					
Constant	7.29	5.44	1.34	.18	[-3.4,18.04]
DS	.59	.15	3.96	<.001	[.39,.89]
SS	.27	21	1.29	.19	[-.15, .69]
DS x SS	-.01	.01	-2.42	.02	[-.03,-.01]
Moderated-Moderation Model					
Constant	.12	6.6	.02	.98	[-12.9,13.2]
DS	.84	.21	4.01	<.001	[.43,1.26]
SS	.61	.29	2.11	.04	[.04, 1.17]
DS x SS	-.03	.01	-2,83	.005	[-.05,-.01]
Gender	21.7	12.68	1.71	.09	[-3.28,46.8]
DS x Gender	-.59	.35	-1.69	.09	[-1.28,.098]
SS x Gender	-.99	1.15	-.86	.39	[-3.27,1.29]
DS x SS x Gender	.03	.01	1.82	.07	[-.01, .05]
Cond. direct effect analysis	Effect	SE	t	p	95%CI

(1A = M(SS) +- 1SD)					
M – 1 SD (22)	.31	.06	6.12	<.001	[.21, .45]
M (27)	.19	.05	3.69	<.001	[.11, .34]
M + 1 SD (29)	.16	.06	2.72	.006	[.08, .32]
Cond. indirect effect analysis					
(1A = M(SS) +- 1SD)					
M – 1 SD (20.4)	.35	.04	7.68	.07	[.25, .41]
M (25.4)	.26	.03	6.89	.08	[.18, .36]
M + 1 SD (30)	.19	.05	3.43	.11	[.08, .23]

Note. Total = 185. M = Mean. SE = Standard Error. CI = Confidence Interval [Lower limit, Upper limit]. DS = Doom-scrolling. SS = Social support. SD = Standard Deviation.

4. Discussion

4.1 General discussion and interpretation of the results.

The primary aim of this study was to assess the impact of engaging in doom-scrolling activities pertaining to climate change-related subjects on symptoms of anxiety. While the phenomenon of doom-scrolling had been extensively explored in the context of COVID-19, an exigency existed for further examination to determine its occurrence across diverse subject matters. Moreover, the study sought to assess whether doom-scrolling, specifically in the context of climate change-related topics, exerted an influence on anxiety. The hypotheses 1A and 1B posited that increased engagement in doom-scrolling would correlate with elevated anxiety levels, which were accepted. Introducing social support as a moderator variable, the hypotheses 2A and 2B posited that it would attenuate the impact of doom-scrolling on anxiety symptoms. Therefore, social support diminished the effect of doom-scrolling, doom-scrolling about climate change-related topics and anxiety.

Moreover, there was an expressed expectation regarding gender differentials, postulating that women would manifest a more pronounced moderating effect of social support. Consequently, hypotheses 3A and 3B postulated that women, in comparison to men, would experience diminished anxiety symptoms when engaging in doom-scrolling activities, owing to the moderation effect of social support. This hypothesis could not be accepted.

4.1.1 Anxiety and doom-scrolling (about climate change-related topics)

The quantitative study's findings revealed a statistically significant correlation between doom-scrolling, doom-scrolling about climate change-related topics, and heightened anxiety levels among individuals. This implies that the act of doom-scrolling is associated with an increase in anxiety symptoms. This outcome aligns with prior research findings by Anand et al. (2021) and Buchanan et al. (2019). It is noteworthy that not only exposure to negative news but also actively engaging in doom-scrolling behavior impacts an individual's mental health, as suggested by Cianconi et al. (2020).

Moreover, the findings align with Anand et al.'s (2021) study, suggesting that people turn to doom-scrolling to find both news and positive content as a coping mechanism to alleviate anxiety and fear. Contrary to expectations, this behavior tends to heighten anxiety levels rather than diminish them. Other researchers propose the importance of the way of scrolling (Buchanan et al., 2021). They found that kindness-scrolling, so being aware of the risks of the information and a limited time spent on social media, does not have emotional consequences, whereas doom-scrolling affects the well-being of an individual.

This pattern extends to doom-scrolling related to climate change topics. As anxiety about climate change negatively affects individual well-being, coupled with the adverse effects of exposure to negative news in general, these findings align with previous studies by Berry et al. (2009) and Cianconi et al. (2020). Consequently, the repercussions of doom-scrolling on well-being, particularly anxiety, observed predominantly during the COVID-19 pandemic, are similarly applicable to climate change-related topics.

Moreover, the emergence of the term "eco-anxiety" suggests that the phenomenon warrants further investigation (Coffey et al., 2021; Pihkala, 2020). The correlation between variables such as 'doom-scrolling about climate change-related topics' and 'anxiety' is evident through this study and the study of other researchers (Apprich, 2023; Grossekemper, 2023; Hau, 2023; te Pas, 2023). Doom-scrolling, therefore, appears to be a contributing factor to the broader concept of eco-anxiety, indicating a potential avenue for more in-depth exploration.

