



Misperceptions in a post-truth world: Effects of subjectivism and cultural relativism on bullshit receptivity and conspiracist ideation

Julia Aspernäs^{*}, Arvid Erlandsson, Artur Nilsson

Department of Behavioural Sciences and Learning, Linköping University, SE – 581 83 Linköping, Sweden

ARTICLE INFO

Keywords:

Truth relativism
Epistemic beliefs
Misinformation
Conspiracy theories
Pseudo-profound bullshit
Subjectivism
Cultural relativism
Analytical thinking
Actively open-minded thinking
Post-truth

ABSTRACT

This research investigated whether belief in truth relativism yields higher receptivity to misinformation. Two studies with representative samples from Sweden (Study 1, $N = 1005$) and the UK (Study 2, $N = 417$) disentangled two forms of truth relativism: subjectivism (truth is relative to subjective intuitions) and cultural relativism (truth is relative to cultural context). In Study 1, subjectivism was more strongly associated with receptivity to pseudo-profound bullshit and conspiracy theories than cultural relativism was. In Study 2 (pre-registered), subjectivism predicted higher receptivity to both forms of misinformation over and above effects of analytical and actively open-minded thinking, profoundness receptivity, ideology, and demographics; the unique effects of cultural relativism were in the *opposite* direction (Study 1) or non-significant (Study 2).

1. Introduction

If factual information is to democracy what money is to economy, then public discourse built on falsehood makes democratic societies go bankrupt (Kuklinski et al., 2000). In modern democracies, the major obstacle for citizens in making informed decisions on what to believe is indeed the spread of inaccurate information rather than a lack of information. The Oxford Dictionaries famously named *post-truth* “word of the year” in 2016, and its relevance has not declined since. As false news are spread at a higher rate than real news online (Vosoughi et al., 2018) and the importance of facts in political discourse is receding (e.g., Jamieson, 2015; Lewandowsky et al., 2017), those who wish to get the public’s attention have fewer incentives to be accurate and may instead resort to manipulative rhetoric, seductive narratives, and demagoguery (Kuklinski et al., 2000; Lewandowsky et al., 2017). Individuals with more liberal views on the criteria that need to be met in order for a statement to be deemed “true” may be more vulnerable to endorsing falsehood. In other words, *truth relativism* may be the perfect soil for cultivating false beliefs.

Relativism comes in many forms, and an individual holding relativist views need not subscribe to all of them. The phenomenon that the relativist considers to be impossible to objectively determine varies across different forms of relativism (e.g., truth, morality, or beauty), as

do the factors that the phenomena are considered to be *relative to* (e.g., cultural norms, subjective intuitions, or theoretical systems). Common to all forms of *truth relativism*, however, is a denial of the existence of objective truths that hold up independent of perspective. A person who believes that truth is relative to cultural, subjective, or other kinds of perspectives may be more likely to believe in false information so long as it accords with cultural groups’ or their own personal perception. Rejecting false claims when presented with evidence that contradict them may require an acknowledgement of the possibility that a statement can be objectively false, regardless of how many people believe in it or how it makes you feel. Nonetheless, the construct of truth relativism has received scant attention in contemporary psychological research and there are hitherto few empirical investigations of its role in receptivity to misinformation.

In the current research, the goal was therefore to assess this link in a rigorous and systematic manner, by first making sure that truth relativism is measured in a psychometrically sound way. Across two studies (one of which was preregistered), we found evidence of two main factors of truth relativism: cultural relativism and subjectivist relativism (or subjectivism). We compared associations between these forms of relativism and receptivity to conspiracy theories and pseudo-profound bullshit over and above other known predictors of receptivity to misinformation, such as analytical thinking, actively open-minded

^{*} Corresponding author.

E-mail addresses: Julia.Aspernas@liu.se (J. Aspernäs), Arvid.Erlandsson@liu.se (A. Erlandsson), Artur.Nilsson@liu.se (A. Nilsson).

<https://doi.org/10.1016/j.jrp.2023.104394>

Received 22 December 2022; Received in revised form 25 April 2023; Accepted 9 June 2023

Available online 10 June 2023

0092-6566/© 2023 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

thinking, and political ideology. Overall, we found that subjectivism was the most pernicious form of truth relativism, with the most detrimental effects on receptivity to misinformation.

1.1. Truth relativism

Psychological research on *epistemic beliefs* concerning the nature, sources, and justification of knowledge (Chinn et al., 2011) has almost exclusively been confined to educational psychology, with a focus on how beliefs of students impact learning in adolescence (e.g., Cartiff et al., 2021). The role of epistemic beliefs in how adults digest information has received much less attention. Although there have been notable attempts to elucidate individual differences in epistemological beliefs among adults as well (e.g., Coan, 1979; Johnson et al., 1988; Kramer et al., 1992; Unger et al., 1986; Royce & Mos, 1980), most of these studies were conducted several decades ago and have failed to generate scale development or validation adhering to modern psychometric standards (for an exception, see Nilsson, 2014a; Nilsson & Strupp-Levitsky, 2016). There is thus a lack of systematic work on the nature and significance of epistemological beliefs among adults (Nilsson & Bäckström, 2022).

An adult's beliefs about the nature of truth are plausibly rather stable and to some extent involved in how they interact with the world. Personality theories are today increasingly recognizing that beliefs, values, goals, strivings, life stories and other aspects of the subject's point of view are integral parts of an individual's personality (e.g., McAdams & Pals, 2006; Nilsson, 2014b; Möttus et al., 2020). These characteristics may be more sensitive to environmental factors than dispositional traits (Kandler et al., 2022) and develop later in life, but they tend to show similar levels of stability and universality in adulthood (e.g., Kandler et al., 2014; Leung et al., 2012). Research on which personality characteristics make people more receptive to misinformation should thus take beliefs into consideration.

1.1.1. Measuring truth relativism

Some of the earlier attempts to capture epistemological beliefs purported to address relevant constructs such as *relativism*, *absolutism*, *objectivism*, *postmodernism*, or *constructionism* (e.g., de Zavala & Van Bergh, 2007; Johnson et al., 1988; Kramer et al., 1992; Martin et al., 1994; Unger et al., 1986). Although some of the measures that were used in these studies do contain items that appear to tap into truth relativism (e.g., de Zavala & Van Bergh, 2007; Kramer et al., 1992; Martin et al., 1994), these tend to be mixed with items covering many other kinds of worldview beliefs (e.g., view of human nature, society, morality, and the universe) and even dispositional traits (e.g., openness and intuitive thinking), which makes it difficult to isolate the role of truth relativism specifically. Furthermore, the focus in these research programs was not on understanding the role of epistemological beliefs in receptivity to misinformation.

In a first attempt to map associations between epistemic beliefs and receptivity to misinformation, Garrett and Weeks (2017) developed measures of three epistemic beliefs: *faith in intuition for facts* and *need for evidence*, which seem to be intended to reflect beliefs about the sources and justification of truth, and *truth is political*, which seems to be intended to reflect beliefs about the nature of truth. Their results indicated that epistemic beliefs uniquely predicted beliefs concerning conspiracy theories and high profile scientific and political issues over and above other relevant predictors such as religious fundamentalism, need for cognition, education, and political ideology. Faith in intuition for facts and belief that truth is political predicted less belief accuracy and stronger endorsement of conspiracy theories, while the opposite was true for need for evidence. Similar results were later found with fake news discernment and belief in conspiracy theories as outcomes (Rudloff et al., 2022; Rudloff & Appel, 2022).

While this research program is innovative and thought-provoking, it is important to consider exactly what is being measured. The truth is

political scale is composed of items that capture beliefs about whether societal forces and powerholders influence what is *regarded* or *presented* as true (e.g., “Scientific conclusions are shaped by politics” and “What counts as truth is defined by power”)—that is to say, a belief about the nature of *society* (cf. Unger et al., 1986)—rather than the nature of *truth* *per se*. Moreover, the items could have been perceived as stating that “the elite” tells the people what to believe. Individuals with conspiracist ideation often mistrust institutions (e.g., Bruder & Kunert, 2022), which could explain part of the positive associations between the truth is political scale and belief in conspiracy theories—they may very well believe that those in power attempt to influence public discourse and indoctrinate citizens by concealing what is true regardless of whether they subscribe to truth relativism or not. In other words, while this research program is highly relevant and important for understanding why people fall for misinformation, it did not address the role of truth relativism (as traditionally defined in philosophy) *per se*, which was the goal of the current research.

1.1.2. Types of truth relativism

There are different forms of truth relativism. Cultural relativism is the belief that truth-values depend on cultural or societal perspectives. This means that beliefs in different cultural contexts can be true at the same time even when they seemingly contradict each other. In other words, if different groups or cultures have disparate views on a factual matter (e.g., the Big Bang), a cultural relativist could argue that both perspectives are equally true; not just equally valid as views that should be respected or tolerated but equally *true*. By contrast, subjectivism is the belief that truth-values depend on people's subjective mental lives. That is, if a person believes, feels, or intuitively that something is true, then it is true. This means that the truth-value of a statement lacks connection to the world outside of the individual. While the cultural relativist positions truth in the convictions or epistemic norms that social groups have reached consensus on, the subjectivist places truth in each and every individual's personal belief. In other words, there are potentially as many truths about a factual matter as there are people on earth.

