The rational impression account of trust in science

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Introduction

Addressing important societal challenges, from fighting climate change to managing pandemics, is greatly facilitated by trust in science. Studies have demonstrated that individuals with higher levels of trust in science are more likely to accept the scientific consensus on global warming (Bogert et al., 2024). These individuals are also more likely to engage in pro-environmental behavior and support climate policies (Cologna & Siegrist, 2020; Hornsey et al., 2016). Trust in science has also been shown to be positively associated with willingness to get vaccinated (Sturgis et al., 2021; for Covid-19 in particular, Lindholt et al., 2021). During the Covid-19 pandemic, a panel study in 12 countries found that trust in scientists was the strongest predictor of whether people followed public health guidelines, such as mask-wearing or social distancing (Algan et al., 2021). Similar results have been found by other studies (e.g., positive effects of trust in science on acceptance of social distancing in the US, Koetke et al., 2021).

Given the individual and social cost of a lack of trust in science, most studies have focused on understanding why some people do not trust science. However, it also important to understand why most people do trust science: it is important theoretically, as this trust could result from very different processes–from blind deference to a rational assessment of scientific evidence; it is important practically, as, depending on why people do trust science, different interventions aimed at increasing trust in science could be conceived. Here, we argue that, even though people do not know much about science, their trust in science can still be rational.

We start by reviewing work on explanations for variations in trust in science, work which has focused on why some people do not trust science. We argue that this work has not fully solved a basic puzzle: why do most people tend to trust science, in spite of knowing so little about it?

To solve this puzzle, we then develop a 'rational impression' account of trust in science. According to this account, people do not need a profound understanding or detailed knowledge of science, to perceive it as trustworthy. Instead, by appealing to basic cognitive mechanisms of information evaluation, science impresses people, who then mostly forget what had impressed them.

The puzzle of why people trust science

A widely agreed-upon definition of trust is the willingness to be vulnerable to another party–whether an individual, a group, or an institution (Mayer et al., 1995; Rousseau et al., 1998). Building on this idea, trust in science has been defined as "one's willingness to rely on science and scientists (as representatives of the system) despite having a bounded understanding of science" (Wintterlin et al., 2022, p. 2). This definition implies that trust in science goes beyond knowledge of science. Yet, the idea that knowledge of science is the primary cause of trust in–and more generally positive attitudes towards–science has long dominated research on public understanding of science (Bauer et al., 2007). This idea is widely known under the term "deficit model", because much of the literature attested to the public "depressingly low levels of scientific knowledge" that were assumed to be the principal cause of negative attitudes towards science (Sturgis & Allum, 2004, p. 56).

The deficit model has been widely criticized for idealizing of science and viewing the public as deficient: for implying that "to know science is to love it" (Bauer et al., 2007) and for portraying science knowledge as "superior to whatever 'non-scientific' or 'local' knowledge the public may (also) possess" (Gauchat, 2011). The literature has since moved beyond the idea of science knowledge as the principle driver of trust in science. However, the focus on explaining a lack of trust, rather than trust, persists.

Researchers have increasingly studied how people's values, world views, and identities shape their attitudes towards science (Hornsey & Fielding, 2017; Lewandowsky & Oberauer, 2021). The psychological literature has focused

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on explaining negative attitudes towards science with motivated reasoning–selecting and interpreting information to match one's existing beliefs or behaviors (Hornsey, 2020; Lewandowsky et al., 2013; Lewandowsky & Oberauer, 2016). This research mostly suggests that certain psychological traits, such as a social dominance orientation, or a tendency of engaging in conspiracy thinking, lead people to reject science. Arguments on a general conspiratory thinking style as one of the root causes of science rejection shift the debate, to some extent, from a knowledge deficit to a broader reasoning deficit (Hornsey & Fielding, 2017; Rutjens & Većkalov, 2022)[1].

Motivated reasoning accounts have been popular in light of accumulating evidence in the US for a widening partisan gap regarding trust in science, with Republicans trusting less and Democrats trusting more (Gauchat, 2012; Krause et al., 2019; Lee, 2021). Contrary to what the deficit model would suggest, some influential work on motivated reasoning has shown that partisan-driven rejection of science does not appear to be the result of a lack of cognitive sophistication: Kahan et al. (2012) have shown that greater science literacy was associated with more polarized beliefs on climate change. Drummond and Fischhoff (2017) have extended these findings to other controversial science topics, namely stem cell research and evolution: they show that both greater science literacy and education are associated with more polarized beliefs on these topics. However, this phenomenon that "people with high reasoning capacity will use that capacity selectively to process information in a manner that protects their own valued beliefs" (Persson et al., 2021, p. 1), known under the term 'motivated numeracy', has largely failed to replicate (Hutmacher et al., 2024; Persson et al., 2021; Stagnaro et al., 2023). Other studies, focusing on the case of climate change, have argued that partisan divides might simply be the result of bayesian information updating, rather than motivated reasoning (Bayes & Druckman, 2021; Druckman & McGrath, 2019).

Since the Covid-19 pandemic, the role of misinformation in fostering distrust in science has been increasingly studied (Druckman, 2022; National Academies of Sciences, 2024; Scheufele & Krause, 2019). For this literature, by contrast with the deficit model, the problem of trust in science is less a lack of information, and more the abundance of harmful information.

The deficit model proposed a content-based explanation of trust: people would trust science because of their knowledge and understanding of science. Perhaps in response to this, recent literature in science communication has shifted the focus on source-based explanations of trust: from science knowledge to perceptions of scientists. This work has established that people evaluate scientists along different dimensions (Intemann, 2023), including competence, but also also integrity, benevolence or openness (Besley et al., 2021; Hendriks et al., 2015). This literature suggests that, for enhancing trust in science, the latter, warmth-related (i.e. other than competence) dimensions could be particularly relevant (Fiske & Dupree, 2014). The idea is that people already perceive scientists as very competent, but not as very warm, thus offering a greater margin for improvement.

Another explanation for distrust towards science is the *alienation model* (Gauchat, 2011). According to this model, the "public disassociation with science is a symptom of a general disenchantment with late modernity, mainly, the limitations associated with codified expertise, rational bureaucracy, and institutional authority" (Gauchat, 2011, p. 2). This explanation builds on the work of social theorists (Beck, 1992; Giddens, 1991; Habermas, 1989; see Gauchat, 2011 for an overview) who suggested that a modern, complex world increasingly requires expertise, and thus shapes institutions of knowledge elites. People who are not part of these institutions experience a lack of agency, resulting in a feeling of alienation.

On the whole, the literature on public trust in science focuses not on explaining why people do trust science, but on why they do not, or not enough. As reviews of science-society research have noted, the literature continues to operate in "deficit" paradigms (Bauer et al., 2007; Scheufele, 2022) which tend to overlook the elevated levels of trust (see next section).

