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Climate Change Denial and Right-Wing Populism: The Mediating Role of (Mis)Trust in Climate Science

Amanda Remsö

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Supervisor: Emma Renström

Abstract

Climate change denial tends to be prevalent among right-wing populists, but the underlying reasons for this remain unclear. Given that persistent climate change denial among the public could impede efforts to address the negative consequences of anthropogenic climate change, it is important to identify the psychological correlates of these attitudes. This thesis aimed to investigate the hypothesis that mistrust in climate science mediates the association between attitudinal variables associated with contemporary right-wing populism and climate change denial, as right-wing populists' discourse on climate change tends to be centered on claims that climate science is politically biased and therefore unreliable. The results from an online survey with 232 participants from the United States demonstrated that climate change denial was most strongly predicted by exclusionism and anti-egalitarianism—negative attitudes towards feminism, multiculturalism, and homosexuality—which are prominent features of contemporary right-wing populism. And this association was entirely mediated by mistrust in climate science, even while controlling for general faith and literacy in science. Surprisingly, populist attitudes did not predict climate change denial or mistrust of climate science. This suggests that the hosting ideological dimension of right-wing populism, characterized by resistance to social and cultural changes, plays a key role in this context. Future efforts to understand and engage with the ideological concerns and biases associated with mistrust in climate science could therefore be beneficial when addressing climate change denial.

Keywords: climate change denial, mistrust, right-wing populism

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Climate Change Denial and Right-Wing Populism: The Mediating Role of (Mis)Trust in Climate Science

Anthropogenic climate change is causing significant disruptions in nature and impacting the lives of billions of people worldwide. Extreme weather events are becoming more frequent and severe, biodiversity is declining, and decades of progress in global health could be threatened as a result (Pörtner et al., 2022; World Health Organization, 2023). According to IPCC, the Intergovernmental Panel on Climate Change, the window of opportunity to secure a liveable and sustainable future for all is rapidly closing (Pörtner et al., 2022). Although the scientific consensus on anthropogenic climate change now exceeds 99% of total publications in the peer-reviewed scientific literature (Lynas et al., 2021), there remains a tendency among (some parts of) the public to deny climate change or certain aspects of it. For instance, some believe that climate change is a hoax altogether that was invented to deceive people (Ibbetson, 2021), while others question the extent of human contribution or the large-scale impact of climate change (Ekberg et al., 2022).

While successful climate change mitigation involves political commitment and policies (Pörtner et al., 2022), public awareness and understanding can influence individual behavior and demand for sustainable policies (Hornsey et al., 2016; Rode et al., 2021). For example, a recent meta-analysis found that climate change denial is negatively associated with pro-environmental behavioral intentions, policy support, and trust and acceptance of climate science (Biddlestone et al., 2022). Consequently, persistent climate change denial among the public may impede efforts to address this global crisis.

Prior analyses show that right-wing populist parties and supporters across the West are particularly prone to deny or downplay climate change (e.g., Lockwood, 2018), and at the level of individuals, recent studies have highlighted the association between populist attitudes and climate change denial (Huber, 2020). Other variables commonly associated with

contemporary right-wing populism, such as exclusionary and anti-egalitarian attitudes—negative attitudes towards feminism, multiculturalism, and homosexuality—have also been linked to climate change denial (Jylhä & Hellmer, 2020). While the relationship between mainstream ideology (i.e., conservative or liberal) and climate change denial has received considerable attention in psychological research, less is known about right-wing populism and denial (Huber, 2021). As right-wing populism has gained significant traction in the West during the 21st century (Greven, 2016; Lochocki, 2018), understanding its impact on various aspects of society, including contentious issues like climate change, has become increasingly important.

Here, I aim to contribute to this by exploring the role of mistrust in climate science, as right-wing populists' discourses on climate change often involve challenging and opposing the collective trust in climate science, such as questioning the credibility of the scientific data and asserting that the evidence is politically biased (Giorgi & Eslen-Ziya, 2022). This suggests that individuals with stronger right-wing populist attitudes may be more likely to mistrust climate science and engage in subsequent climate change denial. However, in light of the growing evidence highlighting the diverse nature of science denial (e.g., Rutjens et al., 2022), I will also explore whether the proposed relationship holds while accounting for overall faith and literacy in science. By contrasting various correlates of science denial in this context, the results can inform policymakers on how to effectively address the factors that potentially contribute to it. Ultimately, this can facilitate public action and engagement in addressing the challenges posed by climate change.

Climate Change Denial and Political Ideology

Climate change denial and *climate change deniers* are terms commonly used to refer to those who reject or dispute the reality, extent, or anthropogenic causes of climate change (Almiron & Tafalla, 2019). But some scholars caution against this indiscriminate use, as not

all forms of climate change opposition or inaction stem from denial (Almiron & Moreno Cabezudo, 2022). Denial, as defined by the Oxford Dictionary, refers to “a statement that something is not true or does not exist” (Oxford University Press, 2023a). Hence, this term may create a false dichotomy between those who believe in climate change and those who do not, while in reality, the public appraisal of climate change is much more complex (Ekberg et al., 2022). While acknowledging this limitation, I will be using the term climate change denial throughout this thesis, recognizing that it represents a range of attitudes rather than a binary denier versus non-denier perspective (Dunlap, 2013).

At the level of individuals, a significant focus of research has been on identifying the role of worldviews, or ideologies, in shaping climate change denial. Affiliation with conservative parties is the largest correlate of climate change denial, according to meta-analytical findings (Hornsey et al., 2016), and further research has sought to delineate what part of ideology could explain this. Acceptance and endorsement of social hierarchies and resistance to social and cultural changes correlate with denial, including anti-feminist attitudes, negative attitudes towards multiculturalism and homosexuality, racial resentment, and xenophobic attitudes (Benegal, 2018; Hornsey, 2021; Jylhä et al., 2020; Jylhä & Hellmer, 2020; Krange et al., 2019; Stanley et al., 2019). These attitudes are commonly associated with socially conservative ideologies (Jost et al., 2013), including right-wing populism (Mudde, 2007).

Indeed, at the party-political level, contemporary right-wing populists across the West tend to oppose climate change mitigation policies and dismiss or downplay climate change (Forchtner, 2019; Fraune & Knodt, 2018; Gemensis et al., 2012; Lockwood, 2018; Lockwood & Lockwood, 2022; Schaller & Carius, 2019). For instance, in the United States, Donald J. Trump's election victory for the Republican Party in 2016 brought national power to right-wing populism (Mudde, 2022), a period well-known for its opposition to climate change

mitigation policies, in particular the country's withdrawal from the Paris Agreement in 2020 (international treaty on climate change; United Nations Framework Convention on Climate Change, 2020).

In this thesis, I define populism in line with the ideational approach (Hawkins & Kaltwasser, 2018; Mudde, 2017), which sees populism as “an ideology that considers society to be ultimately separated into two homogeneous and antagonistic groups, ‘the pure people’ versus ‘the corrupt elite’, and which argues that politics should be an expression of the *volonté générale* (general will) of the people” (Mudde, 2004, p. 543). In other words, the ideational approach views populism as a set of ideas that can be manifested in political parties as well as in populist attitudes among individuals (Akkerman et al., 2014). These core ideas of populism include people-centrism, which prioritizes the interests of the common people; anti-elitism, which refers to the allegedly immoral and corrupt elite who seek to exploit the pure and moral people; and the Manichean outlook, which represents the conflict between *the good side* (the people) and *the bad side* (the elite), (Erisen et al., 2021).

The ideational approach furthermore defines populism as a thin-centered ideology, meaning that the core populist ideas are often combined with a so-called *hosting ideology* across the political spectrum. In other words, populism can be merged with different ideological backgrounds, such as right-wing, left-wing, or centrist orientations. It is therefore crucial to separate *populist attitudes* from *political attitudes* when studying attitudinal variables associated with right-wing populism. Contemporary right-wing populism tends to incorporate socially conservative ideologies (Mudde, 2007; Rydgren, 2017), and the primary focus tends to be on preserving the social status quo, national identity, and culture, with *the people* referring to the ethnic majority members of a nation. As a result, right-wing populists tend to exclude segments of society based on ethnic nationalist grounds, advocate for

immigration restrictions, and oppose multiculturalism and minority rights (Mudde, 2007; Rydgren, 2017).

Mistrust in Climate Science and Right-Wing Populism

In addition, populists tend to mistrust social institutions, such as political parties, bureaucratic institutions, and the media (Rydgren, 2017). While research on the relationship between populism and science is scarce, some analyses suggest that this mistrust extends to right-wing populists' appraisal of climate change, as their discourse frequently involves doubt and suspicions about the trustworthiness of climate science and allegations of biased results (Giorgi & Eslen-Ziya, 2022). Drawing on the ideational approach to populism, I aim to empirically test this claim at the level of individuals. Specifically, I seek to test whether the ideational core of populism—populist attitudes—coupled with the hosting ideology—in particular resistance to social and cultural changes—predict mistrust in climate science and ultimately climate change denial.