This distinction between cultural and subjectivist forms of truth relativism has great theoretical relevance. In particular, it may entail a substantial difference in receptivity to misinformation. The subjectivist's emphasis on personal intuition could yield a vulnerability to seductive narratives devised to evoke feelings rather than provide accurate accounts of reality. On classical dual process accounts (e.g., Kahneman, 2011; Stanovich & West, 1998), cognitive biases and errors are increased by intuitive thinking and spontaneous responses. Consistent with these accounts, faith in intuition for facts, which was intended to measure the inclination to determine accuracy in terms of whether something *feels right* in the study by Garrett and Weeks (2017), predicted greater receptivity to misinformation. This result is in line with previous research on the role of intuitive thinking in susceptibility to false beliefs (Bensley et al., 2014; Erceg et al., 2020; Evans et al., 2020; Sterling et al., 2016; Tomljenovic et al., 2019). Receptivity to misinformation may not be as pervasive among cultural relativists insofar as their beliefs are constrained by widely shared cultural convictions and therefore less amenable to subjective intuition. Furthermore, the likelihood of rejecting false beliefs in the face of contradictory evidence is plausibly lower among subjectivists. According to motivated reasoning accounts (e.g., Kunda, 1990), the human tendency to prefer information that fits with their preconceptions is only overridden through an active motivation to thwart gut reactions (e.g., Pennycook et al., 2021). This motivation may matter little to subjectivists, who think that accuracy can be gauged in terms of their subjective feelings. By contrast, the cultural relativist's willingness to acknowledge different cultural perspectives may to some extent reflect intellectual humility, which is associated with openness and tolerance, as well as an awareness of the fallibility of personal beliefs (Leary et al., 2017).

1.2. Competing predictors

Even if truth relativism predicts receptivity to misinformation, it might be that this occurs solely by virtue of its associations with other well-known predictors of receptivity to misinformation. It is therefore important to investigate whether truth relativism is associated with other predictors and whether it uniquely predicts receptivity to misinformation over and above competing predictors.

Among the most investigated predictors is *analytical thinking*. The evidence suggesting that those with greater analytical ability are superior at detecting and rejecting misinformation is plentiful. For instance, analytical thinking has been shown to improve discernment of fake news from real news (Bago et al., 2020; Pennycook & Rand, 2019), reduce belief bias (Aspernäs et al., 2022; Toplak et al., 2011; Trippas et al., 2015), and mitigate pro-Kremlin disinformation (Erlach et al., 2022). Nevertheless, resisting misinformation requires not only analytical abilities but also a motivation to be accurate, or to engage in *actively open-minded thinking*. This means intentionally seeking out and considering contrary evidence, with a willingness to reject beliefs that cannot stand the test of scrutiny, and tolerance of individuals with different beliefs (Baron et al., 1990; Stanovich & West, 1997; Svedholm-Häkkinen & Lindeman, 2018). Actively open-minded thinking has been found to predict accurate beliefs on politically contaminated issues regardless of analytical ability or political sympathies (Stenhouse et al., 2018), as well as critical thinking skills over and above the effect of general cognitive ability (Stanovich & West, 1997; West et al., 2008). Recent studies have shown that items constructed to measure actively open-minded thinking load on several distinct factors, including *dogmatism*, *fact resistance*, and *belief personification* (Svedholm-Häkkinen & Lindeman, 2018).

Other studies have suggested that right-wing conservatives tend to be disproportionately susceptible to misinformation (Imhoff et al., 2022; Nilsson et al., 2019; van Prooijen et al., 2022). Some researchers have argued that conservative ideology tends to attract persons with cognitive characteristics and personality traits that make them more reliant on intuition and gut reactions in their evaluation of information (e.g., Jost & Amodio, 2012), while others have emphasized similarities between individuals of different ideological stripes in terms of cognitive biases (e.g., Ditto et al., 2019).

1.3. Receptivity to misinformation

Misinformation can consist either of clear-cut falsehood, which is common in conspiracy theories, or of a seductive ambiguous presentation which rather *misleads* the recipient, as in the case of pseudo-profound bullshit. Although most past research in this area (e.g., Garrett & Weeks, 2017) has focused on belief in conspiracy theories and other clear-cut falsehoods, pseudo-profound bullshit is also highly relevant because it may be particularly appealing to subjectivists, who equate truth with what *feels* right.

1.3.1. Belief in conspiracy theories

Conspiracy theories typically attribute socially or politically significant events, such as the 9/11 attacks in the U.S., to secret malicious plots involving powerful people or institutions (Wood et al., 2012). While some conspiracy theories may indeed be true, individuals who believe in one conspiracy theory often believe in other conspiracy theories (e.g., Bruder et al., 2013; Goertzel, 1994; Swami & Coles et al., 2011) even when they are incompatible (Wood et al., 2012), adopting a general conspiracist mindset or worldview (e.g., Imhoff & Bruder, 2014; Swami & Coles, 2010). They often show a preference for simple solutions and antipathy toward individuals with competing worldviews (Imhoff et al., 2022), along with a lack of analytical and actively open-minded thinking (Stanovich, West, & Toplak, 2016; Swami et al., 2014). Subjectivists may be particularly likely to adopt a conspiracist mindset insofar as they are reluctant to complicate matters with demands for evidence and accuracy; and they may be vulnerable to the emotional appeals that help

conspiracy theories attract sympathy (Basol et al., 2021; Roozenbeek & van der Linden, 2019). Conspiracy theories could be less appealing to someone who construes truth in terms of correspondence with an external world in general than to someone who confides in either cultural consensus or subjective feelings, because they contain both claims about factual matters that are blatantly contradicted by evidence and claims about what is concealed from the public that are near impossible to falsify (Lewandowsky et al., 2013). Moreover, perhaps this signature element of conspiracist claims, i.e., revealing what is *actually* “true” despite contradictory evidence, attracts individuals who believe that truth is determined by their own subjective perception.

1.3.2. Bullshit receptivity

Bullshit refers to nonsense from someone attempting to persuade or impress without concern for what is true or false (Frankfurt, 2005). The bullshitter tries neither to speak the truth nor to lie but rather to achieve a certain effect on the audience, which makes the meaning of the message secondary to the feelings it can evoke. *Pseudo-profound* bullshit is a subtype of bullshit that uses grandiose wording to give the impression of intellectual depth. As pseudo-profound bullshit specifically operates with seductiveness, rather than with claims that can be refuted, a person who relies on subjective feelings to determine the truth-value of information may be particularly vulnerable to such language. Likewise, individuals who emphasize correspondence with reality may hesitate to endorse sentences when what is claimed is not clear. Recent studies suggest that receptivity to pseudo-profound bullshit is negatively associated with analytical thinking (Nilsson et al., 2019; Pennycook et al., 2015) and positively associated with endorsement of conservative ideology (Nilsson et al., 2019; Pfattheicher & Schindler, 2016).

1.4. Overview of research

In two studies, we investigated the association between truth relativism and receptivity to misinformation, in the form of conspiracy theories and pseudo-profound bullshit. We built on and refined a scale from a recent attempt to integrate previous theories and models of basic beliefs (Nilsson & Bäckström, 2022). This scale was created with careful consideration of the definition of truth relativism. In refining this scale, we made an effort to select and create items that aimed specifically at the nature of truth (e.g., “A factual claim that is true in one culture need not be true in another”), and nothing but the truth, i.e., *not* moral relativism and *not* the fact that different people or groups sometimes *perceive* factual matters differently.

In Study 1, exploratory analyses of responses from a representative sample of the Swedish population revealed that truth relativism could be divided into two factors: subjectivism and cultural relativism. We also found that only subjectivism predicted higher degrees of bullshit receptivity and belief in conspiracy theories while cultural relativism did not. In the preregistered Study 2, we sought to replicate the results in a representative sample of the UK population and to rigorously test hypotheses based on results of the first study by using improved measures with higher validity and reliability. In line with our preregistered hypotheses (summarized in Table 3), we were able to replicate the results from the first study—subjectivism was indeed a particularly strong predictor of receptivity to misinformation. We also found that it was negatively associated with actively open-minded thinking, corroborating our expectations.

In both studies, we measured analytical thinking, receptivity to pseudo-profound bullshit, and right (vs. left) ideology with standard measures (Frederick, 2005; Nilsson et al., 2019; Pennycook et al., 2015). In the second study, we constructed a larger pool of items to measure subjectivist and cultural relativism, reduced the scales according to preregistered criteria, and validated the distinction through confirmatory factor analysis; we measured belief in conspiracy theories on a broader spectrum of issues, including items selected from different measures (i.e., Brotherton et al., 2013; Bruder et al., 2013; Krouwel

et al., 2017; Ståhl & van Prooijen, 2018; van Prooijen et al., 2018) intended to appeal to both rightist and leftist participants; and we included measures of different components of actively-open minded thinking, namely dogmatism, fact resistance, and belief personification (Svedholm-Häkkinen & Lindeman, 2018). In both studies, we investigated the unique contribution of subjectivism and cultural relativism to the prediction of receptivity to misinformation when controlling for competing predictors. We report all measures and exclusions in both studies.

2. Study 1

2.1. Method

2.1.1. Participants

We collected the data in June of 2020 in collaboration with the independent research firm Origo. Some of the data were collected for a previous research project, whose results have been reported elsewhere (*masked for blind review*). Unlike Study 2, the analyses in Study 1 were exploratory and not preregistered. All materials, including data, codebook, and analysis code, can be found on the OSF-page: https://osf.io/j3rkz/?view_only=6f279782ce0e4bf4845df50e0ce4c8e2. The sample size was based on a power analysis conducted in Gpower 3.19 which suggested that 1000 participants would be sufficient to detect effects in the analysis testing the previous research project's central hypothesis (*masked for blind review*). The sample was representative of the Swedish adult population in terms of age, gender, education level, geographic region, and political sympathies. We received data from 1283 participants and excluded eight participants who did not give their consent to participate and 270 participants who failed an attention check. Out of the remaining participants, six did not complete the full survey but were included in the analyses, leaving the total sample size at 1005 participants (500 women, 497 men, 2 unspecified gender, and 6 who did not report age or gender; $M_{\text{age}} = 46.3$ years, $SD = 15.5$).

2.1.2. Materials and procedure

The participants completed an online survey with seven sections in a fixed order. We informed the participants at the beginning of the survey that it would include an attention check to make sure that they were reading the questions. Five of the sections included measures of truth relativism, bullshit receptivity, belief in conspiracy theories, analytical thinking, and demographics and political orientation. All participants also completed a section with measures of ideological belief bias (*masked for blind review*) and one of two manipulation checks. The dataset and all materials can be found in the [supplementary material](#).

