sustainability

MDPI

Article

The Relationship between Climate Anxiety and Pro-Environment Behaviours

Zac Coates *, Michelle Kelly and Scott Brown

School of Psychological Science, College of Engineering, Science and Environment, University of Newcastle, Callaghan 2308, Australia; michelle.kelly@newcastle.edu.au (M.K.); scott.brown@newcastle.edu.au (S.B.)
* Correspondence: zac.coates@uon.edu.au

Abstract: Previous studies examining psychological distress associated with climate change have found cognitive, affective and behavioural influences. This distress, termed climate anxiety, is thought to be chronic in nature, and may result in long-lasting and significant negative impacts on mental health. The present study examined how climate anxiety may be impacting people's frequency of pro-environment behaviours. To effectively measure participants' behavioural frequency and preferences, we used a discrete choice experiment, which simulated a transport scenario where participants would have to make trade-offs between cost, time and eco-friendliness. A total of 256 participants (95 male, 161 female) completed the study. It was found that participants with moderate levels of climate anxiety had a higher frequency of pro-environment behaviours than participants with low or high levels of climate anxiety. Furthermore, participants with low or high levels of climate anxiety gave a higher preference for options that cost less or take less time. This evidence supports the hypothesis that moderate levels of climate anxiety may be optimal for pro-environmental behavioural response.

Keywords: climate anxiety; climate change anxiety; solastalgia; fear of climate change; choice of behaviour; DCE; pro-environment behaviour; decisions

check for updates

Citation: Coates, Z.; Kelly, M.; Brown, S. The Relationship between Climate Anxiety and Pro-Environment Behaviours. *Sustainability* **2024**, *16*, 5211. https://doi.org/10.3390/su16125211

Academic Editor: Gideon Baffoe

Received: 8 May 2024
Revised: 7 June 2024
Accepted: 12 June 2024
Published: 19 June 2024

1. Introduction

Research into climate change and its effect on individuals is a somewhat recent phenomenon, with substantially more research having been conducted within the last 10 years than ever before. Research along with communication of findings through general media channels and the focus from political agendas and campaigns have highlighted climate change as a key issue, and this communication has affected people's attitudes towards peers based on their opinions of the future effects of climate change [1,2]. Carbon emissions have been identified as the key factor driving climate change, as the global economy, urbanisation and developments are at an all-time high [3–7]. Following this increasing trend of carbon emissions, the effects of climate change, based on current projections, could be catastrophic, which concerns many people [8–10].

Recently, debates regarding the impacts of climate change on the community have included impacts on mental health [11–13]. These emotional impacts are caused not only by the direct influence of climate change, such as bush-fires, flooding or droughts [14], but also, as described by many scientific reports, simply due to perception and awareness of climate change [15–17]. These claims were supported by an American Psychological Association [18] survey aimed at measuring "Stress in America: Generation Z"; through this survey, it was found that 51% of respondents reported climate change as a significant source of stress. In a more recent survey by the American Psychological Association [19], it was found that 68% of respondents were at least a little worried about climate change and its effects. Similar findings supporting prevalence and distress associated with climate anxiety have also been examined globally [20].

Distress associated with feelings of guilt and despair due to inaction regarding climate change has also gained increasing recognition amongst mental health professionals [11,21,22].

These feelings of guilt and despair associated with climate change have been linked to more serious mental health issues, such as subclinical depressive symptoms [21,23]. When examining whether these feelings have resulted in behavioural change, or lack thereof, we can see that not everyone reacts the same [21,22]. For some, these feelings of distress may be debilitating [21,22] and people can feel powerless to change [21]. For others, these feelings may be an important resource in encouraging constructive activity to help reduce the impacts of climate change [22].

Climate anxiety and eco-anxiety are terms that are commonly used to refer to feelings of worry and distress about the climate crisis and more broadly the environment; however, there are a wide range of definitions and operationalisations of climate anxiety and eco-anxiety. Clayton and Karazsia [24] defined climate anxiety as a broad range of inhibiting negative emotions causing distress regarding climate change, and these feelings may, or may not, be further reflected in behaviours. These terms have also been identified as the experience of distress related to the environment causing guilt, fear, worry, hopelessness, shame and despair [25]. It was noted in Coffey et al.'s [26] review that terms such as "climate change anxiety" and "ecological stress" are often used when discussing eco-anxiety. Eco-anxiety has also been defined as "a chronic fear of environmental doom", "mental distress or anxiety associated with worsening environmental conditions" or "anxiety experienced in response to ecological crisis" [26].

Research examining the implications of climate anxiety have identified inconsistent findings regarding the association between climate anxiety, or eco-anxiety, and pro-environment behaviours. Some previous research has found a positive association between climate anxiety, or eco-anxiety, and pro-environmental behaviour [17,27]. However, Clayton and Karazsia [24] found no association between pro-environment behaviours and climate anxiety. These findings were further supported in a similar study by Kapeller and Jager [28], examining anxiety about climate change, stating that there were no increases in pro-environmental intent when several conditions regarding personal values and knowledge were met. It was stated that these findings may be due to the often debilitating nature of climate anxiety, and concerns about climate change. Anxiety regarding environmental disaster and climate change has the potential to be viewed as a chronic stressor, further inhibiting pro-environment behaviours [24,27]. Overwhelming feelings about the unknown are not uncommon and may be related to a far more established area of research. These inconsistent findings support the ideas that although habitual worry, or concern, about climate change may be unconstructive and dysfunctional for some individuals, it may serve as a constructive adaptive response for others [29,30].

Anxiety is a normal and well-established reaction to stressful situations [31–33]. Previous research has found that feelings of anxiety may be debilitating in severe cases, but moderate levels of anxiety may act as a mediator of improved task performance, for example, if someone is not anxious at all about how they will perform in a test, they generally will perform worse than someone who is moderately anxious; however, someone who is very anxious will also perform poorer than someone who is moderately anxious [34]. This phenomenon is referred to as the Yerkes–Dodson law and represents a relationship between pressure and performance in the shape of an inverted U [35]. This occurs as people with low levels of anxiety may not have enough arousal to fully engage in an activity, whereas people with high levels of anxiety may have too much arousal creating increased cognitive load, causing poorer performance on a specific task [34,36].

