

Article

The Socio-Epistemic Architecture of Climate Denial: Mapping Individual Trajectories and Alternative Credibility Criteria

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Abstract

Despite the broad scientific consensus on anthropogenic climate change, the rejection or contestation of this consensus remains socially relevant. This study adopts a qualitative approach to understand climate denial as a process by analyzing individual trajectories of adherence to climate misinformation. Twelve semi-structured interviews were conducted with individuals who expressed positions of denial, minimization, or contestation of the dominant scientific explanation of climate change. The findings indicate that questioning of the climate consensus most often emerges from informal exposure to digital content, particularly on social media and online platforms. These initial exposures are subsequently reinforced by closed informational ecosystems, often organized around private groups, where alternative criteria of credibility are consolidated, and dissenting figures are valued as legitimate authorities. A systematic delegitimization of institutional science was also observed, frequently associated with perceived political or economic agendas. A central finding of the study is the emergence of selective trust in science, in which scientific knowledge is accepted in domains such as medicine, biology, and technology but rejected in climatology. Additionally, the analyzed discourses reveal strong resistance to refutation and the absence of clear criteria for revising previously held positions. The study contributes to research in Environmental Education and Climate Literacy by demonstrating that climate denial should be understood as a socio-epistemic phenomenon rather than merely as a deficit of scientific knowledge.

Keywords: climate denial; climate misinformation; selective trust in science; online information ecosystems; social media influence; climate literacy; environmental education; qualitative interviews



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1. Introduction

Despite robust, widely documented scientific evidence of anthropogenic climate change, the phenomenon continues to face public contestation. Current estimates indicate that approximately 99% of peer-reviewed scientific articles support the view that climate change is predominantly caused by anthropogenic factors (Lynas et al. 2021). Nevertheless, the rejection of this consensus, particularly the denial of human causality, remains socially salient and politically consequential (Ejaz 2025; Leka and Furnham 2024).

Importantly, climate skepticism is not a homogeneous phenomenon. Previous research has identified multiple forms of rejection, including trend denial (rejecting that warming is occurring), attribution denial (rejecting human causality), and impact minimization (Cook et al. 2018). In this study, the term climate denial is used in a broader analytical sense

to refer to discursive positions that reject, minimize, or contest the dominant scientific explanation of anthropogenic climate change.

The persistence of such positions cannot be explained solely as a deficit in scientific literacy. A substantial body of research demonstrates that the rejection of established scientific knowledge often emerges from identity-related dynamics, cultural orientations, and ideological predispositions, and may even coexist with high levels of formal education (Kahan et al. 2011). In this context, the erosion of trust in scientific and political institutions has been identified as a key factor shaping the reception of climate information (Nicolosi et al. 2025). Rather than emerging from isolated encounters with misinformation, climate skepticism frequently develops within broader contexts of institutional distrust and cultural contestation over expertise.

The expansion of digital media has nevertheless transformed the informational environments in which such dynamics unfold. Rather than assuming a direct causal link between digital exposure and belief formation, current research highlights how climate misinformation has evolved into more diffuse and adaptive modalities, often leveraging user engagement patterns to amplify minority dissent (Gardam et al. 2025). Within these digital environments, individuals frequently report navigating spaces that reinforce their existing worldviews, a dynamic that interacts with the psychological tendency to preferentially consume information aligning with prior beliefs (Jiang et al. 2024). Repeated exposure to climate-skeptical narratives, as perceived and recalled by users, can increase their subjective credibility through mechanisms akin to the “illusory truth effect”, whereby familiarity enhances perceived truthfulness (Frenda et al. 2011). Consequently, digital exposure is conceptualized here not as a deterministic cause of climate denial, but as an interactive catalyst that intertwines with pre-existing institutional distrust and ideological orientations.

Following Cook et al. (2018) and Ejaz (2025), climate skepticism encompasses multiple forms of rejection, including trend denial, attribution denial, and impact minimization. The present study uses the broader term climate denial as an analytical category encompassing these different forms of contestation of the dominant scientific explanation. We took care to ensure that our interview was underpinned by the principles of semi-structured interviews, which are particularly suitable for exploring personal narratives, meaning-making processes, and sensitive or controversial topics (Fagan 2025; Elmir et al. 2011).