People tend to trust science

Across the globe, most people do trust science, at least to some extent. A recent study in 68 countries found that, across the globe, trust in scientists was "moderately high" (mean = 3.62; sd= 0.70; Scale: 1 = very low, 2 = somewhat low, 3 = neither high nor low, 4 = somewhat high, 5 = very high), with not a single country below midpoint trust (Cologna et al., 2025). Long-term global data on trust in science across time is sparse. Yet, the available data suggests, if anything, a recent increase of trust in science: In 2018, the Wellcome Global Monitor (WGM) surveyed of over 140000 people in over 140 countries on trust in science (Wellcome Global Monitor, 2018). In 2020, during the first year of the Covid pandemic and before vaccines were widely available, a follow-up survey was run in 113 countries, involving 119000 participants (Wellcome Global Monitor, 2020). Between these two surveys, on average, trust in science has risen (Wellcome Global Monitor, 2021): In 2020, 41% (32% in 2018) of respondents said they trust science a lot, 39% (45% in 2018) said they trust science to some extent, 13% (also 13% in 2018) said they trust science "not much or not at all",

[1] Note that in these studies, conspiracy thinking is conceived of as a general psychological trait, i.e. a general a way of thinking. For a distinction between general conspiracist worldviews and conspiracy beliefs about science specifically, see Rutjens and Većkalov (2022).

and 7% (10% in 2018) answered "don't know". In the US, where long term data is available from the US General Social Survey (GSS), this public trust appears to be both remarkably stable and elevated relative to other institutions (Funk et al., 2020; Funk & Kennedy, 2020; Smith & Son, 2013): From the early 1970s to 2022, the currently latest year available in the GSS, on average 40% of Americans say they have a great deal of confidence in the scientific community. This is the second highest score (just behind the military) among 13 institutions listed in the GSS, including, e.g., the government, press, organized religion or medicine. Note, however, that the most recent polls suggest a drop in trust in science in the US (Lupia et al., 2024).

Is trust in science rational?

Both the deficit model and the other existing accounts focus on why some people do not trust science (enough). Implicitly, this literature takes trust in science for granted, as a normatively rational default. However, even if we agree that the scientific consensus is accurate, and that a decently high level of trust in science is warranted, that does not mean that the public's trust in science is automatically rational. People may trust science for reasons that have little to do with evidence or epistemic justification. While we are not aware that this argument has been explicitly made in the trust-in-science literature, different fields of research offer potential theoretical grounds.

In social psychology, Milgram (1974) 's obedience experiments have famously been interpreted to demonstrate that people blindly defer to authorities, even when doing so conflicts with their own moral intuitions. This interpretation of blind deference has been contested (Mercier, 2017); yet, in cases where people deferred, they were particularly sensitive to cues of scientific authority (Haslam & Reicher, 2012). Research on normative conformity (e.g., Asch, 1956 's conformity experiments) has shown that in certain contexts, people may align their views with group norms, not because they have independently evaluated the evidence, but because they wish to fit in or avoid social sanctions (see Mercier, 2017 for an argument that these cases of conformity are, in fact, pretty rare). Trust in science could, therefore, in some cases be the result of deference to authority or social conformity rather than critical evaluation of scientific claims.

From a sociological perspective, especially in Bourdieu's framework, trust in science may be strongly influenced by *habitus*—a system of dispositions shaped by one's social class and cultural background (Bormann & Thies, 2019). Rather than a reasoned appraisal of science's trustworthiness, trust might result from internalized norms. In line with this argument, Archer et al. (2015) show that school children aged 11-15 years already differ considerably in their "science capital"-an index of several questions pertaining to how much they value and engage with science. These differences were associated with differences in cultural capital (e.g. parental university attendance), gender, and ethnicity.

Finally, research in cultural evolution highlights the role of *prestige bias*: humans are inclined to adopt beliefs and behaviors from individuals or institutions perceived as prestigious. This process is not rational, because humans only need to identify who is prestigious, and not why.

Deference to authority, social conformity, habitus or prestige bias are possible explanations of how public trust in science could stem from irrational information processing. But what would rational trust in science look like? Implicitly, the deficit model has made this case: knowledge of science should convince people of its epistemic qualities, and thus elicit trust. However, as we will showcase in the next section, this explanation does not align with the data: People do not know much about science, and correlations between science knowledge and trust are, if present, weak.

People do not know much about science

The deficit model implies that science knowledge is the main cause of trust in science. Accordingly, the elevated levels of trust in science should be matched by elevated levels of science knowledge. But this is not the case.

Early attempts of measuring science knowledge have developed what is known as the "Oxford scale" (Table 1[2]) to measure science knowledge–a set of specific true/false or multiple-choice questions about basic science facts.[3] As the name suggests, this measure was developed by scholars associated with the University of Oxford in the late 1980s, in collaboration with Jon D. Miller, a pioneer in research on science literacy in the US (Durant et al., 1989). The Oxford scale remains popular: different versions of it have been used in large-scale survey projects, including several Eurobarometer surveys, as well as in the National Science Foundation's (NSF) "Science and Engineering Indicators" surveys in the US (National Academies of Sciences, Engineering, and Medicine, 2016). Survey results from the Oxford scale have been taken to showcase a science knowledge deficit among the public. For example, from the first surveys in which they were used, Durant et al. (1989) (p.11) report that only "34% of Britons and 46% of Americans appeared to know that the Earth goes round the Sun once a year, and just 28% of Britons

[2] The original scale proposed by Durant et al. (1989) comprised 20-items. Several reduced versions of this have been used in different survey projects and studies since then. For example, Miller (1998) reports that a Eurobarometer in 1992 included only 9, and a Science and Engineering Indicator survey in 1995 only 10 of these items. Gauchat (2011) reports relying on a 14-item scale based on several Science and Engineering Indicators surveys included in the GSS (but does not provide an overview of the included items).

[3] The meta-analysis included two types of studies: one that measured general scientific knowledge, and one that measured knowledge specific to biology and genetics

and 25% of Americans knew that antibiotics are ineffective against viruses". According to the National Academies of Sciences, Engineering, and Medicine (2016), performance on the Oxford scale items in the US has been "fairly stable across 2 decades" (National Academies of Sciences, Engineering, and Medicine, 2016, p. 51)[4].

The Oxford scale has received various forms of criticism, ranging from minor concerns for being–ironically, in light of the bad performance–too easy to answer (Kahan, 2015), to the fundamental critique that it only captures factual recall (Bauer et al., 2007; Pardo & Calvo, 2004). What should actually matter for trust, according to this fundamental critique, is a different kind of knowledge, namely an institutional and methodological understanding of how science works.

The literature on science literacy goes well beyond Oxford-scale type, factual measures of trust in science. Even the creators of the Oxford scale were, to some extent, aware of its limitations (National Academies of Sciences, Engineering, and Medicine, 2016). They never intended the Oxford scale items to serve as a comprehensive measure of science literacy. For example, Durant et al. (1989) also developed a scale of "understanding of processes of scientific inquiry"– several multiple-choice questions about the scientific method and basic concepts of probability. Miller (2004) viewed a scientifically literate citizen as someone who has both a "(1) a basic vocabulary of scientific terms and constructs; and (2) a general understanding of the nature of scientific inquiry." His measure of science literacy included open-ended questions, for example on what people understand as the meaning of scientific study (Miller, 1998).

However, these measures have hardly drawn a more positive image of the public's knowledge of science: Using an index of various understanding questions, Miller (2004) (p. 288) concluded that "approximately 10 percent of US adults qualified as civic scientifically literate in the late 1980s and early 1990s, but this proportion increased to 17 percent in 1999". Miller described that, according to his measure, someone qualifies as scientifically literate if they possess "the level of skill required to read most of the articles in the Tuesday science section of The New York Times, watch and understand most episodes of Nova, or read and understand many of the popular science books sold in bookstores today" (Miller, 2004, p. 288).

More recent data suggest that science literacy in the US may have improved slightly since Miller's assessment during the early 2000s, but it still remains rather low. Based on results from the 2018 US Science & Engineering Indicators, Scheufele and Krause (2019) (p. 7663) report that "one in three Americans (36%) misunderstood the concept of probability; half of the population (49%) was unable to provide a correct description of a scientific experiment; and three in four (77%) were unable to describe the idea of a scientific study."