Arent and Landers [37] further examined this relationship between arousal, anxiety and performance by assessing college-age participants' response times while riding an exercise bike. Participants were first randomly allocated into one of eight arousal groups (between 20 and 90%) and made aware they were competing for a cash prize. Participants were then assessed using the Competitive State Anxiety Inventory-2 and Sport Anxiety Scale, to measure their levels of cognitive and somatic anxiety. Participants' response times were then analysed assessing the influence of cognitive and somatic anxiety on response time. As hypothesised through the inverted U theory, participants' performance

was highest when exhibiting moderate levels of somatic anxiety. Arent and Landers [37] noted that due to the low cognitive load required for the task in their study, cognitive anxiety was not predictive of performance. But, in tasks inducing high cognitive loads, cognitive anxiety may be predictive of performance, such as cognitive load induced from tasks requiring complex decision making. This presumption has been supported in further studies examining stress and performance in roles with greater cognitive load, such as high-pressure work environments and high-impact decisions [38–41]. Therefore, it may be prudent to consider the potential connection between general anxiety and climate anxiety. Essentially, we expect that the stress associated with pro-environment decision making, due to the level of climate anxiety, may exhibit a similar response pattern. Previous research examining the anxiety of environmental disasters and the climate crisis has identified feelings of control and helplessness to be key factors, with reduced feelings of control identified as potentially debilitating [42–45].

Previous research examining environmental behaviours has often relied on self-report measures to gauge individuals' likelihood of engaging in pro-environment actions (e.g., "I would sign a petition about an environmental issue, yes or no?") [46]. However, these self-report measures have frequently shown that stated intentions may not accurately reflect real-world behaviours [47]. As a result, the field has faced limitations in assessing the frequency of pro-environment actions, understanding the trade-offs individuals consider when making environmentally conscious choices, and identifying effective strategies for promoting behavioural change [46–48].

Recognising the significance of these limitations is crucial, as prior research has highlighted that human behaviours play a substantial role in environmental challenges, including biodiversity loss, climate change and environmental pollution [49,50]. Without a deeper understanding of the underlying motivations driving people's decisions, it becomes challenging to implement and assess the effectiveness of intervention strategies [51].

Previous studies investigating pro-environment behaviours have employed a variety of tools, often developed for specific studies, rather than relying on established and validated measures. These methods have included field observations, laboratory-based behavioural tasks, domain-specific and general self-report measures, including Likert-based surveys [47]. A review by Lange and Dewitte [47] highlighted a notable distinction between individuals' intentions regarding pro-environment behaviours and their actual actions. While these measures may indicate individuals' willingness to engage in pro-environment behaviours, they do not provide insights into the frequency of such behaviours or factors influencing their decisions, including trade-offs they might consider when choosing environmentally friendly alternatives.

Discrete choice experiments (DCEs) may offer an efficient partial solution to some of these issues. DCEs enable the examination of the importance of specific attributes, such as time, when making pro-environment decisions. A DCE involves individuals making decisions between two hypothetical options, which offer differing levels of each attribute, mirroring real-life decisions. For example, participants may have to choose from one of two choices; the first choice may be cheaper, slower and not eco-friendly, compared to the second choice. In this scenario, a participant whose primary focus is saving money may opt for the first choice. Selections in these tasks allow researchers to investigate trade-offs people are willing to make based on the pros and cons of each decision. These selections provide us with utility scores. Utility scores provide insights into the relative importance of each attribute when making decisions. For instance, a participant with a high cost utility score tends to prioritise cost-effectiveness over factors like speed or eco-friendliness (as shown in Figure 1). These utility scores not only help us understand the frequency with which participants choose cost-effective options but also show situations when they opt for different choices. In essence, utility scores allow us to assess both the typical preferences and the variations in decision-making patterns.

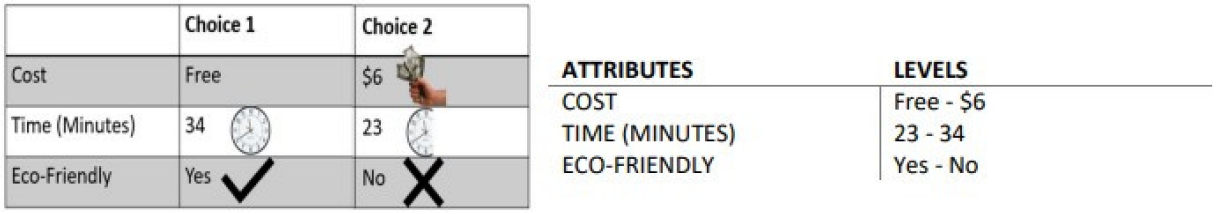

Figure 1. This is an example of a DCE, on the left with levels and attributes on the right. Participants will make a number of decisions between the 2 options, as levels of attributes change. Utility scores measured will provide a deeper understanding of the factors considered when making travel decisions.

Previously, DCE methods have been extensively used to accurately measure and further understand consumer behaviours in a wide range of domains, such as transport choices, health choices and consumer choices [52–54]. These use cases for DCEs have been shown to have strong external validity and criterion validity, showing that stated choices within the tasks were seen to be consistent with real choices made by the same individuals, indicating that DCEs can reasonably predict behaviours [55–58]. The use of DCEs when examining pro-environment behaviours may allow for the analysis of which factors are most important to individuals when making pro-environment decisions. This analysis may allow us to determine what societal and governmental changes may be required to make pro-environment options more appealing. For experiments focusing on pro-environment behaviours, factors may include, but are not limited to, trade-offs between cost, time, social pressures, convenience or eco-friendliness. Examining trade-offs will identify how we may make pro-environment options more appealing.

The key question addressed in this study is how do feelings of anxiety regarding the environment affect pro-environment behaviours? To address this question, we will measure climate anxiety and utilise a pro-environment behaviour DCE to determine how these feelings may affect the participants' pro-environment behaviours. We will also examine the relationship between climate anxiety and general anxiety, as previous research has observed inconsistent relationships between worry about climate change and psychological distress [25].

It is hypothesised that participants exhibiting moderate levels of climate anxiety will exhibit more pro-environment behaviours than participants reporting low or high levels of climate anxiety. Further, it is hypothesised that participants exhibiting moderate levels of climate anxiety will have utility scores identifying eco-friendliness as of higher importance than time or cost. Inversely, it is hypothesised that participants exhibiting high and low levels of climate anxiety will have utility scores identifying time and/or cost as of higher importance than eco-friendliness, due to increased cognitive load inhibiting responses and a lack of stimulation, respectively. It is also hypothesised that participants' climate anxiety scores will be positively correlated with general anxiety.

2. Materials and Methods

2.1. Participants and Recruitment

A total of 267 participants (166 female, 101 male) aged 18-84 years ($M = 28.2$, $SD = 14.60$) completed the study online. Participants were recruited through the university's undergraduate student research participant pool and via Facebook advertising. Student volunteers participated in return for course credit, while the community sample went into a draw to win gift vouchers. Informed consent was obtained from all participants. The study was approved by the university's ethics committee (approval number H-2019-0402). Sample size requirement of 220 was calculated using methods described in "Sample Size Requirements for Discrete-Choice Experiments in Healthcare: a practical guide" [59] using pilot data. Data collection occurred from April to December 2021.

