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ARTICLE

Advice-taking in carbon footprint assessments: How psychological and cultural factors shape reliance on experts' advice

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Abstract

In this pre-registered experiment conducted in the Netherlands and Türkiye ($N_{\text{total}} = 550$), we investigated how the source of advice (peer vs. expert) influences people's decision-making when assessing the carbon footprint of a flight between two cities. We also examined whether this effect was influenced by their conspiracy mentality, collective narcissism, epistemic individualism, and climate change scepticism. Our findings suggest that people overall rely more on experts' advice than peers', especially in the Netherlands compared with Türkiye. Moreover, individuals high in conspiracy beliefs, epistemic individualism, and collective narcissism reduced the weight advantage typically given to expert advice over peer advice. Only a specific form of climate change scepticism (i.e., trend scepticism) showed similar effects. Overall, our results indicate that individuals who value their own opinion and harbour distrust towards experts or science tend to discount expert advice.

KEYWORDS

advice-taking, carbon footprint, collective narcissism, conspiracy mentality, expertise defiance

BACKGROUND

Recent conspiracy research has taken an interest in conspiracy believers' apparent scepticism. Conspiracy believers claim to be 'critical freethinkers' (Harambam & Aupers, 2015, 2017). They also display a 'chronically distrusting mindset' (Newman et al., 2022) and 'epistemic individualism', which stresses individual responsibility in knowledge and rejection of expertise (Tomas et al., 2022). They also claim

to be using less the advice others might give them, but actually use them as much as any other person (i.e., not much, Altay et al., 2023). Overall, conspiracy believers display what we refer to as ‘misplaced distrust’: They seem, overall, to trust themselves more than others in information gathering, social information use, and knowledge acquisition.

In this regard, authors have examined if such a distrusting scepticism was generalized to all social information processing, or if it was targeted at specific sources, and notably, authorities (Frenken & Imhoff, 2022; Imhoff & Lamberty, 2018; Pierre, 2020). A recent study by Altay et al. (2023) tested experimentally whether conspiracy believers differ from non-believers in their reliance on information from others. They examined how conspiracy believers adjusted their initial estimations when presented with advice from fellow participants or experts. The findings revealed no significant effect of conspiracy beliefs on advice use (Altay et al., 2023).

The study by Altay et al. (2023) is, to the best of our knowledge, the first to link conspiracy beliefs to advice-taking behaviour through judge-advisor systems. These behavioural tasks involve a judge who has to give an estimate of a certain unknown quantity and, after being given advice by an external third party, to potentially revise their judgement (Kämmer et al., 2023). One key advantage of this paradigm is that it measures the *weight of advice* as a continuous variable ranging from 0 (i.e., not considering the advice at all) to 1 (i.e., aligning fully on the advice).

While the study by Altay et al. (2023) provided valuable insights that challenged previous claims positing conspiracy mentality as a general tendency to discount others' advice (see Frenken & Imhoff, 2022; Imhoff & Lamberty, 2018), their findings also raise further questions, for at least two reasons, as they themselves note in their discussion. The first reason is that the advice-taking measure concerned tasks that were unlikely to evoke differences between conspiracy believers and non-believers (i.e., flying distance between cities, and number of animals in a picture). While the authors explain that their results support a lack of differences in advice-taking behaviour, we argue this may be because the judged information lacked contextual relevance and was unlikely to reveal differences linked to conspiracy beliefs. In this article, we consider tasks that involve more societally relevant topics in order to observe the influence of conspiracy beliefs on advice-taking behaviour.

The second reason is that it did not propose a variation in the source of the advice. A major factor explaining why people believe a specific piece of information lies in the credibility they attribute to its source. Expertise, for instance, is a factor that fosters advice taking (Dalal & Bonaccio, 2010; Meshi et al., 2012). In their meta-analysis, Bailey et al. (2022) highlight that advice taking is shaped by its perceived quality, which is strongly associated with perceived expertise and past performance. Moreover, believing in conspiracies has, for instance, been shown to be linked to a decrease in trust in institutional or epistemic experts (e.g., Franks et al., 2017; Imhoff et al., 2018; Nera et al., 2022). However, Nera et al. (2022) found that conspiracy mentality was not associated with decreased trust in some groups, and notably, the medical personnel during COVID-19. We therefore argue that mentioning the source of advice is essential in order to assess whether conspiracy beliefs influence advice-taking behaviour.

In this study, we assess the hypothesis that conspiracy mentality is associated with the rejection of external advice (operationalized as egocentric discounting), in a task the topic of which is more directly relevant to conspiracy thinking than airplane distances (i.e., carbon emission of airplanes). Conspiracy thinking and carbon footprint assessment are tightly related. For instance, believing in climate change-related conspiracies reduced the apparent need to curb carbon emissions (Jolley & Douglas, 2014; Van Prooijen et al., 2025). Similarly, climate change conspiracy theorists are less likely to be involved in political actions that aim at reducing their carbon footprint (Uscinski et al., 2017). In this regard, this study aims at qualifying the findings of Altay et al. (2023).

Additionally, it examines whether the effect of advice source (expert vs. peer) on egocentric discounting is moderated by distrust-associated individual factors. These factors are related to knowledge updating (epistemic individualism; Tomas et al., 2022), identity (collective narcissism; De Zavala, 2011), societal perception (conspiracy beliefs; Jolley & Douglas, 2014), and climate change beliefs (climate change scepticism; Sarathchandra & Haltinner, 2020). In other words, we test how the source of advice (expert vs. fellow participant) can reduce egocentric discounting on the topic of carbon footprint

estimates. We first test the main effect of the source of advice (expert vs. peer). We then examine a series of prominent moderators susceptible to impeding the acceptance of the expert (vs. peerlay) advice—namely, conspiracy mentality, collective narcissism, non-conspiratorial climate scepticism, and epistemic individualism. Doing so enables us to examine how the weight given to an expert's advice is moderated by distrust-laden variables.

The results of this study will contribute to informing public communication and policy-making related to climate change. Effective climate change mitigation depends substantially on public acceptance of scientific guidance (Hornsey et al., 2016); however, widespread reluctance to trust experts and to comply with their recommendations presents significant obstacles to addressing these challenges (Lewandowsky et al., 2013; Peresman et al., 2025). A deeper understanding of the psychological and cultural factors underlying these attitudes is therefore essential for developing more effective strategies to foster public trust and improve policy implementation.

To better understand why some individuals may resist scientific recommendations, especially in the context of climate change, it is important to examine the underlying psychological dispositions that shape such attitudes—most notably, conspiracy mentality and epistemic mistrust, epistemic individualism, collective narcissism, and climate change scepticism.