The 2024 US Science & Engineering Indicators, based on data from the Pew Research Center's American Trends Panel (ATP) from 2020, report that "60% of U.S. adults could correctly note that a control group can be useful in making sense of study results" and that "only half of U.S. adults (50%) could correctly identify a scientific hypothesis" (National Science Board, National Science Foundation, 2024, p. 24).

A weak correlation between knowledge and trust

So far, we have contrasted the elevated levels of trust with the low levels of science knowledge. This is only indirect evidence for a weak association between the two. More direct evidence on this association comes with two major limitations: First, direct evidence is based mostly on narrow, factual knowledge as measured by the Oxford scale, and not on a broader, institutional understanding of science. Second, the relevant studies have typically assessed attitudes towards science more broadly, rather than trust in science in particular. In a seminal meta-analysis Allum et al. (2008) found that Oxford scale type science knowledge was only weakly associated with attitudes towards science. Moreover, this weak association only held for general attitudes–for attitudes towards specific contentious science topics (e.g., climate change), the study did not find an association.

Another limitation of the evidence of a weak association between trust in science and science knowledge presented so far is that it is–to a large extent–based on data from the US and, to some extent, Europe. However, a recent global study points towards a similar conclusion: Cologna et al. (2025) tested the relationship between national science literacy scores, based on the Program for International Student Assessment (PISA), and national average trust in scientists for the 68 countries included in their study. They found no statistically significant association.

This section has established that public trust in science is relatively high, but that knowledge and understanding of science do not seem to be strong determinants of this trust. Does this mean that trust in science is irrational? In the next section we argue that no, not necessarily.

The rational impression account of trust in science

In this section, we develop a 'rational impression' account of trust in science, according to which people trust science because they have been impressed by it. This impression of trust persists even after knowledge of the specific content has vanished. The account builds on two basic mechanisms of information evaluation: First, if something is highly consensual, it is likely to be true. This is particularly relevant when people lack relevant background knowledge to evaluate claims for

[4]Note that for this trend scale, the National Science Board who publishes results from the Science and Engineering Indicators selected a subset of 9 of the items shown in Table 1.

Table 1

1	The center of the Earth is very hot. (True)
2	The continents on which we live have been moving their locations for millions of years and will continue to move in the future. (True)
3	Does the Earth go around the Sun, or does the Sun go around the Earth? (Earth around Sun)
4	How long does it take for the Earth to go around the Sun? (One year)*
5	All radioactivity is man-made. (False)
6	It is the father's gene that decides whether the baby is a boy or a girl. (True)
7	Antibiotics kill viruses as well as bacteria. (False)
8	Electrons are smaller than atoms. (True)
9	Lasers work by focusing sound waves. (False)
10	Human beings, as we know them today, developed from earlier species of animals. (True)
11	The universe began with a huge explosion. (True)

*Only asked if previous question was answered correctly.

An 11-item version of the Oxford-scale, as reported in a comprehensive review of the literature on scientific literacy (National Academies of Sciences, Engineering, and Medicine, 2016)

themselves, as is often the case in science. Second, if someone finds out something that is hard-to-know, we tend to be impressed by it, if we deem it true. This impression makes us infer that the person is competent, a crucial component of trustworthiness. However, it is hard or even impossible to recall exactly how we formed this impression.

People infer accuracy from consensus

In order to make the best of communicated information, animals need to be able to evaluate it, i.e. being able to distinguish inaccurate and harmful from accurate and beneficial information (Maynard-Smith & Harper, 2003). It has been argued that humans have evolved a suite of cognitive mechanisms to serve this function (Mercier, 2020; Sperber et al., 2010). In particular, we rely on cues of an informant's trustworthiness, and check the plausibility of an information against our background knowledge.

In the case of science, reliable cues and background information are scarce: people generally have little first-hand information to evaluate individual scientists' trustworthiness, because they don't know scientists personally. People also largely lack relevant background knowledge to evaluate the plausibility of scientific findings. Sometimes, to a certain extent, people might be able to judge the accuracy of scientific findings for themselves, for example when they are exposed to accessible and convincing explanations in school (Lombrozo, 2007; Read & Marcus-Newhall, 1993; for a review, see Lombrozo, 2006). But for most scientific research, people cannot possibly evaluate the quality of the information for themselves, let alone make their own observations (e.g. quantum mechanics, genes).

An additional way to evaluate whether something is true or not is to aggregate opinions. It has been shown that, when no better information is available, people rely on majority heuristics: the more others agree on something, the more likely we are to believe them to be right (Mercier & Morin, 2019). Literature on the wisdom of crowds has shown that this inference–from convergence of opinions to accuracy–is often appropriate (see e.g., Hastie & Kameda, 2005). In non-science related contexts, it has been shown that people go even further and infer that others are more competent, the more they agree with each other (Pfänder, De Courson, et al., 2025). In these experiments, participants were deprived of relevant background knowledge and were told that the others were answering independently of each other.

More indirect evidence suggests that people make this inference also in the context of science: Pfänder and Mercier (2025) showed that in France, people trust scientists more when they work in disciplines that people perceive as more consensual. Yet more suggestive evidence comes from a popular psychological model, the "gateway model". The model suggests that informing people about the scientific consensus on specific issues acts as a gateway to change their beliefs on these issues (Linden, 2021). Studies have demonstrated the effectiveness of consensus messaging in changing people's beliefs on contentious science topics such as climate change (Većkalov et al., 2024) or vaccination (Salmon et al., 2015; for an overview of results on vaccination, climate change, and genetically modified food, see Van Stekelenburg et al., 2022). This evidence is only suggestive, however, because the fact that consensus changes people's beliefs or attitudes does not necessarily require enhanced trust. An alternative explanation, for example, is normative conformity-that is, when people follow the majority because of social pressure rather than a belief that the majority is correct (Mercier & Morin, 2019).[5]

In the absence of other reliable cues and background knowledge, inferences from consensus are likely to be given considerable weight in a cognitive system of epistemic vigilance. In the case of science, this weight should play in favor of science's perceived trustworthiness: It has been argued that, by contrast with other intellectual enterprises, consensus is the defining trait of science (Collins, 2002). Not only do scientists agree on things, but they agree on impressive things–things that would be impossible for any individual to ever uncover for themselves.

People trust but forget impressive science

People use the degree of consensus as a cue to infer whether an information is accurate, and, to some extent, whether the informants are competent. However, this latter inference on the informants' competence should strongly depend on how impressive the information is.

For an information to be impressive, at least two criteria should be met: (i) there is reason to believe it is true, and (ii) it is perceived as hard to uncover. In the case of science, perceived consensus might be the main relevant cue for (i), and (ii) can be mostly taken for granted. For example, most people would probably only be mildly impressed by someone telling them that a given tree has exactly 110201 leaves. Even though obtaining this information implies an exhausting counting effort, everyone in principle knows how to do it. By contrast, finding out that it takes light approximately 100,000 years to travel from one end of the Milky Way to the other is probably impressive to most people, as they would not know how such a distance can be measured.

Outside the realm of science, with trivia questions, it has been shown that people have accurate perceptions of whether something is hard to know or not, and that they use this information to infer someone's competence (Dubourg et al., 2025): knowing a rare piece of information indicates a high likelihood of knowing more information in the same domain.