2.2. Measures

The following was delivered on Qualtrics online survey software version March 2021. Prior to starting the survey, participants were required to read the study information statement and provide informed consent [60].

2.2.1. Discrete Choice Experiment (DCE)

Our DCE was developed to determine the importance of different attributes when considering transport, particularly eco-friendly transport options. To achieve this, we constructed a 3 (attributes: time, cost, eco-friendliness) × 2 (levels: 23/34 min, Free/$6, Yes/No) DCE (Figure 1). These levels were chosen after careful consideration of the types of journeys people may take on a daily basis. Due to this, we chose to simulate factors of a journey from Bondi to Glebe (suburbs in Sydney, Australia) during moderate traffic hours using 2 modes of transport, bike and car, for the attributes and levels used in our DCE. This simulation includes both positive and negative factors for either transport option. Due to our sample population, travel like this would be familiar for most, if not all, participants (the attribute levels were decided based on real transportation options available for commuters in two Australian cities. The choices were sourced from common commutes in Sydney and Newcastle, NSW, Australia.)

2.2.2. Climate Change Anxiety Scale (CCAS)

The unidimensional CCAS is derived from Clayton and Karazsia's [24] 4-factor 22-item measure, and consists of 13 items, with 8 items examining cognitive–emotional impairment and 5 examining functional impairment due to worries about climate change with scores in these 2 factors being aggregated as a single score [61]. Frequency ratings were made by participants on a series of 5-point Likert scales (0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Often, 4 = Almost Always) [24]. We also included questions from factor 2 of Clayton and Karazsia's [24] initial 4-factor 22-item measure, which consists of 6 items asking participants about their level of behavioural engagement, e.g., "I recycle". We performed this to confirm the construct validity of our DCE. The CCAS has good discriminant, structural, convergent and divergent validity [24,61]. The scale also has high internal reliability, as demonstrated by Clayton and Karazsia across three studies [24].

2.2.3. Depression Anxiety Stress Scale (DASS-21)

The DASS-21 is a self-report measure of the severity and frequency of negative emotions over the previous week [62]. For this study, we only used the seven anxiety items. Participants responded to questions regarding frequency of feelings and behaviours on a 4-point Likert scale (0 = Never applied to me, 1 = Sometimes applied to me, 2 = Often applied to me, 3 = Almost always applied to me). These items gave participants a score between 0 and 21, with higher scores indicating greater levels of anxiety. The DASS-21 offers favourable internal consistency (alpha = 0.89) and temporal stability (range of rs = 0.71–0.81) [63]. The DASS-21 also has good convergent and discriminant validity [63].

2.2.4. Experimental Procedure

Following consent, participants completed surveys over approximately 15 min for which the order of the DCE and CCAS were counterbalanced. Firstly, the participants were asked to answer two demographic questions, age and gender (Male, Female, Non-Binary or "Other/Prefer not to say"). Participants either completed the CCAS after the demographic questions, followed by the adapted DCE and then the DASS-21 or they completed the demographic questions, then the DCE first followed by the CCAS and then the DASS-21. This was to examine whether there may be priming of response in the behavioural task after being assessed on climate anxiety. Excluding demographics, questions within each block were randomised and questions within the DCE block had answer options in a randomised order to negate the effects of right–left bias. Prior to the DCE block, participants were presented with the following vignette: "The following questions will involve you making

decisions on transport options. The options to consider consist of different factors associated with two transport methods between Glebe and Bondi Junction during moderate traffic. This journey is roughly 10km and includes travel along toll roads. When making these decisions you will have to consider the associated time, cost, and whether the option is considered eco-friendly." Participants were then asked to make 28 different decisions, choosing between a pair of transport options (described in Measures). Each choice included differing levels of time, cost and eco-friendliness, requiring participants to consider the levels of these attributes carefully for each decision. Options within pairs were presented as "Choice 1" and "Choice 2" with modes of transport, which may include these factors not being identified (Figure 1). We performed this to reduce possible implicit bias associated with differing modes of transport; this is known as an unlabelled DCE design.

2.2.5. Data Preparation and Statistical Analysis

All self-report scales were scored and prepared for analysis in Microsoft Excel. Thirty-one participants were excluded from analysis due to having incomplete data sets. Attribute utility scores were calculated using a random-parameters logit (RPL) model; this involved participants' choices being regressed against characteristics of the alternative transport options presented. The regression used a cumulative logit link function. This is psychologically equivalent to assuming that preferences are internal random variables and that people make decisions by comparing these preferences against fixed thresholds. The regression analysis estimates how much the average preference changes with changes in the attribute levels. These "utility" coefficients were estimated separately for each person, and for each attribute, and they indicate the impact of changes in these attribute levels on transport choices. Estimation of utility parameters from choice data was carried out using the R language and its 'ordinal' package [64,65]. Eco and cost trait utility scores were then multiplied by −1 as in the initial design, the more desirable traits in these attributes were in choice 1. This led to negative utility scores, as negative utility scores indicated participants' preference for choice 1 and not a negative preference for this attribute (Figure 1). Thus, a positive cost trait utility indicates an individual's degree of preference for the cheapest option, a positive time trait utility indicates an individual's preference for the fastest option and a positive eco trait utility indicates an individual's preference for the most eco-friendly option. CCAS squared scores and differences in attribute utility scores were also calculated for use in the polynomial regression required to examine our proposed inverted U relationship. Analysis was conducted on R 4.3.0 [65].

3. Results

3.1. Descriptive Data

The final sample included 236 participants aged 18–84 years. This included 153 female participants, 83 male. A total of 76 participants were from the community recruitment strategy and 160 from university recruitment. Descriptive data of participants can be seen in Table 1.

Table 1. Descriptive data for all study variables and relationship with climate anxiety.

Variable	Mean	SD	Pearson's *R*
Age	27.82	12.15	−0.083
Anxiety	6.44	4.99	0.540 **
Cost Attribute Utility Score	3.15	2.68	−0.438 **
Time Attribute Utility Score	2.38	1.90	−0.360 **
Eco Attribute Utility Score	3.89	3.00	−0.071
Behavioural Engagement	15.35	2.97	−0.146 *
Climate Anxiety Score	34.31	12.27	-

* indicates relationships with p-value < 0.05, ** indicates relationships with p-value < 0.001.