4.1.2 Anxiety, doom-scrolling (about climate change-related topics) and the moderator social support

In this study, significant effects were observed for both doom-scrolling and doom-scrolling about climate change-related topics. The impact of these behaviours diminished in the presence of greater social support, although it remained statistically significant. For

instance, individuals scoring 22 points on the 'perceived social support' questionnaire exhibited lower anxiety levels when tending to doom-scroll compared to those with 27 points.

Perceived social support has been linked to the well-being of children and adolescents, showing a capacity to reduce anxiety and feelings of isolation (Chu et al., 2010; Harandi et al., 2017). Positive social interactions were associated with lower anxiety symptoms, while negative interactions correlated with elevated anxiety levels (DiNicola, 2013). Notably, the relationship between social support and anxiety appears context-dependent, as evidenced by studies during the COVID-19 pandemic (Villasanta et al., 2022). During the crisis, limited access to social support coincided with decreased perceived social support, contributing to higher levels of anxiety, depression, and stress. With the resolution of the crisis, access to social networks increased, leading to a subsequent rise in perceived social support. Therefore, it is essential to consider the study's timeframe, as post-disaster stressors may negatively influence perceived social support, affecting mental health (Manning & Clayton, 2018).

Furthermore, the current study aligns with findings by Manning & Clayton (2018), indicating that perceived social support moderated the impact of climate change on anxiety. However, the complexity of the relationship was underscored by additional factors. Negative news about climate change was found to decrease social support, and individuals with higher anxiety symptoms may utilize less social support (Cianconi et al., 2020; Stout & Farooque, 2003). This may explain why individuals with higher social support also exhibit higher anxiety levels than those with lower anxiety levels. Additionally, variations in social support types (e.g., emotional support, instrumental support) may contribute to the observed relationship (Taylor, 2011). Individuals with higher anxiety levels may seek different forms of social support, and unaccounted variables in this study could explain the relationship.

Furthermore, individuals with high social support may still experience anxiety due to the overwhelming negative information encountered during doom-scrolling about climate change. The supportive network might not completely counteract the anxiety-inducing effects of such content. Shared anxieties within the social support network related to climate change may also contribute to higher anxiety levels collectively (Kira et al., 2012). Lastly, individuals with higher social support might employ different coping strategies than those with lower social support, adding complexity to the overall relationship (Thoits, 1986).

4.1.3 Anxiety, doom-scrolling (about climate change-related topics), the moderator social support and the moderated moderator gender

The results are in line with other studies that found that there are no gender differences regarding social support (Fusilier, 1986; Zhang & Li, 2011). Although Arnberg & Meli (2013) indicated that greater social support was available for women, there might be a difference between actual social support and perceived social support, which must be taken into account.

Climate change is a global issue affecting individuals regardless of gender, potentially reducing gender-based differences in anxiety from doom-scrolling. Both genders may share similar coping mechanisms for climate change-related anxieties (Abedin, 2013). If coping strategies are comparable, perceived social support's moderating effect may be similar across genders, resulting in a lack of significant gender differences (Abedin, 2013).

If individuals, regardless of gender, perceive climate change threats equally, anxiety levels and the moderating role of social support may be consistent across genders, acting as a universal buffer (Abedin, 2013; Ngigi, 2016). This consistency in social support's role could contribute to the absence of gender differences in the relationship, including doom-scrolling (Fusilier, 1986; Zhang & Li, 2011).

Cultural factors may play a role in shaping attitudes and responses to climate change. If cultural norms regarding the perceived severity of climate change and the role of social support are similar across genders, this could contribute to the lack of gender differences in the observed relationship (Bessah, 2021; Ngigi, 2016).

4.2. Limitations

Firstly, the study's sample size exhibited an uneven distribution between men and women, with a substantially larger representation of women (123) compared to men (62). This discrepancy may limit the ability to draw gender-specific conclusions or to generalize the study's findings to a broader population with a more balanced gender representation (Streb et al., 2022). The overrepresentation of one gender could potentially skew the observed relationships and hinder the generalizability of the results to the broader population, particularly in terms of gender-related nuances in the relationship between doom-scrolling about climate change-related topics and anxiety. Still, it is possible to draw conclusions, as 60 participants who identify as ‘men’ participated, which is a considerable amount. Therefore, the study could take efforts to recruit a more balanced sample in future research. Although it is not as important as other factors (Streb et al., 2022).

One notable limitation of this study was the relatively homogeneous composition of the sample, with a predominant focus on participants from Germany and the Netherlands. The

lack of cultural diversity raised concerns about the generalizability of findings to a broader, more culturally diverse population. Cultural influences could significantly impact individuals' perceptions, behaviours, and responses to various stimuli, including doom-scrolling about climate change-related topics. Henrich and colleagues (2010) describe it as Western, educated, industrialized, rich and democratic societies (WEIRD) samples. The study's findings may be limited in their applicability to individuals from different cultural backgrounds, and caution should be exercised when extrapolating the results to populations with diverse cultural perspectives. The absence of representation from a more varied cultural context may limit the study's ability to capture the full spectrum of reactions and nuances associated with doom-scrolling and its impact on anxiety (Henrich et al., 2010).