2.1.2.1. Truth relativism. We built on a recent attempt to comprehensively integrate the literature on basic beliefs, which resulted in the development of a multitude of distinct scales measuring beliefs about epistemology, metaphysics, human nature, and the world. Truth anti-realism (which encompasses truth relativism) was specified as one of the 36 original belief dimensions (Nilsson & Bäckström, 2022). We used the best performing seven relativism items. The items were presented in a randomized order, and the participants responded to whether they agreed with them or not on a scale from 1 ("Completely disagree") to 7 ("Completely agree"). Results from exploratory factor analyses (using data from Nilsson & Bäckström, 2022) suggested that subjectivism and cultural relativism may be distinct factors. We therefore performed confirmatory factor analysis using the current data in AMOS 25.0 to formally test this. We compared the fit of a two-factor model with the fit of a one-factor model (with items as indicators and maximum likelihood estimation) in terms of the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Root Mean Squared Residual (SRMR). Common rules of thumb suggest that obtaining CFI > 0.95, RMSEA < 0.06, and SRMR < 0.08 is desirable under many

circumstances (Hu & Bentler, 1999). The fit of the two-factor model was excellent, $\chi^2(13) = 55.1$ ($p < .001$), CFI = 0.978, RMSEA = 0.050 (90 % CI [0.037, 0.064]), SRMR = 0.0326. Merging the factors into a one-factor model yielded substantially lower fit, $\Delta\chi^2(1) = 86.6$ ($p < .001$), $\chi^2(14) = 141.7$ ($p < .001$), CFI = 0.932, RMSEA = 0.084 (90 % CI [0.072, 0.097]), SRMR = 0.0465. Based on these results we constructed separate scales from four subjectivism items (e.g., "Truth is a subjective feeling; if it feels correct or obvious to a person then it is true"; $M = 2.88$, $SD = 0.95$; $\alpha = 0.75$; $\omega_t = 0.77$) and three cultural relativism items (e.g., "What is true varies from one situation and society to another"; $M = 3.31$, $SD = 0.88$; $\alpha = 0.55$). All items and their means and standard deviations can be found in [Supplement 1](#).

2.1.2.2. Bullshit and profoundness receptivity. We used a short-version of the Swedish bullshit and profoundness receptivity scale (Erlandsson et al., 2018), which has exhibited excellent structural validity: i.e., bullshit- and profoundness-receptivity were homogenous factors that were distinct from each other (Nilsson et al., 2019). We used four pseudo-profound bullshit sentences (e.g., "The hidden meaning transforms the abstract beauty") and four genuinely profound aphorisms (e.g., "A river cuts through a rock, not because of its power but its persistence"). The profoundness receptivity items were included in regression analyses to control for the possibility that some individuals rate everything as meaningful (Nilsson et al., 2019). All items were presented in a randomized order. The participants rated the meaningfulness of the sentences on a scale from 1 ("Not at all meaningful") to 5 ("Very meaningful") ($M_{\text{bullshit}} = 2.99$, $SD = 0.80$; $\alpha = 0.71$; $\omega_h = 0.65$; $\omega_t = 0.72$; $M_{\text{profound}} = 4.18$, $SD = 0.80$; $\alpha = 0.64$; $\omega_h = 0.62$; $\omega_t = 0.65$).

2.1.2.3. Conspiracy theories. We used two COVID-19-related items (e.g., "Governments have hidden important information about how the spread of the coronavirus could be stopped"). The participants responded on a scale from 1 ("Do not at all believe it") to 5 ("Believe it completely") ($M = 2.31$, $SD = 1.09$; $\alpha = 0.69$).

2.1.2.4. Analytical thinking. We measured analytical thinking with the three original cognitive reflection test items (Frederick, 2005; $M = 0.95$, $SD = 1.07$; $\alpha = 0.67$), which have previously been translated into Swedish and used in several studies (e.g., Nilsson et al., 2019). The currency and amount are replaced in the first item to make it fit in a Swedish context: "A bat and a ball cost 110 SEK in total. The bat costs 100 SEK more than the ball. How much does the ball cost?"

2.1.2.5. Political orientation. The participants reported general left-right self-placement on a scale from 1 ("Very far to the left") to 9 ("Very far to the right") ($M = 5.01$, $SD = 1.91$). This type of self-placement item is widely used in political psychology (e.g., Jost, 2006). The participants also reported party preference and self-placement on social conservative and economic issues (these responses are included in data files but not in the analyses).

2.1.2.6. Demographics. The participants reported their gender, age, and level of education with the following options: 1 = "Not finished elementary school" ($n = 4$), 2 = "Finished elementary school" ($n = 84$), 3 = "Finished high school" ($n = 397$), 4 = "Started studies at the university" ($n = 125$), and 5 = "University degree" ($n = 389$).

2.1.3. Statistical analyses

We report Pearson correlations and results of linear regression analyses. In the regression analysis predicting belief in conspiracy theories, we entered subjectivism and cultural relativism in the first step, followed by analytical thinking in the second step, demographics (male gender, age, and education level) in the third step, and lastly right (vs. left) self-placement in the fourth step. In the regression analysis predicting bullshit receptivity, we entered the same variables in the same

order, but we entered profoundness receptivity in the second step, making it a total of five steps.

We investigated the differences between subjectivism and cultural relativism in terms of their associations with receptivity to bullshit and conspiracy theories by computing Steiger z -tests and through inspection of bias-corrected 95 % bootstrap confidence intervals (10,000 resamples) of the correlation coefficients (two parameters significantly differ in magnitude at $p < .05$ if their 95 % confidence intervals overlap by less than half the length of one arm, Cumming, 2009).

We report Cronbach's alpha, omega hierarchical, and omega total reliability coefficients that were calculated using the psych package (v. 2.3.3; Revelle, 2023) in R (v. 4.2.3). The omega coefficients represent the extent to which the variance in item responses is saturated by one general factor (omega hierarchical) and by all factors (omega total) and they do, unlike Cronbach's alpha, not rely on the often-unrealistic assumption of tau equivalency (Zinbarg et al., 2005). We report the hierarchical omega coefficients only for scales with four or more items where we were able to obtain a correct estimate of this coefficient. R code is available in [supplementary material](#).

2.2. Results

The correlations displayed in Table 1 indicate that subjectivism and cultural relativism were strongly positively related to each other ($p < .001$) but varied in their associations to other variables. Subjectivism was moderately positively related to bullshit receptivity and to belief in conspiracy theories ($p < .001$). Cultural relativism, on the other hand, was weakly positively related to bullshit receptivity ($p < .001$), but *not* to belief in conspiracy theories ($p = .147$).

As subjectivism and cultural relativism had such strikingly different relations to bullshit receptivity and belief in conspiracy theories, we investigated these correlations more thoroughly. Bullshit receptivity was more strongly associated with subjectivism ($r = 0.30$ [0.23, 0.36]) than with cultural relativism ($r = 0.11$ [0.04, 0.18]; $z = 6.10$, $p < .001$). Belief in conspiracy theories was also more strongly associated with subjectivism ($r = 0.25$ [0.19, 0.31]) than with cultural relativism ($r = 0.05$ [−0.02, 0.11]; $z = 6.71$, $p < .001$).

The results from the regression analyses displayed in Table 2

revealed even more striking dissimilarities between subjectivism and cultural relativism. After controlling for the other form of truth relativism, competing predictors, and demographics, only subjectivism was positively associated with bullshit receptivity and endorsement of conspiracy theories ($p < .001$), while cultural relativism was *negatively* associated with both bullshit receptivity ($p = .016$) and belief in conspiracy theories ($p = .001$). In other words, unique aspects of cultural relativism that do not overlap with subjectivism predicted *less* receptivity to bullshit and conspiracy theories.

2.3. Discussion

The results indicate not only that subjectivism and cultural relativism are distinct forms of truth relativism, but also that they may differ profoundly in terms of their associations with receptivity to misinformation. They suggest that subjectivism entails a particular vulnerability to misinformation, whereas cultural relativism may be less harmful. The results were, however, exploratory and would need to be corroborated with a preregistered hypothesis test and more rigorous measurement.

3. Study 2

In this study, we investigated whether the distinction between subjectivism and cultural relativism, and their respective associations with receptivity to misinformation, would hold up with more substantive measures and additional competing predictors taken into consideration. We also looked more closely at the relation between truth relativism and actively open-minded thinking (dogmatism, fact resistance, and belief personification subscales), which is particularly interesting given that a subjectivist, who views truth as determined by personal intuition, may find actively open-minded scrutiny of evidence redundant and irrelevant.

Our time-stamped preregistration (https://aspredicted.org/blind.php?x=N8Z_T4H) included the hypotheses, study design, planned sample size, inclusion and exclusion criteria, and planned primary analyses. The preregistered hypotheses are shown in Table 3. These were based on results from Study 1 together with literature suggesting that an over-reliance on intuition (and by implication subjectivity as a gauge for

Table 1
Bivariate Pearson correlations with 95 % confidence intervals between the variables.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Subjectivism									
2. Cultural relativism	0.508 [0.460, 0.552]***								
3. Bullshit receptivity	0.295 [0.237, 0.350]***	0.109 [0.048, 0.170]***							
4. Profoundness receptivity	−0.010 [−0.072, 0.052]	0.105 [0.043, 0.166]***	0.117 [0.056, 0.178]***						
5. Belief in conspiracy theories	0.253 [0.194, 0.310]***	0.046 [−0.016, 0.108]	0.234 [0.174, 0.291]***	−0.089 [−0.150, −0.027]**					
6. Analytical thinking	−0.230 [−0.288, −0.170]***	−0.162 [−0.222, −0.102]***	−0.237 [−0.295, −0.178]***	0.143 [0.082, 0.204]***	−0.245 [−0.302, −0.186]***				
7. Right (vs. left) self-placement	−0.009 [−0.071, 0.053]	−0.038 [−0.100, 0.024]	0.029 [−0.033, 0.091]	0.024 [−0.038, 0.086]	0.183 [0.123, 0.242]***	−0.016 [−0.078, 0.046]			
8. Male gender	−0.124 [−0.185, −0.063]***	−0.184 [−0.243, −0.123]***	−0.067 [−0.129, −0.005]*	−0.106 [−0.167, −0.044]***	−0.081 [−0.143, −0.019]*	0.248 [0.189, 0.306]***	0.140 [0.079, 0.201]***		
9. Age	0.050 [−0.012, 0.112]	0.060 [0.002, 0.122]	0.040 [−0.022, 0.102]	0.103 [0.042, 0.164]**	−0.123 [−0.184, −0.062]***	−0.122 [−0.182, −0.060]***	0.057 [−0.005, 0.119]	0.043 [−0.019, 0.105]	
10. Education level	−0.114 [−0.175, −0.053]***	0.037 [−0.025, 0.099]	−0.135 [−0.195, −0.074]***	0.152 [0.091, 0.213]***	−0.153 [−0.213, −0.091]***	0.193 [0.132, 0.252]***	−0.001 [−0.063, 0.061]	−0.048 [−0.110, 0.014]	−0.076 [−0.137, −0.014]**

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

Table 2

Standardized regression coefficients from linear regression analyses predicting bullshit receptivity and belief in conspiracy theories respectively.