In the case of science, Pfänder, Rouilhan, et al. (2025) showed that reading about impressive scientific findings increased participants' perceptions of both the scientists' competence and the trustworthiness of their discipline. At the same time, participants forgot almost immediately about the specific content that generated these impressions.

This forgetting could explain the low levels of science knowledge. We commonly form impressions of the people around us while forgetting the details of how we formed these impressions: If a colleague fixes our computer, we might forget exactly how they fixed it, yet remember that they are good at fixing computers. As an extreme example, patients with severe amnesia can continue to experience emotions linked to events they could not recall (Feinstein et al., 2010). In the context of science, Liquin and Lombrozo (2022) have shown that while people find some science-related explanations more satisfying than others, this did not predict how well they could recall the explanations shortly after, suggesting that impressions and knowledge formation can be quite detached.

Additional predictions of the rational impressions account

The rational impressions account makes several additional predictions. First, competence should be the main dimension of scientists' trustworthiness. In social psychology, a popular model suggests that people evaluate others along two fundamental dimensions: competence and warmth (Cuddy et al., 2008). Similarly, for trust in scientists, researchers have distinguished between an epistemological and an ethical dimension (Intemann, 2023; Wilholt, 2013). Sometimes, researchers make more fine-grained distinctions: For example, Hendriks et al. (2015) have argued for three dimensions: expertise/competence, integrity, and benevolence. Besley et al. (2021) has suggested openness as an additional fourth dimension. Across these dimensions, anything but competence should be very hard to evaluate for people: there are relatively very few scientists in the world, and most people probably do not know any personally. The only other way they could judge scientists' character is through media coverage. But news on science–by contrast, for example, with news on politicians–mostly tend to concern the science, not the scientists. Besides, people consume very little news in general (Newman et al., 2023). Competence, however, can be judged based on the mechanisms of the rational impression account. Accordingly, scientists should score higher in competence evaluations than in other dimensions of trustworthiness. In line with this prediction, it has been shown that people perceive scientists as very competent, but not so much as warm (Fiske & Dupree, 2014). A recent Pew survey found that 89% of Americans viewed research scientists as intelligent, but only 65% viewed them as honest, and only 45% described research scientists as good communicators (Kennedy & Brian, 2024; see also Fiske & Dupree, 2014). Beyond the US, a recent study confirmed this tendency on a global scale (Cologna et al., 2025): People perceived scientists as highly competent, with 78% tending to believe that scientists are qualified to conduct high-impact research. By contrast, people held scientists in lower esteem with regards to their integrity and benevolence: Only 57% of people tended to believe that most scientists are honest, and

[5] However, an accuracy inference seems to be the more plausible mechanism here: Studies on consensus messaging do not seem to be settings of high social pressure that we might expect to produce instances of normative conformity, compared to, for instance, the famous Asch experiments (Asch, 1956).

only 56% tended to believe that most scientists are concerned about people's well-being.

Second, education, and more precisely science education, should be the main correlate of trust in science. Since most people consume very little news (Newman et al., 2023), the bulk of exposure to science can be assumed to happen during education. Education, and in particular science education, has been consistently identified as one of the strongest correlates of trust in science (Noy & O'Brien, 2019; Wellcome Global Monitor, 2018, 2020; but see Cologna et al., 2025 who only find a small positive relationship between tertiary education and trust in science). This is compatible with the fact that people, even those who received a science education, do not know much about science: if we assume that education has some causal effect on trust in science, this effect does not need to be driven by a pure transmission of knowledge and understanding (for a similar argument, see Bak, 2001). The candidate mechanism proposed by the rational impression account is exposure to impressive scientific content. Students might not understand much of it, and potentially recall even less later on; but they might have been impressed by it, to the point that they come to perceive scientists as competent, and thus, everything else equal, as trustworthy. This impression might persist even when specific knowledge vanishes. In line with this, Motta (2018) found that, in the US, the more children were interested in science at age 12–14 years, the more they tended to trust in climate scientists in adulthood (mid thirties), irrespective of their political ideology.

Third, people with a basic science education should trust essentially all of basic science. These people should have had the opportunity to form impressions of trustworthiness of science. This should have built a solid baseline of trust in science. People might deviate from this default and distrust science on certain specific science topics for other reasons, but they should trust most of science. This is in line with the finding that in the US, almost everyone–even people who say they don't trust science in general or who hold specific beliefs blatantly violating scientific knowledge (e.g. that the earth is flat)–trusts almost all of basic science knowledge (e.g. that electrons are smaller than atoms) (Pfänder, Kerzreho, et al., 2025).

Discussion

It has long been a puzzle to the deficit model–which suggests that trust in science is primarily driven by science knowledge–that knowledge of science is at best weakly associated with science attitudes (Allum et al., 2008; National Academies of Sciences, Engineering, and Medicine, 2016). The rational impression account can make sense of this: it lays out how trusting science without recalling specific knowledge can be the result of a sound inference process, rooted in basic cognitive mechanisms of information evaluation.

The account is compatible with the finding that education, and in particular science education, has been repeatedly identified as one of the strongest correlates of trust in science (Bak, 2001; Noy & O'Brien, 2019; Wellcome Global Monitor, 2018, 2020; but see Cologna et al., 2025). By contrast with the deficit model, it suggests that the main causal role of education for public trust in science is not transmission of knowledge and understanding, but impression generation.

The rational impression account aligns with recent normative accounts of what makes science trustworthy. Instead of particular institutional features-certain methods, norms, or processes–these accounts argue that the trustworthiness of science lies in its diversity: Cartwright et al. (2022) make the case that scientific knowledge emerges from a "tangle" of results, relying on diverse research methods. Oreskes (2019) makes a similar case: She argues that scientific practice takes place in different scientific communities who rely on a variety of different research methods. Through some shared practices, in particular peer-review, these communities engage in critical dialogue. What makes scientific knowledge trustworthy, according to Oreskes, is when from this diversity of actors and methods, a consensus emerges. According to this view, to infer trustworthiness, people should have a representation of the diversity of science. The rational impression account is, in a way, less strict: it does not require a representation of diversity. It does require, however, that people have a representation of science as an institution of independent thinkers.

The rational impressions account faces several limitations. First, it proposes a possible micro-level model of trust in science and should be seen as complementing, not competing with, macro-level processes that shape public trust in science. The rational impression account fits with a sociological literature investigating how "individual cognition and practice establish and maintain institutional fields and status hierarchies, especially in the face of imperfect knowledge" (Gauchat & Andrews, 2018, p. 569). However, sociological macro-level accounts have described how trust in science is entangled with broader cultural and political dynamics. These accounts, like the individual-level accounts reviewed above, tend to focus on explaining distrust in science. For example, Gauchat (2011) describes the 'alienation model', according to which the "public disassociation with science is a symptom of a general disenchantment with late modernity, mainly, the limitations associated with codified expertise, rational bureaucracy, and institutional authority" (Gauchat, 2011, p. 2). This explanation builds on the work of social theorists (Beck, 1992; Giddens, 1991; Habermas, 1989; see Gauchat, 2011 for an overview) who suggested that a modern, complex world increasingly requires expertise, and thus shapes institutions of knowledge elites. People who are not part of these institutions experience a lack of agency, resulting in a feeling of alienation. Similarly, Gauchat (2023) argues that politicization of science in the US needs to be seen in its broader cultural context. Precisely, according to Gauchat, science has enabled the authority of the modern regulatory state. Consequently, conservative distrust of science reflects deeper structural tensions with the institutions and rational–legal authority of modern governance. At the micro-level, this is consistent with research showing that right-wing authoritarian ideology is associated with distrust towards science and scientists (Kerr & Wilson, 2021).