Conspiracy mentality and epistemic mistrust

Conspiracy mentality is commonly defined as a trait-like disposition or generalized worldview characterized by pervasive scepticism towards powerful groups and a tendency to interpret major events as the outcome of covert conspiracies (Nera & Schöpfer, 2023; Pierre, 2020). This definition sometimes leads to the mistaken assumption that conspiracy mentality is necessarily tied to belief in specific historical or political events and contributes to the oversight that not all conspiracy theories are tied to discrete events; many involve ongoing, systemic claims (e.g., the belief that mainstream science is manipulated or that the media is controlled by powerful elites) (Nera & Schöpfer, 2023). Importantly, holding a high level of conspiracy mentality does not necessarily mean that an individual endorses specific conspiracy theories; rather, it reflects an increased likelihood of finding such theories plausible when encountered, a tendency that is often reflected in distinct patterns of epistemic behaviour (Nera, 2024a, 2024b).

Conspiracy believers are often found to exhibit reduced trust in authoritative sources of information, such as scientific or legal institutions (Imhoff et al., 2018; Nera et al., 2022). Concurrently, they exhibit a marked preference for informal sources, such as advice from peers or information disseminated through social media platforms (Alsubhani et al., 2022; Martinez et al., 2022). This phenomenon is consistent with Pierre's (2020) framework, which examines the role of 'epistemic mistrust' in explaining belief in conspiracies.

Epistemic mistrust refers to a deep scepticism towards mainstream sources, such as governmental agencies or the media, often stemming from perceived inconsistencies with personal experiences or historical events (Pierre, 2020). This scepticism towards authoritative sources of power, in turn, drives a pursuit of autonomous knowledge acquisition as a way to regain epistemic agency and increases vulnerability to misinformation (Pierre, 2020; Van De Cruys et al., 2023). That stated, Pierre's model overlooks an important distinction between institutional and epistemic authority, a crucial nuance given that the credibility of institutional authority depends on factors, such as honesty, transparency, and ethical commitment (Marmor, 2011), which may justify a degree of reasonable scrutiny of their competence (Tomas et al., 2022).

Epistemic authority, on the other hand, refers to authority grounded on expertise, knowledge, or credibility within a specific domain of inquiry, such as scientists or scholars being experts in their respective fields (Tomas et al., 2022). Acknowledging such authority hinges on the recognition that humans are cognitively limited, and hence, cannot be epistemically independent on all matters (Constantin & Grundmann, 2018; Tomas et al., 2022). This recognition is essential for the critical decision-making process, as the essence of critical thinking lies not in the mere act of 'thinking for oneself' but in the ability to discern the legitimacy of epistemic authorities and the criteria by which they are deemed credible (Tomas et al., 2022).

Epistemic individualism

Recent findings revealed that conspiracy believers tend to adopt an epistemically individualist stance (Altay et al., 2023; Tomas et al., 2022). Epistemic individualism represents an epistemological position, deeply rooted in longstanding philosophical inquiry, questioning the reliability of others' testimonies in the pursuit of knowledge (Tomas et al., 2022). It traces back to the works of philosophers, such as Descartes, Locke, and Kant, who emphasized the importance of thinking independently, trusting one's own reason, and approaching others' opinions with critical scrutiny. Originally, this epistemological stance involves a robust critique of the 'appeal to authority fallacy', which exposes the misconception of relying on pseudo-experts (Tomas et al., 2022). However, it also carries the risk of individuals dismissing legitimate authorities with genuine expertise (Guillon, 2018).

Guillon (2018) proposed examining conspiracy beliefs through epistemic individualism, suggesting that their rise may stem from an excessive form that rejects epistemic authority and promotes verifying information solely on one's own. Building on this framework, Tomas et al. (2022) examined epistemic individualism across two distinct dimensions: 'self-reliance' defined as the tendency to depend on one's cognitive abilities and judgements when seeking and assessing knowledge; and 'expertise defiance' which refers to scepticism towards or outright rejection of established expert opinions. While self-reliance emerged as an essential component of the critical thinking process and was moderately associated with belief in conspiracy theories, the study demonstrated that expertise defiance ran counter to critical thinking ability and was strongly associated with conspiratorial thinking (Tomas et al., 2022). These findings support previous arguments that associate belief in conspiracies with one's desire to claim epistemic autonomy, rather than relying on external authorities of expertise (Harambam & Aupers, 2015, 2017; Tomas et al., 2022).

Collective narcissism

Extending the epistemic inquiry into the social dimensions of belief formation, we note that individuals' strong attachment to certain ideas does not always stem from a genuine belief in their truthfulness (Sperber et al., 2010). When individuals 'perceive' rejection by the dominant group (typically referring to the group with more power, influence, or societal status), they tend to seek a stronger connection with the in-groups with which they identify (Branscombe et al., 1999). Although the pursuit of a positive social or collective identity and a sense of group belonging is an important human tendency, often beneficial to both individuals and their community (Fiske & Taylor, 2013), a collective identity driven by unmet psychological needs carries the risk of leading to collective narcissism (Cislak & Cichocka, 2023).

Collective narcissism is defined as an exaggerated belief in the greatness and superiority of one's social group or identity, such as ethnicity or religion (De Zavala, 2011). It encompasses a sense of entitlement, a strong desire for recognition and admiration for the in-group, and a belief in its inherent superiority over other groups (De Zavala, 2011). When these narcissistic needs are unmet, they can give rise to hostility toward out-groups perceived as threatening or 'undermining' this perceived superiority (Cislak & Cichocka, 2023).

Such hostility may foster the acceptance of narratives portraying out-groups or external authorities with societal power as existential threats to the in-group (Nera et al., 2022). For instance, individuals with a defensive national in-group identification may perceive global agreements and climate policies as threats to national sovereignty (Bertin et al., 2021). This perception, in turn, can increase receptiveness to such threat-based narratives, thereby reinforcing scepticism towards climate science and expert knowledge (Bertin et al., 2021; Nera et al., 2022).

Climate change scepticism

Despite the growing interest in the connection between conspiracy mentality and the rejection of science and expertise, findings on this relationship remain complex and nuanced (Landrum & Olshansky, 2019;

Rutjens & Večkalov, 2022). For instance, a study by Landrum and Olshansky (2019) found that while conspiracy mentality strongly influenced the rejection of the theory of evolution, its impact on the rejection of climate change was less pronounced. However, their use of a single-item measure to measure the acceptance of climate change lacked the nuanced approach necessary to capture the multifaceted factors underlying climate change scepticism (Landrum & Olshansky, 2019).