	Bullshit receptivity					Belief in conspiracy theories			
	Step 1R ² = 9.1 %	Step 2R ² = 10.5 %	Step 3R ² = 14.2 %	Step 4R ² = 14.9 %	Step 5R ² = 14.8 %	Step 1R ² = 7.4 %	Step 2R ² = 11.1 %	Step 3R ² = 14.7 %	Step 4
Subjectivism	0.331***	0.341***	0.303***	0.291***	0.291***	0.317***	0.277***	0.266***	0.264***
Cultural relativism	−0.063	−0.081*	−0.098**	−0.084*	−0.084*	−0.119***	−0.131***	−0.116***	−0.110**
Profoundness receptivity		0.125***	0.155***	0.171***	0.170***				
Analytical thinking			−0.204***	−0.197***	−0.196***		−0.198***	−0.196***	−0.185***
Male gender				0.017	0.014			−0.018	−0.047
Age				−0.032	−0.033			−0.177***	−0.187***
Education level				−0.092**	−0.093**			−0.098***	−0.102***
Right (vs. left) self- placement					0.021				0.200***

Note: *** $p < .001$; ** $p < .01$; * $p < .05$.**Table 3**

Summary of hypotheses.

	Description
H1	Participants with a higher degree of subjectivism will be more likely to perceive bullshit as meaningful.
H2	Participants with a higher degree of subjectivism will be more likely to believe in conspiracy theories.
H3	Subjectivism will predict bullshit receptivity more strongly than cultural relativism will.
H4	Subjectivism will predict endorsement of conspiracy theories more strongly than cultural relativism will.
H5	Subjectivism will be negatively associated with actively open-minded thinking including dogmatism, fact resistance, and belief personification.

truth) may increase receptivity to misinformation.

3.1. Method

3.1.1. Participants

We collected the data from Prolific in September–October of 2021 (all materials can be accessed through OSF: https://osf.io/j3rkz/?view_only=6f279782ce0e4bf4845df50e0ce4c8e2). The power analysis based on the results from Study 1 suggested that a sample size of around 250 should give us more than 80 % power to detect the hypothesized effects, and a sample of this size is likely to yield stable estimates of correlation coefficients (Schönbrodt & Perugini, 2013). Nevertheless, as we planned to exclude participants who failed both of our two attention checks, and effect sizes in replication studies tend to be smaller than the original effects, we requested a sample of 400 participants that was representative of the UK population in terms of age, sex, and ethnicity. We received data from 444 participants who gave their informed consent to participate in the study. The final sample consisted of 417 participants who had completed the survey and passed at least one of our two attention checks (218 women, 195 men, 4 unspecified gender, and 1 who did not report age; $M_{\text{age}} = 44.3$ years, $SD = 15.2$).

3.1.2. Materials and procedure

The participants completed an online survey with seven sections in the same order as listed below. The first five sections included the measures that were central to our hypotheses, followed by demographics and political orientation, and lastly a measure of prosocial behavior. The measure of prosociality was not related to the research questions we address in this article and is not included in the analyses. Two of the sections included attention checks. We informed participants of the attention checks and that failing to follow their instructions could lead to exclusion from the survey.

3.1.2.1. Truth relativism. We used a total of 31 items, of which seven were used in Study 1 and 24 were new. All items and their means and

standard deviations can be found in Supplement 1. We sought to create new items that were easily interpreted and varied in their wordings (to prevent methods factors) while still precise and accurate in their content. We included 15 items that were presumed to measure subjectivism (e.g., “Truths are simply personal beliefs that indicate how a person sees the world”) and 16 that were presumed to measure cultural relativism (e.g., “The truth cannot vary from place to place” – reversed). A third of the items were reversed (i.e., five items for each scale). The items were presented in a randomized order and participants responded on a scale from 1 (“Completely disagree”) to 7 (“Completely agree”). We performed confirmatory factor analysis to evaluate the subjectivism and cultural relativism scales with the same procedure as in Study 1. In accordance with our preregistration, we iteratively excluded items with loadings below 0.30 on their designated factor (starting with those with the lowest loadings) and items that loaded approximately equally strongly on both factors. Potentially cross-loading items were identified based on modification indices. Seven subjectivism items ($M = 3.30$, $SD = 1.17$; $\alpha = 0.84$; $\omega_h = 0.76$; $\omega_t = 0.88$) and nine cultural relativism items ($M = 4.57$, $SD = 1.08$; $\alpha = 0.83$; $\omega_h = 0.74$; $\omega_t = 0.85$) satisfied the inclusion criteria ($0.30 \leq |\lambda| \leq 0.82$). The fit of the two-factor model was excellent, $\chi^2(103) = 189.7$ ($p < .001$), CFI = 0.964, RMSEA = 0.045 (90 % CI [0.035, 0.055]), SRMR = 0.0390. Merging the factors into a one-factor model yielded substantially lower fit, $\Delta\chi^2(1) = 209.2$ ($p < .001$), $\chi^2(104) = 398.9$ ($p < .001$), CFI = 0.878, RMSEA = 0.083 (90 % CI [0.074, 0.091]), SRMR = 0.0597. This indicated that our scales measured distinct factors and that we could proceed with testing our hypotheses. These scales can be found in the Appendix.

3.1.2.2. Analytical thinking. We used the same set of items as in Study 1 ($M = 1.16$, $SD = 1.18$; $\alpha = 0.74$).

3.1.2.3. Bullshit and profoundness receptivity. We used the full original set of items (seven bullshit-sentences and seven profound aphorisms) from Erlandsson et al. (2018). The item order was randomized. The participants responded on a scale from 1 (“Not at all meaningful”) to 6 (“Very meaningful”). ($M_{\text{bullshit}} = 2.80$, $SD = 1.00$; $\alpha = 0.84$; $\omega_h = 0.77$; $\omega_t = 0.88$; $M_{\text{profound}} = 4.55$, $SD = 0.80$; $\alpha = 0.73$; $\omega_h = 0.7$; $\omega_t = 0.78$).

3.1.2.4. Conspiracy theories. We used the same two COVID-19-related items used in our previous data collection as well as an additional 13 items intended to measure general conspiracist thinking that should be appealing to both groups on the right (e.g., “The science behind global warming has been invented or distorted out of self-interest”) and the left (e.g., “The economic crisis of 2007 was created deliberately by bankers to make lower and middle income groups poorer, and themselves richer”). The new 13 items were taken from the Conspiracy Mentality Questionnaire (Bruder et al., 2013), from the factors *malevolent global*, *personal well-being*, and *control of information* from the Generic Conspiracist Belief Scale (Brotherton et al., 2013), from Krouwel et al.

(2017) and Ståhl and van Prooijen (2018), and from the *economic conspiracy theories* and *other conspiracy theories* in van Prooijen et al. (2018). Because we used items from several scales, we performed exploratory factor analysis, using maximum likelihood extraction and direct oblimin rotation. The scree plot indicated that there was one clear factor (the eigenvalues fell sharply from 6.65 on factor 1 to 1.31 on factor 2) that accounted for 44.33 % of the variance in the items. Item order was randomized. Participants responded on a scale from 1 (“Do not at all believe it”) to 5 (“Believe it completely”) ($M = 2.56$, $SD = 0.78$; $\alpha = 0.91$; $\omega_h = 0.76$; $\omega_t = 0.92$).

3.1.2.5. Actively open-minded thinking. We used 14 items from a short scale (Svedholm-Häkkinen & Lindeman, 2018), all presented in a randomized order. Participants responded on a scale from 1 (“Completely disagree”) to 7 (“Completely agree”). We included items from the three (out of four) most relevant factors identified by Svedholm-Häkkinen and Lindeman (2018), namely dogmatism (“I believe that loyalty to one’s ideals and principles is more important than “open-mindedness”), fact resistance (“Beliefs should always be revised in response to new information or evidence”), and belief personification (“I tend to classify people as either for me or against me”). We subsequently dropped the belief personification scale from the analyses based on results from confirmatory factor analysis, because only one of the three scale items loaded strongly on this factor (the factor loadings were 0.22, 0.25, and 0.97; $\alpha = 0.48$). We also moved one item from the dogmatism scale to the fact resistance scale based on confirmatory factor analyses. The revised two-factor model, $\chi^2(43) = 193.8$ ($p < .001$), CFI = 0.853, RMSEA = 0.092 (90 % CI [0.079, 0.105]), SRMR = 0.0664, yielded significantly higher fit than a one-factor model, $\Delta\chi^2(1) = 50.7$ ($p < .001$), $\chi^2(44) = 244.5$ ($p < .001$), CFI = 0.805, RMSEA = 0.105 (90 % CI [0.092, 0.118]), SRMR = 0.0756. We therefore retained the distinction between dogmatism ($M = 3.06$, $SD = 1.07$; $\alpha = 0.71$; $\omega_h = 0.56$; $\omega_t = 0.77$) and fact resistance ($M = 2.72$, $SD = 0.93$; $\alpha = 0.72$; $\omega_h = 0.56$; $\omega_t = 0.82$). All items and their means and standard deviations can be found in Supplement 1.