A second limitation of the rational impression account is that it assumes people have a representation of science as consensual. However, in practice–with perhaps some exceptions, such as during the Covid-19 pandemic–most people do not literally compare the opinions of different scientists for themselves and come to the conclusion that something is largely consensual. Where, then, could the representation of consensus possibly emerge? A plausible explanation, we believe, is that education fosters a representation of consensus: During education, in particular during early education, knowledge is typically presented as simply the result of science–a seemingly unanimous enterprise that produces knowledge. School books hardly teach about historical science controversies, suggest uncertainty around scientific findings, or cover cutting-edge research where disagreements are the norm. This could induce a default consensus assumption in people's perceptions of science. However, this argument is of course only speculative.

Third, the rational impression account cannot explain, for example, why people with no education, and thus presumably very little exposure to science, have some trust in science (Wellcome Global Monitor, 2018). A possible explanation could be two step effects, via some educated people who trust science whom they trust.

Fourth, conversely, the account also cannot explain why, in a context of the global north, where essentially everyone has been exposed to science through a basic science education, some people do not trust some aspects of science, or say they don't trust science in general (even if that is not really true, see Pfänder, Kerzreho, et al., 2025). Suggestions have already been made for a number of issues such as vaccination (Miton and Mercier 2015), GMOs (Blancke et al. 2015), or nuclear energy (Hacquin et al. 2021). However, research is still needed to better understand what motivates these rejections (see e.g., Hornsey 2020).

Beyond these theoretical and empirical limitations, the rational impression account is limited in its implications. First, we do not believe that flooding people with impressive consensual science knowledge is the key to overcoming all distrust of science. In the context of trust in political institutions, it has been argued that trust and distrust are not necessarily symmetrical: what causes the former might not help alleviate the latter (Bertsou, 2019). We believe this is at least to some degree true for science, too. For example, consensus messaging has been shown to help convince people to trust science on particular issues, such as climate change or vaccines, but it is less clear whether it worked by fostering perceptions of trustworthiness. It could be the case that the people convinced by consensus messages already trusted science, but have not held strong opinions on the specific matter. This is not implausible, since it has been shown that on most matters, large segment of the public do not have opinions (Bourdieu, 1979; Zaller, 1992). For people who do not only lack trust, but who actively distrust, motivated reasoning accounts are likely better suited as a theoretical framework. Addressing relevant underlying motivations directly might be more fruitful to mitigate distrust in science than exposing people to consensual science more generally.

Second, and related, just because we propose an account by which trust in science can be the result of a rational cognitive process, this does not imply that, conversely, all distrust in science is irrational. Some groups of people do in fact have good reasons not to trust science. For example, some science has historically contributed to fostering racism (see e.g. Fuentes, 2023; Nobles et al., 2022), via instances such as the tragically famous Tuskegee syphilis study (Brandt, 1978; Scharff et al., 2010).

Third, we do not think that science communication should stress consensus at all costs. In the rational impression account, consensus plays a central role for generating trust. However, this should not incentivize science communicators to neglect transparency about uncertainty. Acknowledging uncertainty in science communication has been argued to be crucial for fostering long term trust in science (Druckman, 2015). For example, in the context of Covid-19 vaccines, Petersen et al. (2021) have shown that communicating uncertainty is crucial for building long term trust in health authorities.

Fourth, science communication should not aim for impressiveness at all costs either. Research has shown that intellectual humility can increase trust in scientists (Koetke et al., 2024). Trying to oversell scientific results might therefore backfire. People appear to value transparency via open data practices in science (Song et al., 2022), and trust science that replicates more (Hendriks et al., 2020). We should therefore expect that simply doing better, more transparent science, and being humble about it, is likely to be the most effective strategy to impress the public and elicit perceptions of trustworthiness.

Fifth, educators should not stop aiming at fostering a proper understanding of science. Most students might not understand all of the content, or recall much specific knowledge later on. However, for some students at least, some of that knowledge will be remembered, and will prove important in their lives. Second, to be impressive, a piece of information does not need to be confusingly complex. In fact, a proper understanding of research findings and their methods might even help in appreciating their complexity–even if, once again, that understanding is forgotten later.

Despite these limitations, we believe that the rational impressions account offers optimism for studies of science-society interfaces, and the field of science communication in particular: Exposure to science, especially one that leaves an impression, might be the foundation of public trust in science. This means that effective science communication is essential for fostering trust in science. Low scientific literacy levels should not discourage education and communication efforts, as they are not necessarily a good indicator of the value added in terms of fostering trust in science.

Taking a broader perspective, our account fits into a picture of humans as not gullible (Mercier, 2017, 2020). The "failure" of the knowledge account of trust in science–the fact that science knowledge appears to not be strongly associated with trust in science–might suggest that public trust in science is, to a large extent, irrational. The notion that trust in science is irrational or easily granted may amplify concerns about the impact of misinformation: if trust lacks a solid, rational foundation, then we would expect misinformation to easily lead people astray. There is much work to be done still to understand how misinformation impacts people's beliefs, and in particular elite-driven misinformation and more subtle forms of misinformation, such as one-sided reporting. But it has been shown that people are generally able to distinguish between true and false news and, if anything, tend to be generally skeptical of news (Pfänder & Altay, 2025). As a consequence, for a better informed public, fighting for (true) information seems at least as relevant as fighting against misinformation (Acerbi et al., 2022). Misinformation researchers increasingly acknowledge this: A recent report on science misinformation by the National Science Foundation (National Academies of Sciences, 2024) dedicates considerable space on developing strategies to produce better information, for example by promoting high-quality science, health, and medical journalism.

The rational impression account stresses the role of fighting for information, when it comes to fostering trust in science. Well-placed trust in science does not require profound understanding or recall of specific knowledge; but it does require exposure to good science.

References

Acerbi, A., Altay, S., & Mercier, H. (2022). Research note: Fighting misinformation or fighting for information? *Harvard Kennedy School Misinformation Review*. https://doi.org/10.37016/mr-2020-87

Algan, Y., Cohen, D., Davoine, E., Foucault, M., & Stantcheva, S. (2021). Trust in scientists in times of pandemic: Panel evidence from 12 countries. *Proceedings of the National Academy of Sciences*, *118*(40), e2108576118. https://doi.org/10.1073/pnas.2108576118

Allum, N., Sturgis, P., Tabourazi, D., & Brunton-Smith, I. (2008). Science knowledge and attitudes across cultures: a meta-analysis. *Public Understanding of Science*, *17*(1), 35–54. https://doi.org/10.1177/0963662506070159

Archer, L., Dawson, E., DeWitt, J., Seakins, A., & Wong, B. (2015). "Science capital": A conceptual, methodological, and empirical argument for extending bourdieusian notions of capital beyond the arts. *Journal of Research in Science Teaching*, *52*(7), 922–948. https://doi.org/10.1002/tea.21227

Asch, S. E. (1956). Studies of independence and conformity: I. A minority of one against a unanimous majority. *Psychological Monographs: General and Applied*, *70*(9), 1–70. https://doi.org/10.1037/h0093718

Bak, H.-J. (2001). Education and Public Attitudes toward Science: Implications for the "Deficit Model" of Education and Support for Science and Technology. *Social Science Quarterly*, *82*(4), 779–795. https://doi.org/10.1111/0038-4941.00059

Bauer, M. W., Allum, N., & Miller, S. (2007). What can we learn from 25 years of PUS survey research? Liberating and expanding the agenda. *Public Understanding of Science*, *16*(1), 79–95. https://doi.org/10.1177/0963662506071287

Bayes, R., & Druckman, J. N. (2021). Motivated reasoning and climate change. *Current Opinion in Behavioral Sciences*, *42*, 27–35. https://doi.org/10.1016/j.cobeha.2021.02.009

Beck, U. (1992). *Risk society: towards a new modernity* (Repr). Sage.