It is essential to emphasize that while climate change scepticism and denial may have occasionally been used interchangeably in past literature, they represent distinct positions on the scientific consensus regarding climate change, albeit with some overlap (De Graaf et al., 2023). Whereas denial, which typically involves a complete rejection of the occurrence of climate change, scepticism may acknowledge its occurrence while questioning its anthropogenic causes, severity, and its projected negative impacts (De Graaf et al., 2023). Compared with climate change denialists, sceptics make up a larger portion of the population: recent estimates suggest that approximately 36% of the global population expresses scepticism about the anthropogenic causes of climate change (Bagó et al., 2023; Chandeze & Petit, 2023).

Scepticism towards climate change can stem from various factors, including limited exposure to extreme weather events (e.g., rising sea levels, wildfires) among individuals in regions less affected by these events, as well as from differences in education levels, political affiliations, and economic concerns (Sarathchandra & Haltinner, 2020). Individuals with stronger climate scepticism tend to show less willingness to adopt environmentally responsible behaviours, such as reducing carbon emissions, conserving energy, or following the guidance of climate experts, thereby undermining collective efforts to address climate change (De Graaf et al., 2023).

The scientific perspective on climate change plays a crucial role in shaping public policy and supporting well-informed decision-making (Vulpe, 2020). However, studies show that political commentary, particularly from conservative media outlets and politicians, often influences public perceptions of climate change more than scientific information. For instance, individuals who distrust climate science are found to be more likely to trust institutional leaders advocating non-environmental policies (Haltinner & Sarathchandra, 2021; Sarathchandra & Haltinner, 2020). At the same time, it is important to recognize that public engagement with contentious scientific topics, including (but not limited to) climate change, extends beyond news reporting, as individuals often exhibit a preference for information that aligns with their pre-existing beliefs and values (Sarathchandra & Haltinner, 2023).

Given the important role experts play in conveying climate change information to the public, we expect that the weight given to advice will be higher when it comes from experts compared with peers, particularly among individuals with low levels of climate change scepticism (H5).

THE PRESENT STUDY

Previous research has identified strong links between conspiracy mentality and the inclination to disregard information that challenges individuals' pre-existing beliefs and the willingness to connect with like-minded others (see Biddlestone et al., 2021; Nera et al., 2022). When considered within the frameworks discussed above, these findings suggest that conspiracy believers' distrust of epistemic authorities can be explained by the inclination to preserve their existing beliefs. This raises doubts about whether the expected (but not observed) negative correlation between conspiracy mentality and conformity found in Altay et al. (2023) can meaningfully account for conspiracy believers' scepticism towards specific sources of information.

Moreover, the experimental advice-taking tasks used in the study by Altay et al. (2023) involved neutral topics, such as estimating metric distances between cities and the number of objects in a stimulus. However, prior research suggests that conspiracy believers' scepticism towards information sources is closely tied to their personal and collective experiences and motivations (Pierre, 2020; Van De Cruys et al., 2023). This raises questions of whether different results might emerge if the behavioural tasks involved more contextually grounded scenarios in which conspiracy beliefs are more likely to manifest.

We hypothesize that incorporating a more sensitive topic for conspiracy believers would produce different outcomes. Accordingly, we conducted a similar study, focusing on carbon footprint estimations (Jolley & Douglas, 2014; Van Prooijen et al., 2025).

Finally, while Altay et al. (2023) focused on examining conspiracy believers' advice-taking preferences from fellow participants, our study is strongly motivated by the fact that the sceptical mindset of conspiracy believers is specific to particular epistemic authority structures (Pierre, 2020, 2023).

While there are many individual-level variables susceptible to moderating the effect of advice source, we narrowed down our investigation to four potential moderators that encompass various levels of distrust: conspiracy mentality, non-conspiracist climate change scepticism, collective narcissism, and epistemic individualism. All these variables are either well-known associates of science rejection (conspiracy mentality, collective narcissism), or provide an explanation as to why they might elicit the rejection of experts' advice (epistemic individualism, non-conspiracist climate change scepticism). We therefore examined experimentally how the source of advice (experts versus peers) influences the perceived weight of advice on carbon emission estimation, and to what extent this relationship is moderated by conspiracy mentality, epistemic individualism, collective narcissism, and climate change scepticism.

Specifically, we attempted to test the following hypotheses:

H1. The weight of advice will be higher when it comes from experts compared with peers.

H2. The weight of advice will be higher when it comes from experts compared with peers, even more so when conspiracy mentality is low.

H3. The weight of advice will be higher when it comes from experts compared with peers, even more so when epistemic individualism is low.

H4. The weight of advice will be higher when it comes from experts compared with peers, even more so when collective narcissism is low.

H5. The weight of advice will be higher when it comes from experts compared with peers, even more so when climate change scepticism is low.

METHOD

This study was pre-registered via [AsPredicted.org](https://aspredicted.org/frhx-wb54.pdf) (<https://aspredicted.org/frhx-wb54.pdf>). The final anonymized dataset, the study material, and the jamovi analysis file are available in an OSF folder (https://osf.io/c38qz/?view_only=055d52a0849c4dc9a7435b9f7ed0e1b1). This study received ethical approval at Tilburg School of Humanities and Digital Sciences (REDC2024.09).

Participants

The sample size was established through a power analysis for multiple linear regression (two-tailed). The analysis indicated that with a 5% α -level and 90% power, a total of 265 participants were required to reliably detect a small effect ($f^2 = .04$).¹

Participants ($N = 1037$) from the Netherlands ($n = 341$) and Türkiye ($n = 696$) were recruited for this study and were asked to partake in an online experiment. Following the exclusion of incomplete

¹This part diverges from our pre-registration. We had initially planned to collect 250 participants based on Schönbrodt and Perugini (2013) but decided instead to consider the power calculation run by Altay et al. (2023) as a model for this study.

responses ($n = 393$ of which $n_{\text{Turkish}} = 382$) and participants who failed the attention check ($n = 84$, of which $n_{\text{Turkish}} = 70$), 244 participants from Türkiye (173 female, two non-binary, six prefer not to say, $M_{\text{age}} = 34.70$, $SD_{\text{age}} = 15.07$) and 316 participants from the Netherlands (162 female, one non-binary, two prefer not to say, $M_{\text{age}} = 26.01$, $SD_{\text{age}} = 6.95$) remained in the final sample ($N_{\text{final}} = 550$).

Procedure

Participants were recruited from the Netherlands and Türkiye via email and social networks of the authors, using a combination of volunteer sampling and course-credit-based recruitment at Tilburg University and Dokuz Eylül University. All participants gave informed consent before they were randomly assigned to one of the two between-subjects conditions ('peer' or 'expert') and were only exposed to one type of advice. In both conditions, participants completed 10 advice-taking tasks, each involving an estimation of the CO₂ emissions for a direct flight between two world cities. After providing an initial estimate, participants were presented with an estimate either from another participant (peer condition) or a carbon footprint expert (expert condition) and were asked to provide a second estimate for the same question. This process was repeated for all 10 tasks, with the flight pairs presented in random order.

