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RESEARCH ARTICLE

Are conspiracy theorists inaccurate, unmotivated to be accurate, or both?: A latent class analysis

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Abstract

Background

A rapidly growing body of research demonstrates that conspiratorial ideation is related to less accuracy, more overconfidence, and more reliance on intuition. Yet, the bulk of this research has focused on belief in conspiracy theories rather than conspiracy theorists. As such it remains unclear whether all conspiracy theorists are equally inaccurate, overconfident, and reliant on intuition or whether there are types of conspiracy theorists who differ across these variables.

Methods

To address this gap in the literature, we conducted a preregistered secondary data analysis of the variable-level and person-centered relations among conspiratorial ideation, accuracy, overconfidence, and motivations across five samples (*Ns* ranged from 477 to 3,056). We used multiple measures of each variable to build in conceptual replication.

Results

Broadly, the variable-centered results were consistent with existing research and revealed that conspiratorial ideation tended to be related to less accuracy, more overconfidence, more reliance on intuition and closemindedness, and less rational thinking and openmindedness. In person-centered analyses, we found two classes of individuals, one who scored higher on conspiratorial ideation and one who scored lower. In the conspiracy theorist class, we found that conspiracy theorists were not unknowledgeable and irrational across

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Conclusions

Thus, conspiracy theorists may be more psychologically complex than originally presumed based on variable-level results. Future research is needed to examine how different motives manifest in conspiracy theorists and to leverage insights from such research to reduce susceptibility to misinformation.

Keywords
conspiratorial ideation, accuracy, knowledge, motivation, latent class analysis, conspiracy theory

 This article is included in the Conspiracy Theories and Misinformation collection.

Introduction

What comes to mind when you think of a conspiracy theorist? Perhaps you imagine an individual with clippings strewn over the wall and red twine connecting the dots. This individual is highly confident in the accuracy of their beliefs, wants to convince you of the veracity of this "hidden truth", and is motivated to find the answers. Another possibility is that you imagine an individual who seems to endorse several disparate conspiracy theories. This individual speaks in contradictions, seems flagrantly inaccurate but confident, and does not appear to notice or care that their arguments are riddled with inconsistencies. At first blush, these individuals may seem one and the same—after all, they are both ultimately likely to be inaccurate and appear to be overconfident and closeminded. Nevertheless, beyond this common currency of inaccuracy, overconfidence, and closemindedness, there are potentially noteworthy differences between these two individuals: the former appears to be highly motivated to be accurate whereas the latter appears to be unmotivated to be accurate.

These potential differences in motivation across conspiracy theorists raise important implications for our understanding how conspiratorial ideation arises and also how to change it. If there are different classes of conspiracy theorists with different psychological features, then the developmental pathways leading to conspiratorial ideation are also likely to differ. Similarly, if there are different classes of conspiracy theorists, then each class will likely need different interventions targeting different psychological processes to effectively reduce conspiratorial ideation (see Evans & Stanovich, 2013). For instance, accuracy nudges (i.e., reminders to attend to accuracy when engaging with information) shift peoples' attention to accuracy rather than their motivations to be accurate (see Pennycook & Rand, 2022); hence, accuracy nudges may be effective only for those who already value attending to accuracy and are motivated to be accurate. Other interventions aim to provide rational counterarguments to conspiracy theories and debunk their illogical claims (e.g., Orosz et al., 2016); such interventions may only be effective if individuals possess the requisite critical thinking skills to effectively engage with the information and subsequently correctly update their views. With these possibilities in mind, we sought to investigate whether there are different classes of conspiracy theorists that may share a propensity to be inaccurate, overconfident, and closeminded but differ in their motivations to engage in rational thinking.