3.2. Analysis

All requirements for planned statistical analysis were met. The correlation matrix including all variables analysed in this study may be seen in Appendix A.

3.2.1. Order Effects

No significant effects of the order of the questionnaire presentation were found. This was examined via examining differences between groups' CCAS scores with either DCE first or CCAS first; we found no significant differences in CCAS scores, $t(234) = -0.737$, $p = 0.462$. This analysis was included to assure that neither pro-environment behaviours nor climate anxiety were primed due to completing either our DCE or CCAS first.

3.2.2. Climate Anxiety and Attribute Utility Scores

Firstly, we analysed the attribute utility scores using a repeated-measures ANOVA and conducted planned post-hoc analysis with Bonferroni correction. The results showed a significant difference in scores ($F(2470) = 30.278$, $p < 0.001$, $\eta^2 = 0.114$). The planned post-hoc analysis further examined participants' preferences for these attributes. Eco trait utility scores were significantly higher than time trait utility scores, $t(235) = 7.781$, $p < 0.001$, $d = 0.51$, 95% CI [1.044, 1.976], and cost trait utility scores, $t(235) = 3.825$, $p < 0.001$, $d = 0.249$, 95% CI [0.276, 1.208]. Cost trait utility scores were significantly higher than time trait utility scores, $t(235) = 3.957$, $p < 0.001$, $d = 0.258$, 95% CI [0.302, 1.234] (Figure 2). These findings indicate that participants had a higher preference for eco-friendliness (eco trait utility) compared to both time-related considerations (time trait utility) and cost-related considerations (cost trait utility). Additionally, cost-related considerations were given higher preference than time-related ones.

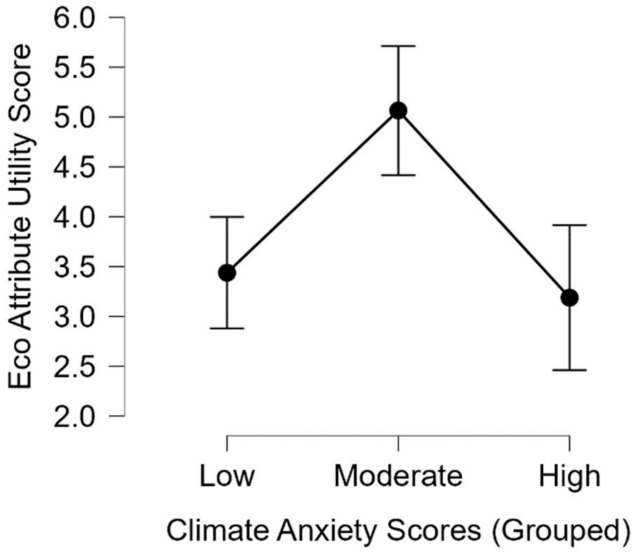

Figure 2. Descriptive plot of eco trait utility scores with CCAS groups.

Correlation analysis was again utilised to examine the relationship between participants' climate anxiety (CCAS) score and attribute utility scores. Participants' CCAS scores were significantly negatively correlated with time trait utility scores and cost trait utility scores; however, the relationship between CCAS scores and eco trait utility was not significant (Table 1). This suggests that higher levels of climate anxiety are associated with lower utility scores for the time and cost traits, indicating that individuals with greater climate anxiety are less willing to trade off their time and financial costs for environmentally friendly choices. In contrast, the lack of a significant correlation with eco trait utility suggests that climate anxiety may not strongly influence participants' preferences for eco-friendliness in this context.

We then examined differences in participants' eco trait utility based on whether they had low, moderate or high CCAS scores. To perform this, participants were split into three even groups based on their CCAS scores, with the bottom 78 participants in the low CCAS group, the middle 78 participants in the moderate CCAS group and finally, 80 participants in the high CCAS group. These groupings were based on a tertile split, with the low CCAS group including participants with scores of 4–10, the moderate CCAS group including participants with scores of 11–22 and the high CCAS group including participants with scores of 23–53. A two-way ANOVA was utilised with planned post-hoc analysis using Bonferroni corrections, which found a significant difference in scores $F(2233) = 9.727$, $p < 0.001$, $\eta^2 = 0.077$. The planned post-hoc analysis demonstrated that moderate CCAS scores were significantly higher than both low, $t(235) = 3.061$, $p = 0.002$, $d = 0.535$, 95% CI [0.329, 2.542], and high, $t(235) = 2.974$, $p < 0.001$, $d = 0.457$, 95% CI [0.288, 2.494], CCAS scores; however, there was no significant difference between low and high CCAS scores ($p = 0.851$) (Figure 2).

We then further examined the shape of the relationship between CCAS scores and attribute utility scores using polynomial regression with intercept, linear and quadratic terms. A significant negative quadratic effect was seen between participants' CCAS score and eco trait utility score $\beta = -5.878$, $p < 0.001$, adjusted $R^2 = 0.147$, indicating that participants with moderate levels of climate anxiety have higher eco trait utility scores. When examining the shape of our cost and time trait utility scores, there was no significant quadratic effect. To investigate potential interactions between the CCAS scores and the utilities attached to the eco vs. cost and time attributes, we then examined the shape of the cost and time utility scores' quadratic relationships and analysed their strength in regard to the CCAS and eco trait utility score. We performed this by first calculating the difference between our eco trait utility score and cost and time trait utility scores; this allowed us to determine whether participants with moderate CCAS scores indicated eco trait utility as the most important factor, and participants with low or high CCAS scores indicated either time or cost as the most important factors. To examine this, we ran the same analysis previously described but instead used our difference values. We found a significant negative relationship in both eco–cost trait utility difference ($\beta = -4.129$, $p < 0.001$, adjusted $R^2 = 0.113$) and eco–time trait utility difference ($\beta = -4.862$, $p < 0.001$, adjusted $R^2 = 0.087$), indicating that participants with moderate CCAS scores identified the eco trait utility as the more important factor and participants with low and high CCAS scores identified either the cost or time trait utility as more important.

3.2.3. Other Differences in CCAS Scores

Correlation analysis was utilised to examine the relationship between age and participants' CCAS scores and found no significant relationship between participants' age and CCAS score (Table 1). Correlation analysis was then used to examine the relationship between participants' CCAS scores and anxiety scores and found a significant positive relationship between participants' CCAS scores and anxiety scores $r(235) = 0.540$, $p < 0.001$.