Upon completing the behavioural tasks, participants filled out the following questionnaires: the Conspiracy Mentality Questionnaire (CMQ, Bruder et al., 2013), the Single-Item Conspiracy Beliefs Scale (Lantian et al., 2016), the epistemic individualism scale (Tomas et al., 2022), the Collective Narcissism Scale (De Zavala et al., 2019), and the Climate Change Scepticism Questionnaire (De Graaf et al., 2023). Then, they responded to demographic questions (age, gender, last diploma), which were only collected for descriptive reasons in line with the ethical approval received. Lastly, all participants were given a debriefing, and they reaffirmed their consent.

All materials were provided in the participants' native languages, namely, Dutch and Turkish. Each translation underwent a back-translation process into English, performed by independent translators who were native speakers of the respective languages. The intercoder reliability of each translated measure was evaluated using Cohen's Kappa and indicated near-perfect agreement for all measures. Cohen's Kappa values are provided below.

Materials

Source of the advice (peer and expert)

In both conditions, participants were asked to estimate the quantity of CO₂ emitted for a direct, one-way flight between two world cities ('Imagine that you are taking a direct, one-way flight in Economy Class on an Airbus A320 from [City 1] to [City 2]. What do you think is the quantity of CO₂ emitted (per person) for your trip?'). After submitting their initial estimate, participants were presented with the same question, along with an estimate supposedly provided by either another participant ('Another participant estimated it as [+/-%] kg of CO₂') or a carbon footprint expert ('An expert in carbon footprint estimated it as [+/-%] kg of CO₂'). They were then asked to provide a second estimate for the same question. This process was repeated 10 times for both conditions.

The quantity of CO₂ emissions (in kilograms) was calculated using the ICAO Carbon Emissions Calculator (ICEC), developed by the International Civil Aviation Organization, a United Nations agency. The ICEC is the only internationally recognized tool for estimating carbon emissions from aviation travel (International Civil Aviation Organization, n.d.). Relying on Altay et al. (2023), the advice presented to participants was randomly generated within a $\pm 40\%$ range of the calculated CO₂ emissions. This approach, widely used in advice-taking research, ensures consistency and enhances internal validity (Altay et al., 2023).

Measures

All descriptives and correlations between items can be found in [Table 1](#).

Weight of advice

The weight of advice (WoA) for each question was calculated using the formula '(Final estimate–initial estimate)/(advice–initial estimate)' (Bailey et al., 2022; Harvey & Fischer, 1997). All 10 weights of advice metrics (i.e., one per question) were then averaged. This metric varies from 0, indicating complete disregard for the advice in favour of the original estimate, to 1, signifying full reliance on the advice while disregarding the initial estimate. Consistent with prior studies (Bailey et al., 2022), we recoded any values below 0 as 0 (between 6.73% and 9.64% across all 10 items) and those exceeding 1 as 1 (between 11.27% and 18.91% across all 10 items). Additionally, we omitted trials where the initial estimate matched the provided advice ($n=2$).

Conspiracy mentality questionnaire

The CMQ, a widely used measure in conspiracy research (e.g., Altay et al., 2023; Bruder et al., 2013; Nera et al., 2024), consists of five items designed to assess conspiracy mentality (e.g., 'I think that many very important things happen in the world, which the public is never informed about'). Belief scores were measured on a scale ranging from 1 (*totally false*) to 7 (*totally right*).

The questionnaire had already been translated into Turkish; however, one item contained a minor error in the translation. The original item, 'Government agencies closely monitor all citizens,' was translated as 'Hükümet ajanları bütün vatandaşları yakından izlemektedir' (Bruder et al., 2013). The word 'ajan' means 'spy' in Turkish. The correct term for 'agency' is 'kurum'. Therefore, the item was revised to 'Hükümet kurumları bütün vatandaşları yakından izlemektedir.' The corrected version of the item was used in the current study. The intercoder reliability of the overall Dutch translation was Cohen's $\kappa = .94$. Overall reliability of the scale was very good ($\alpha = .87$), both in the Netherlands ($\alpha = .84$) and in Türkiye ($\alpha = .81$).

Single-Item Conspiracy Beliefs Scale

Developed by Lantian et al. (2016), it aims to measure conspiracy mentality with a single item. The Single-Item Conspiracy Beliefs Scale (SICBS) assesses individuals' scepticism of official explanations for political and social events, such as the 9/11 attacks, the death of Princess Diana, and the assassination of John F. Kennedy, with a single item. Belief scores are measured on a scale ranging from 1 (*totally false*) to

TABLE 1 Correlations and descriptives of all continuous measures.

	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.
1. Climate change scepticism	2.52	0.93	—				
2. Epistemic individualism	3.55	1.01	.36***	—			
3. Collective narcissism	3.69	0.93	.12**	.31***	—		
4. Conspiracy mentality	4.55	1.25	.09*	.46***	.41***	—	
5. Beliefs in conspiracy theories	5.51	2.4	.08	.40***	.34***	.73***	—
6. Weight of advice	0.49	0.31	-.03	-.03	.02	-.04	.01

Note: All scales measured on a 7-point scale except for beliefs in conspiracy theories, measured on a 9-point scale.

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

9 (*totally right*). The intercoder reliability was assessed as Cohen's $\kappa = .96$ for the Turkish translation and Cohen's $\kappa = .92$ for the Dutch translation.

The reason for including a second scale, the SICBS, alongside the CMQ was to provide a more comprehensive assessment of the tendency to endorse conspiracy theories. As a matter of fact, while the CMQ measures a broad and generalized inclination to distrust authorities and reflects diffuse scepticism towards those in power, the SICBS targets belief in specific, widely known conspiracy theories (e.g., the death of Princess Diana and the 9/11 attacks), capturing scepticism towards particular high-profile events.

Epistemic Individualism Scale

The Epistemic Individualism Scale (EIS, Tomas et al., 2022) consists of seven items measuring two dimensions of epistemic individualism: self-reliance (e.g., 'It is my responsibility to verify the validity of the information I read and hear, not a third party's responsibility.') and expertise defiance (e.g., 'I never consider the experts' words to be reliable.'). Each item was measured on a scale ranging from 1 (*totally disagree*) to 7 (*totally agree*). The intercoder reliability was Cohen's $\kappa = .97$ for the Turkish and Cohen's $\kappa = .93$ for the Dutch translations. Overall reliability of the scale was very good ($\alpha = .80$), very good in the Netherlands ($\alpha = .83$) and acceptable in Türkiye ($\alpha = .71$).