Conspiracy theories & conspiratorial ideation

Conspiracy theories can be broadly defined as beliefs that a powerful group of individuals plots in secret to harm the common good and reap personal benefits (e.g., Uscinski, 2019). This nefarious group of individuals varies considerably across conspiracy theories, ranging from marginalized groups in society (see Bilewicz & Sedek, 2015) to international political elites (e.g., Nera et al., 2021) to "Big Pharma" companies (e.g., Brotherton et al., 2013). Although these disparate conspiracy theories tend to be positively interrelated, forming a web of conspiracy beliefs (see Frenken & Imhoff, 2021), the content of the beliefs matters— different conspiracy beliefs vary in their rates of endorsement, cross-cultural implications, and even their predictors (Enders et al., 2021; Imhoff et al., 2022b). Given the variability across conspiracy

theories, it is perhaps unsurprising that there are numerous ways to measure conspiratorial ideation (i.e., the tendency to believe conspiracy theories).

Current measures of conspiratorial ideation focus on either belief in *general* (or generic) conspiracy theories (e.g., Brotherton et al., 2013) or belief in *specific* conspiracy theories (e.g., Swami et al., 2011). General conspiracy theories represent abstract, decontextualized beliefs (e.g., the government is out to harm the people) whereas specific conspiracy theories represent concrete, contextualized beliefs (e.g., the American government plotted the 9/11 terrorist attacks). Although measures of general and specific conspiratorial ideation tend to be strongly and positively interrelated (e.g., Brotherton et al., 2013), they are separable. Belief in specific conspiracy theories is less common, more malleable, less stable, and more imbued with content-irrelevant variance (e.g., current events) than belief in general conspiracy theories (see Imhoff et al., 2022). Thus, belief in general conspiracy theories more closely reflects a *conspiratorial mindset* than belief in specific conspiracy theories (although both tap into a conspiratorial mindset).

Burrowing into belief in specific conspiracy theories, there are varying measures that cover different conspiracy theories. For instance, some measures exclusively assess political conspiracy theories (e.g., Federico et al., 2018) whereas others exclusively assess vaccine conspiracy theories (e.g., Jolley & Douglas, 2014). Still other measures include a list of different conspiracy theories (e.g., Swami et al., 2011). No matter the domain of conspiratorial ideation assessed, it is clear that disparate conspiracy theories belong together, forming a reliable and valid composite of conspiratorial ideation (e.g., Swami et al., 2011). In line with these findings, even mutually exclusive conspiracy theories, such as those espousing that the late Diana, Princess of Wales, is secretly alive and those espousing that Princess Diana was killed by the British Royal Family, are positively interrelated (e.g., Wood et al., 2012; but see, van Prooijen et al., 2023). What this means is that those prone to conspiratorial ideation seek out information that is consistent with the notion that (a) all events have a secret cause and (b) this secret cause is being hidden for nefarious reasons (see Wood et al., 2012).

In the current study, we aimed to comprehensively assess conspiratorial ideation. As such, we included measures of belief in both specific conspiracy theories (vaccine conspiracy theories, contradictory conspiracy theories, political conspiracy theories) and general conspiracy theories.

Variable-centered vs. person-centered analyses in research on conspiratorial ideation

Scholars are growing increasingly dedicated to identifying the ways in which cognition and cognitive styles intersect to give rise to conspiratorial ideation (see Brashier, 2022). Recent research has sought to clarify the links between different measures of conspiratorial ideation, on the one hand, and accuracy, confidence, and motivations to engage in rational thinking, on the other hand. Such research has attempted to uncover whether there is a double-

burden of low accuracy and reduced motivation to engage in rational thinking across individuals prone to conspiratorial ideation.

Conspiratorial ideation is linked to lower *accuracy* across a variety of measures. It is consistently weakly to moderately related to less intelligence, spanning cognitive measures of intelligence (e.g., Bowes & Tasimi, 2022) and self-reported levels of intelligence (e.g., Swami & Furnham, 2012). In addition, conspiratorial ideation is weakly to strongly related to less knowledge about vaccinations (e.g., Đorđević *et al*., 2021), the COVID-19 virus (e.g., Moore *et al*., 2021), science (e.g., Lewandowsky *et al*., 2013), and the media news (e.g., Ashley *et al*., 2022). Similarly, conspiratorial ideation is also moderately related to lower abilities to discern between truth and falsehoods (e.g., Bowes & Tasimi, 2022; see Brashier, 2022) and between profound and meaningless statements (e.g., Pennycook *et al*., 2015). In total, these results suggest that conspiratorial ideation is related to less accuracy, spanning intelligence, knowledge, and truth discernment.