3.1.2.6. Demographics. Aside from gender and age, we collected demographic information on left–right political self-placement on a scale from 1 (“Very far to the left”) to 9 (“Very far to the right”) ($M = 4.61$, $SD = 1.40$), and education level: 1 = “Not finished elementary school” ($n = 0$), 2 = “Finished elementary school” ($n = 8$), 3 = “Finished high school” ($n = 84$), 4 = “Started studies at college or university” ($n = 88$), and 5 = “College or university degree” ($n = 237$).

3.1.2.7. Attention checks. We included the first attention check in the truth relativism section (“This is a test to check if you are reading the statements. Please ensure that you are reading this statement by ticking Completely agree.”) and the second in the bullshit receptivity section (“The purpose of this item is for you to show us that you are paying attention. Show us that you are paying attention by ticking Not at all meaningful.”). The wording of both attention checks resembled the respective section’s other items.

3.1.3. Statistical analyses

As stated in our preregistration, we report tests of Pearson correlation and results of linear regression analyses. These were conducted in the same manner as in Study 1, with the exception of the linear regression analyses predicting bullshit receptivity and belief in conspiracy theories respectively, where we included dogmatism and fact resistance in the final steps together with right (vs. left) self-placement.

We also report results from linear regression analyses predicting dogmatism and fact resistance respectively where we entered subjectivism and cultural relativism in the first steps, analytical thinking in the second steps, demographics in the third steps, and right (vs. left) self-placement in the final fourth steps.¹ Deviations from our preregistration include adding right (vs. left) self-placement, dogmatism, and fact resistance in the last step of the regression analyses predicting receptivity to bullshit and conspiracy theories and adding right (vs. left) self-placement in the last step of the regression analyses predicting dogmatism and fact resistance.

As in Study 1, we investigated whether subjectivism would predict bullshit receptivity and endorsement of conspiracy theories more strongly than would cultural relativism through comparison of the bias-corrected 95 % bootstrap confidence intervals (10,000 resamples) of the respective correlation coefficients, along with Steiger z-tests. We also report reliability for the scales in a similar manner as in Study 1.

3.2. Results

The correlations displayed in Table 4 revealed a pattern similar to what we found in Study 1. Once again, subjectivism and cultural relativism were positively related to each other ($p < .001$), but their associations to other variables differed. Consistent with H1 and H2, subjectivism was moderately positively related to both bullshit receptivity and belief in conspiracy theories ($p < .001$). Cultural relativism was also positively related to bullshit receptivity ($p = .003$) and belief in conspiracy theories ($p = .004$) but only weakly.

In line with H3 and H4, and similar to the results of Study 1, bullshit receptivity was more strongly associated with subjectivism ($r = 0.26$ [0.17, 0.35]) than with cultural relativism ($r = 0.15$ [0.05, 0.24]; $z = 2.79$, $p = .003$) and belief in conspiracy theories was also more strongly associated with subjectivism ($r = 0.28$ [0.18, 0.37]) than with cultural relativism ($r = 0.14$ [0.03, 0.25]; $z = 3.28$, $p = .001$). Subjectivism remained a unique predictor of bullshit receptivity ($p < .001$) and belief in conspiracy theories ($p = .001$) in the regression analyses (see Table 5) after controlling for profoundness receptivity (in the regression analysis predicting bullshit receptivity), competing predictors, and demographics, but cultural relativism had no significant independent effect in any of the steps (see Table 5).

In line with H5, subjectivism had a strong positive correlation (see Table 4) with fact resistance ($p < .001$) and a positive weak correlation to dogmatism ($p = .014$), while cultural relativism related moderately positively only to fact resistance ($p < .001$). The positive associations between subjectivism and dogmatism ($p = .010$) and fact resistance ($p < .001$) respectively held up after controlling for cultural relativism and competing factors in the regression analyses displayed in Table 6, giving further credence to H5. Interestingly, cultural relativism was negatively associated with dogmatism when adjusting for subjectivism ($p = .004$).

3.3. Discussion

All of the preregistered hypotheses (see Table 3) were supported. Similar to Study 1, the results indicate that subjectivists are particularly vulnerable to misinformation. They also suggest that subjectivists are prone to dogmatism and fact resistance in evaluating information. The result from Study 1 that cultural relativism was negatively associated with bullshit receptivity and belief in conspiracy theories after controlling for other factors was, however, not replicated. Cultural relativism had no significant association with receptivity to misinformation or fact resistance independent of other predictors, but it did have a negative association with dogmatism after controlling for subjectivism.

¹ Non preregistered mediation analyses of indirect effects of truth relativism on receptivity to misinformation through fact resistance and dogmatism are reported in Supplement 2.

Table 4

Bivariate Pearson correlations with 95 % confidence intervals between the variables.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Subjectivism											
2. Cultural relativism	0.629 [0.567, 0.683]**										
3. Bullshit receptivity	0.262 [0.171, 0.350]**	0.147 [0.052, 0.240]**									
4. Profoundness-receptivity	−0.094 [−0.188, 0.002]	0.029 [−0.067, 0.125]	0.303 [0.213, 0.387]**								
5. Belief in conspiracy theories	0.276 [0.185, 0.363]**	0.141 [0.046, 0.234]**	0.416 [0.333, 0.492]**	0.136 [0.040, 0.229]**							
6. Dogmatism	0.120 [0.024, 0.214]*	−0.022 [−0.118, 0.074]	0.332 [0.244, 0.415]**	0.086 [−0.010, 0.180]	0.333 [0.245, 0.416]**						
7. Fact resistance	0.307 [0.217, 0.391]**	0.201 [0.107, 0.291]**	0.304 [0.215, 0.389]**	−0.113 [−0.207, −0.017]*	0.268 [0.176, 0.354]**	0.510 [0.435, 0.577]**					
8. Analytical thinking	−0.191 [−0.282, −0.097]**	−0.115 [−0.209, −0.020]*	−0.254 [−0.342, −0.162]**	0.020 [−0.077, 0.115]	−0.261 [−0.348, −0.169]**	−0.270 [−0.357, −0.179]**	−0.296 [−0.382, −0.206]**				
9. Right (vs. left) self-placement	−0.008 [−0.103, 0.089]	−0.012 [−0.108, 0.084]	0.004 [−0.092, 0.100]	0.099 [0.003, 0.193]*	0.078 [−0.018, 0.172]	0.250 [0.158, 0.338]**	0.175 [0.081, 0.267]**	−0.060 [−0.155, 0.036]			
10. Male gender	−0.060 [−0.156, 0.036]	−0.139 [−0.232, −0.043]**	−0.008 [−0.105, 0.088]	−0.016 [−0.112, 0.081]	−0.008 [−0.104, 0.089]	−0.029 [−0.125, 0.067]	−0.028 [−0.124, 0.068]	0.230 [0.137, 0.320]**	0.150 [0.054, 0.243]**		
11. Age	−0.200 [−0.291, −0.106]**	−0.172 [−0.264, −0.077]**	−0.271 [−0.358, −0.179]**	0.082 [−0.014, 0.177]	−0.204 [−0.294, −0.110]**	−0.092 [−0.187, 0.004]	−0.184 [−0.275, −0.089]**	0.046 [−0.050, 0.142]	0.245 [0.153, 0.333]**	−0.007 [−0.104, 0.089]	
12. Education	−0.009 [−0.105, 0.087]	−0.010 [−0.106, 0.086]	−0.062 [−0.157, 0.034]	0.008 [−0.088, 0.104]	−0.051 [−0.147, 0.045]	−0.081 [−0.175, 0.015]	−0.162 [−0.254, −0.067]**	0.111 [0.015, 0.205]*	−0.174 [−0.266, −0.080]**	−0.018 [−0.115, 0.078]	−0.101 [−0.195, −0.004]*

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

Table 5

Standardized regression coefficients from linear regression analyses predicting bullshit receptivity and belief in conspiracy theories.

	Bullshit receptivity					Belief in conspiracy theories			
	Step 1R ² = 6.4 %	Step 2R ² = 16.8 %	Step 3R ² = 20.9 %	Step 4R ² = 27.3 %	Step 5R ² = 32.1 %	Step 1R ² = 7.2 %	Step 2R ² = 11.4 %	Step 3R ² = 13.6 %	Step 4R ² = 18.9 %
Subjectivism	0.272***	0.340***	0.301***	0.259***	0.204***	0.303***	0.263***	0.233***	0.195**
Cultural relativism	−0.017	−0.074	−0.074	−0.086	−0.059	−0.045	−0.045	−0.047	−0.009
Profoundness receptivity		0.330***	0.332***	0.348***	0.346***				
Analytical thinking			−0.211***	−0.210***	−0.145**		−0.213***	−0.216***	−0.154**
Gender				−0.046	0.051			0.048	0.039
Age				−0.262***	−0.211***			−0.164***	−0.150**
Education level				−0.065	−0.044			−0.039	−0.019
Right (vs. left) self-placement					−0.067				0.033
Dogmatism					0.164**				0.241***
Fact resistance					0.133*				0.004

Note: *** $p < .001$; ** $p < .01$; * $p < .05$.**Table 6**

Standardized regression coefficients from linear regression analyses predicting dogmatism and fact resistance.