Collective narcissism

Developed by De Zavala et al. (2009), the scale consists of 23 items (e.g., 'I wish other groups would more quickly recognize the authority of my group'). Participants were asked to answer the questionnaire thinking about their national groups. Each item was measured on a scale ranging from 1 (*totally disagree*) to 7 (*totally agree*). The intercoder reliability was assessed as Cohen's $\kappa = .97$ for the Turkish and Cohen's $\kappa = .92$ for the Dutch questionnaires. Overall reliability of the scale was excellent ($\alpha = .92$), both in the Netherlands ($\alpha = .90$) and in Türkiye ($\alpha = .93$).

Climate Change Scepticism Questionnaire

The Climate Change Scepticism Questionnaire (CCS-Q; De Graaf et al., 2023) consists of 12 items measuring climate change scepticism across four dimensions: trend scepticism (e.g., 'I am hesitant to believe climate change scientists tell the whole story'), attribution scepticism (e.g., 'The climate change we are observing is just a natural process'), impact scepticism (e.g., 'I believe that most of the claims about climate change are exaggerated'), and response scepticism (e.g., 'Human behavior has little impact on global warming'). Each item was rated on a 7-point Likert scale, ranging from 1 (*totally disagree*) to 7 (*totally agree*). The Dutch version of the questionnaire was already available (De Graaf et al., 2023), and the intercoder reliability for the Turkish version was assessed as Cohen's $\kappa = .98$. Overall reliability of the scale was very good ($\alpha = .87$), both in the Netherlands ($\alpha = .92$) and in Türkiye ($\alpha = .79$).

Statistical analyses

To test the first hypothesis (H1), a linear regression model was run with the source of advice (peer vs. expert) as the independent variable and the weight of advice (WoA) as the dependent variable. To examine hypotheses H2 through H5, a series of multiple regression analyses were performed. These analyses included the source of advice and each moderator variable as predictors, namely conspiracy mentality (measured by the CMQ for H2a and the Single-item Conspiracy Beliefs Scale for H2b), epistemic individualism (H3), collective narcissism (H4), and climate change scepticism (H5), with the WoA as the outcome variable.

RESULTS

For hypotheses H2–H5, all results are displayed in Figure 1.

H1: Influence of source on weight of advice

A linear regression analysis was conducted to test whether the source of advice (peer vs. expert) influenced the WOA assigned by participants. The model was statistically significant ($F(1, 549) = 88.86$, $p < .001$, $R^2 = .14$, adjusted $R^2 = .14$). The source of advice had a significant effect on WOA ($\beta = -.75$, $t(549) = -9.43$, $p < .001$, $b = -0.23$, 95% CI $[-0.28, -0.18]$), with participants giving less weight to advice from peers compared with experts.

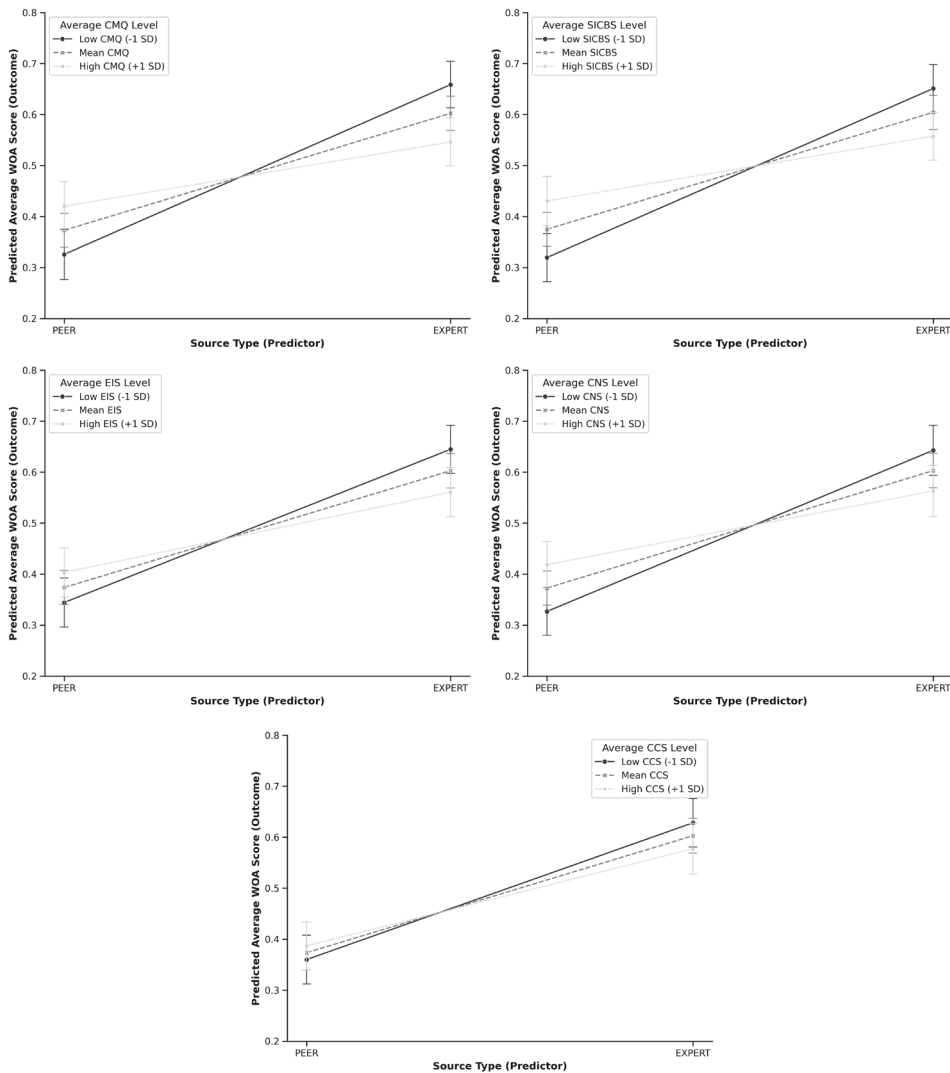


FIGURE 1 Simple effects for all moderators. CCS, Climate Change Skepticism; CMQ, Conspiracy Mentality Questionnaire; CNS, Collective Narcissism Scale; EIS, Epistemic Individualism Scale; SD, standard deviation; SICBS, Single-Item Conspiracy Beliefs Scale. The scale of the graphs was truncated between 0.2 and 0.8 for readability purposes. The actual scores for the WOA span from 0 to 1.

