



Belief in science and climate anxiety: findings from a quota-sample

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Received: 21 December 2023 / Accepted: 25 April 2024

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Abstract

Aim To date, no studies exist investigating whether belief in science is associated with climate anxiety. Thus, our goal was to examine the link between belief in science and climate anxiety (also among different age groups).

Subject and methods Data were taken from a general adult population online sample (n = 3091 persons aged 18 to 74 years; spring 2022). Climate anxiety was measured with the Climate Anxiety Scale. The Belief in Science Scale was used to measure belief in science. Multiple log-linear regressions were used, adjusting for a wide array of covariates.

Results Multiple log-linear regressions showed that a greater belief in science was significantly associated with higher (log) climate anxiety ($\beta = .003$, $p < .001$) among the total sample, particularly driven by younger adults. More precisely, a greater belief in science was significantly associated with higher (log) climate anxiety ($\beta = .006$, $p < .001$) among individuals aged 18 to 29 years, whereas these factors were not significant in the other age groups (i.e., among individuals aged 30 to 49 years, among individuals aged 50 to 64 years, and among individuals aged 65 to 74 years). There was a significant interaction between individuals aged 65 years to 74 years (reference category: individuals aged 18 to 29 years) and belief in science ($\beta = -0.007$, $p = .03$).

Conclusion This study identified an association between a greater belief in science and higher climate anxiety, particularly among younger individuals, whereas this link was not present among older age groups. Further studies are required to confirm our current findings.

Keywords Climate anxiety · Climate change · Belief in science · Germany

Introduction

Climate change is occurring, and it can increase global temperatures. Melting of glaciers and polar ice can raise the sea levels, which can lead to natural disasters such as floods or severe storms (Huckelba and Van Lange 2020). The loss of various species may occur (e.g., polar bears) because their natural habitats are severely influenced by the temperature increases (Huckelba and Van Lange 2020). The Arctic Ocean may be an ice-free zone by the Summer of 2050 (Screen and Deser 2019). Among the survival challenges,

scarcity of food stands out as a particularly impactful one (Huckelba and Van Lange 2020). In sum, climate change is a major threat to the overall well-being and survival of humanity (Steffen et al. 2015).

As a result, people may develop *climate anxiety* (Panu 2020)—an “anxiety significantly related to anthropogenic climate change” (p. 3) (Panu 2020). Although research on the determinants of climate anxiety is still in its infancy, several determinants have already been identified (e.g., Ogunbode et al. 2022; Whitmarsh et al. 2022). For example, previous research showed that younger individuals reported higher climate anxiety compared to older individuals (Clayton 2020). Moreover, it has been shown that women had higher levels of climate anxiety (Ramírez-López et al. 2022). Furthermore, climate information seeking behavior predicts climate anxiety (Whitmarsh et al. 2022).

Thus far, however, there is a complete lack of studies investigating whether *belief in science* is associated with climate anxiety. Hence, we aimed to investigate the association between belief in science and climate anxiety (also among

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different age groups). Following Dagnall et al. (2019), belief in science mainly refers to “confidence and trust in the validity of scientific methods and outcomes” (p. 2). Moreover, a stronger belief in science is accompanied by an outright rejection of ideas that do not fit into the traditional framework of science (e.g., paranormal ideas or religious skepticism) (Dagnall et al. 2019).

In a larger context, it has been shown that belief in science is associated with other anxiety-related outcomes. For example, belief in science is positively associated with higher existential anxiety (Farias et al. 2013). Another study showed a positive association between belief in science and COVID-19 induced anxiety (Rothgerber et al. 2020). Thus, one may conclude that belief in science is also positively associated with other anxiety-related outcomes, such as climate anxiety.

Knowledge about the factors associated with climate anxiety is of great importance (e.g., for public health staff, policymakers, and clinicians) because climate anxiety in turn can contribute to lower mental health (Schwartz et al. 2023) or higher loneliness (Hajek and König 2022). Individuals with higher levels of climate anxiety also think that they will die earlier (Hajek and König 2023). On the other hand, higher climate anxiety can predict pro-environmental actions (Whitmarsh et al. 2022).