This study adopts a qualitative approach to understand climate denial as a socio-epistemic trajectory at the individual level. Rather than treating denial as a fixed position, the phenomenon is conceptualized here as a dynamic process. Participants’ narratives suggest that this process often begins with an initial moment of questioning or doubt, followed by the consolidation of preferred information sources, the development of alternative criteria for evaluating credibility, and the maintenance of positions through mechanisms of cognitive and identity coherence.

Importantly, the “social” dimension of this trajectory does not refer primarily to formal social networks but to the informal epistemic communities that emerge in digital environments. Within these communities, individuals share information, reinforce credibility criteria, and collectively validate alternative interpretations of climate science.

By mapping these trajectories, the article contributes to research in Environmental Education and Climate Literacy in three main ways. First, it characterizes typical entry pathways and alternative credibility criteria associated with climate denial, offering an empirically grounded conceptual framework. Second, it clarifies the role of institutional distrust, social identity, and media consumption in sustaining these positions. Third, it provides insights for educational and communication strategies that recognize climate misinformation as a complex socio-epistemic phenomenon rather than merely a problem of insufficient scientific knowledge.

RQ1. How do individuals describe their pathways into climate skepticism and contestation of climate science?

RQ2. How do participants describe the informational ecosystems and credibility criteria that sustain their climate-skeptical positions?

RQ3. How do participants construct trust, authority, and resistance to refutation when evaluating climate-related information?

2. Materials and Methods

This study adopts a qualitative, exploratory approach, suitable for analyzing complex, socially contested phenomena that are strongly mediated by individual narratives (Braun and Clarke 2006). The aim is not to test hypotheses or establish causal relationships, but rather to understand the processes, trajectories, and discursive mechanisms associated with adherence to, or denial of, the scientific consensus on climate change. The methodological design is based on semi-structured interviews, allowing for a common interview guide across participants while maintaining sufficient flexibility to explore individual trajectories. Prior to data collection, the interview guide was reviewed and validated by two professionals in the field of sociology and environmental education. Their comments focused on the clarity of the questions, the need to avoid biased wording, and the breadth of the topics covered, which ultimately improved the initial draft. These two professionals were chosen for their track record of conducting qualitative research, including interviews.

2.1. Participant Selection

Participants were recruited from Facebook pages and semi-closed online groups in which climate-skeptical narratives were actively discussed. Due to explicit confidentiality requests from participants and the sensitive nature of these online environments, the names of these digital communities are not disclosed to protect participant anonymity and group privacy. Facebook was chosen because it remained one of the second-most active platforms where the target participants discussed matters publicly (Euronews 2022; Thomas 2022).

The recruitment process followed a purposive sampling strategy. An initial screening of potential participants was based on their public interaction history and comments within these spaces to identify individuals who actively participated in climate-related discussions. Recruitment was then conducted through direct contact via Facebook Messenger. Invitation messages briefly explained the study's goals, guaranteed total anonymity, and invited voluntary participation. During this initial contact, the socio-demographic alignment (gender and political orientation) was confirmed, resulting in a homogeneous final cohort. A total of 20 invitations were sent over a two-week period, from which 12 individuals agreed to participate. No restrictions based on gender or political orientation were imposed during the recruitment process. The homogeneity observed arose organically from the recruitment context. Eligibility was assessed based on publicly available comments and self-descriptions indicating skepticism toward anthropogenic climate change, rejection of the scientific consensus, or recurring engagement with climate-skeptical narratives.

The inclusion criteria were: (i) explicit expression of skepticism, minimization, or rejection of the scientific consensus on anthropogenic climate change; (ii) age of 18 years or older; and (iii) willingness to participate voluntarily in an individual interview.

Participants are presented in the study using pseudonyms and are characterized through a limited set of variables (Table 1), including age, level of education, professional background, and their primary self-reported "entry point" into climate skepticism. This characterization aims to contextualize the analyzed trajectories without implying statistical representativeness. A defining characteristic of the final sample is its ideological and gender homogeneity: all 12 participants were male and self-identified as right-wing. While this pat-

tern emerged organically from voluntary participation in the targeted online environments, it aligns with previous literature that establishes a robust correlation between political conservatism, specific masculine identities, and climate change skepticism (Dunlap and Brulle 2015; Forchtner and Lubarda 2023). Consequently, this study does not aim to provide a representative profile of all climate skepticism, but rather to explore the specific discursive trajectories within a sociopolitical segment where such positions are highly salient.

Table 1. Illustrative examples of the coding and theme development process.