Conspiratorial ideation is also related to more *overconfidence*. Typically, overconfidence is calculated as the difference between estimated and actual performance, such that higher scores indicate more overconfidence. Conspiratorial ideation is weakly to moderately related to more overconfidence on measures of logical reasoning (e.g., Vranic *et al*., 2022), numeracy, cognitive reflection, and perceptual reasoning (e.g., Pennycook *et al*., 2022). In addition, conspiratorial ideation is weakly related to having unwarranted confidence in one's abilities to mechanistically explain political topics (e.g., Vitriol & Marsh, 2018). Thus, conspiratorial ideation appears to be related to more overconfidence across measures.

Finally, prior research has examined the relations between conspiratorial ideation people's *motivations to be accurate* (see Binnendyk & Pennycook, 2022; see Brashier, 2022). One useful way to probe into these motivations is to assess cognitive styles, or individual differences in thinking tendencies. To understand accuracy motives, two cognitive styles are often assessed: tendencies to be rational (vs. intuitive) and open-minded (vs. closeminded).

First, people differ in the tendency to engage in effortful, rational thought versus quick, intuitive thought (e.g., Pacini & Epstein, 1999). Reliance on intuition often gives rise to inaccuracy, as biases and erroneous gut hunches go unchecked (e.g., Kahneman, 2011). Conspiratorial ideation is moderately to strongly related to more reliance on intuition, including self-reported reliance on intuition (e.g., confirmatory thinking) and susceptibility to biases and fallacies (e.g., conjunction fallacy, illusory pattern perception; Bowes *et al*., 2023). Not only is conspiratorial ideation related to more reliance on intuition, but it is also weakly to moderately related to less reliance on rational thinking, including self-reported rational thinking (e.g., need for cognition, objectivism) and cognitive reflection (e.g., Bowes *et al*., 2023).

Second, people differ in the tendency to engage in reflective, openminded thought versus confirmatory, closeminded thought (e.g., West *et al*., 2008). Openminded thinking predicts searching

for new information (and hence more accuracy; Haran *et al*., 2013) whereas closemindedness, or dogmatism, refers to staunchly holding on to one's beliefs and not seeking out information about these beliefs (and hence less accuracy; Schulz *et al*., 2020). Conspiratorial ideation is strongly related to less open-mindedness (e.g., Stanovich & Toplak, 2019), which parallels the correlations with less rational thinking, and weakly related to more closemindedness (e.g., Bowes *et al*., 2023), which parallels the correlations with more intuitive thinking.

In aggregate, most research illustrates that conspiratorial ideation is related to less accuracy, more overconfidence, more reliance on intuition and less rational thinking, and more closemindedness and less open-mindedness. These variablecentered analyses have made important inroads in uncovering how conspiratorial ideation is related to accuracy and motivation, yet the aforementioned findings only show that these variables are related to each other *across* people. These results do not shine a light on whether the two types of conspiracy theorists presented earlier exist. Although variable-centered research is ostensibly aiming to draw conclusions about *conspiracy theorists*, it is only possible to draw conclusions about *conspiratorial ideation*.

To make conclusions about people (conspiracy theorists) rather than constructs (conspiratorial ideation), we need to use different methodological approaches. Specifically, to answer the question of "who are conspiracy theorists?", we need personcentered analyses. These analyses, largely falling under the umbrella of *latent class analyses*, allow for the identification of whether there are statistically separable classes of individuals. If there are classes that are distinguishable from each other empirically, it is then possible to identify whether these differences align with and/or inform theory. For instance, personcentered analyses were recently used to understand whether there is evidence for a uniform conspiratorial mindset (and, that is indeed what they found; Frenken & Imhoff, 2021).