Thirdly a potential limitation of this study lies in the fact that the doom-scrolling about climate change-related topics scale utilized was developed by Bachelor students (Apprich, 2023; Grossekemper, 2023; Hau, 2023; te Pas, 2023). While sincere efforts may have been invested in its creation, the involvement of less experienced researchers raised concerns about the scale's robustness. The psychometric properties, including reliability and validity, may be subject to scrutiny due to the scale's origin. It was essential to acknowledge that the scale's ability to comprehensively capture the intricacies of doom-scrolling behavior related to climate change might be influenced by the relative inexperience of its developers.

Addressing this limitation involved recognizing the need for cautious interpretation of the results associated with the doom-scrolling scale. Future research might benefit from using validated scales developed by experienced researchers or conducting additional validation assessments to ensure the reliability and validity of the scale in the context of climate change-related topics. This acknowledgment enhances transparency and encourages a nuanced consideration of findings related to doom-scrolling behaviour.

4.3 Strengths

A major strength of this study lies in its comprehensive approach to measuring doom-scrolling behaviour. Unlike many studies that concentrate on doom-scrolling tendencies in regard to COVID-19, this research expands its scope by assessing doom-scrolling behaviour in the context of climate change. This deliberate inclusion of a specific thematic focus not only broadens the study's relevance beyond the confines of COVID-19 but also provides valuable insights into the nuanced dynamics of doom-scrolling in relation to a crucial societal issue.

Furthermore, the study's focus on Germany and the Netherlands in the context of doom-scrolling contributes to its strength by presenting a distinct cultural context compared to prior research centered on participants from Turkey and Norway (Satici et al., 2022; Sharma et al., 2022; Ytre-Arne & Moe, 2021). This intentional variation in cultural backgrounds enhances the generalizability of findings, offering a more comprehensive understanding of doom-scrolling across diverse sociocultural contexts.

Additionally, the study demonstrates strength in its sample diversification, particularly with respect to age. The inclusion of a diverse age range ensures a representative and comprehensive exploration of doom-scrolling behaviour, thereby strengthening the study's validity and applicability to a broader population.

Another notable strength of this study is its potential to provide valuable insights for psychologists and researchers interested in the realm of social support in the context of doom-scrolling. By exploring the dynamics of doom-scrolling behaviour, it becomes evident that participants profit when having a social environment on which they can rely, especially in the digital age. The findings may contribute to the existing body of knowledge in psychology, shedding light on the role of social support mechanisms in the context of contemporary phenomena like doom-scrolling. This aspect not only enriches the academic discourse but also holds practical implications for developing strategies to enhance social support in the digital era, especially when being confronted with overwhelming negative news.

4.4 Future Directions

In paving the way for future research endeavours, several key directions emerge from the current study. Firstly, the exploration of doom-scrolling has predominantly centered around topics related to COVID-19. This study extended this scope to topics of climate change. To broaden the scope and deepen the understanding, future research could extend investigations into various domains within and beyond climate change. Exploring the impact of doom-scrolling in different contexts, such as political events, health crises, or technological advancements, promises a more comprehensive understanding of its implications for mental health and well-being across diverse topics.

Secondly, a crucial step for advancing the field involves subjecting the doom-scrolling about climate change-related topics scale to a rigorous peer-review process. Developed by Bachelor students, the scale warrants careful scrutiny of its psychometric properties, including validity and reliability. Ensuring the robustness of the measurement tool through

comprehensive validation enhances its credibility and applicability in future research endeavours.

Moreover, the study underscores the importance of acknowledging and integrating the social environment into clinical interventions for mental health issues. Recognizing the significant role of social support networks in mitigating anxiety emphasizes the need to incorporate strategies leveraging positive social interactions within mental health interventions. This holistic approach acknowledges the interconnectedness of individual mental health and the social context in which doom-scrolling occurs.

4.5 Conclusion

To the researcher's knowledge, this study represents the inaugural exploration of doom scrolling within the climate change context and the usage of a measurement tool for this phenomenon (CCD). Furthermore, it endeavours to address the existing gap by examining how social support moderates the impact of doom scrolling on psychological distress.

In this study, a quantitative study with the variables ‘doom-scrolling about climate change-related topics’ on anxiety symptoms with the moderator ‘perceived social support’ and the moderated moderator ‘gender’ was conducted. It was found that doom-scrolling increases anxiety symptoms and is moderated by ‘perceived social support’ but not by gender. Therefore, when participants doom-scroll, they reported higher anxiety symptoms but used their social support as a coping mechanism.

The study findings align with previous research indicating no gender differences in social support. The global nature of climate change concerns may diminish gender-based variations in anxiety-inducing effects, suggesting that perceived social support acts as a universal buffer against anxiety, irrespective of gender. Cultural factors may also play a role in shaping attitudes and responses, potentially contributing to the absence of gender differences in the observed relationship between doom-scrolling, perceived social support, and anxiety. Given the negative mental health effects of doom scrolling, additional studies with a considerable sample size according the G*Power analysis have to be conducted in order to gain a better perspective of the scope of the problem, especially within the realm of a wider range of settings in which the behaviour occurs.