Example Quotation	Initial Code	Sub-Theme	Final Theme
"I came across a Facebook post. . ."	Exposure through social media	Digital exposure	Entry pathways
"The climate has always changed naturally"	Natural climate variability	Experiential reasoning	Entry pathways
"They are independent scientists"	Alternative expertise	Alternative authority	Credibility criteria
"Scientific journals have a green agenda"	Institutional distrust	Delegitimisation of institutional science	Resistance to refutation

2.2. Data Collection Instrument

Data were collected using a semi-structured interview guide organized into thematic blocks reflecting the central dimensions of the study:

- (i) The emergence of questioning regarding the scientific consensus.
- (ii) Informational ecosystems and credibility criteria.
- (iii) Relationships with science and epistemic coherence.
- (iv) Social and educational context.

The interview guide was designed to encourage narrative and reflective responses while avoiding confrontational or normative formulations. This approach sought to reduce defensive responses and promote the spontaneous expression of participants' rationalizations. Such a strategy aligns with methodological recommendations for interviews addressing controversial and politically sensitive beliefs.

2.3. Interview Procedure

Interviews were conducted individually, primarily in remote formats, either via video-conference or audio calls, depending on participants' preferences. This option was adopted for both logistical and methodological reasons, as remote formats may enhance perceived anonymity and reduce social desirability bias when discussing sensitive topics.

Interviews lasted approximately 50 to 60 min. All interviews were recorded with participants' informed consent and subsequently transcribed verbatim for analysis. The transcripts were anonymized by removing identifying information to ensure participant confidentiality.

2.4. Ethical Considerations

Participation in this study was strictly voluntary. Prior to the interviews, all participants received comprehensive information about the study's aims, data-handling procedures, and their right to withdraw at any stage without negative consequences. Formal informed consent was obtained from all participants prior to data collection.

Given the potentially sensitive nature of political, ideological, and climate-related beliefs, rigorous measures were implemented to protect participant anonymity and confidentiality. Audio recordings and interview transcripts were fully anonymized by removing any direct or indirect identifying information (such as specific regional references, professions, or specific digital group names) and were securely stored in password-protected files.

accessible exclusively to the research team. This work received positive approval from the ethics committee of the Polytechnic Institute of Bragança, number 573000.

2.5. Data Analysis Strategy

Data were analysed using reflexive thematic analysis following the six-phase framework proposed by Braun and Clarke (2006, 2021). The analytical process began with a verbatim transcription of the interviews, which was undertaken manually by the first author. The transcripts were subsequently checked against the original audio recordings to ensure transcription accuracy.

The first author conducted the coding manually through repeated engagement with the data over approximately four weeks. An inductive orientation guided the initial stages of analysis, allowing codes and sub-themes to emerge from participants' narratives rather than being imposed from pre-existing theoretical categories. As the analysis progressed, the developing codes, themes, and interpretations were discussed with the second author to encourage reflexive dialogue, challenge interpretations, and strengthen the analytical rigour of the study.

Consistent with the principles of reflexive thematic analysis (Braun and Clarke 2021), no formal intercoder reliability statistics were calculated, as coding was treated as an interpretative and reflexive process rather than a procedure aimed at achieving statistical agreement between coders.

To enhance analytical transparency, Table 1 provides illustrative examples of the coding process, showing how initial codes were grouped into sub-themes and subsequently developed into broader thematic categories

3. Results

A total of 12 individuals participated in the study, all male, aged 23 to 68 years, representing different media generations, ranging from participants whose informational socialization occurred in a pre-Internet context to those fully integrated into contemporary digital ecosystems. Participants' educational backgrounds ranged from incomplete secondary education ($n = 3$) to completed secondary education ($n = 5$) and higher education ($n = 4$), including training in technical, legal, and scientific fields.

Participants worked in a variety of professional sectors, including security services, transportation, administrative services, entrepreneurship, and higher education teaching.

Participants self-positioned on a 10-point left–right ideological scale, where 1 represented the political left and 10 represented the political right.

All participants positioned themselves politically on the right side of the ideological spectrum (scores between 7 and 10 on a left–right scale), frequently expressing skepticism toward state intervention and a strong distrust of institutions.

Table 1 presents a summary characterization of the participants, including age, level of education, professional background, and the primary “entry point” into questioning the climate consensus.