Yet, to our knowledge, only one study has examined potential *psychological differences* across conspiracy theorists using person-centered analyses (Jones *et al*., 2023). Their aim was to identify classes of individuals who endorse (or do not endorse) COVID-19 conspiracy theories based on individual differences in intuitive and rational thinking styles and verbal reasoning (in addition to mistrust, sociopolitical control, need for closure, and adherence to health guidelines). There was evidence for three classes: low, moderate, and high COVID-19 conspiracy belief groups. In line with correlational evidence, the high COVID-19 conspiracy belief group scored highest on intuitive thinking and lowest on verbal ability; in contrast with correlational evidence, the moderate COVID-19 conspiracy belief group scored lowest on rational thinking. Thus, this study indicates that there are meaningful conspiracy belief subgroups, at least for COVID-19 conspiracy theories, and illuminates potential complexities (e.g., rational thinking) that warrant additional investigation.

Present investigation
In the current study, we sought to replicate and extend upon the existing research summarized above in a preregistered secondary

data analysis including thousands of individuals and multiple measures of conspiratorial ideation (Bowes & Fazio, 2023a). First, regarding replication, we examined the relations between conspiratorial ideation and variables of interest at the variable-level (e.g., intelligence, knowledge, truth discernment, overconfidence, reliance on intuition vs. rationality, closemindedness vs. open-mindedness).

To extend this research, we conducted latent class analyses on a subset of the sample to ascertain whether there are classes of conspiracy theorists who endorse a range of conspiracy theories (and not solely COVID-19 conspiracy theories; Jones *et al*., 2023). Moreover, we used an array of measures of accuracy, overconfidence, and motivations to be rational/open-minded, which afforded the opportunity for cross-validation. Turning to accuracy, we assessed intelligence, knowledge, and truth discernment to clarify whether conspiratorial ideation is related to less accuracy *across the board* or perhaps only *certain forms* of inaccuracy. Using multiple measures of accuracy also allowed for us to assess multiple forms of overconfidence across the accuracy measures. For motivations, we investigated whether conspiratorial ideation was related to reliance on intuition versus rational thinking and close-mindedness versus open-mindedness. Using these measures will allow us to ascertain whether the two types of conspiracy theorists described earlier exist—that is, whether there is one class of conspiracy theorists who are inaccurate and overconfident but motivated to be accurate (high in rational thinking and open-mindedness) and one class of conspiracy theorists who are inaccurate and overconfident and unmotivated to be accurate (high in intuitive thinking and close-mindedness).

It is our hope that findings from the present investigation will inspire generative research on who conspiracy theorists are in the real world and how to best reduce conspiratorial ideation within and across individuals. Given the existing research summarized above, we advanced the following research questions (RQs) and hypotheses. All hypotheses were preregistered prior to data analysis.

RQ1: Is conspiratorial ideation related to less intelligence, knowledge, and truth discernment?
We hypothesize that conspiratorial ideation will be related to less intelligence, knowledge (trivia knowledge, political knowledge, science literacy), and truth discernment (real vs. false news headlines, real vs. false fact-based items, meaningful vs. meaningless sentences).

RQ2: Is conspiratorial ideation related to more overconfidence regarding one's intelligence and knowledge?
We hypothesize that conspiratorial ideation will be related to greater overestimation (i.e., perceiving that one performed better on a measure than is reflected in their actual score).

RQ3: Is conspiratorial ideation related to more (a) reliance on intuition and (b) close-minded cognition?
We hypothesize that conspiratorial ideation will be related to more reliance on intuition and more closemindedness.

RQ4: Is there a class of individuals who score highly on conspiratorial ideation, and is this class characterized by less knowledge, more reliance on intuition, and more close-mindedness?
We hypothesize that there will be 3 classes of individuals scoring at low, medium, and high levels of conspiratorial ideation. We predict that the class of individuals that is characterized by high levels of conspiratorial ideation will be the least accurate, the most overconfident, the most reliant on intuition, and the most close-minded compared to the other classes.