Bertsou, E. (2019). Rethinking political distrust. *European Political Science Review*, *11*(2), 213–230. https://doi.org/10.1017/S1755773919000080

Besley, J. C., Lee, N. M., & Pressgrove, G. (2021). Reassessing the Variables Used to Measure Public Perceptions of Scientists. *Science Communication*, *43*(1), 3–32. https://doi.org/10.1177/1075547020949547

Bogert, J. M., Buczny, Harvey, & Ellers, J. and. (2024). The effect of trust in science and media use on public belief in anthropogenic climate change: A meta-analysis. *Environmental Communication*, *18*(4), 484–509. https://doi.org/10.1080/17524032.2023.2280749

Bormann, I., & Thies, B. (2019). Trust and trusting practices during transition to higher education: Introducing a framework of habitual trust. *Educational Research*, *61*(2), 161–180. https://doi.org/10.1080/00131881.2019.1596036

Bourdieu, P. (1979). Public opinion does not exist. *Communication and Class Struggle*, *1*, 124–130.

Brandt, A. M. (1978). Racism and Research: The Case of the Tuskegee Syphilis Study. *The Hastings Center Report*, *8*(6), 21. https://doi.org/10.2307/3561468

Cartwright, N., Hardie, J., Montuschi, E., Soleiman, M., &

Thresher, A. C. (2022). *The tangle of science: Reliability beyond method, rigour, and objectivity*. Oxford University Press.

Collins, R. (2002). *The sociology of philosophies: a global theory of intellectual change* (4. print., 1. Harvard Univ. Pr. paperback ed., 2000). Belknap Press of Harvard Univ. Press.

Cologna, V., Mede, N. G., Berger, S., Besley, J., Brick, C., Joubert, M., Maibach, E. W., Mihelj, S., Oreskes, N., Schäfer, M. S., Linden, S. van der, Abdul Aziz, N. I., Abdulsalam, S., Shamsi, N. A., Aczel, B., Adinugroho, I., Alabrese, E., Aldoh, A., Alfano, M., … Zwaan, R. A. (2025). Trust in scientists and their role in society across 68 countries. *Nature Human Behaviour*, 1–18. https://doi.org/10.1038/s41562-024-02090-5

Cologna, V., & Siegrist, M. (2020). The role of trust for climate change mitigation and adaptation behaviour: A meta-analysis. *Journal of Environmental Psychology*, *69*, 101428. https://doi.org/10.1016/j.jenvp.2020.101428

Cuddy, A. J. C., Fiske, S. T., & Glick, P. (2008). *Warmth and Competence as Universal Dimensions of Social Perception: The Stereotype Content Model and the BIAS Map* (Vol. 40, pp. 61–149). Elsevier. https://doi.org/10.1016/S0065-2601(07)00002-0

Druckman, J. N. (2015). Communicating Policy-Relevant Science. *PS: Political Science & Politics*, *48*(S1), 58–69. https://doi.org/10.1017/S1049096515000438

Druckman, J. N. (2022). Threats to Science: Politicization, Misinformation, and Inequalities. *The ANNALS of the American Academy of Political and Social Science*, *700*(1), 8–24. https://doi.org/10.1177/00027162221095431

Druckman, J. N., & McGrath, M. C. (2019). The evidence for motivated reasoning in climate change preference formation. *Nature Climate Change*, *9*(2), 111–119. https://doi.org/10.1038/s41558-018-0360-1

Drummond, C., & Fischhoff, B. (2017). Individuals with greater science literacy and education have more polarized beliefs on controversial science topics. *Proceedings of the National Academy of Sciences*, *114*(36), 9587–9592. https://doi.org/10.1073/pnas.1704882114

Dubourg, E., Dheilly, T., Mercier, H., & Morin, O. (2025). Using the Nested Structure of Knowledge to Infer What Others Know. *Psychological Science*, *36*(6), 443–450. https://doi.org/10.1177/09567976251339633

Durant, J. R., Evans, G. A., & Thomas, G. P. (1989). The public understanding of science. *Nature*, *340*(6228), 11–14. https://doi.org/10.1038/340011a0

Feinstein, J. S., Duff, M. C., & Tranel, D. (2010). Sustained experience of emotion after loss of memory in patients with amnesia. *Proceedings of the National Academy of Sciences*, *107*(17), 7674–7679. https://doi.org/10.1073/pnas.0914054107

Fiske, S. T., & Dupree, C. (2014). Gaining trust as well as respect in communicating to motivated audiences about science topics. *Proceedings of the National Academy of Sciences*, *111*(Supplement_4), 13593–13597. https://doi.org/10.1073/pnas.1317505111

Fuentes, A. (2023). Systemic racism in science: Reactions matter. *Science*, *381*(6655), eadj7675. https://doi.org/10.1126/science.adj7675

Funk, C., & Kennedy, B. (2020). *Public confidence in scientists has remained stable for decades*. https://www.pewresearch.org/short-reads/2020/08/27/public-confidence-in-scientists-has-remained-stable-for-decades/

Funk, C., Tyson, A., Kennedy, B., & Johnson, C. (2020). *Science and scientists held in high esteem across global publics*. https://www.pewresearch.org/science/2020/09/29/science-and-scientists-held-in-high-esteem-across-global-publics/

Gauchat, G. (2011). The cultural authority of science: Public trust and acceptance of organized science. *Public Understanding of Science*, *20*(6), 751–770. https://doi.org/10.1177/0963662510365246

Gauchat, G. (2012). Politicization of Science in the Public Sphere: A Study of Public Trust in the United States, 1974 to 2010. *American Sociological Review*, *77*(2), 167–187. https://doi.org/10.1177/0003122412438225

Gauchat, G. (2023). The Legitimacy of Science. *Annual Review of Sociology*, *49*(1), 263–279. https://doi.org/10.1146/annurev-soc-030320-035037

Gauchat, G., & Andrews, K. T. (2018). The Cultural-Cognitive Mapping of Scientific Professions. *American Sociological Review*, *83*(3), 567–595. https://doi.org/10.1177/0003122418773353

Giddens, A. (1991). *Modernity and self-identity: Self and society in the late modern age*. Stanford University Press.

Habermas, J. (1989). *Jürgen Habermas on society and politics: a reader* (S. Seidman, Ed.; 1. [print.]). Beacon Press.