Pseudonym	Age	Education	Professional Field	Political Orientation	Dominant Entry Pathway
P1	23	Incomplete secondary education	Security services	Right (7–10)	Facebook; dissenting “scientific” figures
P2	29	Secondary education	Security services	Right (7–10)	Social media; independent online research
P3	31	Secondary education	Firefighter	Right (7–10)	Online videos (YouTube)
P4	33	Higher education	Civil engineer	Right (7–10)	Internet, independent online research blogs
P5	33	Secondary education	Taxi driver	Right (7–10)	Perceived failures of political predictions
P6	34	Incomplete secondary education	Truck driver	Right (7–10)	Social media + rejection of school knowledge
P7	36	Secondary education	Administrative services	Right (7–10)	Internet vs. traditional media
P8	45	Higher education	Computer science teacher	Right (7–10)	Informal discussion + criticism of climate models
P9	47	Secondary education	Gardening business owner	Right (7–10)	“Independent” digital groups
P10	55	Higher education	Law	Right (7–10)	Dissident authorities + personal experience
P11	65	Secondary education	Civil engineering entrepreneur	Right (7–10)	Internet + generational experience
P12	68	Higher education	Chemistry teacher	Right (7–10)	Internet + scientific identity

3.1. RQ1: How Do Individuals Describe Their Pathways into Climate Skepticism and Contestation of Climate Science?

Initial Entry Pathways

Participants rarely described their initial questioning as resulting from systematic engagement with scientific literature. Instead, it typically arises from informal, often accidental exposure to digital content.

A recurring pattern involved references to social media as the primary initial trigger, particularly Facebook, YouTube, or other non-institutional digital environments, reported by half of the cohort ($n = 6$). Participants reported having encountered content presenting alternative narratives to the dominant scientific discourse, which stimulated curiosity and motivated further exploration:

“I came across a post on Facebook by chance and started listening to the real scientists who are not connected to the lobbies.” (P1)

Another frequent pattern involved the mobilization of the idea that “the climate has always changed,” presented as self-evident knowledge and often associated with personal experience or generational memory. In these cases, doubt precedes information-seeking and functions primarily as confirmation of a pre-existing belief:

“I have always been suspicious because the climate has always changed naturally.” (P11)

Some participants also referred to perceived failures of past climate predictions, frequently attributed to political or media discourse, as a decisive factor in their loss of confidence in climate science:

“Nothing they say makes sense; nothing has changed that I have seen.” (P5)

3.2. RQ2: What Informational Ecosystems and Credibility Criteria Sustain Climate-Skeptical Positions?

3.2.1. Informational Ecosystems

Following the initial moment of questioning, participants’ narratives reveal the consolidation of relatively closed informational ecosystems characterized by a preference for digital groups, alternative platforms, and sources perceived as “independent.” Private groups on social media and messaging applications appear as central spaces of discursive legitimization, functioning simultaneously as sources of information, social validation, and identity reinforcement:

“In our Facebook group, there are several people with authority to speak.” (P1)

Within these ecosystems, institutional scientific authority is frequently delegitimized and associated with economic interests, political agendas, or censorship. In contrast, dissenting figures, often portrayed as being silenced by dominant institutions, are valued precisely because of their perceived marginality:

“Fewer and fewer people dare to speak because they are silenced by the woke system.” (P2)

Participants also attribute authority to individuals with scientific or technical backgrounds not directly related to climatology, such as engineering or chemistry, considering such expertise sufficient to support claims about climate processes:

“Climate involves chemistry, so I think I have the authority to understand it.” (P12)

3.2.2. Criteria of Credibility and Information Validation

The criteria participants use to assess the credibility of information sources differ substantially from conventional academic standards. The analysis reveals four recurring patterns. First, financial or institutional independence emerges as a central criterion of credibility. Sources not associated with universities, governments, or international organizations are frequently perceived as more trustworthy.

Second, dissent itself is often framed as evidence of truth, effectively inverting the logic of scientific consensus. Minority status is interpreted as an indicator of intellectual courage and authenticity:

“They [those who reject anthropogenic climate change] are the modern Galileo’s.” (P12)

Third, several participants rely on personal experience and everyday observation as legitimate means of validating knowledge about climate:

“For me, it has always been cold and hot.” (P10)

Several participants also appealed to “common sense” and personal intuition when evaluating climate-related claims, often presenting these as legitimate alternatives to formal scientific validation.

3.3. RQ3: How Do Participants Construct Trust, Authority, and Resistance to Refutation When Evaluating Climate-Related Information?