Methods
Ethics
All included studies were approved by the first-author's Institutional Review Board (IRB) prior to data collection (approval numbers: IRB00108410, IRB00116796, IRB00115335, IRB00107584). All participants signed informed consent forms, which were IRB approved, prior to participating in the study. All data are anonymized. Participants

Participants included both community and undergraduate participants. To recruit online community participants, we used CloudResearch (Samples 1, 3, and 4) and Prolific (Sample 5). On CloudResearch, we applied the universal participant exclude list, and all participants were American, had a minimum of a 95% approval rate, and had a minimum of 100 completed "HITs". On Prolific, participants were recruited from all available countries. All participants had to be 18 years of age or older. Regarding undergraduate participants, we recruited students enrolled in an introductory psychology course at Emory University (Sample 2) via the SONA Systems platform; all students were a minimum of 18 years of age, and students completed the survey online. SB was responsible for participant recruitment and approval; the study description and survey were posted on the respective recruitment platform, and all participant contact and recruitment took place via the respective recruitment platforms. All data were collected between September 2018 and April 2020.

We screened for inattentive and careless responding using several methods in varying combinations across samples. We screened for implausible patterns of responding on a measure of general personality (see Barends & de Vries, 2019) and examined potential responses that were highly improbable or illogical on open-ended questions (e.g., one "27-year-old" reported voting 60 times). We also analyzed click counts on the consent page (e.g., 3 "clicks" were required on the consent page to move forward in the survey battery) and administered an attention check item. On the attention check item, participants were asked to accurately track the perspective of a brief argument that either was in favor of or against a certain topic (e.g., stricter gun control). Participants were asked in a forced-choice question whether the author "agreed" or "disagreed" with the topic; participants failed this attention check if they selected the wrong answer.

Collapsed sample
To maximize statistical power, we collapsed across samples (N_{total} = 3,056). The collapsed sample (M_{age} = 33.35, SD_{age} = 13.14) was primarily female (57.3%) and college-educated (32.3%). Most

participants identified as White (71.8%), followed by Asian (12.5%), Black or African-American (10.3%), and Hispanic or Latino (8.6%). Most participants were politically Democratic (44.3%), followed by independent (19.2%) and Republican (19.1%). Participants tended to identify as Christian (45.5%), followed by agnostic (20.7%) and atheist (17.8%). Participants most frequently reported that their annual household income was between $40,000 to $69,000 (excluding the college sample). The measures we employed varied across samples (Table 1); as such, the sample sizes for our analyses ranged from 477 to 3,056.

Measures
Participants completed an online survey that included various individual differences measures. Participants completed the survey online on Qualtrics, and the link to the Qualtrics survey was posted on the relevant recruitment platforms. Descriptive statistics, internal consistency coefficients, and item response scales are in Table 2.

Conspiratorial ideation
We administered five different self-report conspiratorial ideation measures in varying combinations across our samples (see also Table 1): (1) the *Belief in Conspiracy Theories Inventory* (BCTI; Swami *et al*., 2011), a 15-item inventory of belief in specific conspiracies (i.e., concrete, event-based conspiracy theories); (2) the *Generic Conspiracist Belief Scale* (GCBS; Brotherton *et al*., 2013), a 15-item measure of belief in general conspiracy theories (i.e., decontextualized, abstract conspiracy theories); (3) Federico and colleagues' (2018) 7-item measure of political conspiracy theories; (4) Wood and colleagues' (2012) measure of belief in mutually incompatible conspiracy theories; and (5) the *Vaccine Conspiracy Theories Scale* (VCBS; Shapiro *et al*., 2016), a 7-item measure of belief in vaccine-related conspiracy theories. Items are summed within each conspiratorial ideation measure to generate a total score. We examined the correlations between all five measures of conspiratorial ideation and knowledge, intelligence, discernment, overconfidence, rational and intuitive thinking, and open-minded and closeminded cognition.

As described later in the "Data Analytic Plan" subsection, we conduct latent class analyses to identify whether conspiracy theorists are characterized by low accuracy, more overconfidence, and more close-mindedness and reliance on intuition. These analyses are conducted using Samples 1 and Samples 2, as these two samples provide the greatest number of the variables of interest for this research question. The BCTI (belief in specific conspiracy theories) is the only measure of conspiratorial ideation that was used in Samples 1 and 2; thus, it is the measure of conspiratorial ideation we will use in the latent class analyses.