3.2.4. Eco Trait Values and Eco-Friendly Behavioural Engagement

Correlation analysis was utilised to examine the relationship between participants' eco trait utility scores and participants' behavioural engagement scores, as measured by factor 2 of the CCAS, and found a positive correlation between these scores, $r = 0.404$, $p \leq 0.001$. These findings indicate a reasonable association between self-reported behavioural engagement and behavioural engagement measured through our DCE. We did not expect a strong relationship here as it is well established that self-report measures of pro-environment behaviours more accurately reflect on someone's propensity or inclination rather than actual behaviour.

4. Discussion

This study investigated the relationship between climate anxiety and pro-environment behaviours via self-report questionnaires and a discrete choice experiment (DCE). To achieve this, we developed a DCE that simulated transport choices for participants. This DCE allowed us to further examine not only the frequency of pro-environment decisions but also the trade-offs participants would be willing to make as part of these pro-environment choices. Through this, we were able to examine the relationship that climate anxiety has with participant preferences regarding pro-environment travel choices.

4.1. Links between Climate Anxiety and Pro-Environment Behaviours

Climate anxiety, which has been identified as feelings of worry and concern about the impacts of climate change, has previously been the focus of numerous recent studies. A key focus of this recent research has examined how climate anxiety may impact related behaviours, such as pro-environment behaviours. Much of this previous research has found mixed results, with some finding that the level of climate anxiety does not indicate a person's likelihood for pro-environment behaviours, or a "greener" lifestyle [24,28]. However, there is a growing body of literature that indicates that climate anxiety may be positively associated with pro-environment behaviours, thus an adaptive response to the issue of climate change [17,27,66]. When considering these varied findings, we wanted to examine whether perhaps this relationship was more complex than simply positively or negatively related. We hypothesised that participants exhibiting moderate levels of climate anxiety would exhibit more pro-environment decisions, as measured through our DCE, than participants reporting low or high levels of climate anxiety. Initial analysis of our results found evidence in support of some initial claims from Clayton and Karazsia [24], as climate anxiety was not found to be significantly related to participants' eco trait utility scores. However, upon further examination, as hypothesised, we found that participants with moderate levels of climate anxiety exhibited a significantly higher preference for "eco-friendly" options than participants reporting low or high levels of climate anxiety, with quite substantial effect sizes examined in our initial ANOVA, $d = 0.535$ for the comparison between moderate and low, and $d = 0.457$ for the comparison between moderate and high climate anxiety groups. This was supported further with a significant negative quadratic linear relationship (inverted U). These findings indicate there is in fact a significant relationship between climate anxiety and pro-environment decision making and further support the claim that high levels of climate anxiety may be inhibiting behavioural change due to the debilitating nature of climate anxiety and associated stress due to the extreme complexity of the issue [14,67]. These findings may provide some clarity on the initial mixed results, as studies that had found no relationship may have included a high proportion of participants with high levels of climate anxiety, potentially overshadowing any relationship that may be examined.

It was also hypothesised that participants exhibiting moderate levels of climate anxiety would have preferences of choices, identifying eco-friendliness as of higher importance than time or cost. This hypothesis was supported in our findings, indicating that moderate levels of climate anxiety may be optimal for pro-environment decision making. These findings provide further evidence supporting our assumption that an increase in pro-environment behaviours may have a similar inverted U relationship with climate anxiety that has been seen in performance-based tasks, such as sports or in high-pressure work environments [38–41]. These findings highlight the importance of re-framing environmental issues to attempt to alleviate anxiety associated with climate change, as this may further encourage behavioural change.

4.2. Examining Climate Anxiety and General Anxiety

As previously discussed, climate change anxiety has been linked to a range of negative mental health outcomes [11–13]. Due to this, we wanted to examine whether climate anxiety was directly related to general anxiety, or whether there may be further complexities to

consider. In line with our hypothesis, we found that climate anxiety was significantly positively correlated with participants' general levels of anxiety; these findings are aligned with previous research [24]. The moderate positive correlation (r = 0.54) indicates that there are aspects of the climate anxiety construct that are unique, differing from general anxiety. This discussion of the various themes that may be associated with climate anxiety, such as themes found in health anxiety, existential anxiety and death anxiety, is important as it will provide an increased understanding of the dynamics of climate anxiety [68].

4.3. Relationship between Age and Climate Anxiety

Often, concerns about climate change are considered to be worries of the younger generations and portrayed as somewhat generational disagreements [69]. However, these claims have not necessarily been supported, as previous research has found mixed results when examining the relationship between climate anxiety and age [70–73]. When examining this relationship, we found no significant relationship between age and climate anxiety, which indicates that this divide may be somewhat misguided and counterproductive. This expected relationship is not due to an expectation that younger people are more knowledgeable about climate change, but rather due to the negative, often fear-focused nature of climate change education through social media and an increase in climate change education in schooling [74,75]. However, many of these studies have had limited to no focus on older generations. Addressing these gaps may be of great importance to understanding the dynamics of climate anxiety and its impacts across the lifespan.

4.4. Future Direction, Strengths and Limitations

Future research should focus on the further analysis of frequency and preferences associated with pro-environment choices using DCEs and other behavioural assessments. Future research may include an increase in attributes and levels when using DCEs to examine pro-environment behaviours to gain a deeper and fuller understanding of what trade-offs people are willing to make, allowing for more appealing eco-friendly options to be made available. This further understanding of eco-conscious decision making may allow for policy alignment, which may serve as an important factor in driving positive behavioural changes and addressing the potential challenges of climate change. This is important to note as it is suggested that high-level policy change is incredibly beneficial for reducing stress and distress associated with climate change, as this may show understanding and validate fears that people may have [28].

The novel experimental approach provides a step forward to understanding environmental behaviours utilising more objective methods. The use of a DCE allowed us to measure participants' preferences when choosing eco-friendly travel options and examine the frequency with which they chose these options and demonstrated a link to a behavioural engagement factor measured through self-report (CAS Factor 2). These findings indicate that discrete choice experiments (DCEs) can be useful in future research on pro-environment choices, especially when considering factors like choice frequency and participant preferences. This research approach can be applied to various areas, such as studying behavioural change or implementing policies related to a more environmentally friendly lifestyle, including changes in public transportation.

The study design was limited by the novelty of the construct of climate anxiety, and the variations in definitions across the literature. These variations make it difficult to make broad comparisons without further psychometric data for available measures. It is also important to note that due to the use of online polling, participants required access to the Internet; this requirement may have excluded other possibly concerned individuals without Internet access the opportunity to participate. Our study was also limited by the binary nature of our DCE, e.g., Yes or No option for eco-friendly. This design may have encouraged participants to pick eco-friendly options due to the nature of this choice. Future studies should use a more in-depth DCE design with differing values for eco-friendliness of choices, such as star ratings. More in-depth choices will allow a further understanding of

how pro-environmental decisions are made, giving a much clearer idea of trade-offs people are willing to consider when making these choices. Future studies may also further examine the relationship between anxiety and climate anxiety by utilising a more comprehensive anxiety scale or incorporating other scales such as the Death Anxiety Scale, or Locus of Control, allowing for a deeper understanding of the components of climate anxiety.