Haslam, S. A., & Reicher, S. D. (2012). Contesting the "Nature" Of Conformity: What Milgram and Zimbardo's Studies Really Show. *PLOS Biology*, *10*(11), e1001426. https://doi.org/10.1371/journal.pbio.1001426

Hastie, R., & Kameda, T. (2005). The Robust Beauty of Majority Rules in Group Decisions. *Psychological Review*, *112*(2), 494–508. https://doi.org/10.1037/0033-295X.112.2.494

Hendriks, F., Kienhues, D., & Bromme, R. (2015). Measuring Laypeople's Trust in Experts in a Digital Age: The Muenster Epistemic Trustworthiness Inventory (METI). *PLOS ONE*, *10*(10), e0139309. https://doi.org/10.1371/journal.pone.0139309

Hendriks, F., Kienhues, D., & Bromme, R. (2020). Replication crisis = trust crisis? The effect of successful vs failed replications on laypeople's trust in researchers and research. *Public Understanding of Science*, *29*(3), 270–288. https://doi.org/10.1177/0963662520902383

Hornsey, M. J. (2020). Why Facts Are Not Enough: Understanding and Managing the Motivated Rejection of Science. *Current Directions in Psychological Science*, *29*(6), 583–591. https://doi.org/10.1177/0963721420969364

Hornsey, M. J., & Fielding, K. S. (2017). Attitude roots and Jiu Jitsu persuasion: Understanding and overcoming the motivated rejection of science. *American Psychologist*, *72*(5), 459–473. https://doi.org/10.1037/a0040437

Hornsey, M. J., Harris, E. A., Bain, P. G., & Fielding, K. S. (2016). Meta-analyses of the determinants and outcomes of belief in climate change. *Nature Climate Change*, *6*(6), 622–626. https://doi.org/10.1038/nclimate2943

Hutmacher, F., Reichardt, R., & Appel, M. (2024). Motivated reasoning about climate change and the influence of Numeracy, Need for Cognition, and the Dark Factor of Personality. *Scientific Reports*, *14*(1), 5615. https://doi.org/10.1038/s41598-024-55930-9

Intemann, K. (2023). Science communication and public trust in science. *Interdisciplinary Science Reviews*, *48*(2), 350–365. https://doi.org/10.1080/03080188.2022.2152244

Kahan, D. M. (2015). Climate-Science Communication and the Measurement Problem. *Political Psychology*, *36*(S1), 1–43. https://doi.org/10.1111/pops.12244

Kahan, D. M., Peters, E., Wittlin, M., Slovic, P., Ouellette, L. L., Braman, D., & Mandel, G. (2012). The polarizing impact of science literacy and numeracy on perceived climate change risks. *Nature Climate Change*, *2*(10), 732–735. https://doi.org/10.1038/nclimate1547

Kennedy, A. T., & Brian. (2024). *Public trust in scientists and views on their role in policymaking*. https://www.pewresearch.org/science/2024/11/14/public-trust-in-scientists-and-views-on-their-role-in-policymaking/

Kerr, J. R., & Wilson, M. S. (2021). Right-wing authoritarianism and social dominance orientation predict rejection of science and scientists. *Group Processes & Intergroup Relations*, *24*(4), 550–567. https://doi.org/10.1177/1368430221992126

Koetke, J., Schumann, K., Bowes, S. M., & Vaupotič, N. (2024). The effect of seeing scientists as intellectually humble on trust in scientists and their research. *Nature Human Behaviour*, 1–14. https://doi.org/10.1038/s41562-024-02060-x

Koetke, J., Schumann, K., & Porter, T. (2021). Trust in science increases conservative support for social distancing. *Group Processes & Intergroup Relations*, *24*(4), 680–697. https://doi.org/10.1177/1368430220985918

Krause, N. M., Brossard, D., Scheufele, D. A., Xenos, M. A., & Franke, K. (2019). Trends—americans' trust in science and scientists. *Public Opinion Quarterly*, *83*(4), 817–836. https://doi.org/10.1093/poq/nfz041

Lee, J. J. (2021). Party Polarization and Trust in Science: What about Democrats? *Socius*, *7*, 23780231211010101. https://doi.org/10.1177/23780231211010101

Lewandowsky, S., Gignac, G. E., & Oberauer, K. (2013). The Role of Conspiracist Ideation and Worldviews in Predicting Rejection of Science. *PLOS ONE*, *8*(10), e75637. https://doi.org/10.1371/journal.pone.0075637

Lewandowsky, S., & Oberauer, K. (2016). Motivated Rejection of Science. *Current Directions in Psychological Science*, *25*(4), 217–222. https://doi.org/10.1177/0963721416654436

Lewandowsky, S., & Oberauer, K. (2021). Worldview-motivated rejection of science and the norms of science. *Cognition*, *215*, 104820. https://doi.org/10.1016/j.cognition.2021.104820

Linden, S. van der. (2021). The Gateway Belief Model (GBM): A review and research agenda for communicating the scientific consensus on climate change. *Current Opinion in Psychology*, *42*, 7–12. https://doi.org/10.1016/j.copsyc.2021.01.005

Lindholt, M. F., Jørgensen, F., Bor, A., & Petersen, M. B. (2021). Public acceptance of COVID-19 vaccines: cross-national evidence on levels and individual-level predictors using observational data. *BMJ Open*, *11*(6), e048172. https://doi.org/10.1136/bmjopen-2020-048172

Liquin, E. G., & Lombrozo, T. (2022). Motivated to learn: An account of explanatory satisfaction. *Cognitive Psychology*, *132*, 101453. https://doi.org/10.1016/j.cogpsych.2021.101453

Lombrozo, T. (2006). The structure and function of explanations. *Trends in Cognitive Sciences*, *10*(10), 464–470. https://doi.org/10.1016/j.tics.2006.08.004

Lombrozo, T. (2007). Simplicity and probability in causal explanation. *Cognitive Psychology*, *55*(3), 232–257. https://doi.org/10.1016/j.cogpsych.2006.09.006

Lupia, A., Allison, D. B., Jamieson, K. H., Heimberg, J., Skipper, M., & Wolf, S. M. (2024). Trends in US public confidence in science and opportunities for progress. *Proceedings of the National Academy of Sciences*, *121*(11), e2319488121. https://doi.org/10.1073/pnas.2319488121

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An Integrative Model of Organizational Trust. *The Academy of Management Review*, *20*(3), 709. https://doi.org/10.2307/258792

Maynard-Smith, J., & Harper, D. (2003). *Animal signals*. Oxford University Press.

Mercier, H. (2017). How Gullible are We? A Review of the Evidence from Psychology and Social Science. *Review of General Psychology*, *21*(2), 103–122. https://doi.org/10.1037/gpr0000111

Mercier, H. (2020). *Not born yesterday: the science of who* *we trust and what we believe*. https://doi.org/10.1515/9780691198842

Mercier, H., & Morin, O. (2019). Majority rules: how good are we at aggregating convergent opinions? *Evolutionary Human Sciences*, *1*, e6. https://doi.org/10.1017/ehs.2019.6

Milgram, S. (1974). *Obedience to authority: An experimental view* (1st ed.). Harper & Row.

Miller, J. D. (1998). The measurement of civic scientific literacy. *Public Understanding of Science*, *7*(3), 203–223. https://doi.org/10.1088/0963-6625/7/3/001

Miller, J. D. (2004). Public Understanding of, and Attitudes toward, Scientific Research: What We Know and What We Need to Know. *Public Understanding of Science*, *13*(3), 273–294. https://doi.org/10.1177/0963662504044908

Motta, M. (2018). The enduring effect of scientific interest on trust in climate scientists in the United States. *Nature Climate Change*, *8*(6), 485–488. https://doi.org/10.1038/s41558-018-0126-9

National Academies of Sciences, E. (2024). *Understanding and addressing misinformation about science*.

National Academies of Sciences, Engineering, and Medicine. (2016). *Science Literacy: Concepts, Contexts, and Consequences* (C. E. Snow & K. A. Dibner, Eds.). National Academies Press. https://doi.org/10.17226/23595

National Science Board, National Science Foundation. (2024). *Science and technology: Public perceptions, awareness, and information sources*. https://ncses.nsf.gov/pubs/nsb20244

Newman, N., Fletcher, R., Eddy, K., Robertson, C. T., & Nielsen, R. K. (2023). *Digital news report 2023*.