H2: Moderating effect of conspiracy mentality

A moderation analysis was conducted to examine whether conspiracy mentality, measured by the SICBS and the CMQCMQ, moderated the effect of source on WOA. The overall model was significant ($F(3, 547) = 36.50, p < .001, R^2 = .17, \text{adjusted } R^2 = .16$). The interaction between source and SICBS was significant ($\beta = -.15, t(547) = -2.83, p = .005, b = -0.02, 95\% \text{ CI } [-0.03, -0.01]$), and the interaction between source and CMQ was also significant ($\beta = -.18, t(547) = -3.48, p < .001, b = -0.04, 95\% \text{ CI } [-0.07, -0.02]$). These results indicate that individuals with higher conspiracy beliefs exhibited a less pronounced preference for expert advice over peer advice compared with those with lower conspiracy beliefs.

The moderating role of SICBS was examined first. The effect of the expert source was significant across all levels: low ($-1 \text{ SD}; b = 0.33, 95\% \text{ CI } [0.27, 0.40], t = 9.77, p < .001$), mean ($b = 0.23, 95\% \text{ CI } [0.18, 0.28], t = 9.53, p < .001$), and high ($+1 \text{ SD}; b = 0.13, 95\% \text{ CI } [0.06, 0.19], t = 3.71, p < .001$). This pattern indicates the effect, while always present, was strongest at lower levels of SICBS. For the CMQ, a similar pattern emerged. The expert source effect was significant at a low level ($-1 \text{ SD}; b = 0.33, 95\% \text{ CI } [0.27, 0.40], t = 9.75, p < .001$), at the mean level ($b = 0.23, 95\% \text{ CI } [0.18, 0.28], t = 9.54, p < .001$), and at a high level ($+1 \text{ SD}; b = 0.13, 95\% \text{ CI } [0.06, 0.19], t = 3.68, p < .001$). The strength of the source effect diminished as Average CMQ increased.

H3: Moderating effect of epistemic individualism

To test whether epistemic individualism moderated the effect of source on WOA, another moderation analysis was performed. The model was significant ($F(3, 547) = 33.01, p < .001, R^2 = .15, \text{adjusted } R^2 = .15$). The interaction term was significant ($\beta = -.14, t(547) = -2.48, p = .013, b = -0.04, 95\% \text{ CI } [-0.07, -0.01]$). This suggests that the tendency to favour expert advice over peer advice was weaker among individuals with higher epistemic individualism than among those with lower epistemic individualism.

The analysis of epistemic individualism as a moderator showed the effect of the expert source was significant at a low level ($-1 \text{ SD}; b = 0.30, 95\% \text{ CI } [0.23, 0.37], t = 8.81, p < .001$), at the mean level ($b = 0.23, 95\% \text{ CI } [0.18, 0.28], t = 9.44, p < .001$), and at a high level ($+1 \text{ SD}; b = 0.16, 95\% \text{ CI } [0.09, 0.23], t = 4.56, p < .001$).

H4: Moderating effect of collective narcissism

The moderating effect of collective narcissism was examined using a linear regression model. The model was significant ($F(3, 547) = 34.43, p < .001, R^2 = .16, \text{adjusted } R^2 = .15$). The interaction between source and collective narcissism was significant ($\beta = -.13, t(547) = -2.15, p = .032, b = -0.04, 95\% \text{ CI } [-0.08, -0.00]$), indicating that those with higher collective narcissism showed a stronger tendency to discount expert advice in favour of peer advice. Specifically, the expert source effect was strongest at a low level of collective narcissism (CNS; $-1 \text{ SD}; b = 0.32, 95\% \text{ CI } [0.25, 0.38], t = 9.17, p < .001$), remained strong at the mean level ($b = 0.23, 95\% \text{ CI } [0.18, 0.28], t = 9.53, p < .001$), and was weaker, though still significant, at a high level ($+1 \text{ SD}; b = 0.14, 95\% \text{ CI } [0.08, 0.21], t = 4.19, p < .001$).

H5: Moderating effect of climate change Scepticism

A final moderation analysis assessed whether climate change scepticism moderated the effect of source on WOA. The overall model was significant ($F(3, 547) = 30.57, p < .001, R^2 = .14, \text{adjusted } R^2 = .14$). However, the interaction term was not statistically significant ($\beta = -.08, t(547) = -1.45, p = .148, b = -0.03, 95\% \text{ CI } [-0.06, 0.01]$), suggesting that climate change scepticism did not significantly alter the relationship between source and WOA.

Although the overall interaction between Source and Average CCS was not statistically significant in the primary regression model, a simple slopes analysis was conducted based on theoretical interest and to confirm the consistency of the significant main effect of Source. The effect of the expert source was indeed significant and positive at a low level of Average CCS (-1 SD; $b = 0.27$, 95% CI [0.20, 0.34], $t = 7.80$, $p < .001$), at the mean level ($b = 0.23$, 95% CI [0.18, 0.28], $t = 9.40$, $p < .001$), and at a high level ($+1$ SD; $b = 0.19$, 95% CI [0.12, 0.26], $t = 5.49$, $p < .001$). This confirms that the positive effect of the expert source is robust and does not significantly depend on the level of CCS.

EXPLORATIVE ANALYSES

Cross-cultural comparisons

To test for cross-cultural differences between our Dutch and Turkish subsamples, we considered the population factor as an additional moderator to the aforementioned analyses.

A significant interaction between Source and Population was found to affect WOA, $F(2, 547) = 12.94$, $p < .001$, $\eta_p^2 = .05$, as illustrated in Figure 2. This indicates that the effect of source on WOA significantly differs, though to a small extent, between the two populations (Dutch vs. Turkish). For expert advice, Turkish participants weighed expert advice less than Dutch individuals, $b = -0.13$, $\beta = -.41$, $t(547) = -3.70$, $p < .001$, 95% CI $[-0.19, -0.06]$. For peer advice, Turkish–Dutch individuals relied more on peer advice than Dutch participants, $b = 0.12$, $\beta = 0.38$, $t(547) = 3.49$, $p < .001$, 95% CI [0.05, 0.18]. This suggests that for Turkish people, the advice of peers and experts was closer to each other in how it affected their advice taking than for Dutch people, who considered the advice of experts more willingly than that of peers.

However, none of the three-way interactions (i.e., Source \times Moderator \times Population) reached significance, suggesting that no differences can be expected between Dutch and Turkish people.

Sub-dimensions of climate change Scepticism

Because climate change scepticism is a polymorphic concept, we explored to what extent its different facets affected the effect of source of advice on advice taking. Trend scepticism (i.e., the rejection of climate change expertise and scientific evidence) was a significant moderator of the effect of source on WOA, $F(2, 547) = 7.84$, $p < .001$, $\eta_p^2 = .03$. None of the other dimensions were significant moderators, all $p > .05$.