	Dogmatism				Fact resistance			
	Step 1R ² = 2.4 %	Step 2R ² = 8.2 %	Step 3R ² = 8.6 %	Step 4R ² = 15 %	Step 1R ² = 8.8 %	Step 2R ² = 14.3 %	Step 3R ² = 17.7 %	Step 4R ² = 20.5 %
Subjectivism	0.216***	0.169**	0.155*	0.154*	0.291***	0.246***	0.222***	0.221***
Cultural relativism	−0.158*	−0.158*	−0.162**	−0.171**	0.021	0.021	0.017	0.011
Analytical thinking		−0.250***	−0.245***	−0.223***		−0.241***	−0.230***	−0.215***
Gender			0.011	−0.037			0.036	0.004
Age			−0.088	−0.153**			−0.148**	−0.191***
Education level			−0.062	−0.025			−0.149**	−0.123**
Right (vs. left) self-placement				0.271***				0.184***

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

The fact that the unique associations to cultural relativism differed between dogmatism and fact resistance shows that it is indeed fruitful to disentangle these facets of actively open-minded thinking, but one may want to exercise caution when comparing the results to those of other studies with complete versions of actively open-minded thinking scales.

4. General discussion

Receptivity to misinformation has been the subject of research much longer than the so-called post-truth world we live in, in which (mis)information is spread rapidly (Vosoughi et al., 2018) and a myriad of “truths” are available for people to pick and choose from. Remarkably, whether a relativistic (or “post-truth”) denial of the existence of objective truths does in fact yield higher receptivity to misinformation has, until now, remained untested. This research represents the first substantive attempt at measuring relativist beliefs about the truth and clarifying their role in receptivity to misinformation. Across two studies with representative samples from Sweden and the UK, we found evidence of two distinct forms of truth relativism: subjectivism and cultural relativism. The results suggest that it is particularly the subjectivist belief that truth is no more than a personal intuition or feeling, rather than the belief that truth is relative to cultural context, that most strongly and robustly predicts receptivity to misinformation.

4.1. Findings

Subjectivism had significantly stronger correlations with bullshit receptivity and belief in conspiracy theories than cultural relativism did, which dovetails with the fact that many other well-known predictors of receptivity to misinformation involve an over-reliance on intuitive thinking (e.g., Pennycook & Rand, 2019). Moreover, subjectivism but not cultural relativism proved to be a unique predictor of bullshit

receptivity, belief in conspiracy theories, dogmatism, and fact resistance after controlling for the other forms of truth relativism and competing predictors (analytical thinking, dogmatism, fact resistance, political ideology, and demographics). These results indicate that subjectivism yields a particular vulnerability to misinformation. This may be because subjectivists consult their intuition when determining what is true, which might hinder them from benefitting from the analytical ability they very well may have, given that faith in intuition has proved to be associated with questionable beliefs (e.g., Evans et al., 2020; Tomljenovic et al., 2019). The positive associations between subjectivism and both dogmatism and fact resistance indicate that subjectivists are indeed rigid and reliant on prior beliefs and feelings rather than driven by accuracy goals (Kunda, 1990), which may make their beliefs more difficult to debunk with counterevidence.

In other words, epistemic beliefs could be reflected in how information is approached. The truth *realist* may be more preoccupied with seeking evidence of correspondence with reality (“is this an accurate depiction of the world as we know it?”). A cultural truth relativist may see claims as marinated in social context and therefore seek to determine the truth values in terms of their fit with a particular cultural framework (“do I know of any social groups who support this view?”). The subjectivist, finally, may approach a piece of information with few questions asked other than “does this *feel* right to me?”.

Interestingly, a unique association between cultural relativism and lower receptivity to bullshit and conspiracy theories (in Study 1) and dogmatism (in Study 2) emerged when we controlled for competing predictors. A possible explanation is that cultural relativism without the component that overlaps with subjectivism reflects an intellectual humility involving acknowledgement of different cultural perspectives and resilience against misinformation (Leary et al., 2017). Moreover, the fact that bullshit receptivity was the only measure of receptivity to misinformation that cultural relativism was repeatedly positively related to

may reflect the openness often found in intellectually humble individuals (Leary et al., 2017), which in its extreme form may be associated with higher bullshit receptivity (Bainbridge et al., 2019). Another possible interpretation is that there was a mismatch in the levels of beliefs reflected in cultural relativism and the two forms of misinformation. Beliefs in cultural relativism emphasize the relevance of the collective for determining what is true, while both forms of misinformation required the participants to report whether they themselves believed in the particular statement. This sort of outcome variable may be more aligned with beliefs about the role of individual characteristics (i.e., subjective intuitions) for determining truth, which is reflected in subjectivist relativism. It is possible that misinformation statements depicting beliefs at a collective level (e.g., hyper-partisan misinformation) would have been more appealing to individuals who believe in cultural relativism. An experimental design might also be used to investigate whether making social identity salient would increase the predictive power of cultural relativism.

At the same time, cultural relativism was still consistently positively correlated with bullshit receptivity, and with belief in conspiracy theories and fact resistance in Study 2. This suggests that the rejection of objective truths – common to both subjectivism and cultural relativism – may render greater receptivity to misinformation. Although belief in objective truths does not in itself entail resilience against misinformation, a person who acknowledges but one existing reality and stresses the importance of investigating correspondence with this reality likely has a narrower range of claims to choose between. Such a person should be less likely to harbor false beliefs, insofar as he or she would be more likely to come across evidence that contradicts those false beliefs and to therefore abandon them. In future studies, researchers could investigate more rigorously the associations between different information evaluation processes and epistemic beliefs as the current research does not examine mechanisms behind such information evaluation.

It is finally worth noting that the correlations between receptivity to misinformation and both analytical thinking and the dogmatism and fact resistance facets of actively open-minded thinking were consistent with previous research (e.g., Pennycook & Rand, 2019; Stanovich & West, 1997; Stenhouse et al., 2018). We also found evidence of the rigidity of the right hypothesis in the positive correlation between right (vs. left) self-placement and belief in conspiracy theories in Study 1 and fact resistance and dogmatism in Study 2, consistent with previous research (e.g., Imhoff et al., 2022; Nilsson et al., 2019).

4.2. Limitations and future work

In spite of the fact that our relativism items were carefully worded, there is a possibility that some participants interpreted them in a way that we did not intend. Although we intentionally chose words that described relativism of *the truth* and not relativism to beliefs or perspectives, we cannot rule out the possibility that participants confused these two things, as epistemological concepts may be difficult to understand and epistemological beliefs can be tricky to measure (Nilsson & Bäckström, 2022). Some individuals may very well simply have embraced certain narratives and ways of talking about these matters without deeper reflection on views about knowledge or truth. Furthermore, it is possible that what measure of cultural relativism really captures is, at least in part, a willingness to tolerate different social groups' perceptions of truth. A potential extension of the current research would be to include items that describe personal beliefs as well as cultural perceptions of specific factual matters to further ascertain whether views of *truth* indeed are measured. Investigating the distinctness of cultural relativism and tolerance or appreciation of worldview differences (e.g., Hjerm et al., 2020), as well the relationships between subjectivist and cultural truth relativism and faith in intuition and belief that truth is political (Garrett & Weeks, 2017), would also be valuable contributions. In addition, it may perhaps be possible to devise relevant behavioral measures of the extent to which people act in accordance

with truth relativist views, as self-report measures may suffer from social desirability biases (Paulhus, 1984). Extensions of this research would be particularly valuable if performed in cultural contexts dissimilar to Western European post-industrial nations with highly educated populations (e.g., the UK and Sweden), because factors such as culture and education level plausibly affect epistemic beliefs and discourses about knowledge.

Another problem concerns a possible ideological tilt in the measures. In this research, we focused on two forms of receptivity to misinformation that have been found to be associated with social conservatism (e.g., Imhoff et al., 2022; Nilsson et al., 2019). Although we took great pains to include conspiracy theories that would appeal to both rightists and leftists and there are at least subgroups on the left who are highly receptive to pseudo profound bullshit (Nilsson et al., 2019), future studies would benefit from a careful selection of misinformation with equal appeal to groups with different political orientations. Including measures of different kinds of political preferences rather than just single-item self-placement items would also be advantageous to this end.

Nevertheless, the results do suggest that taking beliefs concerning the nature of truth into consideration sheds new light on why people fall for misinformation. In future work, researchers may want to broaden the scope of investigation, so as to compare the effects of truth relativism with effects of other epistemic beliefs and map out the cognitive characteristics and vulnerabilities of individuals with different epistemic beliefs (e.g., Garrett & Weeks, 2017; Nilsson & Bäckström, 2022), as well as different ideological convictions (Nilsson et al., 2019, 2020). Furthermore, researchers may want to look more closely at the connection between subjectivist beliefs and dogmatic views. The positive association we found between subjectivism and dogmatism could seem surprising, as subjectivism seems to entail that every individual has a “right” to their own “truth” which, at face-value, seems less dogmatic. Dogmatic relativism may seem like a contradiction in terms, but our findings suggest that it is a real and under-researched psychological phenomenon.

4.3. Conclusion

This research demonstrates that truth relativism is a unique predictor of belief in conspiracy theories and receptivity to pseudo-profound bullshit. It shows that the belief that truth is no more than a subjective intuition is likely to be more harmful, yielding higher vulnerability to misinformation and lower likelihood of deliberative scrutiny of evidence, compared to the belief that truth is relative to cultural context. Future attempts to understand why people fall for misinformation should take the role of epistemic beliefs concerning the nature of truth into consideration.

Open practices

These studies earned Open Materials and Open Data badges for transparent practices. Materials and data can be found at https://osf.io/j3rkz/?view_only=6f279782ce0e4bf4845df50e0ce4c8e2. Our time-stamped preregistration (https://aspredicted.org/blind.php?x=N8Z_T4H) included the hypotheses, study design, planned sample size, inclusion and exclusion criteria, and planned primary analyses.

Author contributions

J.A., A.E. and A.N. were involved in formulating research questions, designing the studies, and the data collection for both studies. A.N. planned the analyses. J.A. and A.N. analyzed the data. J.A. wrote the manuscript. A.E. and A.N. provided feedback on the manuscript.