Here I define trust as the assumption or willingness to expose oneself to vulnerability when dependent on others, and trust in authoritative figures, like scientists, often serves as a cognitive heuristic that people rely on when forming their opinions on contentious matters (Blöbaum, 2016; Siegrist, 2021). Like most relationships in a democracy, the relationship between science and citizens is built on trust. As science tends to address topics beyond individuals' direct experience (Wolpert, 1994) and specialized knowledge is typically required to fully understand it, achieving a full public understanding of science is often unfeasible, which emphasizes the crucial role of public trust in science (Hendriks et al., 2016). When individuals lack trust in a domain, it is often referred to as *mistrust* or *distrust*, where distrust typically implies a settled belief that someone is acting dishonestly or is untrustworthy, while mistrust generally refers to doubts and suspicions (Oxford University

Press, 2023b). In this thesis, the term mistrust will be primarily used, while terms such as *lack of trust* and *decreased trust* will be used interchangeably.

A recent study found that the association between populist attitudes and climate change denial can be explained by a lack of interest in and mistrust of science (Huber et al., 2022). Similarly, populists' positions on science are frequently referred to as “anti-science” or “anti-intellectualism”, indicating a deep-seated mistrust and aversion towards scientists and experts (Saurette & Gunster, 2011). Several studies have demonstrated that individuals who hold stronger populist attitudes are more inclined to believe in conspiracy theories (Castanho Silva et al., 2017; Erisen et al., 2021; Marcos-Marne et al., 2022), which tend to encompass the belief that authorities repeatedly cover up major events for their winning (Sutton & Douglas, 2014). Relatedly, Mede and Schäfer (2020) introduced the concept of science-related populism to target populists' mistrust toward not only politicians but also scientists and scholarly institutions. In this view, the Manichean antagonism exists between the virtuous ordinary people and the unvirtuous academic elite, in which virtuousness is attributed to common-sense knowledge and folk wisdom, *the people*, over scientific knowledge, *the elite* (Mede & Schäfer, 2020). Taken together, individuals with stronger populist attitudes should exhibit less trust in climate science and consequently more climate change denial, not directed at climate science specifically but rather aimed at scientists as part of the anti-elitist idea. This link could also arise because the scientific endeavor in itself challenges the notion that knowledge can and should be fully understood and produced by everyone, which conflicts with the people-centric idea prevalent in populism.

However, this view may oversimplify right-wing populists' position on science. Rather than rejecting science as a whole, right-wing populists tend to primarily oppose scientific findings that contradict traditionalistic and conservative values (Krämer & Klingler, 2020). They often express a quest for what they perceive as “true” expertise, distinct from

what they view as liberally biased mainstream experts and institutions (Giorgi & Eslen-Ziya, 2022). For instance, Ylä-Anttila (2018) showed how right-wing populists' discourse on immigration aims to challenge “the establishment” by advocating for positions by non-mainstream experts. In this context, mistrust in climate science and subsequent climate change denial can be understood as integral parts of the hosting ideology, particularly rooted in resistance to social and cultural changes (Mudde, 2007).

Climate change mitigation requires profound policy changes that may reprioritize sociopolitical goals and impact current economic and social structures (Fisher, 2019). Rather than being about science per se, right-wing populists may mistrust and deny climate science because they oppose the sociopolitical dynamics they believe have generated it. Previous research has shown that climate change denial is correlated with resistance to social and cultural changes, such as anti-feminist attitudes, negative views of multiculturalism and homosexuality, racial resentment, xenophobic attitudes (Benegal, 2018; Jylhä et al., 2020; Jylhä & Hellmer, 2020; Krange et al., 2019), and social dominance orientation (Häkkinen & Akrami, 2014; Jylhä & Akrami, 2015; Jylhä et al., 2016, 2021; Stanley & Wilson, 2019). Social dominance orientation (Pratto et al., 1994) measures individuals' desire to maintain and establish hierarchically structured intergroup relations and is also associated with negative views toward science and scientists (Azevedo & Jost, 2021), potentially because these individuals perceive scientists as a threat to social hierarchies (Kerr & Wilson, 2021). Building on this, individuals who align with these attitudes commonly associated with the hosting ideology of contemporary right-wing populism (Mudde, 2007) may view climate science as advocating for an inclusive and egalitarian political agenda that they oppose, resulting in mistrust in climate science.

Aims and Hypotheses

The overarching aim of this thesis is to investigate the association between attitudinal variables associated with contemporary right-wing populism and climate change denial, focusing specifically on the mediating role of mistrust in climate science. Drawing on previous research, I will independently investigate the contribution of populist attitudes (Huber, 2020) as part of the ideational core and exclusionary and anti-egalitarian attitudes (Jylhä & Hellmer, 2020) as part of the hosting ideology. Social dominance orientation (Pratto et al., 2014) will be included as a control variable for the same purpose. While a previous study has explored the link between populist attitudes, mistrust in science, and climate change denial (Huber et al., 2022), no research to date has examined the involvement of *political attitudes* associated with the hosting ideology of right-wing populism.

Furthermore, I will test whether the proposed associations persist when accounting for overall faith and literacy in science, as the origins of science denial can be heterogeneous (e.g., Rutjens et al., 2022). I will also control for the contribution of demographic variables, such as political orientation and political affiliation, which may play a role based on previous research (Hornsey et al., 2016). To achieve these aims, I developed a conceptual mediation model (Figure 1) and conducted an online survey to test the separate paths of the model as well as the full model. The following hypotheses will be tested:

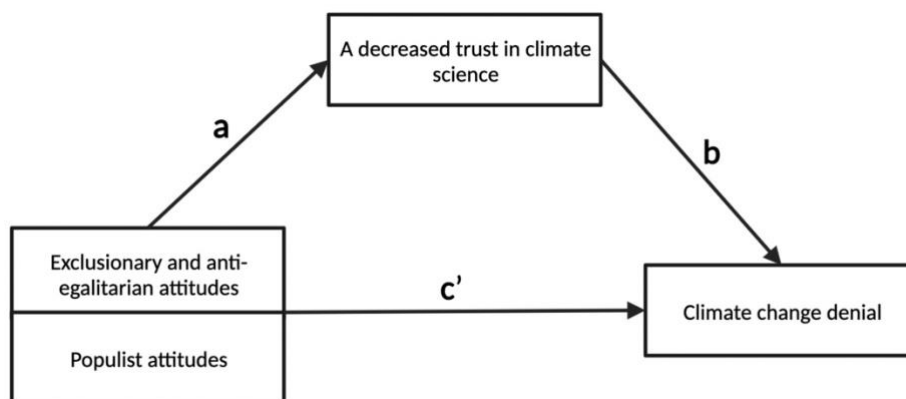
H1: Exclusionary and anti-egalitarian attitudes (a), and populist attitudes (b), will independently predict climate change denial (outcome) while controlling for faith in science and scientific literacy.

H2: Exclusionary and anti-egalitarian attitudes (a), and populist attitudes (b), will independently predict a decreased trust in climate science (mediator) while controlling for faith in science and scientific literacy.

H3: The independent effects of exclusionary and anti-egalitarian attitudes (a), and populist attitudes (b), on climate change denial (outcome), will be mediated by a decreased trust in climate science (mediator) while controlling for faith in science and scientific literacy, such that a decreased trust in climate science will increase climate change denial.

Figure 1

Conceptual Mediation Model



Note. Exclusionary and anti-egalitarian attitudes and populist attitudes, respectively, are tested as separate variables. Control and demographic variables are not displayed here.

Method

Participants and Procedure

In total, 232 participants from the United States ($M_{\text{age}} = 40.6$, $SD_{\text{age}} = 13.47$) were recruited and participated through the online data collection platform Prolific (2023). Prolific is a website that connects researchers with participants. The data collection took place through an online survey that was developed in Qualtrics using a cross-sectional design where data were collected at a single point in time; all data were collected in February 2023. Participants received a payment of \$16.39 per hour for completing the survey, which took approximately 7 minutes. The sample size was determined based on available resources rather than a priori power calculations. To be eligible, participants had to be 18 years of age

or older and residents of the United States. The United States was chosen as the study population because it is the country with the highest percentage of climate change denial in the developed world (YouGov, 2019), which makes it an important population to study. An overview of sample characteristics is available in Table 1.

To begin the survey, participants were presented with an information sheet on anonymous and voluntary participation, ethical guidelines, and the handling of data. The full purpose of the study was not disclosed at the outset to reduce potential demand effects; rather, participants were told that the purpose of this research was to examine their attitudes toward current societal topics and political attitudes. Participants provided consent by indicating that they understood the information and that they agreed to participate.