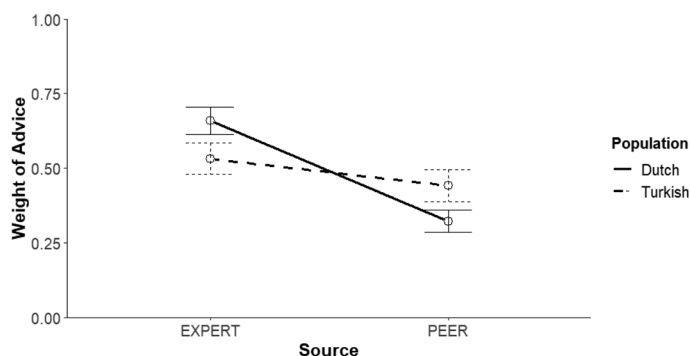


FIGURE 2 Effect of source of advice and population on weight of advice. Bars represent 95% confidence interval around the mean.

DISCUSSION

In this pre-registered, well-powered study, we experimentally assessed how people use advice regarding carbon emissions, and whether advice use is influenced by the source of the advice (i.e., another participant or an expert in carbon footprint). The primary focus of this paper was to investigate how conspiracy mentality, epistemic individualism, collective narcissism, and climate change scepticism shape the relationship between the source of the advice and the weight attributed to the advice.

We found that participants used advice from experts more than advice from peers, highlighting a common human tendency to defer to epistemic authorities (Constantin & Grundmann, 2018; Sperber et al., 2010). This is in line with previous studies on credibility assessment in which perceived expertise constitutes a key dimension (Flanagin & Metzger, 2013).

As anticipated, this tendency to perceive experts as credible sources of information was reduced among individuals exhibiting distrustful tendencies. Believing in conspiracy theories reduced the weight difference between experts' and peers' advice. This supports the now well-established finding that conspiracy believers display a diminished reliance on experts as credible sources of information, indicative of an expert-oriented distrust (Pierre, 2020; Van De Cruys et al., 2023). In this study, such distrust among conspiracy believers appears to go beyond passive scepticism and may actively influence behaviour, leading them to disregard expert opinions and base decisions on alternative, often unsubstantiated, information sources. These results align with prior research documenting a correlation between conspiracy beliefs and distrust in scientific and epistemic experts, including government and media outlets, which are often perceived as potentially corrupt or biased (Lewandowsky et al., 2013; Uscinski et al., 2017). They also nuance the findings of Altay et al. (2023), by supporting their supposition that the impact of conspiracy beliefs on people's advice taking is reliant on specific factors (i.e., the source of the advice).

Additionally, high levels of epistemic individualism and collective narcissism reduce the effect between peer and expert advice taking, respectively. These two dispositions, representative of the distrust one may have in terms of knowledge updating and identity respectively, involve the rejection of the outgroup, be it epistemic experts in the context of epistemic individualism or national outgroup members in collective narcissism (Baudouin et al., 2024; Cislak & Cichočka, 2023; Guillon, 2018; Tomas et al., 2022). Once again, this supports the hypothesis that people who display a distrust of others' identity or opinions tend to be less sensitive to perceived expertise, and thus more likely to rely on advice regardless of the advisor's credentials.

Our study did not reveal a moderating effect of climate change scepticism on the effect of source on advice taking. However, a significant effect of trend scepticism (i.e., the rejection of expertise and scientific evidence regarding climate change) was found to negatively affect the relationship between source and advice taking. In other words, compared with the other dimensions enclosed in climate change scepticism, such as one's perception of possible action (i.e., response scepticism), one's attribution to the cause of climate change (i.e., attribution scepticism), and one's assessment of how major the impact of climate change is (i.e., impact scepticism), trend scepticism is the only dimension that criticizes, again, epistemic expertise and scientific evidence about climate change. It is therefore unsurprising that climate change scepticism did not moderate the effect between source and advice taking, as it considers a large variation of sceptical positions about climate change. The specific moderating effect of trend scepticism, however, reinforces the idea that the influence of expert advice depends on individuals' attitudes toward epistemic authority.

Cross-cultural comparisons

Notably, the effect of advice source on advice weighting was less pronounced in Türkiye compared with the Netherlands, suggesting that Turkish participants viewed experts and peers as more similar sources in terms of credibility. In contrast, Dutch participants were more likely to differentiate between

sources, placing greater trust in expert advice than in peer advice. This is somewhat surprising, as previous research has shown that countries that score lower in individualism, such as Türkiye (scoring 37), compared with the Netherlands (score: 80) in Hofstede's classification, tend to rely more on source credibility as a heuristic (Hofstede et al., 2010; Pornpitakpan & Francis, 2000).

One factor that may help explain this cross-cultural difference is religiosity. According to the World Value Survey Wave 7 (Haerpfer et al., 2022), ranging from 2017 to 2022, Turkish people tend to consider that religion bears a more significant part in their life than Dutch people. While higher levels of religious orthodoxy have previously been connected to decreased trust in science (Rutjens et al., 2021), recent research shows that, contrary to findings in many Christian-majority contexts, religiosity in Muslim-majority countries such as Türkiye is positively associated with trust in scientists (Cologna et al., 2025). This suggests that religiosity may play a different role depending on cultural and religious context, and highlights the need for future research to examine how such variations influence advice-taking behaviour.

That said, it is important to recognize that trust in science does not necessarily imply higher levels of scientific knowledge or science literacy, a consideration particularly relevant in cross-cultural research (Rowland et al., 2022). For example, although Türkiye has reported higher levels of trust in science compared with the Netherlands (Cologna et al., 2025), it has consistently underperformed relative to the Netherlands in assessments of scientific literacy and science knowledge (Sincer et al., 2024). It is possible that limited familiarity with scientific information, combined with a relatively lower capacity to engage with it, led Turkish participants in our study to rely more equally on advice from both peers and experts, resulting in similar weight being assigned to these sources. Future research should explore the complex relationship between scientific literacy and trust in science, especially in cross-cultural comparative contexts, to better understand how these factors influence advice-taking behaviour.

Another factor that may contribute to the observed difference between the two countries might be variation in numeracy literacy, which may have influenced how individuals engage with quantitative information (Sobkow et al., 2025). Average numeracy literacy levels are higher in the Netherlands than in Türkiye (Kavuncu & Polat, 2023). Lower numeracy skills may lead individuals to rely more heavily on advice in general, potentially resulting in overreliance on peer advice. This, in turn, could help explain the smaller perceived gap in credibility between expert and peer advice observed among Turkish participants compared with their Dutch counterparts.

Nevertheless, despite this difference between Türkiye and the Netherlands, no significant differences were found between the two populations in how conspiracy mentality, epistemic individualism, and collective narcissism influenced the relationship between source and the weight placed on advice. This suggests that, although these psychological dispositions affected advice-taking in both countries, their influence followed a similar pattern across cultures. This finding points to the possibility that these effects might be more universal than previously assumed, potentially reflecting a shared cognitive substrate that transcends cultural boundaries.