We assume that individuals scoring higher in belief in science are particularly aware of the most likely drastic consequences of climate change, which in turn could foster higher climate anxiety. Such a positive association between belief in science and climate anxiety may be particularly pronounced among younger adults because they (and their potential children, other relatives, and friends) are likely to be more directly affected by the consequences of climate change than, for example, older individuals. Moreover, younger adults have come of age during a period characterized by the evident climate change and the widespread discourse surrounding it. These individuals are exposed to a wealth of knowledge about global environmental issues disseminated through media, education systems, and digital platforms. As a result of this increased awareness of climate issues, it is plausible that these individuals may experience heightened levels of anxiety (Reyes et al. 2021; Tsevreni et al. 2023).

In sum, our hypotheses were as follows:

- (1) Belief in science is positively associated with climate anxiety in the total sample.
- (2) Age group moderates the association between belief in science and climate anxiety.

With respect to the second hypotheses: We particularly assume that the association between belief in science and

climate anxiety is particularly pronounced among younger adults.

Methods

Sample

Data were taken from a quota-based online survey of 3091 persons (18 to 74 years) living in Germany. For this survey, data were collected in mid-March 2022. Regarding the recruitment procedure: The well-known market research company Bilendi and respondi—a certified market research company (ISO 26362)—undertook the invitation of the participants.

They were selected from a quota-based online sample to ensure that the distribution of respondents by age, gender, and state reflected that of the adult German population as a whole. Overall, 11,900 individuals were invited to participate.

Each individual gave his or her informed consent. The Psychological Ethics Committee of the University Medical Center Hamburg-Eppendorf gave its approval for this study (LPEK-0412). The study was conducted in accordance with the Declaration of Helsinki.

Dependent variables

To measure climate anxiety, Clayton and Karazsia (2020) developed the Climate Anxiety Scale. It has 13 items. Each of the 13 items range from 1 = strongly disagree to 7 = strongly agree/applies completely. Some examples are: “Thinking about climate change makes it difficult for me to concentrate,” “I have nightmares about climate change,” “My concerns about climate change make it hard for me to have fun with my family and friends,” or “My concerns about climate change undermine my ability to work to my potential.” All items were worded in the same direction. By averaging all items, a final climate anxiety score was computed. This final score ranges from 1 to 7, and higher values correspond to higher levels of climate anxiety. In this study, we used the validated German version (Wullenkord et al. 2021). In the current study, Cronbach’s alpha was 0.95 (McDonald’s omega 0.95). Stratified by age group, Cronbach’s alpha (McDonald’s omega in parentheses) was as follows: 0.95 (0.95) among individuals aged 18 to 29 years, 0.96 (0.96) among individuals aged 30 to 49 years, 0.94 (0.94) among individuals aged 50 to 64 years, and 0.93 (0.93) among individuals aged 65 to 74 years.

Convergent and discriminant validity of the CAS have been demonstrated in previous research (Clayton and

Karaszia 2020; Innocenti et al. 2021; Larionow et al. 2022; Mouguiama-Daouda et al. 2022). Good test–retest reliability (3 months) has also been shown. More precisely, the intra class correlation coefficient was 0.88 for the functional impairment subscale and 0.93 for the cognitive impairment subscale in prior research (Innocenti et al. 2021).

Independent variable of interest

Belief in science was quantified using the Belief in Science Scale (BISS) (Farias et al. 2013). As stated by Dagnall et al., the BISS concentrates on the “belief in the value of science as an institution and a source of superior knowledge” (p. 2) (Dagnall et al. 2019). Thus, differences in attitudes toward science can be present (Dagnall et al. 2019)—ranging from a complete rejection of the scientific approach to the belief that science offers unique, truthful insights into our reality (Dagnall et al. 2019).