5. Conclusions

To conclude, inaction regarding climate change and inadequate policy change to prevent or reduce associated levels of climate anxiety may have long-term negative impacts for not only mental, but also physical health [21,24,76]. Through this study, we have found a relationship between climate anxiety and pro-environmental choice, indicating that moderate levels of climate anxiety produce an optimal level of arousal, mediating an increase in pro-environment choices. These findings are very relevant and allow further inspection of what is required when discussing positive and effective climate change messages. Such messages could be re-framed so that anxiety levels are moderated, rather than extreme.

Author Contributions: Z.C.—first author; M.K. and S.B.—supervision, conceptualisation, review and editing. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: University ethics committee approval number H-2019-0402.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author due to restrictions with ethics approval.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

Table A1. Correlation matrix including relationships between study variables.

Pearson's Correlations								
Variable		**Age**	**Anxiety Score**	**Cost Attribute Utility Score**	**Time Attribute Utility Score**	**Eco Attribute Utility Score**	**Climate Anxiety Factor 2**	**Climate Anxiety Scores**
1. Age	Pearson's r	—						
	p-value	—						
2. Anxiety Score	Pearson's r	−0.212	—					
	p-value	0.001	—					
3. Cost Attribute Utility Score	Pearson's r	−0.198	−0.104	—				
	p-value	0.002	0.110	—				
4. Time Attribute Utility Score	Pearson's r	−0.287	−0.130	0.436	—			
	p-value	<0.001	0.046	<0.001	—			
5. Eco Attribute Utility Score	Pearson's r	−0.163	−0.123	0.321	0.289	—		

Table A1. *Cont.*

Pearson's Correlations								
Variable		**Age**	**Anxiety Score**	**Cost Attribute Utility Score**	**Time Attribute Utility Score**	**Eco Attribute Utility Score**	**Climate Anxiety Factor 2**	**Climate Anxiety Scores**
	p-value	0.012	0.059	<0.001	<0.001	—		
6. Climate Anxiety Factor 2	Pearson's r	−0.043	0.089	0.225	0.170	0.404	—	
	p-value	0.512	0.175	<0.001	0.009	<0.001	—	
7. Climate Anxiety Scores	Pearson's r	−0.083	0.540	−0.438	−0.360	−0.071	0.152	—
	p-value	0.204	<0.001	<0.001	<0.001	0.218	0.019	—

References

1. Milfont, T.L.; Wilson, M.S.; Sibley, C.G. The public's belief in climate change and its human cause are increasing over time. *PLoS ONE* **2017**, *12*, e0174246. [CrossRef]
2. Newman, T.P.; Nisbet, E.C.; Nisbet, M.C. Climate change, cultural cognition, and media effects: Worldviews drive news selectivity, biased processing, and polarized attitudes. *Public Underst. Sci.* **2018**, *27*, 985–1002. [CrossRef]
3. Cohen, B. Urban growth in developing countries: A review of current trends and a caution regarding existing forecasts. *World Dev.* **2004**, *32*, 23–51. [CrossRef]
4. Cohen, B. Urbanization in developing countries: Current trends, future projections, and key challenges for sustainability. *Technol. Soc.* **2006**, *28*, 63–80. [CrossRef]
5. Liu, F.; Liu, C. Regional disparity, spatial spillover effects of urbanisation and carbon emissions in China. *J. Clean. Prod.* **2019**, *241*, 118226. [CrossRef]
6. Moser, S.C. Now more than ever: The need for more societally relevant research on vulnerability and adaptation to climate change. *Appl. Geogr.* **2010**, *30*, 464–474. [CrossRef]
7. Tollefson, J. Global industrial carbon emissions to reach all-time high in 2018. *Nature* **2018**, *10*, 2141. [CrossRef]
8. Kubo, T.; Tsuge, T.; Abe, H.; Yamano, H. Understanding island residents' anxiety about impacts caused by climate change using Best–Worst Scaling: A case study of Amami islands, Japan. *Sustain. Sci.* **2019**, *14*, 131–138. [CrossRef]
9. Scaife, A.A.; Spangehl, T.; Fereday, D.R.; Cubasch, U.; Langematz, U.; Akiyoshi, H.; Bekki, S.; Braesicke, P.; Butchart, N.; Chipperfield, M.P.; et al. Climate change projections and stratosphere–troposphere interaction. *Clim. Dyn.* **2012**, *38*, 2089–2097. [CrossRef]
10. Whetton, P.H.; McInnes, K.L.; Jones, R.N.; Hennessy, K.J.; Suppiah, R.; Page, C.M.; Bathols, J.; Durack, P.J. *Australian Climate Change Projec-Tions for Impact Assessment and Policy Application: A Review*; CSIRO Marine and Atmospheric Research Melbourne: Canberra, Australia, 2005.
11. Berry, H.L.; Bowen, K.; Kjellstrom, T. Climate change and mental health: A causal pathways framework. *Int. J. Public Health* **2010**, *55*, 123–132. [CrossRef]
12. Cianconi, P.; Betrò, S.; Janiri, L. The impact of climate change on mental health: A systematic descriptive review. *Front. Psychiatry* **2020**, *11*, 74. [CrossRef]
13. Prohaska, T.R.; Peters, K.E. Impact of natural disasters on health outcomes and cancer among older adults. *Gerontologist* **2019**, *59* (Suppl. 1), S50–S56. [CrossRef]
14. Clayton, S. Mental health risk and resilience among climate scientists. *Nat. Clim. Chang.* **2018**, *8*, 260–261. [CrossRef]
15. Helm, S.V.; Pollitt, A.; Barnett, M.A.; Curran, M.A.; Craig, Z.R. Differentiating environmental concern in the context of psychological adaption to climate change. *Glob. Environ. Chang.* **2018**, *48*, 158–167. [CrossRef]
16. Searle, K.; Gow, K. Do concerns about climate change lead to distress? *Int. J. Clim. Chang. Strat. Manag.* **2010**, *2*, 362–379. [CrossRef]
17. Ogunbode, C.A.; Doran, R.; Hanss, D.; Ojala, M.; Salmela-Aro, K.; van den Broek, K.L.; Bhullar, N.; Aquino, S.D.; Marot, T.; Schermer, J.A. Climate anxiety, wellbeing and pro-environmental action: Correlates of negative emotional responses to climate change in 32 countries. *J. Environ. Psychol.* **2022**, *84*, 101887. [CrossRef]
18. American Psychological Association. Stress in America Generation Z. 2018. Available online: https://www.apa.org/news/press/releases/stress/2018/stress-gen-z.pdf (accessed on 1 March 2021).
19. American Psychological Association. Majority of US Adults Believe Climate Change Is Most Important Issue Today. 2020. Available online: https://www.apa.org/news/press/releases/2020/02/climate-change (accessed on 11 January 2022).
20. Ingle, H.E.; Mikulewicz, M. Mental health and climate change: Tackling invisible injustice. *Lancet Planet. Health* **2020**, *4*, e128–e130. [CrossRef]