Next, participants were presented with items measuring their scientific literacy and faith in science, followed by items on populist attitudes, exclusionary and anti-egalitarian attitudes, social dominance orientation, trust in climate science, and climate change denial, and lastly, a set of demographic items were assessed. In the last section of the survey, a debriefing text on the study's full purpose was presented, and participants could indicate if they had any questions or concerns about the study.

Table 1

Sample Characteristics

Baseline characteristics	<i>n</i>	%
Gender		
Women	93	40.09
Men	131	56.47
Non-binary	8	3.45
Age		
18-35	93	40.09
36-55	95	40.95

Baseline characteristics	<i>n</i>	%
56-77	44	18.97
Race		
Asian or Pacific Islander	23	9.91
Black or African American	24	10.35
Hispanic or Latino	15	6.47
Native American or Alaska Native	1	0.43
White or Caucasian	163	70.26
Multiracial or biracial	6	2.59
A race/ethnicity not listed here	0	
Highest educational level		
Less than high school	1	0.43
High school graduate	37	15.95
Some post high school	79	34.05
Bachelor's degree	83	35.78
Graduate degree	32	13.79
Political orientation		
Conservative	54	23.28
Liberal	65	28.02
Moderate	113	48.71
Political affiliation		
Democrat	98	42.24
Republican	96	41.38
None	38	16.38

Note. Political orientation was here recoded from its original scoring of 1 (*clearly liberal*) to 7 (*clearly conservative*), into a categorical variable: liberal (1-2), moderate (3-5), and conservative (6-7). Age was also recoded into a categorical variable.

Measures

All items described below were scored on scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), unless otherwise indicated. Several shorter versions of the original measures were used to save assessment time and costs, as previous studies had shown them to be reliable. For each measure, participants' mean scores were calculated to create a single

score, unless otherwise indicated. These scores were then used as continuous variables for the statistical analyses. The complete list of items can be found in Appendix A.

Outcome Variable

Climate Change Denial. Climate change denial was measured by relying on six items from the longer 16-item scale by Häkkinen and Akrami (2014). The six items ($\alpha = .76$), for example, “It is unclear if the Earth's climate is changing”, measure different forms of climate change denial, including denial that climate change is happening, doubt that climate change is happening, denial of human causation, and denial of the large-scale consequences of climate change.

Mediator Variable

Trust in Climate Science. Participants' trust in climate science was measured by using seven items ($\alpha = .96$), from Pechar et al. (2018), originally adopted from Nisbet et al. (2015). Participants were instructed to rate how well each item describes their views on the climate science community, for example, “Information from the climate science community is trustworthy”.

Predictor Variables

Exclusionary and Anti-egalitarian Attitudes. Participants' exclusionary and anti-egalitarian attitudes (negative attitudes towards feminism, multiculturalism, and homosexuality) were measured by eight items from Jylhä and Hellmer (2020), one of the items originally from Müller et al. (2014), “In society, too much consideration is given to different minorities than to the people as a whole”. The exclusionary attitudes subscale consisted of four items ($\alpha = .82$), as did the anti-egalitarian attitudes subscale ($\alpha = .85$). Both subscales ($r(230) = .71, p < .01$) were combined to form a single score of exclusionary and anti-egalitarian attitudes ($\alpha = .89$).

Populist Attitudes. Participants' populist attitudes were measured by using six items ($\alpha = .75$), from Akkerman et al. (2014), for example, “The people, and not politicians, should make our most important policy decisions”. The items are designed to measure the ideational core of political populism, including anti-elitism and people-centrism. Thus, the items do not include any clear political ideological leaning.

Control Variables

Faith in Science. Faith in science was measured by using five items ($\alpha = .89$), adapted from a longer scale from Farias et al. (2013; see Rutjens et al., 2022 for use of the shorter scale), for example, “Science tells us everything there is to know about what reality consists of”. The items are designed to measure how much participants support and believe in science as a reliable path to knowledge.

Scientific Literacy. Participants' scientific literacy was measured by adopting eight items ($\alpha = .58$), from Hayes and Tariq (2000; see Rutjens et al., 2022 for use of the eight-item scale). The items, for example, “The center of the earth is very hot”, were rated by participants as to what they believed to be either true or false. Participants' answers were summed up to a score ranging from 0-8 points, where a higher score represents more literacy and was used as a continuous variable for the statistical analyses.

Social Dominance Orientation. Social dominance orientation was measured by using the four-item scale by Pratto et al. (2013), recently adapted and validated by Aichholzer and Lechner (2021), for example, “In setting priorities, we must consider all societal groups”, ($\alpha = .88$). Social dominance orientation measures individuals' desire to maintain and establish hierarchically structured intergroup relations (Pratto et al., 1994).

Demographic Variables

Participants were asked to state their political orientation on a self-placement scale ranging from 1 (*clearly liberal*) to 7 (*clearly conservative*), and political affiliation was

assessed by asking participants which party they liked the most (the Republican party, the Democratic party, none). Participants also indicated their age, gender, race, and education.

For the statistical analyses, higher scores on political orientation represent more political conservatism and were used as a continuous variable. Political affiliation was coded as two dummy variables: Democrat = 1, other = 0, and Republican = 1, other = 0. Gender was coded as a dummy variable: male = 1, other = 0. Race was coded as a dummy variable: White or Caucasian = 1, other = 0. Higher scores on education represent higher education and were used as a continuous variable. Further information on demographics can be found in Table 1.

Ethical Considerations

This thesis was conducted following the principles described in Swedish law (2003:460) on the ethics of research involving humans and the European Union's general data protection regulation (2023). That is, this thesis involved collecting sensitive and confidential information on political attitudes and racial origin, but participation was anonymous, ensuring that no data was tied to a specific person and the results were only presented at the group level. Participants' identifiers were substituted by codes through Prolific to ensure data confidentiality. Informed consent was obtained from all participants before data collection, and participants were informed that they could discontinue their participation at any time without consequences and that the data would only be presented at the group level in a master's thesis and in an academic article.

It is acknowledged that some ethical considerations may arise from this thesis. First, withholding study aims from participants who might already lack trust in science and scientists could potentially have backfire effects. To mitigate this, participants were informed of the full study aim at the end of the survey. Second, some of the items measuring participants' political attitudes could be considered sensitive or private by participants; however, this was made clear in advance during the informed consent process, allowing

participants to withdraw if they wished. In sum, the practice of withholding (some) information from participants and asking sensitive questions was not expected to cause significant emotional distress or have a long-term psychological impact on participants.

Results

Descriptive Analyses

A threshold of $p < .05$ was used to determine the statistical significance of all statistical tests. Prior to analyses, data were screened for missing values, but as the number of missing values was low (12 in total), they were neither imputed nor deleted.

Table 2 presents the means, standard deviations, skewness, and kurtosis for the main variables. Skewness and kurtosis values for all variables were within the acceptable range of -2 to 2 (George & Mallery, 2010), except for climate change denial. The skewness of climate change denial was 1.49 , indicating a right-skewed distribution, with a kurtosis of 2.90 , indicating a heavy-tailed distribution ($M = 2.66$, $SD = 1.77$). The Shapiro-Wilk test confirmed a significant departure from normality ($W = .84$, $p < .001$). To address this, climate change denial was log-transformed with base 10, resulting in skewness and kurtosis values within acceptable ranges and should not pose problems to the statistical analyses (Table 2).

Next, the Pearson zero-order correlations between all measured variables were tested, as shown in Table 3. As anticipated, the outcome variable climate change denial was strongly negatively correlated with the proposed mediator trust in climate science. Furthermore, climate change denial correlated with all other variables except for gender, education, scientific literacy, and, surprisingly, populist attitudes. Specifically, climate change denial was most strongly positively correlated with exclusionary and anti-egalitarian attitudes, followed by political conservatism, social dominance orientation, and Republican affiliation, and most strongly negatively correlated with Democrat affiliation, followed by faith in science. On the contrary, trust in climate science was positively correlated with Democrat

affiliation and faith in science, and negatively correlated with political conservatism, Republican affiliation, exclusionary and anti-egalitarian attitudes, and social dominance orientation. Moreover, age was positively correlated with denial and negatively correlated with trust, such that older participants generally reported more denial and less trust compared to younger participants. Additionally, White or Caucasian race was positively correlated with denial and negatively correlated with trust, such that participants who described themselves as White or Caucasian generally reported more denial and less trust compared to other self-identified races.

Table 2

Means, Standard Deviations, Skewness, and Kurtosis for the Main Variables

Variable	<i>M (SD)</i>	Skewness	Kurtosis
Climate change denial	0.34 (0.27)	0.25	-1.06
Exclusionary and anti-egalitarian attitudes	3.30 (1.49)	0.33	-0.70
Faith in science	4.12 (1.56)	-0.85	-0.85
Populist attitudes	5.35 (0.94)	-0.45	0.67
Scientific literacy	6.01 (1.67)	-0.60	-0.41
Social dominance orientation	2.52 (1.48)	0.85	0.07
Trust in climate science	4.70 (1.70)	-0.53	-0.68

Note. Climate change denial is here log-transformed with base 10.