The BISS consists of ten items focusing on the benefits of science. Each item has six levels (from 1 = strongly disagree to 6 = strongly agree). All items were positively worded. Some examples are (Farias et al. 2013): “All the tasks human beings face are soluble by science,” “Scientists and science should be given more respect in modern society,” “The scientific method is the only reliable path to knowledge,” or “We can only rationally believe in what is scientifically provable.” Based on all ten items, a sum score was generated. This score ranges from 10 to 60, whereby higher values reflect a greater belief in science. In our study, Cronbach’s alpha was 0.92 (McDonald’s omega 0.92). Stratified by age group, Cronbach’s alpha (McDonald’s omega in parentheses) was as follows: 0.90 (0.90) among individuals aged 18 to 29 years, 0.93 (0.93) among individuals aged 30 to 49 years, 0.92 (0.93) among individuals aged 50 to 64 years, and 0.92 (0.92) among individuals aged 65 to 74 years. The BISS has favorable psychometric characteristics (Dagnall et al. 2019). For example, support for convergent validity has been found (Dagnall et al. 2019). A high internal reliability (Cronbach’s alpha = 0.86) has also been demonstrated (Farias et al. 2013).

Covariates

Grounded on former research (Ogunbode et al. 2022; Whitmarsh et al. 2022), covariates were selected for inclusion in regression analysis. Covariates can be categorized into sociodemographic, lifestyle-related, psychological, and health-related factors. Regarding sociodemographic factors, we included sex (men, women, diverse), age (in years), family status (single; widowed; divorced; married, not cohabiting with spouse; married, cohabiting with spouse), children in own household (no, yes), school education (upper Secondary School, qualification for applied

upper Secondary School, polytechnic Secondary School, intermediate Secondary School, currently in School training/education, without school-leaving qualification/Lower Secondary School), state (distinguishing between all 16 federal states of Germany), and employment situation (full-time employment, retired, other) in regression analysis. Regarding lifestyle-related factors, we included smoking behavior (from “never smoker” to “yes, daily”), frequency of sports activities (from “no sports activity” to “more than 4 h a week”), and alcohol intake (from “never” to “daily”) in regression analysis.

Regarding health-related factors, we included chronic conditions (no chronic conditions, at least one or more chronic conditions), and self-rated health (from 1 = very poor to 5 = very good) in regression analysis. Moreover, regarding psychological factors, we included coronavirus anxiety in regression analysis. It was assessed using the Coronavirus Anxiety Scale (Lee 2020; Spitzenstatter and Schnell 2022) (translated by Spitzenstatter and Schnell into the German language), which has five items. A sum score was built, ranging from 0 to 20, whereby higher scores reflect higher coronavirus anxiety. Cronbach’s alpha was 0.92 in this study (McDonald’s omega was also 0.92). Former studies also used this instrument to quantify coronavirus anxiety (e.g., aan het Rot et al. 2023; Hajek and Konig 2023; Öztürk et al. 2023).

Statistical analysis

In a first step, sample characteristics are shown (also stratified by age group). Moreover, effect sizes (in terms of Pearson’s r) are computed—also stratified by age group. Thereafter, multiple log-linear regressions were performed to study the association between belief in science and (log) climate anxiety in the total sample and in different age groups (18 to 29 years; 30 to 49 years; 50 to 64 years; 65 to 74 years). Since climate anxiety was heavily skewed, climate anxiety was logarithmized. We also compared the AIC (3907.2) and the BIC (4172.7) of this log-linear model to a conventional linear regression model (AIC 9188.7; BIC 9454.3) and a gamma log-link model (AIC 10,476.2; 10,741.8). This comparison also substantiated our choice of a log-linear model. Some effect sizes (eta-squared and partial eta-squared) for the associations of interest from the regressions were shown. The partial eta-squared values can be interpreted as (Cohen 1988) 0.01 is “small,” 0.06 is “medium,” and 0.14 is “large.”

A recently developed Stata tool was applied to compute McDonald’s omega (Shaw 2021). Missing values were not present. The significance level was set at $p < 0.05$. Stata 16.1 (Stata Corp., College Station, TX) was used for statistical analyses.