21. Hickman, C.; Marks, E.; Pihkala, P.; Clayton, S.; Lewandowski, R.E.; Mayall, E.E.; Wray, B.; Mellor, C.; van Susteren, L. Climate anxiety in children and young people and their beliefs about government responses to climate change: A global survey. *Lancet Planet. Health* **2021**, *5*, e863–e873. [CrossRef]
22. Pihkala, P. Climate Anxiety. In HELDA. Suomen Mielenterveysseura. 2019. Available online: http://hdl.handle.net/10138/307626 (accessed on 10 August 2021).
23. Bourque, F.; Willox, A.C. Climate change: The next challenge for public mental health? *Int. Rev. Psychiatry* **2014**, *26*, 415–422. [CrossRef]
24. Clayton, S.; Karazsia, B.T. Development and validation of a measure of climate change anxiety. *J. Environ. Psychol.* **2020**, *69*, 101434. [CrossRef]
25. Ojala, M.; Cunsolo, A.; Ogunbode, C.A.; Middleton, J. Anxiety, worry, and grief in a time of environmental and climate crisis: A narrative review. *Annu. Rev. Environ. Resour.* **2021**, *46*, 35–58. [CrossRef]
26. Coffey, Y.; Bhullar, N.; Durkin, J.; Islam, S.; Usher, K. Understanding eco-anxiety: A systematic scoping review of current literature and identified knowledge gaps. *J. Clim. Chang. Health* **2021**, *3*, 100047. [CrossRef]
27. Jain, N.; Jain, P. Eco-Anxiety and Environmental Concern as Predictors of Eco-Activism. *IOP Conf. Ser. Earth Environ. Sci.* **2022**, *1084*, 012007. [CrossRef]
28. Kapeller, M.L.; Jäger, G. Threat and anxiety in the climate debate—An agent-based model to investigate climate scepticism and pro-environmental behaviour. *Sustainability* **2020**, *12*, 1823. [CrossRef]
29. Verplanken, B.; Marks, E.; Dobromir, A.I. On the nature of eco-anxiety: How constructive or unconstructive is habitual worry about global warming? *J. Environ. Psychol.* **2020**, *72*, 101528. [CrossRef]
30. Jang, S.J.; Chung, S.J.; Lee, H. Validation of the climate change anxiety scale for Korean adults. *Perspect. Psychiatr. Care* **2023**. [CrossRef]
31. Bystritsky, A.; Kronemyer, D. Stress and anxiety: Counterpart elements of the stress/anxiety complex. *Psychiatr. Clin. N. Am.* **2014**, *37*, 489–518. [CrossRef]
32. McEwen, B.S.; Eiland, L.; Hunter, R.G.; Miller, M.M. Stress and anxiety: Structural plasticity and epigenetic regulation as a consequence of stress. *Neuropharmacology* **2012**, *62*, 3–12. [CrossRef]
33. Robinson, L. Stress and anxiety. *Nurs. Clin. N. Am.* **1990**, *25*, 935–943. [CrossRef]
34. Hardy, L.; Fazey, J. *The Inverted-U Hypothesis: A Catastrophe for Sport Psychology*; University of Wales: Cardiff, UK, 1988.
35. Yerkes, R.M.; Dodson, J.D. The relation of strength of stimulus to rapidity of habit-formation. *J. Comp. Neurol. Psychol.* **1908**, *18*, 459–482. [CrossRef]
36. Williams, K. Anxiety and formal second/foreign language learning. *RELC J.* **1991**, *22*, 19–28. [CrossRef]
37. Arent, S.M.; Landers, D.M. Arousal, anxiety, and performance: A reexamination of the inverted-u hypothesis. *Res. Q Exerc. Sport* **2003**, *74*, 436–444. [CrossRef]
38. Leung, M.-Y.; Chan, Y.-S.; Olomolaiye, P. Impact of stress on the performance of construction project managers. *J. Constr. Eng. Manag.* **2008**, *134*, 644–652. [CrossRef]
39. Ganster, D.C. Executive job demands: Suggestions from a stress and decision-making perspective. *Acad. Man-Agement Rev.* **2005**, *30*, 492–502. [CrossRef]
40. Welford, A.T. Stress and performance. *Ergonomics* **1973**, *16*, 567–580. [CrossRef]
41. Wilke, P.K.; Gmelch, W.H.; Lovrich, N.P. Stress and Productivity: Evidence of the Inverted U Function. *Public Prod. Rev.* **1985**, *9*, 342. [CrossRef]
42. Pihkala, P. Climate anxiety and environmental education. *Sustainability* **2022**, *12*, 10149. [CrossRef]
43. Stanley, S.K.; Hogg, T.L.; Leviston, Z.; Walker, I. From anger to action: Differential impacts of eco-anxiety, eco-depression, and eco-anger on climate action and wellbeing. *J. Clim. Chang. Health* **2021**, *1*, 100003. [CrossRef]
44. Hogg, T.L.; Stanley, S.K.; O'Brien, L.V.; Wilson, M.S.; Watsford, C.R. The Hogg Eco-Anxiety Scale: Development and validation of a multidimensional scale. *Glob. Environ. Chang.* **2021**, *71*, 102391. [CrossRef]
45. Léger-Goodes, T.; Malboeuf-Hurtubise, C.; Mastine, T.; Généreux, M.; Paradis, P.-O.; Camden, C. Eco-anxiety in children: A scoping review of the mental health impacts of the awareness of climate change. *Front. Psychol.* **2022**, *13*, 872544. [CrossRef]
46. Hini, D.; Gendall, P.; Kearns, Z. The link between environmental attitudes and behaviour. *Mark. Bull.* **1995**, *6*, 22–31.
47. Lange, F.; Dewitte, S. Measuring pro-environmental behavior: Review and recommendations. *J. Environ. Psychol.* **2019**, *63*, 92–100. [CrossRef]
48. Scott, D.; Willits, F.K. Environmental Attitudes and Behavior. *Environ. Behav.* **1994**, *26*, 239–260. [CrossRef]
49. Swim, J.K.; Clayton, S.; Howard, G.S. Human behavioral contributions to climate change: Psychological and con-textual drivers. *Am. Psychol.* **2011**, *66*, 251. [CrossRef]
50. Wynes, S.; Nicholas, K.A. The climate mitigation gap: Education and government recommendations miss the most effective individual actions. *Environ. Res. Lett.* **2017**, *12*, 074024. [CrossRef]
51. Larson, L.R.; Stedman, R.C.; Cooper, C.B.; Decker, D.J. Understanding the multi-dimensional structure of pro-environmental behavior. *J. Environ. Psychol.* **2015**, *43*, 112–124. [CrossRef]
52. Anderson, R.; Thier, M.; Pitts, C. Interpersonal and intrapersonal skill assessment alternatives: Self-reports, situational-judgment tests, and discrete-choice experiments. *Learn. Individ. Differ.* **2017**, *53*, 47–60. [CrossRef]