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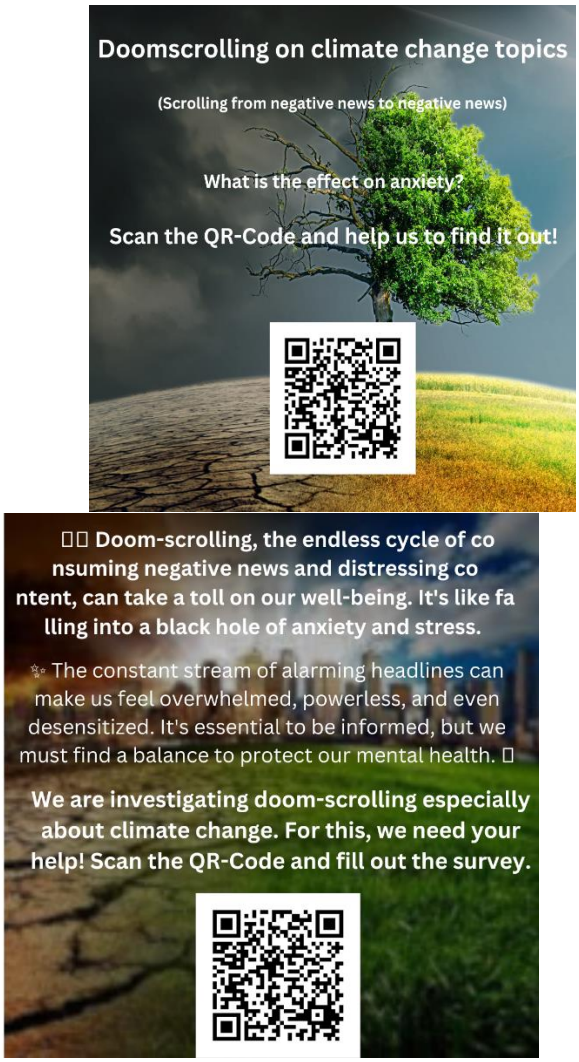
Appendix

During the preparation of this work the author(s) used ChatGPT 3.5 in order to improve the text in regard to grammar and spelling. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the work.

Appendix A: Advertisement



Appendix B: Welcome Screen Study.

Welcome!

You are cordially invited to participate in a study that aims to investigate the phenomenon of doomscrolling related to climate change and its impact on mental health. Doomscrolling, also known as doomsurfing, refers to the behavior of continuously seeking out negative news about a specific topic, particularly on social media or online news platforms. This study

specifically focuses on doomscrolling related to negative climate change news and aims to gain a better understanding of this emerging trend.

The study is being conducted as part of a Master thesis. Your participation will involve completing several scientific surveys related to your mental health and news consumption behavior. It's important to note that you have the freedom to withdraw from the study at any point without providing a reason. The survey consists of six sections: the Doomscrolling Scale (DS), the Coping Competence Questionnaire (CCQ), the Beck's Depression Inventory (BDI), the Perceived Social Support Questionnaire (F-SozU K-6), the Hamilton Anxiety Scale (HAM-A), and additional questions developed by the researchers themselves.

Regarding data handling, all identifying information will be anonymized to ensure confidentiality. Your data cannot be traced back to you, and it will be deleted two years after the completion of the study (by 2025).

Please be aware that the findings of this thesis may be published in a scientific journal. If you have any further questions, feel free to contact the researcher Roman Hartlieb (r.hartlieb@student.utwente.nl) Alternatively, you can reach out to one of the supervisors: Dr. Alejandro Dominguez Rodriguez (a.dominguezrodriguez@utwente.nl), or Marcel Pieterse (m.e.pieterse@utwente.nl).

Please take the time to thoroughly read the following information before deciding whether or not to participate:

It is crucial for you to understand what the study entails. We are specifically seeking participants who are at least 18 years old and meet the following criteria: a stable internet connection, 15-20 minutes of available time to complete the survey, and a strong command of the English language.

You can withdraw from the study at any given moment by closing the tab. Your data will be deleted if the responses are not complete.

Thank you for considering participating in this study!

Appendix C: Informed Consent Study.

Informed Consent

By clicking YES below, I agree to the following: I understand that my participation is voluntary. I also understand that I have the right to withdraw my consent at any time without needing to give a reason, if I experience any discomfort or distress. Furthermore, the following points are clear to me: - All data that are collected by the researcher are treated completely anonymously and cannot and will not be traced back to my identity. - I understand that information I provide will be used for research reports that aim to investigate the impact of doom scrolling on the topic of climate change impacts mental health. - I am currently NOT receiving any kind of treatment (medical or therapy) for a mental disorder - I have NOT had a suicide attempt in the last two years - I am NOT currently suffering from suicidal ideation / thoughts - I understand that taking part in the study involves the following risks: mental discomfort by talking about a sensitive topic such as climate change. - I agree to keep the procedures and explanation of this study to myself and will not pass this information on to others because this might negatively influence the study results. - I give permission for the answers that I provide to be archived in survey database so it can be used for future research and learning. I agree to participate in the study:

Appendix D: Doom-scrolling about climate change-related topics scale (DSCC)

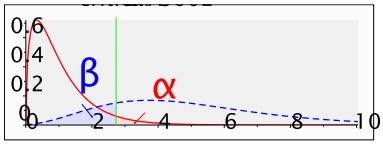
In the following section we want to know how you experience your news consumption related to climate change. Please indicate how much you agree with the statements.