Results

Sample characteristics

Sample characteristics (total sample and stratified by age group) are shown in Table 1. In the total sample, mean age was 46.5 years (18 to 74 years, SD 15.3 years) and 49.5% of all individuals were women. Moreover, the average climate anxiety score was 2.0 (SD 1.2) and the average belief in science score was 40.1 (SD 9.5) in the total sample. Nearly all variables significantly differed according to the age group (except for state, $p = 0.05$). Additional details are presented in Table 1.

The Pearson correlation between belief in science and climate anxiety was $r = 0.05$, $p < 0.01$ among the total sample (18 to 29 years, $r = 0.15$, $p < 0.001$; 30 to 49 years, $r = 0.07$, $p = 0.01$; 50 to 64 years, $r = 0.04$, $p = 0.18$; 65 to 74 years, $r = -0.03$, $p = 0.52$). Moreover, the Pearson correlation between belief in science and (log) climate anxiety was $r = 0.05$, $p = 0.01$ among the total sample (18 to 29 years, $r = 0.11$, $p < 0.01$; 30 to 49 years, $r = 0.07$, $p = 0.02$; 50 to 64 years, $r = 0.04$, $p = 0.17$; 65 to 74 years, $r = -0.01$, $p = 0.88$).

Regression analysis

The multiple log-linear regression findings are presented in Table 2. It was adjusted for sex, age (in years), marital status, having children in own household, school education, state, labor force participation, alcohol consumption, smoking status, sports activities, self-rated health, presence of one or more chronic conditions, and coronavirus anxiety in regression analysis. R^2 in the total sample equaled 0.22. In the age-stratified regressions, R^2 varied from 0.19 (among individuals aged 50 to 64 years) to 0.36 (among individuals aged 18 to 29 years).

Regressions revealed that a greater belief in science was significantly associated with higher (log) climate anxiety ($\beta = 0.003$, $p < 0.001$) among the total sample. Additionally, a greater belief in science was significantly associated with higher (log) climate anxiety ($\beta = 0.006$, $p < 0.001$) among individuals aged 18 to 29 years, whereas these two factors were not significant in the other age groups (i.e., among individuals aged 30 to 49 years, among individuals aged 50 to 64 years, and among individuals aged 65 to 74 years). There was a significant interaction between individuals aged 65 years to 74 years (reference category: individuals aged 18 to 29 years) and belief in science ($\beta = -0.007$, $p = 0.03$).

In terms of effect sizes (i.e., eta-squared and partial eta-squared values), for regressions conducted among the

total sample (Table 2, second column), the overall eta-squared value was 21.9% (95% CI 18.4% to 23.2%) and the partial eta-squared value for belief in science was 0.4% (94% CI 0.07% to 1.0%). Among individuals aged 18 to 29 years (Table 2, third column), the overall eta-squared value was 35.7% (95% CI 24.2% to 36.6%) and the partial eta-squared value for belief in science was 1.5% (95% CI 0.2% to 4.2%). In the remaining age groups, the partial eta-squared value for belief in science varied between 0.002% (among individuals aged 65 years and above) and 0.4% (among individuals aged 50 to 64 years).

Discussion

Using data from a large quota-based survey, our objective was to examine the link between belief in science and climate anxiety (also among different age groups). Regressions revealed a significant association between a greater belief in science and higher (log) climate anxiety among the total sample and individuals aged 18 to 29 years, whereas these factors were not significantly associated among older age groups. On the basis of bivariate associations and the results of multiple regression analysis, the effect sizes of interest are to be classified as “small” in the highest case (i.e., among individuals aged 18 to 29 years). Our initial expectations regarding the associations were met. It should be emphasized that this is the very first study investigating the association between belief in science and climate anxiety and can serve as an initial basis for upcoming studies in this area.

A possible explanation for such a link is that a great belief in science may reflect a clear, science-based understanding of the potential consequences of climate change such as floods. This in-depth knowledge could, in turn, foster higher levels of climate anxiety. Owing to the dearth of studies, future studies are required to gain further insights into the association between belief in science and climate anxiety.