Table 3*Pearson Zero-Order Correlations Between All Measured Variables*

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Climate change denial													
2. Trust in climate science	-.77***												
3. Age	.22**	-.22***											
4. Gender (Male)	.10	-.05	-.16*										
5. Education	-.02	.10	.17*	.05									
6. Race (White or Caucasian)	.24***	-.23***	.38***	-.00	-.08								
7. Democrat	-.48***	.49***	-.31***	-.06	.10	-.32***							
8. Republican	.55***	-.50***	.37***	.05	.05	.36***	-.72***						
9. Political conservatism	.61***	-.61***	.35***	.08	.01	.31***	-.70***	.75***					
10. Faith in science	-.38***	.51***	-.15*	.16*	.01	-.09	.29***	-.28***	-.40***				
11. Scientific literacy	-.05	.07	.19**	.09	.16*	.16*	.01	.02	-.07	.13*			

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
12. Exclusionary and anti-egalitarian attitudes	.67***	-.73***	.25***	.15*	-.01	.18**	-.58***	.60***	.74***	-.42***	-.10		
13. Populist attitudes	-.04	-.04	-.10	-.11	-.04	-.08	-.02	-.03	.04	.02	-.02	.00	
14. Social dominance orientation	.56***	-.59***	.19**	.19*	.02	.21**	-.48***	.49***	.56***	-.24***	-.01	.76***	-.09

Note. * $p < .05$. ** $p < .01$. *** $p < .001$.

Climate Change Denial

To test H1, which states that exclusionary and anti-egalitarian attitudes (a), and populist attitudes (b), will independently predict climate change denial while controlling for faith in science and scientific literacy, I conducted a hierarchical multiple linear regression analysis. The assumptions for multiple linear regression were tested. Linearity was confirmed using a scatterplot (Figure B1), while the absence of heteroscedasticity was supported by a non-significant Breusch-Pagan test, $X^2(1) = 1.84, p = .18$. Normality was indicated by a Q-Q plot (Figure B2), and the independence of observations was satisfied, Durbin-Watson value = 1.88, $p = .34$ (Field et al., 2012). As presented in Table 4, collinearity was assessed using tolerance and variance inflation factor (VIF), which fell within acceptable ranges (tolerance > 0.1, VIF < 10; O'Brien, 2007). Table 4 also presents the unstandardized coefficients, standard errors, and standardized coefficients.

In Model 1, climate change denial was entered as the outcome variable, and the demographic variables age, education, gender, race, Republican affiliation, Democrat affiliation, and political conservatism were included as predictors. The control variables social dominance orientation, faith in science, and scientific literacy were added in Model 2, and the main predictors, exclusionary and anti-egalitarian attitudes, and populist attitudes, were added in Model 3.

Among the demographic variables included in Model 1, only political conservatism and Republican affiliation were significant predictors of climate change denial, both in a positive direction. Together, they explained 38% of the variance in climate change denial, $F(7, 224) = 21.22, p < .001, \text{adj. } R^2 = .38$.

When the control variables were added in Model 2, the significant effects of Republican affiliation and political conservatism in Model 1 remained significant but with smaller effects. Furthermore, Model 2 showed that the effect of scientific literacy was not

significant, while social dominance orientation had a significant positive effect, followed by a negative and smaller effect of faith in science. Together, social dominance orientation and faith in science accounted for an additional 8% of the explained variance in climate change denial, resulting in a total explained variance of 46%, $\Delta F(3, 221) = 11.74, p < .001, \text{adj. } R^2 = .46, \Delta R^2 = .08$.

In Model 3, after adding the main predictors, the significant effects of political conservatism and social dominance orientation found in Model 2 vanished, while Republican affiliation and faith in science remained significant. Moreover, Model 3 shows that out of the two main predictors, exclusionary and anti-egalitarian attitudes and populist attitudes, only the former had a significant and also the largest positive effect on climate change denial, resulting in a 3% increase in explained variance, and a total explained variance of 49%, $\Delta F(2, 219) = 7.20, p < .001, \text{adj. } R^2 = .49, \Delta R^2 = .03$.

These results support H1a, as exclusionary and anti-egalitarian attitudes independently predicted climate change denial, even when controlling for faith in science and scientific literacy. However, this relationship was not observed for populist attitudes, and H1b was therefore not supported by the analysis.

Table 4

Hierarchical Multiple Linear Regression Analysis Predicting Climate Change Denial

Model		B [95% CI]	SE B	β	Tolerance	VIF
1	(Constant)	.08 [-.08, .24]	.08			
	Age	.00 [-.00, .00]	.00	-.02	.72	1.39
	Education	-.01 [-.04, .02]	.02	-.04	.90	1.11
	Gender (Male)	.03 [-.03, .09]	.03	.06	.95	1.06
	Race (White or Caucasian)	.02 [-.05, .09]	.04	.03	.78	1.28
	Republican	.12* [.03, .22]	.05	.23	.35	2.85
	Democrat	-.01 [-.09, .08]	.04	-.01	.40	2.47

Model		B [95% CI]	SE B	β	Tolerance	VIF
	Political conservatism	.06*** [.04, .08]	.01	.43	.38	2.62
2	(Constant)	.18* [-.01, .36]	.10			
	Age	.00 [-.00, .00]	.00	-.01	.70	1.43
	Education	-.01 [-.04, .02]	.02	-.04	.89	1.13
	Gender (Male)	.03 [-.03, .08]	.03	.05	.86	1.16
	Race (White or Caucasian)	.02 [-.05, .08]	.03	.03	.76	1.31
	Republican	.11* [.02, .20]	.05	.20	.35	2.87
	Democrat	.02 [-.06, .10]	.04	.03	.40	2.51
	Political conservatism	.03** [.01, .06]	.01	.24	.32	3.10
	Social dominance orientation	.05*** [.03, .08]	.01	.29	.65	1.55
	Faith in science	-.03** [-.05, -.01]	.01	-.17	.79	1.27
	Scientific literacy	-.00 [-.02, .01]	.01	-.01	.88	1.14
3	(Constant)	.09 [-.16, .33]	.12			
	Age	-.00 [-.00, .00]	.00	-.03	.69	1.46
	Education	-.01 [-.04, .02]	.02	-.03	.88	1.13
	Gender (Male)	.01 [-.04, .07]	.03	.03	.83	1.20
	Race (White or Caucasian)	.04 [-.03, .10]	.03	.06	.75	1.34
	Republican	.10* [.02, .19]	.04	.19	.35	2.89
	Democrat	.02 [-.06, .10]	.04	.04	.40	2.51
	Political conservatism	.02 [-.01, .04]	.01	.10	.27	3.71
	Social dominance orientation	.02 [-.01, .05]	.01	.12	.39	2.51
	Faith in science	-.02* [-.04, -.00]	.01	-.11	.74	1.36
	Scientific literacy	.00 [-.02, .02]	.01	.00	.87	1.15
	Populist attitudes	-.01 [-.03, .02]	.01	-.02	.93	1.07
	Exclusionary and anti- egalitarian attitudes	.07*** [.03, .10]	.08	.36	.25	4.02

Note. CI = confidence interval. VIF = variance inflation factor. * $p < .05$. ** $p < .01$. *** $p < .001$.

Trust in Climate Science

To test H2, which states that exclusionary and anti-egalitarian attitudes (a), and populist attitudes (b), will independently predict a decreased trust in climate science while controlling for faith in science and scientific literacy, I conducted a hierarchical multiple linear regression analysis. The assumptions for multiple linear regression were tested. The linearity and homoscedasticity assumptions were confirmed using a scatterplot (Figure B3), normality was indicated by a Q-Q plot (Figure B4), and the independence of observations was satisfied (Durbin-Watson value = 2.02, $p = .97$). Table 5 presents collinearity statistics, including tolerance and VIF, indicating no multicollinearity issues. The unstandardized coefficients, standard errors, and standardized coefficients are presented in Table 5.

Model 1 included the demographic variables age, education, gender, race, Republican affiliation, Democrat affiliation, and political conservatism as predictors, with trust in climate science as the outcome variable. In Model 2, the control variables were added as predictors: social dominance orientation, faith in science, and scientific literacy; and in Model 3, the main predictors were added: exclusionary and anti-egalitarian attitudes, and populist attitudes.

In Model 1, only political conservatism had a significant and large effect on trust in climate science among the demographic variables, in a negative direction, explaining 37% of the variance in trust in climate science, $F(7, 224) = 20.20, p < .001, \text{adj. } R^2 = .37$.