53. Beck, M.J.; Rose, J.M.; Greaves, S.P. I can't believe your attitude: A joint estimation of best worst attitudes and electric vehicle choice. *Transportation* **2017**, *44*, 753–772. [CrossRef]
54. McGrady, M.E.; Pai, A.L.H.; Prosser, L.A. Using discrete choice experiments to develop and deliver patient-centered psychological interventions: A systematic review. *Health Psychol. Rev.* **2021**, *15*, 314–332. [CrossRef] [PubMed]
55. de Bekker-Grob, E.; Donkers, B.; Bliemer, M.; Veldwijk, J.; Swait, J. Can healthcare choice be predicted using stated preference data? *Soc. Sci. Med.* **2020**, *246*, 112736. [CrossRef]
56. Kelly, J.; Haider, W.; Williams, P.W. A behavioral assessment of tourism transportation options for reducing energy consumption and greenhouse gases. *J. Travel Res.* **2007**, *45*, 297–309. [CrossRef]
57. Quaife, M.; Terris-Prestholt, F.; Di Tanna, G.L.; Vickerman, P. How well do discrete choice experiments predict health choices? A systematic review and meta-analysis of external validity. *Eur. J. Health Econ.* **2018**, *19*, 1053–1066. [CrossRef]
58. Telser, H.; Zweifel, P. Validity of discrete-choice experiments evidence for health risk reduction. *Appl. Econ.* **2007**, *39*, 69–78. [CrossRef]
59. de Bekker-Grob, E.W.; Donkers, B.; Jonker, M.F.; Stolk, E.A. Sample size requirements for discrete-choice experiments in healthcare: A practical guide. *Patient-Patient-Centered Outcomes Res.* **2015**, *8*, 373–384. [CrossRef]
60. Qualtrics. *Qualtrics Privacy Policy*; Qualtrics: Provo, UT, USA, 2021; Available online: https://www.qualtrics.com (accessed on 1 March 2021).
61. Cruz, S.M.; High, A.C. Psychometric properties of the climate change anxiety scale. *J. Environ. Psychol.* **2022**, *84*, 101905. [CrossRef]
62. Lovibond, S.H.; Lovibond, P.F. *Manual for the Depression Anxiety Stress Scales*, 2nd ed.; American Psychological Association: Washington, DC, USA, 1995.
63. Brown, T.A.; Chorpita, B.F.; Korotitsch, W.; Barlow, D.H. Psychometric properties of the depression anxiety stress scales (dass) in clinical samples. *Behav. Res. Ther.* **1997**, *35*, 79–89. [CrossRef]
64. Christensen, R.H.B. Ordinal—Regression Models for Ordinal Data, (R Package Version 2019.12-10). 2019. Available online: https://CRAN.R-project.org/package=ordinal (accessed on 10 January 2022).
65. R Core Team. *R: A Language and Environment for Statistical Computing*; R Foundation for Statistical Computing: Vienna, Austria, 2022; Available online: https://www.R-project.org/ (accessed on 11 June 2023).
66. Verplanken, B.; Roy, D. "My worries are rational, climate change is not": Habitual ecological worrying is an adaptive response. *PLoS ONE* **2013**, *8*, e74708. [CrossRef]
67. Dodgen, D.; Donato, D.; Kelly, N.; Greca, A.; Morganstein, J.; Reser, J.; Ruzek, J.; Schweitzer, S.; Shimamoto, M.; Tart, K.; et al. *Ch. 8: Mental Health and Well-Being (Tech. Rep.)*; US Global Change Research Program: Washington, DC, USA, 2016.
68. Pihkala, P. Anxiety and the ecological crisis: An analysis of eco-anxiety and climate anxiety. *Sustainability* **2020**, *12*, 7836. [CrossRef]
69. Chaaraoui, L. Young People are Worried about Climate Change, and Rightfully So, Harvardpolitics.com. 2023. Available online: https://harvardpolitics.com/youth-climate-worries/#:~:text=The%20fact%20that%20senior%20generations,%E2%80%9Ctheir%20problems%E2%80%9D%20is%20harmful (accessed on 7 June 2024).
70. Ayalon, L.; Roy, S.; Aloni, O.; Keating, N. A scoping review of research on older people and intergenerational relations in the context of climate change. *Gerontologist* **2023**, *63*, 945–958. [CrossRef]
71. Gray, S.G.; Raimi, K.T.; Wilson, R.; Árvai, J. Will Millennials save the world? The effect of age and generational differences on environmental concern. *J. Environ. Manag.* **2019**, *242*, 394–402. [CrossRef]
72. Ojala, M. Climate anxiety. *Rsa J.* **2018**, *164*, 10–15.
73. Wullenkord, M.C.; Tröger, J.; Hamann, K.R.S.; Loy, L.S.; Reese, G. Anxiety and climate change: A validation of the Climate Anxiety Scale in a German-speaking quota sample and an investigation of psychological correlates. *Clim. Chang.* **2021**, *168*, 20. [CrossRef]
74. Anderson, A. Climate change education for mitigation and adaptation. *J. Educ. Sustain. Dev.* **2012**, *6*, 191–206. [CrossRef]
75. Ojala, M. Facing anxiety in climate change education: From therapeutic practice to hopeful transgressive learning. *Can. J. Environ. Educ.* **2016**, *21*, 41–56.
76. Prince, M.; Patel, V.; Saxena, S.; Maj, M.; Maselko, J.; Phillips, M.R.; Rahman, A. No health without mental health. *Lancet* **2007**, *370*, 859–877. [CrossRef]