Intelligence
Participants in all samples completed a 16-item version of *The International Cognitive Ability Resource* (ICAR; Condon & Revelle, 2014), which is a public-domain measure of intelligence that was validated in approximately 200 countries.[1] In addition to a total score, there are four subscale scores: Verbal Reasoning, Letter and Number Series, Matrix Reasoning, and Three-Dimensional Rotation. Correct responses were coded as "1" whereas incorrect responses were coded as "0"; correct items were then summed to generate a total score and the subdimension scores. The ICAR total score and subdimension scores are used in the correlation analyses. The ICAR total score is used in the latent class analyses.

Knowledge
Science literacy. In Samples 3 and 5, participants completed an 8-item measure of scientific knowledge (Kahan *et al*., 2012). Participants were instructed to indicate whether statements (e.g., electrons are smaller than atoms) were true or false or were instructed to select the correct answer from multiple choice questions (e.g., How long does it take for the Earth to go around the Sun?). Correct responses were coded as "1" whereas incorrect responses were coded as "0"; correct items were then summed to generate a total score. Science literacy is used in the correlation analyses.

Trivia knowledge. Participants in Samples 1 and 2 completed a 15-item measure of trivia knowledge that spanned multiple domains (e.g., geography, entertainment, history). All questions were multiple-choice with four response options. Correct responses were coded as "1" whereas incorrect responses were coded as "0"; correct items were then summed to generate a total score. Trivia knowledge is used in both the correlation analyses and the latent class analyses.

Political knowledge. Participants in Samples 3 and 4 completed a 5-item measure of political knowledge (Anson, 2018). All questions were multiple-choice with 2 to 5 response options. Correct responses were coded as "1" whereas incorrect responses were coded as "0"; correct items were then summed to generate a total score. Political knowledge is used in the correlation analyses.

Confidence
We assessed confidence concerning one's performance on the ICAR (intelligence test), trivia knowledge questionnaire, and political knowledge questionnaire.

Overestimation. Participants indicated how many questions they believe they answered correctly out of the total number

Table 1. Overview of measures used across samples.

	Sample 1 *N* = 527)	Sample 2 (*N* = 596)	Sample 3 (*N* = 477)	Sample 4 (*N* = 498)	Sample 5 (*N* = 958)

[1] Participants had 15 minutes maximum to complete the ICAR to preclude them from looking up answers online and to facilitate more rapid completion of the survey battery.

Conspiratorial Ideation					
BCTI	✓	✓		✓	✓
Vaccine CTs					✓
Mut. Cont. CTs					✓
Political CTs			✓		
GCBS			✓		✓
Intelligence	✓	✓	✓	✓	✓
Knowledge Measures					
Science Literacy			✓		✓
Trivia Knowledge	✓	✓			
Political Knowledge			✓	✓	
Confidence					
Overestimation	✓	✓	✓	✓	✓
Overplacement	✓	✓	✓	✓	✓
Confidence ratings	✓	✓	✓	✓	✓
Discernment Measures					
Bullshit Receptivity (full)	✓	✓			
Bullshit Receptivity (modified)					✓
Overclaiming	✓	✓		✓	
False news truth discernment			✓		✓
Rational vs. Intuitive Thinking					
REI (full)		✓			
REI (short)					✓
Confirmatory Thinking	✓	✓			
Objectivism	✓	✓			
Need for Cognition	✓	✓			
CRT-3	✓	✓		✓	✓
CRT-4	✓	✓	✓	✓	✓
Illusory pattern perception					✓

Open-minded vs. closeminded thinking					
Dogmatism	✓	✓	✓	✓	✓
AOT (reversed)					✓

Note. BCTI = Belief in Conspiracy Theories Inventory; GCBS = Generic Conspiracist Belief Scale; Political CTs = Ideological conspiracy theories; Mut. Cont. CTs = Contradictory conspiracy theories; Vaccine CTs = Vaccine Conspiracy Theories Scale; REI = Rational-Experiential Inventory; CRT = Cognitive Reflection; AOT = Actively Open-Minded Thinking

Table 2. Descriptive statistics, internal consistency coefficients, and response scales for each measure.