When adding the control variables in Model 2, the effect size of political conservatism found in Model 1 decreased but remained significant. Furthermore, Model 2 shows that the effect of scientific literacy was not significant, while social dominance orientation had a significant negative effect, followed by an approximately similar positive effect size of faith in science. Additionally, education gained significance in Model 2, but the positive effect size was similar to that in Model 1. Taken together, these variables accounted for an additional

17% of the explained variance in trust in climate science, resulting in a total explained variance of 54%, $\Delta F(3, 221) = 27.76, p < .001, \text{adj. } R^2 = .54, \Delta R^2 = .17$.

In Model 3, the significant effect of political conservatism found in Model 2 vanished, whereas faith in science, education, and social dominance orientation remained significant but with smaller effect sizes. Additionally, Model 3 showed that when including the main predictors, exclusionary and anti-egalitarian attitudes and populist attitudes, only exclusionary and anti-egalitarian attitudes significantly contributed, in a negative direction and with the largest effect size, to trust in climate science, increasing the explained variance by 5%. The significant predictors jointly explained 59% of the total variance in trust in climate science, $\Delta F(2, 219) = 14.86, p < .001, \text{adj. } R^2 = .59, \Delta R^2 = .05$.

These results support H2a in that exclusionary and anti-egalitarian attitudes independently predicted a decreased trust in climate science when controlling for faith in science and scientific literacy. However, no such association was found between populist attitudes and trust in climate science, indicating that H2b was not supported by the analysis.

Table 5

Hierarchical Multiple Linear Regression Analysis Predicting Trust in Climate Science

Model		B [95% CI]	SE B	β	Tolerance	VIF
1	(Constant)	5.85*** [4.84, 6.86]	.51			
	Age	-.00 [-.02, .01]	.01	-.01	.72	1.39
	Education	.18 [-.02, .38]	.10	.10	.90	1.11
	Gender (Male)	-.02 [-.39, .34]	.18	-.01	.95	1.06
	Race (White or Caucasian)	-.06 [-.49, .37]	.22	-.02	.78	1.28
	Republican	-.29 [-.89, .31]	.30	-.09	.35	2.85
	Democrat	.22 [-.33, .78]	.28	.07	.40	2.47
	Political conservatism	-.43*** [-.57, -.28]	.07	-.50	.38	2.62
2	(Constant)	4.59 *** [3.50, 5.69]	.56			
	Age	-.00 [-.02, .01]	.01	-.01	.70	1.43

Model	B [95% CI]	SE B	β	Tolerance	VIF
Education	.19* [.02, .36]	.09	.11	.89	1.13
Gender (Male)	-.07 [-.39, .26]	.17	-.02	.86	1.16
Race (White or Caucasian)	-.08 [-.46, .30]	.19	-.02	.76	1.31
Republican	-.22 [-.73, .30]	.26	-.06	.35	2.87
Democrat	-.03 [-.45, .51]	.24	.01	.40	2.51
Political conservatism	-.19** [-.33, -.06]	.07	-.22	.32	3.10
Social dominance orientation	-.39*** [-.52, -.27]	.06	-.34	.65	1.55
Faith in science	.35*** [.24, .46]	.06	.32	.79	1.27
Scientific literacy	-.00 [-.09, .09]	.05	-.00	.88	1.14
3					
(Constant)	6.11*** [4.73, 7.49]	.70			
Age	-.00 [-.01, .01]	.01	-.01	.69	1.46
Education	.17* [.01, .33]	.08	.09	.88	1.13
Gender (Male)	-.01 [-.32, .31]	.16	-.00	.83	1.20
Race (White or Caucasian)	-.23 [-.59, .13]	.18	-.06	.75	1.34
Republican	-.18 [-.67, .31]	.25	-.05	.35	2.89
Democrat	-.01 [-.47, .44]	.23	-.00	.40	2.51
Political conservatism	-.04 [-.18, .10]	.07	-.04	.27	3.70
Social dominance orientation	-.16* [-.31, -.01]	.08	-.14	.39	2.54
Faith in science	.29*** [.18, .39]	.05	.26	.74	1.36
Scientific literacy	-.02 [-.11, .07]	.05	-.02	.87	1.15
Populist attitudes	-.11 [-.27, .05]	.08	-.06	.93	1.07
Exclusionary and anti- egalitarian attitudes	-.50*** [-.69, -.31]	.10	-.44	.25	4.02

Note. CI = confidence interval. VIF = variance inflation factor. * $p < .05$. ** $p < .01$. *** $p < .001$.

The Mediating Effect of Trust in Climate Science

To test the final hypothesis H3, which states that the independent effect of exclusionary and anti-egalitarian attitudes (a), and populist attitudes (b), on climate change denial, will be mediated by a decreased trust in climate science while controlling for faith in science and scientific literacy, I used PROCESS macro version 4.2 (Hayes, 2018). I

conducted two separate models using PROCESS Model 4, with climate change denial as the outcome variable, trust in climate science as the mediator, and age, education, gender, race, Republican affiliation, Democrat affiliation, political conservatism, social dominance orientation, faith in science, and scientific literacy as covariates. In the first model, exclusionary and anti-egalitarian attitudes were entered as the independent variable, and populist attitudes as a covariate, and in the second model, the variables were switched. The models are based on 10000 bootstrap samples with a 95% confidence interval (CI). Since the previous regression analysis did not show any significant association between populist attitudes and the proposed mediator, trust in climate science, it follows that H3b, which states that the effect of populist attitudes on climate change denial will be mediated by trust in climate science, cannot be considered significant. Therefore, the findings pertaining to the testing of hypothesis H3b through the PROCESS model are presented in Appendix C.

Following Hayes' (2018) guidelines for mediation models, the mediator is considered to have a significant mediational effect if the bias-corrected 95% CI for the indirect effect of the independent variable on the outcome variable, via the mediator, $a*b$ -path, does not include zero. Figure 1 demonstrates the conceptual mediation model.

The result demonstrated a significant indirect effect, $a*b$ -path, of exclusionary and anti-egalitarian attitudes on climate change denial through trust in climate science, $b = .05$, Boot SE = .01, Lower limit CI, Upper limit CI = .02, .07, with a standardized effect of $\beta = .25$, Boot SE = .07, Lower limit CI, Upper limit CI = .13, .40. The total effect, $c' + a*b$ -path, of exclusionary and anti-egalitarian attitudes on climate change denial was significant, $b = .06$, $p < .001$. The direct effect, c' -path, of exclusionary and anti-egalitarian attitudes, and the effect of the mediator trust in climate science on the outcome variable climate change denial, b -path, respectively, are presented in Table 6. Out of the covariates, Republican affiliation also indicated a weaker but significant positive effect on climate change denial. The effect of

exclusionary and anti-egalitarian attitudes on the mediator trust in climate science, a-path, is presented in Table 5.

In support of H3a, the PROCESS model showed that a decreased trust in climate science mediated the relationship between exclusionary and anti-egalitarian attitudes on climate change denial while controlling for faith in science and scientific literacy.

Conversely, H3b, stating that the independent effect of populist attitudes on climate change denial is mediated by a decreased trust in climate science while controlling for faith in science and scientific literacy, was not supported. This was evident in the absence of an effect of populist attitudes on the proposed mediator trust in climate science, as presented in Table 5.

Table 6

Regression Model Predicting Climate Change Denial

	B [95% Boot CI]	Boot SE	β
(Constant)	.65*** [-.16, .33]	.13	
Age	.00 [.00, .00]	.00	-.03
Education	.01 [-.02, .04]	.01	.02
Gender (Male)	.01 [-.04, .07]	.03	.02
Race (White or Caucasian)	.02 [-.05, .08]	.03	.03
Republican	.09* [.01, .17]	.04	.16
Democrat	.02 [-.05, .09]	.04	.04
Political conservatism	.01 [-.01, .03]	.01	.08
Social dominance orientation	.01 [-.02, .04]	.01	.04
Faith in science	.01 [-.01, .03]	.01	.04
Scientific literacy	.00 [-.02, .01]	.01	-.01
Exclusionary and anti-	.02 [-.02, .06]	.02	.11

	B [95% Boot CI]	Boot SE	β
egalitarian attitudes			
Populist attitudes	-.02 [-.04, .01]	.01	-.05
Trust in climate science	-.09*** [-.02, .06]	.01	-.58

Note. Boot CI = Bootstrap confidence interval. Regression is based on 10000 bootstrap samples. * $p < .05$. *** $p < .001$.