3.3.1. Trust in Science

One of the most consistent findings of the study is the presence of selective trust in science. Participants do not reject science as a whole; rather, they draw a clear distinction between domains they perceive as reliable, such as medicine, biology, technology, or engineering, and climate science, which is viewed as an exceptional and problematic field.

The rejection of climatology is often justified by the perceived fragility of climate models, the uncertainty associated with long-term projections, and the belief that climate science is politically instrumentalized:

“If we often cannot predict the weather for next week, how can we know what will happen in 20 years?” (P8)

This selective compartmentalization allows participants to maintain a self-image of rationality and respect for science while simultaneously rejecting a specific scientific domain. This pattern was particularly evident among participants with higher education or technical backgrounds (e.g., P4, P8, and P12), who frequently mobilized their formal training to legitimize skeptical positions while questioning the scientific status of climatology.

3.3.2. Refutability and Resistance to Position Change

When asked about the possibility of revising their position, most participants reported having no clear criteria to guide them in reconsidering their views. Their responses indicate a systematic displacement of the burden of proof onto institutional science, accompanied by the prior dismissal of evidence originating from those sources.

In several cases, denial appears to take on a self-sealing structure in which attempts at refutation are interpreted as further confirmation of a hidden agenda:

“Scientific journals have a green agenda.” (P12)

3.3.3. Social Context, Identity, and Perceived Literacy

At the social level, participants’ narratives oscillate between avoiding conflict and actively attempting to persuade close social circles. Several participants reported influencing family members or colleagues, presenting themselves as holders of alternative knowledge:

“After I explained it to them, they became convinced.” (P6)

Most participants attribute to themselves high levels of critical thinking regardless of their formal education and reject the idea that scientific literacy depends on academic training:

“You don’t need to be an academic to understand this.” (P7)

In some cases, authority is explicitly transferred to members of the group who hold advanced academic degrees, reinforcing the internal legitimacy of the alternative informational ecosystem.

“My family—my parents, brother, and wife—didn’t have an opinion, but after I explained and showed them some posts, they became convinced.” (P4)

Although common patterns emerged across participants, some differences were observed. Younger participants more frequently described digital exposure as an initial trigger, whereas older participants tended to frame skepticism through generational memory and perceived long-term climate variability. Participants with higher education often mobilized technical expertise to legitimize skeptical positions, while others relied more strongly on personal experience and common-sense reasoning. This generational divide is visible when comparing younger participants, such as P1 (23, Security services) and P2 (29, Security services), whose entry points were strictly mediated by Facebook and social media algorithms, with the oldest participants, P11 (65) and P12 (68), who anchored their contestation in ‘generational’ and ‘scientific’ identity claims.

4. Discussion

Three main findings emerged from the analysis. First, participants described climate skepticism as developing through identifiable trajectories rather than emerging suddenly.

Second, these trajectories were reinforced by closed informational ecosystems and alternative credibility criteria. Third, participants displayed selective trust in science, accepting scientific authority in some domains while rejecting climatology.

The findings of this study suggest that climate denial should not be understood as an isolated position or as the result of factual ignorance, but rather as a structured socio-epistemic process sustained by individual trajectories, specific informational ecosystems, and identity-based mechanisms of knowledge validation. This interpretation aligns with a growing body of research that challenges explanatory models based solely on deficits in scientific literacy (Kahan 2012; Lewandowsky and Oberauer 2016). Rather than emerging abruptly, the narratives analyzed here indicate that climate denial tends to develop through identifiable stages involving exposure to questioning narratives, the consolidation of selective informational environments, and the adoption of alternative criteria for evaluating credibility. In this sense, climate denial appears less as a discrete opinion and more as a stabilized outcome of a broader socio-epistemic trajectory.

4.1. Climate Denial as a Process Rather than a Static Position

One of the central contributions of this study lies in conceptualizing climate denial as a gradual trajectory initiated through informal “entry points” and reinforced over time by processes of information selection and validation. These are dynamic observations, which describe climate denial not only as an organized countermovement but also as a phenomenon rooted in everyday media experiences (Dunlap and Brulle 2015).

The fact that most participants reported accidental exposure to social media or digital platforms as the initial trigger for questioning the scientific consensus reinforces the idea that contemporary informational ecosystems function more as incubators of doubt than as spaces for structured transmission of scientific knowledge. These findings are consistent with research on the circulation of misinformation in digital environments, which demonstrates that repetition and familiarity increase the perceived credibility of false claims (Pennycook and Rand 2019).