1. I am actively searching for news when a climate-change related catastrophe occurs in my proximity.
2. I feel the need to avoid climate change news because I feel overwhelmed when reading them.
3. RE: The climate change topic is too pervasive; therefore, I pay less attention to it.
4. RE: Uncertainty in the media about the impact of climate change in the future makes me refrain from engaging with the topic.
5. My concern for other people makes me check news more frequently when a climate-catastrophe is presented in the media.

6. If a climate-catastrophe would occur near me or near people who are close to me, I would feel the urge to look up more news about the event.
7. Negative news about climate change makes me want to assess the truthfulness of the information. Therefore, I actively search for more information.
8. I feel it's my duty to keep up to date with climate change news and be knowledgeable about the topic.
9. My concern about the threat climate change poses to the environment makes me consume news more frequently about the topic.
10. RE: Given my location on the planet, I am less urged to consume news about the changing climate and its consequences.
11. Consuming news about the environment urges me to stay informed and up to date with the topic of climate change.

Note. RE: Items need to be coded in reversed. Items are answered on a 7-point Likert scale. 1=Strongly disagree. 2=Disagree. 3=Somewhat disagree. 4=Neither disagree nor agree. 5=Somewhat agree. 6=Agree. 7=Strongly agree.

Appendix E: G*Power analysis



Note. G* Power analysis

Appendix F

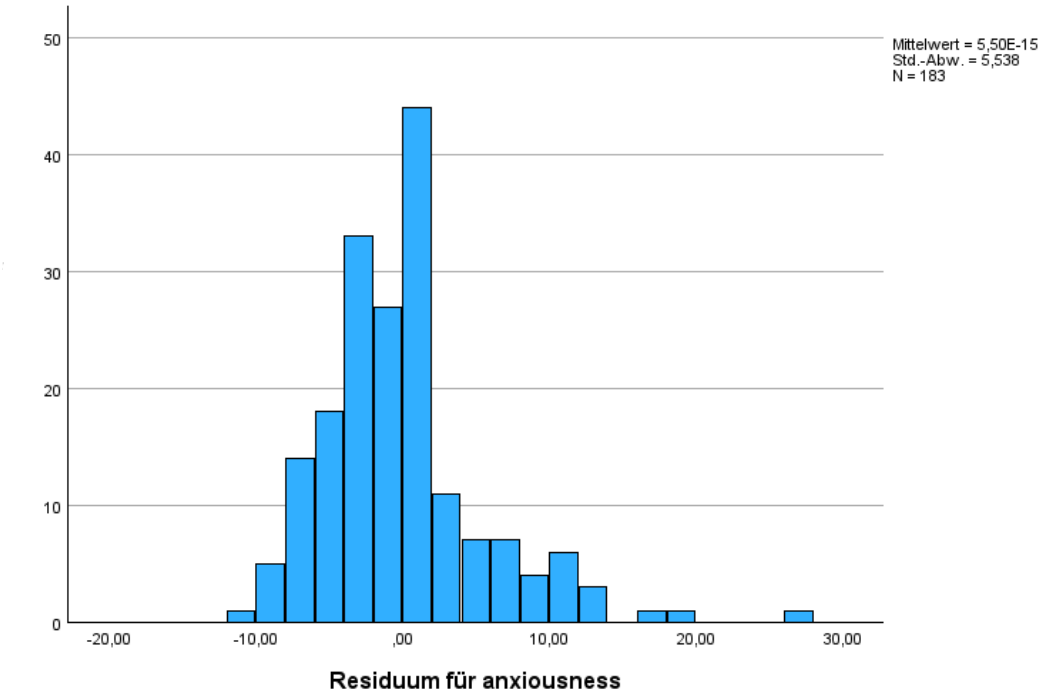


Figure F: Normality of anxiousness residuals

Appendix G

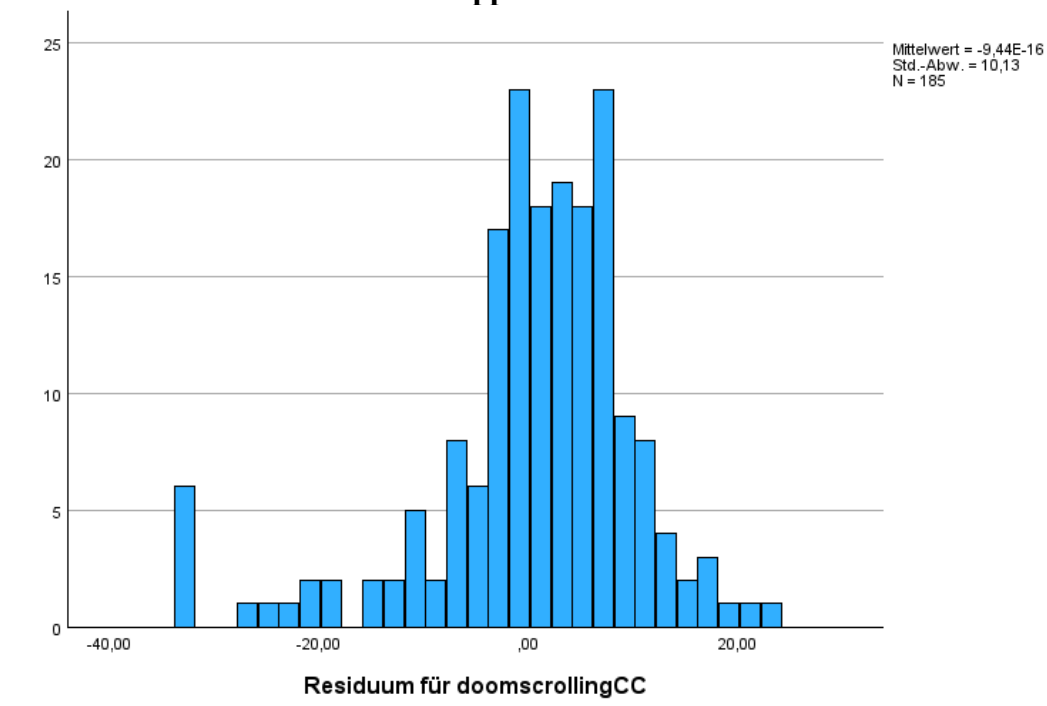


Figure G: Normality of doom-scrolling about climate change-related topics residuals

Appendix H

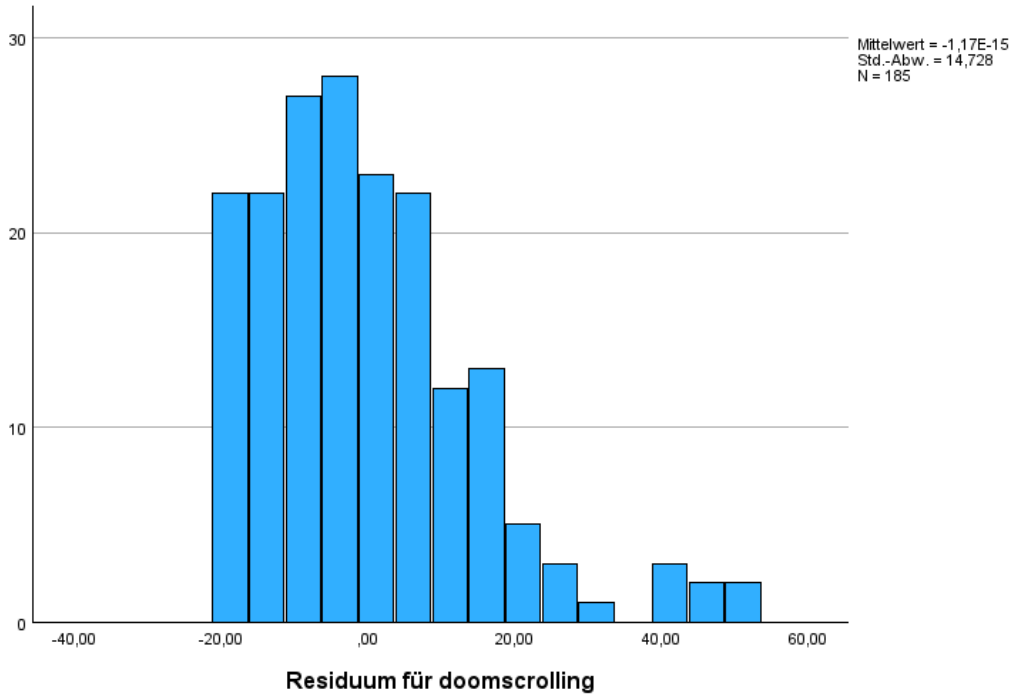


Figure H: Normality of doom-scrolling residuals.