Nobles, M., Womack, C., Wonkam, A., & Wathuti, E. (2022). Science must overcome its racist legacy: Nature's guest editors speak. *Nature*, *606*(7913), 225–227. https://doi.org/10.1038/d41586-022-01527-z

Noy, S., & O'Brien, T. L. (2019). Science for good? The effects of education and national context on perceptions of science. *Public Understanding of Science*, *28*(8), 897–916. https://doi.org/10.1177/0963662519863575

Oreskes, N. (2019). *Why trust science?* Princeton University Press.

Pardo, R., & Calvo, F. (2004). The Cognitive Dimension of Public Perceptions of Science: Methodological Issues. *Public Understanding of Science*, *13*(3), 203–227. https://doi.org/10.1177/0963662504045002

Persson, E., Andersson, D., Koppel, L., Västfjäll, D., & Tinghög, G. (2021). A preregistered replication of motivated numeracy. *Cognition*, *214*, 104768. https://doi.org/10.1016/j.cognition.2021.104768

Petersen, M. B., Bor, A., Jørgensen, F., & Lindholt, M. F. (2021). Transparent communication about negative features of COVID-19 vaccines decreases acceptance but increases trust. *Proceedings of the National Academy of Sciences*, *118*(29), e2024597118. https://doi.org/10.1073/pnas.2024597118

Pfänder, J., & Altay, S. (2025). Spotting false news and doubting true news: a systematic review and meta-analysis of news judgements. *Nature Human Behaviour*, 1–12. https://doi.org/10.1038/s41562-024-02086-1

Pfänder, J., De Courson, B., & Mercier, H. (2025). How wise is the crowd: Can we infer people are accurate and competent merely because they agree with each other? *Cognition*, *255*, 106005. https://doi.org/10.1016/j.cognition.2024.106005

Pfänder, J., Kerzreho, L., & Mercier, H. (2025). *Quasi-universal acceptance of basic science in the US*. https://doi.org/10.31219/osf.io/qc43v_v2

Pfänder, J., & Mercier, H. (2025). *The french trust more the sciences they perceive as precise and consensual*. https://doi.org/10.31219/osf.io/k9m6e_v1

Pfänder, J., Rouilhan, S. D., & Mercier, H. (2025). *Trusting but forgetting impressive science*. https://doi.org/10.31219/osf.io/argq5_v1

Read, S. J., & Marcus-Newhall, A. (1993). Explanatory coherence in social explanations: A parallel distributed processing account. *Journal of Personality and Social Psychology*, *65*(3), 429–447. https://doi.org/10.1037/0022-3514.65.3.429

Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Introduction to Special Topic Forum: Not so Different after All: A Cross-Discipline View of Trust. *The Academy of Management Review*, *23*(3), 393–404. http://www.jstor.org/stable/259285

Rutjens, B. T., & Većkalov, B. (2022). Conspiracy beliefs and science rejection. *Current Opinion in Psychology*, *46*, 101392. https://doi.org/10.1016/j.copsyc.2022.101392

Salmon, D. A., Dudley, M. Z., Glanz, J. M., & Omer, S. B. (2015). Vaccine hesitancy: Causes, consequences, and a call to action. *Vaccine*, *33*, D66–D71.

Scharff, D. P., Mathews, K. J., Jackson, P., Hoffsuemmer, J., Martin, E., & Edwards, D. (2010). More than Tuskegee: Understanding Mistrust about Research Participation. *Journal of Health Care for the Poor and Underserved*, *21*(3), 879–897. https://doi.org/10.1353/hpu.0.0323

Scheufele, D. A. (2022). Thirty years of science–society interfaces: What's next? *Public Understanding of Science*, *31*(3), 297–304. https://doi.org/10.1177/09636625221075947

Scheufele, D. A., & Krause, N. M. (2019). Science audiences, misinformation, and fake news. *Proceedings of the National Academy of Sciences*, *116*(16), 7662–7669. https://doi.org/10.1073/pnas.1805871115

Smith, T. W., & Son, J. (2013). Trends in public attitudes about confidence in institutions. *General Social Survey*

Final Report.

Song, H., Markowitz, D. M., & Taylor, S. H. (2022). Trusting on the shoulders of open giants? Open science increases trust in science for the public and academics. *Journal of Communication*, *72*(4), 497–510. https://doi.org/10.1093/joc/jqac017

Sperber, D., Clément, F., Heintz, C., Mascaro, O., Mercier, H., Origgi, G., & Wilson, D. (2010). Epistemic vigilance. *Mind & Language*, *25*(4), 359–393.

Stagnaro, M. N., Tappin, B. M., & Rand, D. G. (2023). No association between numerical ability and politically motivated reasoning in a large US probability sample. *Proceedings of the National Academy of Sciences*, *120*(32), e2301491120. https://doi.org/10.1073/pnas.2301491120

Sturgis, P., & Allum, N. (2004). Science in Society: Re-Evaluating the Deficit Model of Public Attitudes. *Public Understanding of Science*, *13*(1), 55–74. https://doi.org/10.1177/0963662504042690

Sturgis, P., Brunton-Smith, I., & Jackson, J. (2021). Trust in science, social consensus and vaccine confidence. *Nature Human Behaviour*, *5*(11), 1528–1534. https://doi.org/10.1038/s41562-021-01115-7

Van Stekelenburg, A., Schaap, G., Veling, H., Van 'T Riet, J., & Buijzen, M. (2022). Scientific-Consensus Communication About Contested Science: A Preregistered Meta-Analysis. *Psychological Science*, *33*(12), 1989–2008. https://doi.org/10.1177/09567976221083219

Većkalov, B., Geiger, S. J., Bartoš, F., White, M. P., Rutjens, B. T., Harreveld, F. van, Stablum, F., Akın, B., Aldoh, A., Bai, J., Berglund, F., Bratina Zimic, A., Broyles, M., Catania, A., Chen, A., Chorzępa, M., Farahat, E., Götz, J., Hoter-Ishay, B., … Linden, S. van der. (2024). A 27-country test of communicating the scientific consensus on climate change. *Nature Human Behaviour*, 1–14. https://doi.org/10.1038/s41562-024-01928-2

Wellcome Global Monitor. (2018). *Wellcome Global Monitor 2018*. https://wellcome.org/reports/wellcome-global-monitor/2018

Wellcome Global Monitor. (2020). *Wellcome Global Monitor 2020: Covid-19*. https://wellcome.org/reports/wellcome-global-monitor-covid-19/2020

Wellcome Global Monitor. (2021). *Public trust in scientists rose during the Covid-19 pandemic | News*. https://wellcome.org/news/public-trust-scientists-rose-during-covid-19-pandemic

Wilholt, T. (2013). Epistemic trust in science. *The British Journal for the Philosophy of Science*, *64*(2), 233–253. https://doi.org/10.1093/bjps/axs007

Wintterlin, F., Hendriks, F., Mede, N. G., Bromme, R., Metag, J., & Schäfer, M. S. (2022). Predicting public trust in science: The role of basic orientations toward science, perceived trustworthiness of scientists, and experiences with science. *Frontiers in Communication*, *6*. https://doi.org/10.3389/fcomm.2021.822757

Zaller, J. (1992). *The nature and origins of mass opinion*. Cambridge university press.