Declaration of Competing Interest

The authors declare that they have no known competing financial

interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgment

Vetenskapsrådet (The Swedish Research Council) 2022-02376 and 2022-05429

Appendix

Subjectivism
The truth does not exist – there are only opinions of individual people.
Truths are simply personal beliefs that indicate how a person sees the world.
Truth is a subjective feeling; if it feels correct or obvious to a person then it is true.
What is true depends on what an individual thinks is true.
Truth is nothing more than a person’s subjective experience of the world.
That a person strongly feels that something is in a particular way does not make it true. (REVERSED)
All subjective perceptions of a chain of events are equally true.
Cultural relativism
Truth is relative, and what is true for one person or time may not be true for another.
What is true varies from one situation and society to another.
A factual claim that is true in one culture need not be true in another.
It is impossible to compare different cultures’ beliefs about reality in terms of “correctness”.
Some perceptions that are false today were true in ancient times.
Opposite beliefs in different eras can be equally true – it is all a matter of perspective.
The truth cannot vary from place to place. (REVERSED)
Even when two cultures have opposite worldviews, both can be equally true.
If two cultures have opposite beliefs about what is true, then at least one of them must be wrong. (REVERSED)

Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jrp.2023.104394>.

References

Aspernäs, J., Erlandsson, A., & Nilsson, A. (2022). Motivated formal reasoning: Ideological belief bias in syllogistic reasoning across diverse political issues. *Thinking & Reasoning*. <https://doi.org/10.1080/13546783.2022.2038268>

Bago, B., Rand, D. G., & Pennycook, G. (2020). Fake news, fast and slow: Deliberation reduces belief in false (but not true) news headlines. *Journal of Experimental Psychology*, 149(8), 1608–1613.

Bainbridge, T. F., Quinlan, J. A., Mar, R. A., & Smillie, L. D. (2019). Openness/intellect and susceptibility to pseudo-profound bullshit: A replication and extension. *European Journal of Personality*, 33, 72–88.

Baron, J., Baron, J. H., Barber, J. P., & Nolen-Hoeksema, S. (1990). Rational thinking as a goal of therapy. *Journal of Cognitive Psychotherapy*, 4(3), 293–302.

Basol, M., Roozenbeek, J., Berriche, M., Uenal, F., McClanahan, W. P., & Linden, S. van der. (2021). Towards psychological herd immunity: Cross-cultural evidence for two prebunking interventions against COVID-19 misinformation. *Big Data & Society*, 8(1). <https://doi.org/10.1177/20539517211013868>.

Bensley, D. A., Lilienfeld, S. O., & Powell, L. A. (2014). A new measure of psychological misconceptions: Relations with academic background, critical thinking, and acceptance of paranormal and pseudoscientific claims. *Learning and Individual Differences*, 36, 9–18.

Brotherton, R., French, C. C., & Pickering, A. D. (2013). Measuring belief in conspiracy theories: The generic conspiracist belief scale. *Frontiers in Psychology*, 4(279). <https://doi.org/10.3389/fpsyg.2013.00279>

Bruder, M., Haffke, P., Neave, N., Nouripanah, N., & Imhoff, R. (2013). Measuring individual differences in generic beliefs in conspiracy theories across cultures: Conspiracy Mentality Questionnaire. *Frontiers in Psychology*, 4(225). <https://doi.org/10.1002/fpsyg.12769>

Bruder, M., & Kunert, L. (2022). The conspiracy hoax? Testing key hypotheses about the correlates of generic beliefs in conspiracy theories during the COVID-19 pandemic. *International Journal of Psychology*, 57(1), 43–48.

Cartiff, B. M., Duke, R. F., & Greene, J. A. (2021). The effect of epistemic interventions on academic achievement: A meta-analysis. *Journal of Educational Psychology*, 113(3), 477–498.

Chinn, C. A., Buckland, L. A., & Samarapungavan, A. (2011). Expanding the dimensions of epistemic cognition: Arguments from philosophy and psychology. *Educational Psychologist*, 46(3), 141–167, DOI: 10.1080/00461520.2011.587722.

Coan, R. W. (1979). *Psychologists: Personal and theoretical pathways*. New York: Irvington.

Cumming, G. (2009). Inference by the eye: Reading the overlap of independent confidence intervals. *Statistics in Medicine*, 28(2), 205–220.

de Zavala, A. G., & Van Bergh, A. (2007). Need for cognitive closure and conservative political beliefs: Differential mediation by personal worldviews. *Political Psychology*, 28, 587–608. <https://doi.org/10.1111/j.1467-9221.2007.00591.x>

Ditto, P. H., Liu, B. S., Clark, C. J., Wojcik, S. P., Chen, E. E., Grady, R. H., Celniker, J. B., & Zinger, J. F. (2019). At least bias is bipartisan: A meta-analytic comparison of partisan bias in Liberals and Conservatives. *Perspectives on Psychological Science*, 14(2), 273–291.

Erceg, N., Ružojčić, M., & Galić, Z. (2020). Misbehaving in the Corona crisis: The role of anxiety and unfounded beliefs. *Current Psychology*, 41, 5621–5630.

Erlandsson, A., Nilsson, A., Tinghög, G., & Västfjäll, D. (2018). Bullshit-sensitivity predicts prosocial behavior. *PLoS ONE*, 13(7), e0201474.

Erlach, A., Garner, C., Pennycook, G., & Rand, D. G. (2022). Does analytic thinking insulate against pro-Kremlin disinformation? Evidence from Ukraine. *Political Psychology*, 1–16. <https://doi.org/10.1111/pops.12819>

Evans, A., Sleegers, W., & Mlakar, Z. (2020). Individual differences in receptivity to scientific bullshit. *Judgement and Decision Making*, 15(3), 401–412.

Frankfurt, H. G. (2005). *On Bullshit*. Cambridge: Cambridge University Press.

Frederick, S. (2005). Cognitive reflection and decision making. *Journal of Economic Perspectives*, 19(4), 25–42.

Garrett, R. K., & Weeks, B. E. (2017). Epistemic beliefs’ role in promoting misperceptions and conspiracist ideation. *PLoS ONE*, 12(9), e0184733.

Goertzel, T. (1994). Belief in conspiracy theories. *Political Psychology*, 15(4), 731–742.

Hjerm, M., Eger, M. A., Bohman, A., & Fors Connolly, F. (2020). A new approach to the study of tolerance: Conceptualizing and measuring acceptance, respect, and appreciation of difference. *Social Indicators Research*, 147(3), 897–919. <https://doi.org/10.1007/s11205-019-02176-y>

Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus alternatives. *Structural Equation Modeling*, 6(1), 1–55.

Imhoff, R., & Bruder, M. (2014). Speaking (un-)truth to power: Conspiracy mentality as a generalized political attitude. *European Journal of Personality*, 28(1), 25–43. <https://doi.org/10.1002/per.1930>

Imhoff, R., Zimmer, F., Klein, O., António, J. H. C., Babinska, M., Bangerter, A., Bilewicz, M., Blanuša, N., Bovan, K., Bužarovska, R., Cichocka, A., Delouvé, S., Douglas, K. M., Dyrendal, A., Etienne, T., Gjoneska, B., Graf, S., Gualda, E., Hirschberger, G., ..., van Prooijen, J.-W. Conspiracy mentality and political orientation across 26 countries. *Nature Human Behaviour*, 6, 392–403.

Jamieson, K. H. (2015). Implications of the demise of “fact” in political discourse. *Proceedings of the American Philosophical Society*, 159(1), 66–84.