Appendix I

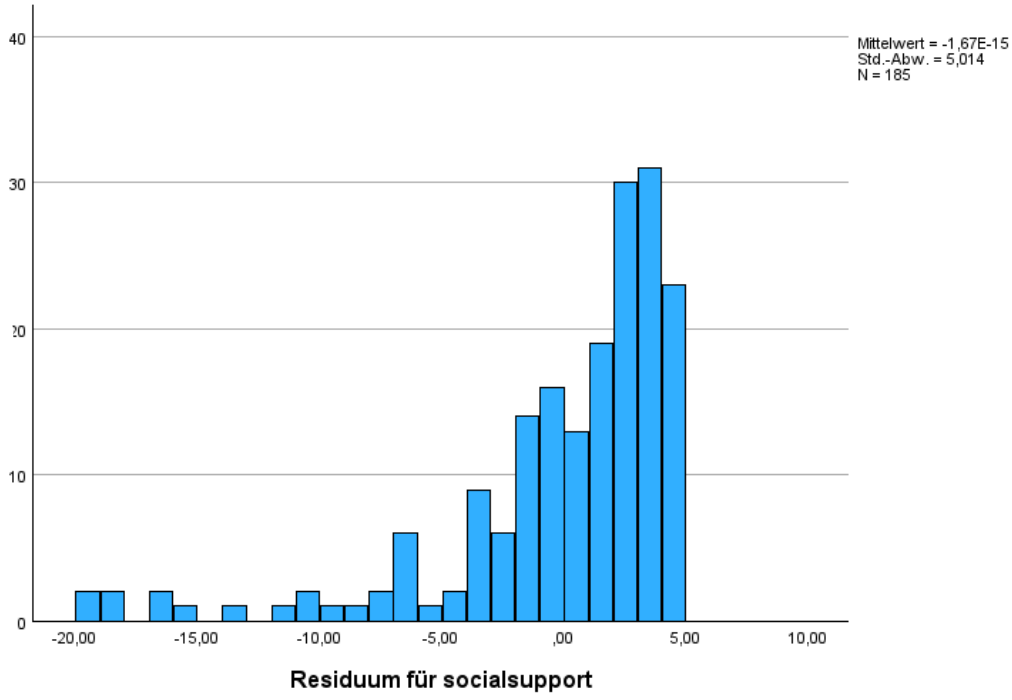
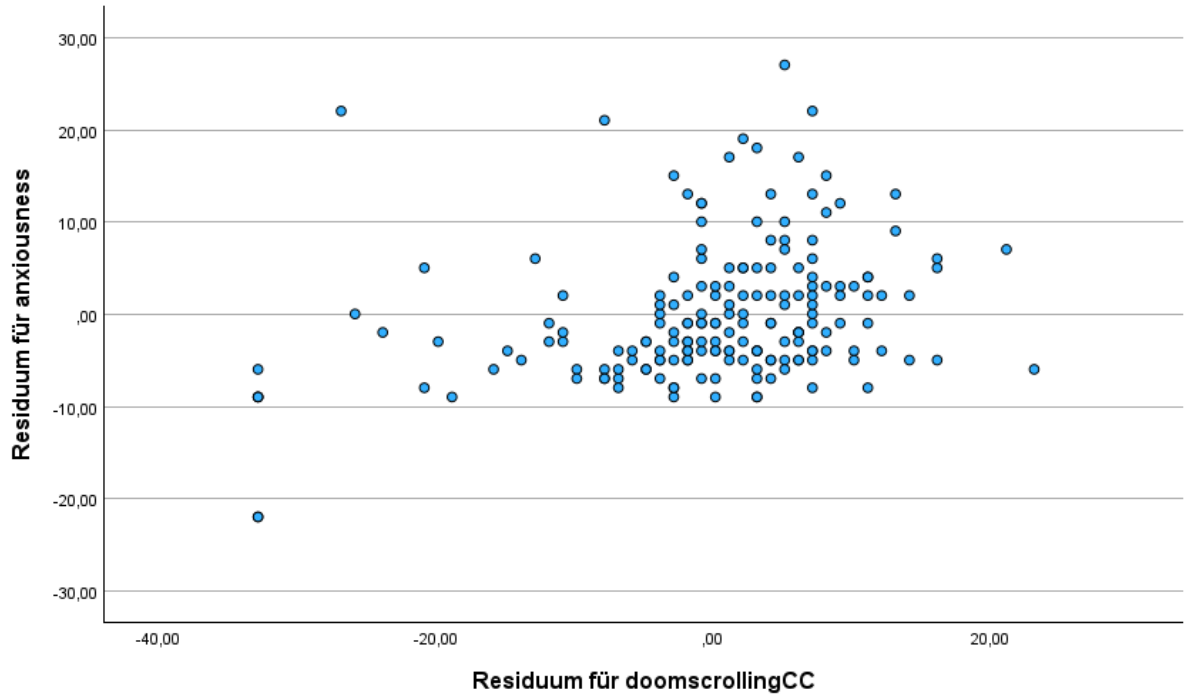