4.2. Closed Digital Ecosystems and Alternative Authority

The consolidation of relatively closed informational ecosystems, centered on private groups and alternative platforms, emerges as a key element in sustaining denialist positions. These spaces simultaneously function as sources of information, communities of belonging, and arenas of epistemic legitimation.

This pattern is consistent with the concepts of echo chambers and epistemic bubbles discussed in the literature on polarization and misinformation (Nguyen 2018). In the specific context of climate change, Dunlap and Brulle (2015) demonstrate that selective exposure to denialist sources reduces perceptions of scientific consensus and reinforces rejectionist attitudes.

The valorization of dissenting figures and the construction of “alternative authorities” further confirm the manufacture of doubt, in which the existence of minority voices is strategically used to suggest scientific controversy where little actually exists (Oreskes and Conway 2010) as seen in the narratives of P1 and P2, who actively weaponized the perceived marginality of their alternative sources.

4.3. Alternative Credibility Criteria and the Inversion of Consensus

The credibility criteria mobilized by participants diverge substantially from classical principles of scientific epistemology, such as peer review, replicability, and institutional consensus. Instead, credibility is associated with perceived independence, dissent, and consistency with personal experience.

These findings align with the cultural cognition framework, which holds that individuals evaluate scientific information in ways that are congruent with their cultural values and social identities (Kahan et al. 2011). The inversion of scientific consensus, in which minority dissent is deemed more credible than institutional consensus, reveals a process of motivated reasoning widely documented in psychological research (Lewandowsky and Oberauer 2016).

The recurring analogy with historical figures such as Galileo further suggests the symbolic appropriation of the “persecuted scientist” narrative, a rhetorical pattern frequently observed in conspiratorial and pseudoscientific discourses (Douglas et al. 2019), directly mirroring P12’s explicit comparison of climate deniers to ‘modern Galileos’.

4.4. Selective Trust in Science

One of the most robust findings of the study is the presence of selective trust in science. Participants do not reject science as a whole but instead delineate a specific domain, climatology, as a problematic exception. Domains such as medicine, engineering, or technology are widely accepted as legitimate and reliable, while climate science is framed as politically contaminated or methodologically weak. This pattern can be understood through the concept of boundary work in 1983 (Gieryn 1983) in which actors seek to redefine the boundaries of legitimate science to protect their epistemic identity. Rather than positioning themselves as anti-scientific, participants frequently present themselves as defenders of “real science”, portraying climatology as a field that has deviated from proper scientific standards.

In this context, critiques of climate models or confusion between weather prediction and climate projection should not be interpreted merely as misunderstandings. Instead, they function as rhetorical strategies through which individuals attempt to delegitimize a specific scientific domain while preserving their self-image as rational and scientifically minded actors. This dynamic helps explain the paradox observed in the interviews: participants simultaneously affirm strong respect for science while rejecting one of its most robustly established fields.

4.5. Limited Refutability and Self-Sealing Belief Structures

Participants’ difficulty in identifying clear conditions under which they would revise their views suggests the presence of self-sealing discursive structures in which contradictory evidence is pre-emptively delegitimized. This pattern is consistent with research linking climate denial to conspiratorial thinking, characterized by resistance to falsifications and systematic distrust of institutions (van der Linden et al. 2017). The displacement of the burden of proof onto institutional science, combined with the interpretation of scientific production as the result of a political “agenda,” reinforces the stability of these beliefs and renders them particularly resistant to traditional science communication strategies based on factual correction.

4.6. Identity, Social, and Political Dimensions

The strong ideological homogeneity of the sample, with all participants positioning themselves on the right of the political spectrum, constitutes one of the most striking empirical patterns of the study. Rather than being treated solely as a methodological limitation, this pattern suggests that climate denial may function as an identity marker within certain sociopolitical contexts. Previous research has consistently identified associations between political conservatism, defense of market-oriented economic systems, and skepticism toward climate science (Dunlap and Brulle 2015). The interviews analyzed here suggest that these associations are not merely ideological preferences but part of broader identity configurations in which acceptance of climate science is perceived as aligned with political

agendas involving state intervention, environmental regulation, or cultural narratives associated with progressive politics.