With regard to the age-stratified regressions: Younger adults with a great belief in science may particularly fear the consequences of climate change for themselves as well as for family and friends. Moreover, they have grown up during a period where climate issues have been widely discussed. This increased attention to climate-related issues can lead to increased levels of anxiety (Reyes et al. 2021; Tsevreni et al. 2023).

Middle-aged or even older adults with a great belief in science, on the other hand, may feel that they themselves and their friends are unlikely to be directly affected by the consequences of climate change. This may explain why the association between higher belief in science and climate change was only present among younger adults. This is supported by the fact that a recent study also showed that an association between higher climate anxiety and lower

Table 1 Sample characteristics (total sample and stratified by age group)

Age group	Individuals aged 18 to 29 years Mean (SD)/n (%)	Individuals aged 30 to 49 years Mean (SD)/n (%)	Individuals aged 50 to 64 years Mean (SD)/n (%)	Individuals aged 65 to 74 years Mean (SD)/n (%)	Total sample Mean (SD)/n (%)	P value
	577 (18.7)	1076 (34.8)	995 (32.2)	443 (14.3)	3091 (100.0)	
Gender						<0.001
Male	123 (21.3)	506 (47.0)	594 (59.7)	331 (74.7)	1554 (50.3)	
Female	453 (78.5)	567 (52.7)	399 (40.1)	112 (25.3)	1531 (49.5)	
Diverse	1 (0.2)	3 (0.3)	2 (0.2)	0 (0.0)	6 (0.2)	
Children in own household						<0.001
No	439 (76.1)	537 (49.9)	775 (77.9)	407 (91.9)	2158 (69.8)	
Yes	138 (23.9)	539 (50.1)	220 (22.1)	36 (8.1)	933 (30.2)	
Marital status						<0.001
Single/divorced/widowed/married, not living together with spouse	308 (53.4)	378 (35.1)	416 (41.8)	164 (37.0)	1266 (41.0)	
Married, living together with spouse	269 (46.6)	698 (64.9)	579 (58.2)	279 (63.0)	1825 (59.0)	
Education						<0.001
Upper secondary school	334 (57.9)	483 (44.9)	284 (28.5)	133 (30.0)	1234 (39.9)	
Qualification for applied upper sec- ondary school	74 (12.8)	142 (13.2)	94 (9.4)	46 (10.4)	356 (11.5)	
Polytechnic secondary school	5 (0.9)	31 (2.9)	114 (11.5)	46 (10.4)	196 (6.3)	
Intermediate secondary school	124 (21.5)	345 (32.1)	360 (36.2)	127 (28.7)	956 (30.9)	
Lower secondary school/without school-leaving qualification	27 (4.7)	74 (6.9)	142 (14.3)	90 (20.3)	333 (10.8)	
Currently in school training/educa- tion	13 (2.3)	1 (0.1)	1 (0.1)	1 (0.2)	16 (0.5)	
Employment status						<0.001
Full-time employed	209 (36.2)	645 (59.9)	488 (49.0)	23 (5.2)	1365 (44.2)	
Retired	1 (0.2)	39 (3.6)	215 (21.6)	391 (88.3)	646 (20.9)	
Other	367 (63.6)	392 (36.4)	292 (29.3)	29 (6.5)	1080 (34.9)	
State						0.05
Baden-Wuerttemberg	81 (14.0)	152 (14.1)	134 (13.5)	50 (11.3)	417 (13.5)	
Bavaria	95 (16.5)	201 (18.7)	144 (14.5)	57 (12.9)	497 (16.1)	
Berlin	17 (2.9)	54 (5.0)	41 (4.1)	26 (5.9)	138 (4.5)	
Brandenburg	11 (1.9)	30 (2.8)	30 (3.0)	20 (4.5)	91 (2.9)	
Bremen	7 (1.2)	9 (0.8)	7 (0.7)	2 (0.5)	25 (0.8)	
Hamburg	12 (2.1)	27 (2.5)	22 (2.2)	9 (2.0)	70 (2.3)	
Hesse	51 (8.8)	67 (6.2)	73 (7.3)	42 (9.5)	233 (7.5)	
Mecklenburg-Western Pomerania	8 (1.4)	19 (1.8)	20 (2.0)	11 (2.5)	58 (1.9)	
Lower Saxony	49 (8.5)	103 (9.6)	88 (8.8)	58 (13.1)	298 (9.6)	
North Rhine-Westphalia	135 (23.4)	208 (19.3)	236 (23.7)	89 (20.1)	668 (21.6)	
Rhineland-Palatinate	35 (6.1)	50 (4.6)	46 (4.6)	18 (4.1)	149 (4.8)	
Saarland	5 (0.9)	15 (1.4)	13 (1.3)	3 (0.7)	36 (1.2)	
Saxony	25 (4.3)	50 (4.6)	49 (4.9)	22 (5.0)	146 (4.7)	
Saxony-Anhalt	13 (2.3)	25 (2.3)	23 (2.3)	18 (4.1)	79 (2.6)	
Schleswig-Holstein	17 (2.9)	38 (3.5)	40 (4.0)	13 (2.9)	108 (3.5)	
Thuringia	16 (2.8)	28 (2.6)	29 (2.9)	5 (1.1)	78 (2.5)	
Smoking status						<0.001
Yes, daily	81 (14.0)	261 (24.3)	298 (29.9)	82 (18.5)	722 (23.4)	
Yes, sometimes	60 (10.4)	89 (8.3)	66 (6.6)	23 (5.2)	238 (7.7)	
No, not anymore	117 (20.3)	285 (26.5)	325 (32.7)	216 (48.8)	943 (30.5)	
Never smoker	319 (55.3)	441 (41.0)	306 (30.8)	122 (27.5)	1188 (38.4)	
Alcohol consumption						<0.001