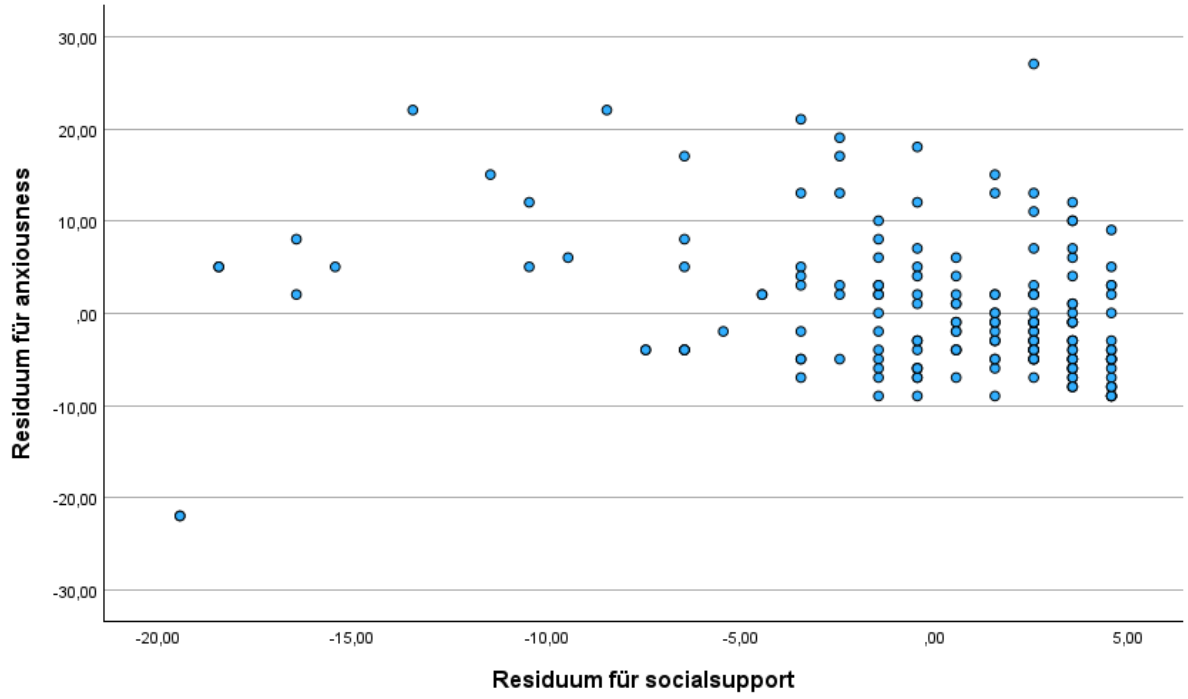
Figure I: Normality of social support residuals.

Appendix J



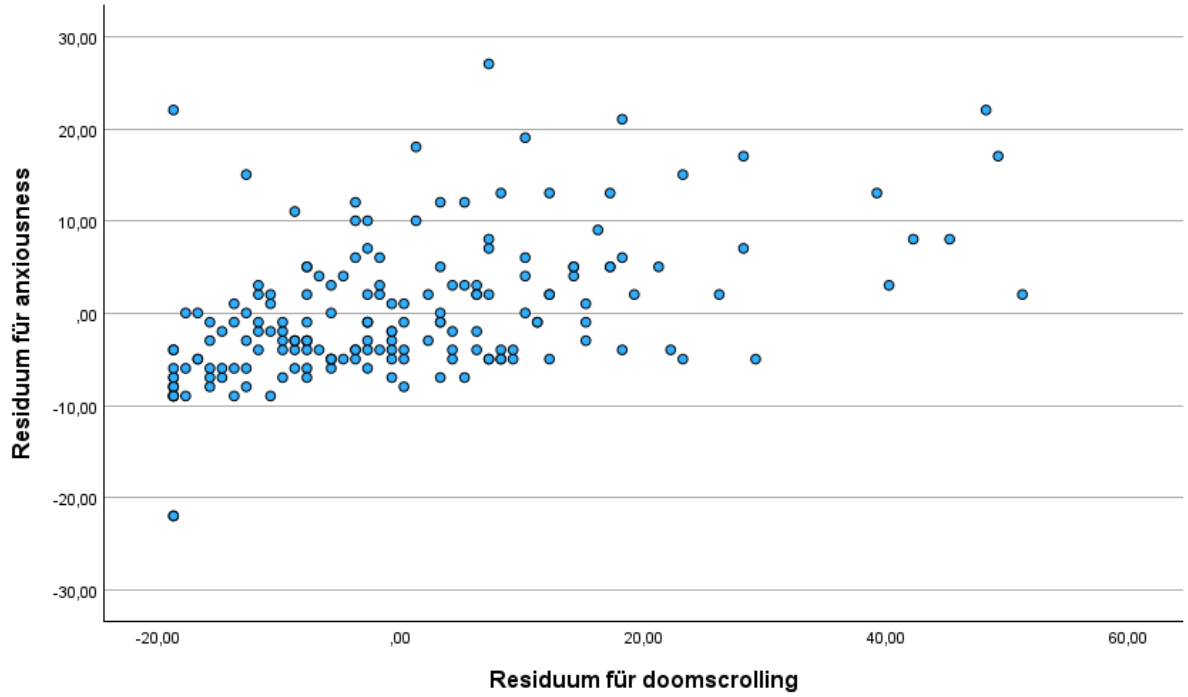
Note: Independence of residuals, the equal variance of residuals, and the linearity in the relationship between residuals for doom-scrolling in climate change-related topics and anxiousness

Appendix K



Note: Independence of residuals, the equal variance of residuals, and the linearity in the relationship between residuals social support and anxiousness

Appendix L



Note: Independence of residuals, the equal variance of residuals, and the linearity in the relationship between residuals doom-scrolling and anxiousness