Our findings have both significant scientific and practical significance. Scientifically, we expand on Altay et al. (2023) by showing that the distinction between peers' and experts' advice matters when addressing the behaviour of conspiracy believers. Furthermore, these findings expand our understanding of how people process information regarding carbon footprint emissions by highlighting how collective narcissism, epistemic individualism, and scepticism towards global warming can distort judgement and hinder the acceptance of scientific evidence.

Practically speaking, our study demonstrates that communicating advice to people depends on individual factors, and that diversifying communication channels might help ensure that advice is heard and considered. In line with our findings, we suggest that for individuals with a strong conspiracy mindset, high epistemic individualism, and collective narcissism, advice coming from peers is more likely to be accepted than advice delivered by experts. Based on these insights, we recommend involving a diverse range of communicators, including non-expert citizens, in delivering climate advice to serve as an effective strategy for reaching sceptical audiences, particularly in polarized or low-trust environments (Peresman et al., 2025).

LIMITATIONS AND FUTURE DIRECTIONS

This study has several limitations. First, we wish to highlight that we did not assess participants' trust in national institutions, which we believe could hold significant explanatory power in accounting for the differences in results regarding the first hypothesis ("The weight of advice will be higher when it comes from experts compared to peers"). Levels of institutional trust likely vary between the Netherlands and Türkiye, given their distinct political contexts. Moreover, scepticism towards expert advice can be magnified when experts are perceived as too closely connected to government or political elites (Peresman et al., 2025).

Relatedly, the visibility and institutionalization of expert advice itself may shape public reactions. In contexts where climate experts operate through formal advisory bodies and deliver high-profile recommendations, as in many Western European democracies, backlash may intensify when trust is low or when expert influence is perceived to threaten individual autonomy through intrusive policies (Patterson et al., 2025). Conversely, in more centralized, state-driven systems such as Türkiye, where expert involvement tends to be less prominent or publicized, people may be less aware of technocratic guidance, or less inclined to resist it (Guler & Kumar, 2022). Future research should therefore include measures of institutional trust and expert visibility to better understand how political context influences individuals' reliance on expert versus peer advice.

Additionally, we did not assess participants' prior knowledge of carbon footprint calculations, which might have influenced their answers to the provided estimation tasks. Participants with more knowledge on the topic may have felt more confident in their own calculations and, as a result, been less likely to be influenced by advice. Conversely, those with less knowledge might have been more reliant on the advice given, whether it came from experts or peers. This limitation is particularly relevant to the fact that climate change may be a less frequently discussed topic in public discourse and raises questions about whether Turkish participants might not have the same level of familiarity with carbon experts as those in the Netherlands (Uzelgun & Castro, 2015).

Moreover, it remains an open question whether results would differ if the behavioural tasks involved estimations that were less objectively quantifiable, such as assessing the environmental destructiveness of a flight rather than estimating its carbon emissions. Such estimations might not only facilitate participants with lower familiarity with carbon emissions and related calculations in making relevant connections, but also more directly reflect advice-taking behaviour by capturing the emotional responses triggered when individuals are confronted with guidance. Future research should investigate advice-taking behaviour across tasks that vary in both objectivity and emotional salience, particularly in contexts where judgements are emotionally charged.

We also wish to highlight that the stakes in this experiment were relatively low. Deciding whether or not to take advice on carbon emissions had no direct consequences for participants. However, recent research on advice taking suggests that high stakes (such as GPs relying on algorithms to assess whether a patient has cancer) can modify the advice-taking behaviour of people (Løhre & Halkjelsvik, 2024; Pálfi et al., 2022). Future studies should investigate how advice-taking patterns shift under higher-stakes conditions, particularly in domains where decisions carry tangible outcomes.

As with previous similar studies relying on advice taking (e.g., Altay et al., 2023; Kämmer et al., 2023), advice was provided to participants irrespective of whether they requested it. However, individuals scoring high on epistemic individualism, for instance, might be reluctant to integrate unsolicited advice, especially in low-stakes contexts, as they tend to trust their own judgement over that of others (Løhre & Halkjelsvik, 2024). To better capture this dynamic, future research should consider designs in which participants actively choose whether to solicit advice, as this may more accurately reflect real-world decision-making processes.

Looking at the effect sizes of the significant moderators, we find that these explain approximately the same proportion of variance, ranging from 14% (epistemic individualism) to 18% (conspiracy beliefs). These concepts are, however, related to some extent (e.g., Cislak & Cichocka, 2023; Tomas et al., 2022). While this study was designed and pre-registered to test all moderators separately, we

encourage follow-up studies to assess to what extent these distrust-related concepts echo each other in advice-taking tasks in a more structured way (e.g., relying on path analysis models).

Finally, the higher drop-out rate in the Turkish sample is a significant limitation, likely attributable to the different recruitment methods used across the countries. While Dutch participants were consistently rewarded with course credit through a centralized system, the Turkish sample depended more on volunteer participation as no equivalent system was available. The incentives for Turkish students were inconsistent, as the provision of course credit was contingent on individual instructors' approval. This discrepancy in recruitment and incentives is the likely cause of the increased attrition observed in the Turkish sample.

CONCLUSION

Our study replicates the now well-established finding (e.g., Dalal & Bonaccio, 2010; Meshi et al., 2012) that higher degrees of expertise facilitate advice-taking behaviour: individuals are more likely to revise their initial estimates of carbon emissions when the advice comes from an expert rather than a peer. Our findings also reveal cultural differences in how this tendency is more present among Dutch citizens compared with Turkish citizens. But more importantly, we demonstrate that the tendency to view experts and peers as distinct epistemic sources influencing advice-taking is impacted by distrustful attitudes, such as conspiracy beliefs, collective narcissism, and epistemic individualism. These three factors, while conceptually distinct, share a similar thread: a distrust of epistemic authority, scientific evidence, and perspectives perceived as belonging to an outgroup. Our study demonstrates that such tendencies do not merely reflect abstract beliefs but have tangible effects on behaviour, particularly when individuals are confronted with expert advice on climate-related issues.

AUTHOR CONTRIBUTIONS

Irmak Sancar: Conceptualization; writing – original draft; methodology; formal analysis; investigation. **Kenzo Nera:** Writing – original draft. **Céline Schöpfer:** Writing – original draft. **Frédéric Tomas:** Conceptualization; methodology; supervision; formal analysis; validation; visualization; writing – original draft.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The preregistration, the final anonymized dataset, the study material, and the jamovi analysis file are available at https://osf.io/c38qz/?view_only=055d52a0849c4dc9a7435b9f7ed0e1b1.

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