Discussion

This thesis aimed to investigate the association between attitudinal variables associated with contemporary right-wing populism and climate change denial and the mediating effect of mistrust in climate science. Anthropogenic climate change poses a serious threat to nature and global health (Pörtner et al., 2022; World Health Organization, 2023), and the scientific community has reached a nearly unanimous consensus on its existence (Lynas et al., 2021), but doubt and denial about its existence, causes, and consequences persist among parts of the public, which could impede efforts to address this crisis (Biddlestone et al., 2022; Ekberg et al., 2022; Ibbetson, 2021). Previous analyses show that right-wing populists tend to deny climate change (e.g., Lockwood, 2018), and at the level of individuals, populist attitudes correlate with denial (Huber, 2020), as well as other attitudes associated with contemporary right-wing populism, such as exclusionism and anti-egalitarianism (negative attitudes towards feminism, multiculturalism, and homosexuality; Jylhä & Hellmer, 2020). Yet the reasons *why* right-wing populists deny climate change are not well understood (Huber, 2021).

Therefore, my aim was to shed some light on this question by exploring the mediating role of mistrust in climate science, as right-wing populists often question the reliability of the scientific data, contest the evidence, and claim that the results of climate science are biased (Giorgi & Eslen-Ziya, 2022). In a survey with 232 participants from the United States, no

significant association was found between participants who reported stronger populist attitudes and climate change denial or lower trust in climate science. However, those reporting stronger exclusionary and anti-egalitarian attitudes did report significantly higher levels of denial. Importantly, this association was entirely mediated by lower trust in climate science, even when considering overall faith and literacy in science.

Right-Wing Populism and Climate Change Denial

The findings of this thesis provide valuable insights into the relationship between right-wing populism and climate change denial. First, the initial regression analysis confirmed previous research by showing that exclusionary and anti-egalitarian attitudes had a direct and relatively strong positive effect on climate change denial (Jylhä & Hellmer, 2020), surpassing the effect of conventional ideological self-placement. While the significant effect of political conservatism vanished when exclusionary and anti-egalitarian attitudes were included in the analysis, Republican affiliation remained significant. This is consistent with Hornsey et al.'s (2016) meta-analysis, which demonstrated that affiliation with conservative parties is the largest demographic correlate of climate change denial, while the effect of political ideology (liberal or conservative) is relatively weaker. However, it should be noted that the association between conservative affiliation and climate change denial may not be generalizable cross-nationally. Nearly half of the samples in Hornsey et al.'s study were from the United States, where the Republican Party has been identified as an outlier compared to other conservative parties in terms of its denial of anthropogenic climate change (Båtstrand, 2015).

Also in line with Hornsey et al. (2016), the correlation between climate change denial and other demographic variables, such as older age and White or Caucasian race, vanished when simultaneously considering the political and ideological variables in the regression analysis. Given that the effect of exclusionary and anti-egalitarian attitudes on climate change

denial was twice the size of Republican affiliation, I suggest moving beyond conventional ideological measures and also considering specific ideological *attitudes* that may serve as more potent predictors of science denial (Pechar et al., 2018). This is further supported by the result showing that the association between exclusionism and anti-egalitarianism, and climate change denial persisted even when accounting for general faith and literacy in science, suggesting that ideology is the primary factor underlying science denial rather than a gap of faith and/or literacy among those individuals (Rutjens et al., 2018, 2022).

Although Jylhä and Hellmer (2020) studied Swedish samples, and this thesis investigated a U.S. sample, the results are comparable, as neither study found a significant effect of populist attitudes (anti-establishment attitudes) on climate change denial when controlling for exclusionism and anti-egalitarianism. Jylhä and Hellmer suggested that future studies could replicate their findings in samples with a higher proportion of populism and/or climate change denial, as the effect of populist attitudes may be more pronounced in such samples. When comparing the mean scores of climate change denial, exclusionary and anti-egalitarian attitudes, social dominance orientation, and populist attitudes in my U.S. sample to Jylhä and Hellmer's Swedish samples, all constructs seem to be higher in the U.S. sample. Additionally, previous research indicates that the United States has the highest percentage of climate change denial in the developed world, with 6% of people saying climate change is not real and 9% not attributing it to human action, while those same numbers are 2% and 6%, respectively, in Sweden (YouGov, 2019). This consistency across different sample types, where exclusionism and anti-egalitarianism are more influential in predicting climate change denial than populist attitudes, strengthens the notion that the hosting ideology of right-wing populism is the primary mechanism at play in this context.

This is also consistent with prior studies that have linked attitudinal variables related to the hosting ideology of contemporary right-wing populism (Mudde, 2007) with climate

change denial, such as racial resentment (Benegal, 2018), xenophobic attitudes (Krange et al., 2019), and social dominance orientation (i.e., desire to maintain and establish hierarchically structured social groups; Stanley & Wilson, 2019; Jylhä & Akrami, 2015; Jylhä et al., 2021). Social dominance orientation (Pratto et al., 1994) was here included as a control variable, and the effect was no longer significant when exclusionary and anti-egalitarian attitudes were included in the regression analysis, which is consistent with Jylhä and Hellmer (2020). This could suggest that while climate change denial is linked to an overall preference for social hierarchies, these preferences may be primarily motivated by a desire to limit the influence of multiculturalism and egalitarianism.

It should be noted that the lack of a significant association between populist attitudes and climate change denial contradicts Huber's study (2020), which did report a significant association. In fact, Jylhä and Hellmer (2020) also found a weak positive correlation between populist sentiments and denial, but, importantly, this correlation vanished when controlling for exclusionism and anti-egalitarianism. Unlike Jylhä and Hellmer, Huber did not measure attitudes associated with the hosting ideology of right-wing populism, but rather party identification and a political left-right scale. Given the previous discussion that ideological *attitudes* seem to overshadow the predictive effect of conventional ideological self-placement scales (Pechar et al., 2018), it is not clear whether Huber's finding would hold when including attitudes related to the hosting ideology of right-wing populism.

Moreover, the sample size in my thesis was considerably smaller ($N = 232$), compared to both Jylhä's and Hellmer's (2020; $N = 909$, $N = 1587$), and Huber's (2020; $N = 3766$), which may have limited the ability of my thesis to detect a small but significant correlation between populist attitudes and denial. It is also possible that social, cultural, and political factors may have contributed to the various effects of populist attitudes across these studies. For example, the discourse on climate change may have shifted since Huber, Jylhä, and

Hellmer conducted their studies in 2016, such that climate change is now framed less as an elite project (Lockwood, 2018). Consequently, individuals with stronger populist attitudes may not be as inclined to deny climate change. Another possibility to consider is that the scale utilized to measure populist attitudes in this thesis (Akkerman et al., 2014) may not accurately capture populist sentiments. However, a recent empirical investigation suggests that the scale has high internal consistency, as also observed in this thesis, and high external validity (i.e., moderate or high correlations with known populist attitude correlates; Castanho Silva et al., 2020).

Right-Wing Populism and Mistrust in Climate Science

While most research on climate change denial focuses on identifying *who* denies it (Hornsey et al., 2016), this thesis also aimed to shed light on *why* some deny. The regression analysis predicting trust in climate science demonstrated that the significant negative effect of political conservatism vanished when exclusionary and anti-egalitarian attitudes were included in the analysis. These findings once again emphasize the need to go beyond general measures of ideology in this context (Pechar et al., 2018).

Furthermore, the negative association between exclusionism and anti-egalitarianism and trust in climate science remained significant even when accounting for overall faith in science and scientific literacy. Just as noted above, ideology also seems to be the primary factor underlying mistrust in climate science (Rutjens et al., 2018a, 2022). However, it is worth noting that the regression analysis also showed a positive association between participants who reported higher faith in science, higher education, and higher levels of trust in climate science. Although beyond the scope of this thesis, overall faith in science and education level may moderate the association between exclusionism and anti-egalitarianism and trust in climate science.

According to the PROCESS model, the relationship between exclusionary and anti-egalitarian attitudes and climate change denial was entirely mediated by lower trust in climate science. In contrast, the regression analysis predicting trust in climate science did not show a significant contribution from populist attitudes, further supporting the notion that the hosting ideology of right-wing populism is the primary mechanism at play. However, these findings contradict the results of Huber et al. (2022), who found that populist attitudes predicted low trust and low interest in science, which fully explained the relationship with climate change denial. Once again, the absence of a significant effect of populist attitudes in my thesis may be attributed to the smaller sample size compared to Huber et al.'s study ($N = 1237$). And similarly to the previous discussion, Huber et al. assessed the hosting ideology of right-wing populism by using a left-right self-placement scale, raising uncertainty about whether the significant effect of populist attitudes would persist when simultaneously considering ideological attitudes such as exclusionism and anti-egalitarianism.

The regression analysis also revealed a significant negative effect of social dominance orientation on trust in climate science, consistent with previous research on the relationship between social dominance orientation and mistrust in science (Azevedo & Jost, 2021; Kerr & Wilson, 2021). Kerr and Wilson suggested that individuals with stronger social dominance orientations may be more inclined to mistrust science due to perceiving scientists as a threat to social hierarchies. The regression analysis in my thesis demonstrated that the effect of exclusionary and anti-egalitarian attitudes on predicting lower trust in climate science was three times larger than that of social dominance orientation. This could suggest that for some individuals, climate science is not only perceived as challenging social hierarchies and contemporary social systems (Fisher, 2019; Kerr & Wilson, 2021; Krange et al., 2021) but also as promoting multiculturalism and egalitarianism (Giorgi & Eslen-Ziya, 2022). For example, some individuals may believe that climate scientists manipulate or cherry-pick their

research results to promote a political agenda aimed at dismantling social hierarchies and the marginalization of certain groups in society. However, this reasoning remains speculative so far.