Table 1 (continued)

Age group	Individuals aged	Individuals aged	Individuals aged	Individuals aged	Total sample	P value
	18 to 29 years	30 to 49 years	50 to 64 years	65 to 74 years		
	Mean (SD)/n (%)	Mean (SD)/n (%)	Mean (SD)/n (%)	Mean (SD)/n (%)	Mean (SD)/n (%)	
Daily	15 (2.6)	39 (3.6)	81 (8.1)	64 (14.4)	199 (6.4)	
Several times a week	58 (10.1)	173 (16.1)	215 (21.6)	98 (22.1)	544 (17.6)	
Once a week	94 (16.3)	185 (17.2)	130 (13.1)	57 (12.9)	466 (15.1)	
1–3 times a month	139 (24.1)	194 (18.0)	151 (15.2)	61 (13.8)	545 (17.6)	
Less often	149 (25.8)	287 (26.7)	227 (22.8)	83 (18.7)	746 (24.1)	
Never	122 (21.1)	198 (18.4)	191 (19.2)	80 (18.1)	591 (19.1)	
Sports activities						<0.001
No sports activity	94 (16.3)	226 (21.0)	352 (35.4)	166 (37.5)	838 (27.1)	
Less than one hour a week	114 (19.8)	213 (19.8)	166 (16.7)	82 (18.5)	575 (18.6)	
Regularly, 1–2 h a week	157 (27.2)	306 (28.4)	221 (22.2)	87 (19.6)	771 (24.9)	
Regularly, 2–4 h a week	116 (20.1)	184 (17.1)	126 (12.7)	64 (14.4)	490 (15.9)	
Regularly, more than 4 h a week	96 (16.6)	147 (13.7)	130 (13.1)	44 (9.9)	417 (13.5)	
Chronic diseases						<0.001
Absence of at least one chronic disease	415 (71.9)	705 (65.5)	404 (40.6)	149 (33.6)	1673 (54.1)	
Presence of at least one chronic disease	162 (28.1)	371 (34.5)	591 (59.4)	294 (66.4)	1418 (45.9)	
Self-rated health (from 1 = very bad to 5 = very good)	3.9 (0.8)	3.8 (0.8)	3.4 (0.9)	3.3 (0.9)	3.6 (0.9)	<0.001
Coronavirus anxiety scale (from 0 to 20, with higher values reflecting higher coronavirus anxiety)	2.1 (3.7)	1.7 (3.4)	1.0 (2.4)	0.9 (2.3)	1.4 (3.1)	<0.001
Climate anxiety	2.4 (1.3)	2.1 (1.3)	1.8 (1.0)	1.8 (1.0)	2.0 (1.2)	<0.001
Belief in science	38.4 (9.0)	40.3 (9.8)	40.1 (9.5)	41.6 (8.9)	40.1 (9.5)	<0.001