Within this framework, rejecting climate science may serve a symbolic function, affirming membership in a particular ideological community. References to “woke culture,” criticism of state intervention, and distrust toward institutional expertise indicate that climate debates are often interpreted through broader cultural conflicts rather than purely scientific disagreements. In this sense, the rejection of climate science may serve less as a position on atmospheric physics and more as a signal of political and cultural identity.

Furthermore, this sociopolitical framing is deeply intertwined with gendered identities. The fact that the cohort is exclusively male aligns with the ‘cool dude effect’ literature, which posits that conservative men are particularly prone to climate skepticism as a means of protecting an industrial-modern masculine identity that views environmental regulations as a threat to economic autonomy and systemic stability. Theoretically, the findings support socio-epistemic approaches to climate skepticism by demonstrating how trust, identity, and informational environments interact in the construction of alternative systems of authority. Rather than emerging solely from factual misunderstanding, climate denial appears to develop through processes of social validation, epistemic boundary formation, and selective trust in expertise.

4.7. Implications for Environmental Education and Climate Literacy

From the perspective of Environmental Education, the findings reinforce the need to move beyond approaches centered exclusively on increasing factual knowledge. If climate denial is embedded in the dynamics of trust, identity, and epistemic authority, strategies based solely on correcting misconceptions or presenting additional scientific information are unlikely to be sufficient.

Interventions such as cognitive inoculation, designed to expose individuals to the rhetorical techniques used in misinformation, have shown promising results in controlled settings (van der Linden et al. 2017). However, the findings of this study suggest that such approaches must be complemented by broader educational efforts addressing the social dimensions of scientific knowledge.

Environmental education may benefit from fostering epistemic humility and an understanding of the sociology of science, including how scientific consensus emerges, how uncertainty is managed in complex systems, and how scientific authority is constructed and contested in democratic societies. Such approaches may help create conditions in which scientific claims are evaluated not merely through ideological alignment but through a more nuanced understanding of how scientific knowledge is produced and validated.

5. Conclusions

This study examined climate denial through the individual trajectories by which people come to question, reject, or reinterpret the scientific consensus on anthropogenic climate change. The findings suggest that climate denial rarely emerges as a sudden or purely cognitive position. Instead, it develops through a gradual socio-epistemic trajectory involving exposure to questioning narratives in digital environments, the consolidation of selective informational ecosystems, and the progressive adoption of alternative credibility criteria through which participants validate knowledge and authority. By conceptualizing climate denial as a trajectory rather than a fixed belief, the study contributes to moving beyond deficit-based interpretations that frame the phenomenon primarily as a lack of scientific knowledge. Participants’ narratives reveal that individuals who reject climate science often maintain a self-image of rationality and scientific respectability, supported

by selective trust in science and by discursive strategies that redefine the boundaries of legitimate scientific authority.

From the perspective of Environmental Education and Climate Literacy, these findings suggest that strategies based solely on the transmission of scientific facts are unlikely to be sufficient. Educational responses may benefit from addressing the social dimensions of knowledge, including the role of trust, authority, and identity in shaping how scientific claims are interpreted within contemporary information ecosystems.

Several limitations should be acknowledged. Because participants were recruited through online environments, the sample reflects a deterritorialized digital ecosystem rather than a specific physical locality. Furthermore, the final cohort was characterized by a distinct gender and ideological homogeneity, consisting exclusively of right-wing male individuals. While this composition emerged organically from voluntary participation within the targeted digital groups, it tightly resonates with previous research regarding the ‘cool dude effect’ and the role of ‘industrial masculinities’ in driving climate skepticism (Dunlap and Brulle 2015; Remsö et al. 2024). Consequently, these characteristics limit the direct transferability of the findings beyond this specific sociopolitical and identity-based segment.

Beyond its practical implications, the study contributes theoretically to understanding climate denial as a socio-epistemic trajectory shaped by interactions among trust, identity, and alternative systems of epistemic authority.

Future research would benefit from comparative designs that incorporate more diverse demographic profiles, including female participants and politically moderate or left-leaning perspectives. Additionally, longitudinal qualitative designs or mixed-method approaches could further explore how these socio-epistemic trajectories of climate denial emerge, stabilize, or potentially fracture across different cultural, national, and political contexts. Future research may benefit from comparative designs, more diverse samples, and mixed-method approaches to further explore how socio-epistemic trajectories of climate denial emerge and evolve across different cultural and political contexts.

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