- Johnson, J. A., Germer, C. K., Efran, J. S., & Overton, W. F. (1988). Personality as the basis for theoretical predilections. *Journal of Personality and Social Psychology*, 55(5), 824–835. <https://doi.org/10.1037/0022-3514.55.5.824>
- Jost, J. T. (2006). The end of the end of ideology. *American Psychologist*, 61(7), 651–670. <https://doi.org/10.1037/0003-066X.61.7.651>.
- Jost, J. T., & Amodio, D. M. (2012). Political ideology as motivated social cognition: Behavioral and neuroscientific evidence. *Motiv Emot*, 36, 55–64.
- Kahneman, D. (2011). *Thinking, fast and slow*. Straus and Giroux: Farrar.
- Kandler, C., Zapko-Willmes, A., & Rauthmann, J. F. (2022). Broad and narrow environmental and genetic sources of personality differences: An extended twin family study. *Journal of Personality*, 00, 1–18. <https://doi.org/10.1111/jopy.12777>
- Kandler, C., Zimmermann, J., & McAdams, D. P. (2014). Core and surface characteristics for the description and theory of personality differences and development. *European Journal of Personality*, 28, 231–243. <https://doi.org/10.1002/per.1952>
- Kramer, D. A., Kahlbaugh, P. E., & Goldston, R. B. (1992). A Measure of Paradigm Beliefs About the Social World. *Journal of Gerontology*, 47(3), 180–181. <https://doi.org/10.1093/geronj/47.3.P180>
- Krouwel, A., Kutiyski, Y., van Prooijen, J.-W., Martinsson, J., & Markstedt, E. (2017). Does extreme political ideology predict conspiracy beliefs, economic evaluations and political trust? Evidence from Sweden. *Journal of Social and Political Psychology*, 5(2), 435–462.
- Kuklinski, J. H., Quirk, P. J., Jerit, J., Schwieder, D., & Rich, R. F. (2000). Misinformation and the currency of democratic citizenship. *The Journal of Politics*, 62(3), 790–816.
- Kunda, Z. (1990). The case for motivated reasoning. *Psychological Bulletin*, 108(3), 480–498.
- Leary, M. R., Diebels, K. J., Davisson, E. K., Jongman-Sereno, K. P., Isherwood, J. C., Raimi, K. T., Deffler, S. A., & Hoyle, R. H. (2017). *Personality and Social Psychology Bulletin*, 43(6), 793–813.
- Leung, K., Lam, B. C. P., Bond, M. H., Conway, L. G., Gornick, L. J., Amponsah, B., et al. (2012). Developing and evaluating the social axioms survey in eleven countries: Its relationship with the five-factor model of personality. *Journal of Cross-Cultural Psychology*, 43(5), 833–857. [10.1177/0022022111416361](https://doi.org/10.1177/0022022111416361).
- Lewandowsky, S., Ecker, U. K. H., & Cook, J. (2017). Beyond misinformation: Understanding and coping with the “post-truth” era. *Journal of Applied Research in Memory and Cognition*, 6, 353–369.
- Lewandowsky, S., Gignar, G. E., & Oberauer, K. (2013). The role of conspiracist ideation and worldviews in predicting rejection of science. *PLOS ONE*, 10(8), e0134773.
- Martin, J. E., Silva, D. G., Newman, J. H., & Thayer, J. F. (1994). An investigation into the structure of epistemological style. *Personality and Individual Differences*, 16(4), 617–629. [https://doi.org/10.1016/0191-8869\(94\)90189-9](https://doi.org/10.1016/0191-8869(94)90189-9)
- McAdams, D. P., & Pals, J. L. (2006). A new big five: Fundamental principles for an integrative science of personality. *American Psychologist*, 61(3), 204–217. <https://doi.org/10.1037/0003-066X.61.3.204>
- Möttus, R., Wood, D., Condon, D. M., Back, M. D., Baumert, A., Costantini, G., Epskamp, S., Greiff, S., Johnson, W., Lukaszewski, A., Murray, A., Revelle, W., Wright, A. G. C., Yarkoni, T., Ziegler, M., & Zimmermann, J. (2020). Descriptive, predictive and explanatory research: Different goals, different approaches, but a shared need to move beyond the big few traits. *European Journal of Personality*, 34. <https://doi.org/10.1002/per.2311>
- Nilsson, A. (2014a). Humanistic and normativistic worldviews: Distinct and hierarchically structured. *Personality and Individual Differences*, 64, 135–140. <https://doi.org/10.1016/j.paid.2014.02.037>
- Nilsson, A. (2014b). Personality psychology as the integrative study of traits and worldviews. *New Ideas in Psychology*, 32, 18–32. <https://doi.org/10.1016/j.newideapsych.2013.04.008>
- Nilsson, A., & Bäckström, M. (2022). The structure of basic beliefs. Linköping University and Lund University. In *Paper presented at the European conference of personality in Madrid, July 12-15, 2022*.
- Nilsson, A., Erlandsson, A., & Västfjäll, D. (2019). The complex relation between receptivity to pseudo-profound bullshit and political ideology. *Personality and Social Psychology Bulletin*, 45(10), 1440–1454.
- Nilsson, A., Montgomery, H., Dimdins, G., Sandgren, M., Erlandsson, M., & Taleny, A. (2020). Beyond ‘liberals’ and ‘conservatives’: Complexity in ideology, moral intuitions, and worldview among Swedish voters. *European Journal of Personality*, 34, 448–469.
- Nilsson, A., & Strupp-Levitsky, M. (2016). Humanistic and normativistic metaphysics, epistemology, and conative orientation: Two fundamental systems of meaning. *Personality and Individual Differences*, 100, 85–94. <https://doi.org/10.1016/j.paid.2016.01.050>
- Paulhus, D. L. (1984). Two-component models of socially desirable responding. *Journal of Personality and Social Psychology*, 46(3), 598–609.
- Pennycook, G., Cheyne, J. A., Barr, N., Koehler, D. J., & Fugelsang, J. A. (2015). On the reception and detection of pseudo-profound bullshit. *Judgement and Decision Making*, 10(6), 549–563.
- Pennycook, G., Epstein, Z., Mosleh, M., Arechar, A. A., Eckles, D., & Rand, D. G. (2021). Shifting attention to accuracy can reduce misinformation online. *Nature*, 592, 590–595. <https://doi.org/10.1038/s41586-021-03344-2>
- Pennycook, G., & Rand, D. G. (2019). Lazy, not biased: Susceptibility to partisan fake news is better explained by lack of reasoning than by motivated reasoning. *Cognition*, 188, 39–50.
- Pfafftheicher, S., & Schindler, S. (2016). Misperceiving bullshit as profound is associated with favorable views of Cruz, Rubio. *Trump and Conservatism*. *PLoS ONE*, 11(4), e0153419.
- Revelle, W. (2023). *psych: Procedures for psychological, psychometric, and personality research*. Evanston, IL: Northwestern University. R package version 2.3.3.
- Roozenbeek, J., & van der Linden, S. (2019). Fake news game confers psychological resistance against online misinformation. *Palgrave Communications*, 5(65), 1–10. <https://doi.org/10.1057/s41599-019-0279-9>
- Royce, J. R., & Mos, L. (1980). *Psycho-epistemological profile*. Edmonton: University of Alberta Printing Office.
- Rudloff, J. P., & Appel, M. (2022). When truthiness trumps truth: Epistemic beliefs predict the accurate discernment of fake news. *Journal of Applied Research in Memory and Cognition*. Advance online publication. <https://doi.org/10.1037/mac0000070>.
- Rudloff, J. P., Huttmacher, F., & Appel, M. (2022b). Beliefs about the nature of knowledge shape responses to the pandemic: Epistemic beliefs, the Dark Factor of Personality, and COVID-19-related conspiracy ideation and behavior. *Journal of Personality*, 90(6), 937–955. <https://doi.org/10.1111/jopy.12706>.
- Schönbrodt, F. D., & Perugini, M. (2013). At what sample size do correlations stabilize? *Journal of Research in Personality*, 47(5), 609–612.
- Ståhl, T., & van Prooijen, J.-W. (2018). Epistemic rationality: Skepticism toward unfounded beliefs requires sufficient cognitive ability and motivation to be rational. *Personal and Individual Differences*, 122, 155–163.
- Stanovich, K. E., & West, R. F. (1997). Reasoning independently of prior belief and individual differences in actively open-minded thinking. *Journal of Educational Psychology*, 89(2), 342–357.
- Stanovich, K. E., & West, R. F. (1998). Individual differences in rational thought. *Journal of Experimental Psychology*, 127(2), 161–188.
- Stanovich, K. E., West, R. F., & Toplak, M. E. (2016). *The rationality quotient: Toward a test of rational thinking*. Cambridge, MA: MIT Press.
- Stenhouse, N., Myers, T. A., Vraga, E. K., Kotcher, J. E., Beall, L., & Maibach, E. W. (2018). The potential role of actively open-minded thinking in preventing motivated reasoning about controversial science. *Journal of Environmental Psychology*, 57, 17–24.
- Sterling, J., Jost, J. T., & Pennycook, G. (2016). Are neoliberals more susceptible to bullshit? *Judgement and Decision Making*, 11(4), 352–360.
- Svedholm-Häkkinen, A. M., & Lindeman, M. (2018). Actively open-minded thinking: Development of a shortened scale and disentangling attitudes towards knowledge and people. *Thinking & Reasoning*, 24(1), 21–40. <https://doi.org/10.1080/13546783.2017.1378723>
- Svedholm-Häkkinen, A. M., & Lindeman, M. (2018). Actively open-minded thinking: Development of a shortened scale and disentangling attitudes towards knowledge and people. *Thinking & Reasoning*, 24(1), 21–40.
- Swami, V., & Coles, R. (2010). The truth is out there: Belief in conspiracy theories. *The Psychologist*, 23(7), 560–563.
- Swami, V., Coles, R., Stieger, S., Pietschnig, J., Furnham, A., Rehim, S., & Voracek, M. (2011). Conspiracist ideation in Britain and Austria: Evidence of a monological belief system and associations between individual psychological differences and real-world and fictitious conspiracy theories. *British Journal of Psychology*, 102(3), 443–463. <https://doi.org/10.1111/j.2044-8295.2010.02004.x>
- Swami, V., Voracek, M., Stieger, S., Tran, U. S., & Furnham, A. (2014). Analytic thinking reduces belief in conspiracy theories. *Cognition*, 133, 572–585.
- Tomljenovic, H., Bubic, A., & Erceg, N. (2019). It just doesn't feel right – the relevance of emotions and intuition for parental vaccine conspiracy beliefs and vaccination uptake. *Psychology & Health*, 35(5), 538–554.
- Toplak, M. E., West, R. F., & Stanovich, K. E. (2011). The Cognitive Reflect Test as a predictor of performance on heuristics-and-biases tasks. *Memory & Cognition*, 39(7), 1275–1289. <https://doi.org/10.3758/s13421-011-0104-1>
- Trippas, D., Pennycook, G., Verde, M. F., & Handley, S. J. (2015). Better but still biased: Analytical cognitive style and belief bias. *Thinking & Reasoning*, 21(4), 431–445. <https://doi.org/10.1080/13546783.2015.1016450>
- Unger, R. K., Draper, R. D., & Pendergrass, M. L. (1986). Personal epistemology and personal experience. *Journal of Social Issues*, 42, 67–79. <https://doi.org/10.1111/j.1540-4560.1986.tb00225.x>
- van Prooijen, J.-W., Ligthart, J., Roseman, S., & Xu, Y. (2022). The entertainment value of conspiracy theories. *British Journal of Psychology*, 113(1), 25–48. <https://doi.org/10.1111/bjop.12522>
- van Prooijen, J.-W., Staman, J., & Krouwel, A. P. M. (2018). Increased conspiracy beliefs among ethnic and Muslim minorities. *Applied Cognitive Psychology*, 32, 661–667.
- Vosoughi, S., Roy, D., & Aral, S. (2018). The spread of true and false news online. *Science*, 359, 1146–1151.
- West, R. F., Toplak, M. E., & Stanovich, K. E. (2008). Heuristics and biases as measures of critical thinking: Associations with cognitive ability and thinking dispositions. *Journal of Educational Psychology*, 100(4), 930–941.
- Wood, M. J., Douglas, K. M., & Sutton, R. M. (2012). Dead and alive: Beliefs in contradictory conspiracy theories. *Social Psychology and Personality Science*, 3(6), 767–773. <https://doi.org/10.1177/1948550611434786>
- Zinbarg, R. E., Revelle, W., & Yovel, I. (2005). Cronbach's α , Revelle's β , and McDonald's ω_H : Their relations with each other and two alternative conceptualizations of reliability. *Psychometrika*, 70, 123–133. <https://doi.org/10.1007/s11336-003-0974-7>