P values are based on Chi² tests or oneway ANOVA, as appropriate

Table 2 Belief in science and (log) climate anxiety among the total sample and stratified by age group. Results of multiple linear regressions

Independent variables	(Log) climate anxiety—total sample	(Log) climate anxiety—individuals aged 18 to 29 years	(Log) climate anxiety—individuals aged 30 to 49 years	(Log) climate anxiety—individuals aged 50 to 64 years	(Log) climate anxiety—individuals aged 65 to 74 years
Belief in science	0.003*** (0.001)	0.006** (0.002)	0.003 (0.002)	0.003 (0.002)	0.000 (0.003)
Potential confounders	✓	✓	✓	✓	✓
Observations	3091	577	1076	995	443
R ²	0.219	0.357	0.209	0.191	0.241

Unstandardized beta-coefficients are reported; robust standard errors in parentheses; *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$; Covariates include: sex, age (in years), marital status, having children in own household, school education, state, labor force participation, alcohol consumption, smoking status, sports activities, self-rated health, presence of one or more chronic conditions, and coronavirus anxiety

perceived longevity only existed among younger adults, whereas no significant association was present in older age groups (Hajek and König 2023).

Some advantages and shortcomings of this study are worth emphasizing. Data for this study came from a quota-based (uncrossed: state, age group, and sex) sample of the general adult population in Germany. A wide array of covariates was covered in regression analysis. Additionally,

psychometrically sound and widely used tools were used to measure our key variables (belief in science and climate anxiety). A potential selection bias, however, cannot be ruled out. More precisely, although our online sample aligns with the German population in various aspects such as age groups, gender distribution, distribution by state, and metrics like median income and the percentage of unemployed individuals, it is worth noting that the proportion of

individuals holding a university degree was elevated within our sample (26.7%) compared to the adult population in Germany (18.5%) (Federal Statistical Office of Germany 2020). Furthermore, it should be acknowledged that our study has a cross-sectional design. This has inherent limitations regarding the directionality of the association. Moreover, it should be acknowledged that an online survey was used. In this respect, participants must at least have access to the internet.

Conclusions

This study identified an association between a greater belief in science and higher climate anxiety in the total sample and among younger individuals. Further research based on longitudinal data is required to confirm our present findings, and stronger conclusions could be drawn from these studies. Moreover, studies from other countries are clearly needed.

Authors' contributions AH: Conceptualization; Data curation; Methodology; Project administration, Visualization; Writing—original draft, Writing—review & editing, Formal analysis.

HHK: Resources; Writing—review & editing; Supervision; Visualization.

Both authors read and approved the final manuscript.

Funding Open Access funding enabled and organized by Projekt DEAL.

Availability of data and materials The datasets generated and/or analysed during the current study are not publicly available due to legal restrictions but are available from the corresponding author on reasonable request.

Code availability The code is available from the corresponding author on reasonable request.

Declarations

Ethics approval The Psychological Ethics Committee of the University Medical Center Hamburg-Eppendorf gave its approval for this study (LPEK-0412). The study was conducted in accordance with the Declaration of Helsinki.

Consent to participate Each individual gave his or her informed consent.

Consent for publication Not applicable.

Conflicts of interest The authors have no competing interests to declare that are relevant to the content of this article.

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