Limitations and Further Directions

As previously mentioned, the sample size could be a limitation, as it was not determined through a priori power calculations but rather by resource constraints. This could mean that there may not be enough variability in the data to accurately estimate the strength of associations, for example, between populist attitudes and climate change denial, especially if the association is expected to be weak (Jylhä & Hellmer, 2020). However, I chose not to perform post hoc power analyses, as these have been demonstrated to be “logically invalid and practically misleading” (Dziak et al., 2020). This is because post-hoc power calculations are solely determined by the obtained p -value, and when the p -value is greater than the statistically significant alpha level (here $p < .05$), the post-hoc power will always be low, thus no additional information is gained from this analysis.

Nevertheless, several of the observed effect sizes are consistent with previous research, supporting the notion of sufficient power. For example, Jylhä & Hellmer (2020) used path analysis to investigate the direct effect of exclusionary and anti-egalitarian attitudes on climate change denial, reporting an effect of $\beta = .38, p < .05$. In comparison, the regression analysis predicting climate change denial in my thesis (trust in climate science was not included in this analysis), as shown in Table 4, yielded similar results; $\beta = .36, p < .001$. While these findings capture overarching trends, larger sample sizes in future research are needed to improve the approximation of the population. Additionally, the log transformation of the outcome variable, climate change denial, may present challenges in comparing the results with previous studies.

Another potential limitation is the poor internal consistency of the scientific literacy scale (8 items; $\alpha = .58$). This could indicate that the items did not consistently measure scientific literacy, which potentially limited the ability to capture the effect of scientific literacy on the tested relationships. Previous studies using the same scale did not report internal consistency measures (Rutjens et al., 2022), which makes it difficult to compare and determine the source of the low internal consistency. However, it is worth noting that some researchers argue against relying solely on objective cut-off values, such as the lowest acceptable Cronbach's alpha coefficient, for evaluating the internal consistency of generic and broad constructs (e.g., Peters, 2014). This perspective can be applied to the construct of scientific literacy as measured here, as it encompasses a broad range of scientific disciplines (Appendix A).

Further, the hypothesized and tested path between the attitudinal variables may not accurately reflect the “true” causal relationship. That is, cross-sectional designs have several limitations when it comes to making inferences about causality (Bullock & Green, 2021). First, it is not clear which variable precedes the others. For example, climate change denial may lead individuals to adopt certain ideological attitudes that legitimize their prior beliefs about climate change. A longitudinal study by Stanley et al. (2019) found that environmental attitudes precede socially hierarchical attitudes. Similarly, denying climate change may lead to lower trust in climate science, which could, in turn, result in, for example, negative attitudes towards feminism, multiculturalism, and homosexuality, if these concepts are perceived to be advocated by untrustworthy climate scientists. Second, confounding variables that systematically vary with the mediator, such as selective media exposure, are also important to consider. For example, studies have shown that conservatives in the United States are more likely to avoid news regarding the reality and consequences of climate change (Hennessy et al., 2017). Failing to account for important variables may lead to

erroneous conclusions about which variable is the “true” mediator. Hence, to better understand the nature and changes of the association between right-wing populism, mistrust in climate science, and climate change denial, future research should consider longitudinal efforts alongside cross-sectional studies. In this way, the survey context, such as the order in which items are assessed, which potentially affects the outcome of all survey research, can also be minimized in impact.

Future studies could also consider replicating this thesis by expanding the scope to include *science-related populist attitudes* (Mede & Schäfer, 2020), in addition to *political populist attitudes*. Climate change denial is likely to arise from both political and scientific controversies, and both types of populism pose an antagonism between the people and the elite. While there is an empirical overlap between science-related populist attitudes and political populist attitudes, they seem to be distinct concepts (Eberl et al., 2023). Therefore, future research could identify the similarities, differences, and interplay between political and science-related populist attitudes in this context.

Finally, building on my previous discussion, it is important to explore individuals’ perceptions of scientists’ motives and how such perceptions may impact their trust and acceptance of science. Whether and why certain segments of the public view scientists as something that could be equated to “political activists” warrants further research. This is crucial, as it holds implications not only for addressing climate change but also for resolving other global crises that rely on scientific evidence for their solutions.

Practical Implications

To summarize, I have shown here that the ideational approach to populism (Hawkins & Kaltwasser, 2018; Mudde, 2017), which distinguishes the ideational core from the hosting ideology, is advantageous for studying the association between right-wing populism and climate change denial at the level of individuals. Based on this approach, the findings of this

thesis suggest that individuals who more strongly oppose multiculturalism and egalitarianism, attitudes commonly associated with the hosting ideology of contemporary right-wing populism (Mudde, 2007; Rydgren, 2017), are more likely to mistrust climate science and deny climate change. While individuals who hold stronger populist attitudes, for example, consider society to be separated into “the pure people” versus “the corrupt elite” (Mudde, 2004), are not necessarily more likely to mistrust climate science and deny climate change. If such an effect exists, it is likely smaller compared to the influence of the hosting ideology (Jylhä & Hellmer, 2020).

Importantly, this approach to populism allows for tailored responses by policymakers and stakeholders (Huber, 2020). Rather than focusing on reducing the “elitism” of climate change discourse and enhancing scientific literacy and faith in science among the public, the findings of this thesis suggest that it may be more effective to address the underlying ideological attitudes associated with denial and mistrust in science. Thus, the observed association between the hosting ideology of right-wing populism, climate change denial, and mistrust in climate science can be seen as a call for greater political pluralism within science from some parts of the public. It is widely acknowledged that academia has a strong political leaning toward the left (e.g., Langbert & Stevens, 2022), and while this political leaning does not necessarily indicate political bias or reduced trustworthiness of scientific research, it could compromise the credibility of researchers and their work, particularly on contentious issues like climate change. This suggests that reframing climate science as a non-partisan endeavor, for example, through transparency practices such as sharing research data and disclosing funding sources, may help dispel suspicions about hidden political agendas. Engaging diverse voices, such that the conversation about climate change includes perspectives from various political leanings, may also prove advantageous. For example, Goldberg et al. (2021) recently demonstrated that climate change advertising featuring

spokespersons more likely to resonate with conservative values can increase belief in climate change and recognition of its human causes among Republicans.

Furthermore, as has been suggested by others (e.g., Jylhä & Akrami, 2015), science communicators could avoid framing messages on climate change mitigation as threats to the social status quo. Environmental movements, such as the environmental justice movement in the United States (2023), commonly argue that addressing problems pertaining to climate change cannot be solved without unveiling the practices maintaining social injustices. In the context of the results in this thesis, these types of framing could potentially hinder efforts to increase public awareness and understanding of climate change among certain segments of the public. However, this reasoning remains speculative at this point.

Conclusions

Why do right-wing populists tend to deny climate change? The findings of this thesis suggest that it is not necessarily related to populist attitudes. Instead, negative attitudes towards feminism, multiculturalism, and homosexuality, along with preferences for social hierarchies, were found to predict mistrust in climate science. This mistrust, in turn, was associated with higher levels of climate change denial. Thus, the hosting ideological dimension of right-wing populism, characterized by resistance to social and cultural changes, seems to be the key mechanism at play in this context. Further research is needed to better understand the ideological concerns and biases associated with this mistrust of climate science. Addressing this is important, as mistrust in science and the undermining of scientific knowledge can pose significant risks to democracy as a whole.

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Appendix A

Item List

See the method section for information on and references to the scales. RV= reverse coded.

Climate Change Denial

1. It is true that global warming is happening (RV)
2. It is unclear if the Earth's climate is changing
3. Global warming that is caused by humans is happening (RV)
4. The variation in the Earth's temperature is natural, and is not due to human activities
5. Climate change will cause widespread losses and damages for people (RV)
6. Climate change will not have a notable impact on humans' living conditions in any significant way

Exclusionary and Anti-Egalitarian Attitudes

1. In society, too much consideration is given to different minorities than to the people as a whole
2. Other cultures are given too much space at the expense of our traditions
3. Our society is enriched by the different cultures we have (RV)
4. Our country's borders should be guarded more strongly
5. Feminist messages create a worrying development in society
6. Our society must become considerably more gender-equal (RV)
7. Marriage as an institution is diluted when the church marries homosexual couples
8. The love of heterosexuals is equal to the love of homosexuals (RV)

Faith in Science

1. We believe too often in science, and not enough in feelings and faith (RV)
2. Science tells us everything there is to know about what reality consists of
3. The scientific method is the only reliable path to knowledge
4. The only real kind of knowledge we can have is scientific knowledge
5. Science is the most efficient means of attaining truth

Populist Attitudes

1. The politicians in the US Parliament need to follow the will of the people
2. The people, and not politicians, should make our most important policy decisions
3. The political differences between the elite and the people are larger than the differences among the people
4. I would rather be represented by a citizen than by a specialized politician
5. Elected officials talk too much and take too little action
6. What people call “compromise” in politics is really just selling out on one's principles

Scientific Literacy

1. The center of the earth is very hot
2. All radioactivity is made by humans
3. Lasers work by focusing sound waves
4. Electrons are smaller than atoms
5. It is the father's gene that decides whether the baby is a boy or a girl
6. Antibiotics kill viruses as well as bacteria
7. All human-made chemicals can cause cancer
8. Astrology has some scientific truths

Short Social Dominance Orientation (SSDO)

1. In setting priorities, we must consider all societal groups (RV)
2. We should not push for equality of societal groups
3. The equality of societal groups should be our goal (RV)
4. Superior societal groups should dominate inferior groups

Trust in Climate Science

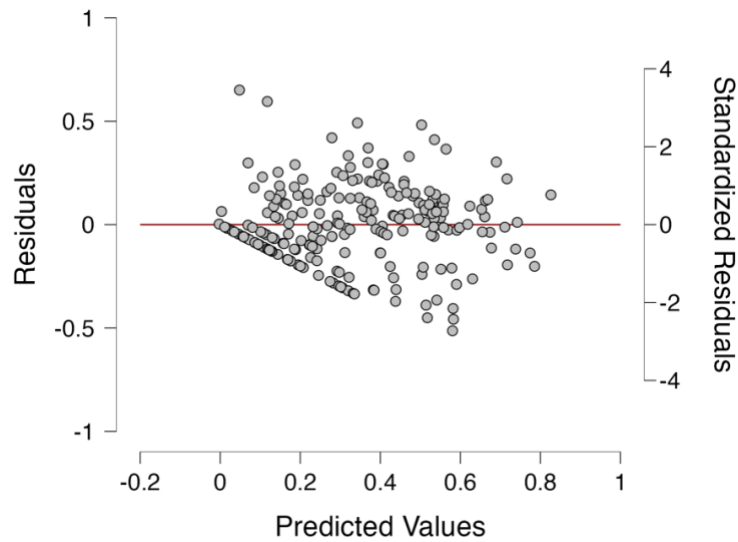
1. I have very little confidence in the climate science community (RV)
2. Information from the climate science community is trustworthy
3. I trust the climate science community to do what is right
4. The climate science community has too much power and influence in society (RV)
5. The findings of climate scientists are influenced by who pays them (RV)
6. The climate science community often does not tell the public the truth (RV)
7. I am suspicious of the climate science community (RV)

Appendix B

Assumption Check Multiple Linear Regression Analyses

Figure B1

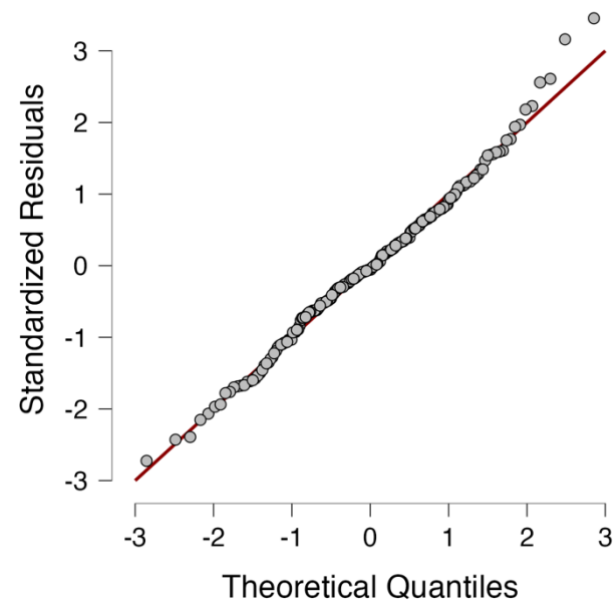
Predicting Climate Change Denial- Residuals versus Predicted



Note. Climate change denial was here log-transformed with base 10.

Figure B2

Predicting Climate Change Denial- Q-Q Plot Standardized Residuals



Note. Climate change denial was here log-transformed with base 10.

Figure B3

Predicting Trust in Climate Science- Residuals versus Predicted

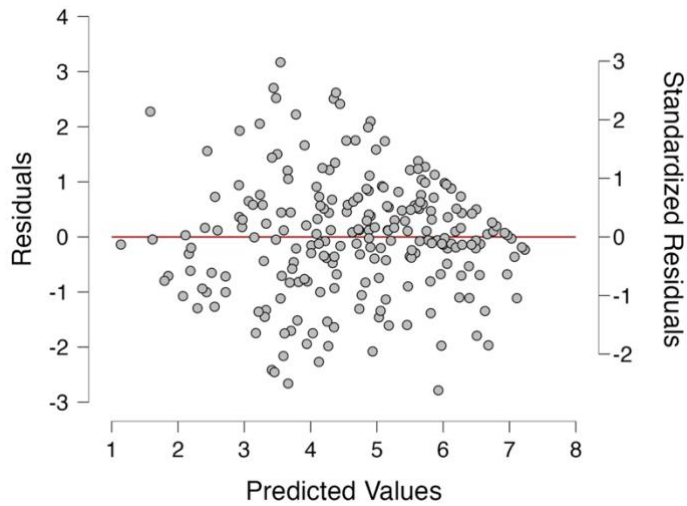
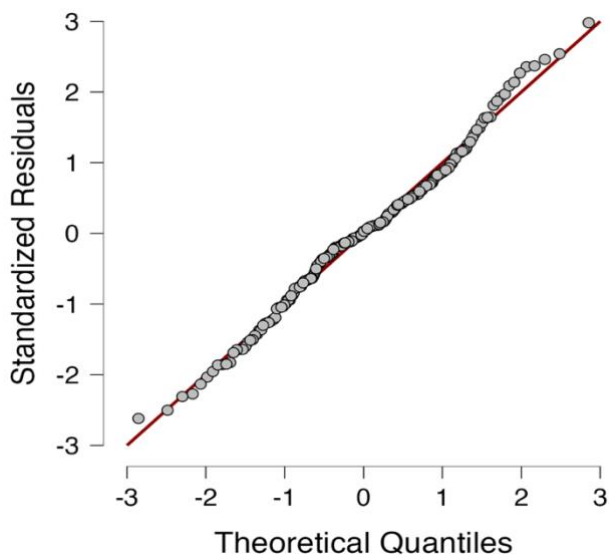


Figure B4

Predicting Trust in Climate Science- Q-Q Plot Standardized Residuals



Appendix C

PROCESS Model Testing H3b

To test H3b, which states that the independent effect of populist attitudes on climate change denial, will be mediated by a decreased trust in climate science while controlling for faith in science and scientific literacy, I used PROCESS macro version 4.2 (Hayes, 2018), Model 4.

Climate change denial was included as the outcome variable, trust in climate science as the mediator, and populist attitudes as the independent variable. Age, education, gender, race, Republican affiliation, Democrat affiliation, political conservatism, social dominance orientation, faith in science, scientific literacy, and exclusionary and anti-egalitarian attitudes were included as covariates. The model is based on 10000 bootstrap samples with a 95% confidence interval (CI).

Following Hayes' (2018) guidelines for mediation models, the mediator is considered to have a significant mediational effect if the bias-corrected 95% CI for the indirect effect of the independent variable on the outcome variable, via the mediator, $a*b$ -path, does not include zero. Figure 1 demonstrates the conceptual mediation model.

The results demonstrated that there was no significant indirect effect, $a*b$ -path, of populist attitudes on climate change denial through trust in climate science, $b = .01$, Boot SE = .01, Lower limit CI, Upper limit CI = $-.00, .03$, with a standardized indirect effect of $\beta = .04$, Boot SE = .03, Lower limit CI, Upper limit CI = $-.01, .09$. The total effect, $c' + a*b$ -path, of populist attitudes on climate change denial was neither significant, $b = .00$, $p = .73$. The direct effect, c' -path, of populist attitudes, and the effect of the mediator trust in climate science on the outcome variable climate change denial, b -path, respectively, are presented in Table 6. Out of the covariates, Republican affiliation also indicated a weaker but significant

positive effect on climate change denial. The effect of populist attitudes on the mediator trust in climate science, a-path, is presented in Table 5.

Thus, H3b, stating that the independent effect of populist attitudes on climate change denial is mediated by a decreased trust in climate science while controlling for faith in science and scientific literacy, was not supported by the analysis.