	M (SD)	α	Response scale/Response type
Conspiratorial Ideation			
Specific CTs (*n* = 3,056)	39.71 (20.22)	.94	1 (*completely false*) to 6 (*completely true*)
Vaccine CTs (*n* = 958)	15.54 (10.41)	.97	1 (*definitely not true*) to 5 (*definitely true*)
Cont. CTs (*n* = 958)	41.88 (21.75)	.91	1 (*definitely not true*) to 5 (*definitely true*)
Political CTs (*n* = 477)	15.81 (5.65)	.71	1 (*not at all true*) to 10 (*definitely true*)
General CTs (*n* = 1,435)	39.40 (14.26)	.95	1 (*strongly disagree*) to 7 (*strongly agree*)
Intelligence (*n* = 3,533)	7.57 (3.46)	-2	Multiple choice
Knowledge Measures			
Science Literacy (*n* = 1,435)	5.35 (1.66)	-4	True-or-false & multiple choice
Trivia Knowledge (*n* = 1,126)	7.01 (2.50)	-4	Multiple choice
Political Knowledge (*n* = 977)	3.13 (1.28)	-4	Multiple choice
Confidence			
Overestimation	Intelligence: .29 (3.61) Trivia: -1.06 (2.96) Political knowledge: .26 (1.35)	-	Fill-in-the-blank
Overplacement	Intelligence: -.46 (23.06) Trivia: -3.52 (21.26) Political knowledge: -50.01 (.95)	-	1st to 99th percentile
Confidence	Intelligence: 50.08 (26.32) Trivia: 40.29 (25.22) Political Knowledge: 64.30 (29.11)	-	0% (*not at all confident*) to 100% (*extremely confident*)
Discernment Measures			
Bullshit Receptivity *d'* (full) (*n* = 1,123)	.57 (.78)	-3	1 (*not at all profound*) to 5 (*very profound*)
Bullshit Receptivity *c* (full) (*n* = 1,123)	.07 (.83)	-3	1 (*not at all profound*) to 5 (*very profound*)
Bullshit Receptivity (modified) (*n* = 958)	74.72 (29.17)	.97	1 (*not at all profound*) to 5 (*very profound*)
Overclaiming *d'* (*n* = 1,621)	1.26 (.61)	-3	0 (*never heard of it*) to 6 (*very familiar*)

Overclaiming c (n = 1,621)	.19 (.69)	-[3]	0 (never heard of it) to 6 (very familiar)
False news truth discernment (n = 1,435)[1]			
Republican	.00 (3.06)[1]	-	1 (not at all accurate) to 5 (very accurate)
Democratic	.00 (3.40)[1]	-	1 (not at all accurate) to 5 (very accurate)
Neutral	.00 (3.21)[1]	-	1 (not at all accurate) to 5 (very accurate)
Rational vs. Intuitive Thinking			
REI Rationality (full) (n = 596)	69.66 (9.58)	.85	1 (definitely false) to 5 (definitely true)
REI Intuition (full) (n = 596)	63.61 (10.46)	.88	1 (definitely false) to 5 (definitely true)
REI Rationality (short) (n = 958)	17.52 (3.47)	.79	1 (definitely false) to 5 (definitely true)
REI Intuition (short) (n = 958)	17.16 (4.13)	.89	1 (definitely false) to 5 (definitely true)
Confirmatory Thinking (n = 1,123)	41.62 (15.54)	.79	1 (strongly disagree) to 5 (strongly agree)
Illusory Pattern Perception (n = 958)			
	M (SD)	**α**	**Response scale/Response type**
Coins Toss	26.88 (13.39)	.90	0 (completely random) to 6 (completely determined)
Snowy Pictures – Pattern	40.82 (12.67)	.87	0 (not at all) to 6 (very much)
Snowy Pictures – Illusory	21.80 (9.69)	.84	0 (not at all) to 6 (very much)
Art – Pattern	49.85 (10.51)	.92	1 (not at all) to 7 (very much)
Art – Illusory	19.35 (11.01)	.94	1 (not at all) to 7 (very much)
Objectivism (n = 1,123)	40.36 (6.21)	.77	1 (not at all) to 5 (extremely)
Need for Cognition (n = 1,123)	233.46 (46.73)	.94	1 (very strong disagreement) to 9 (very strong agreement)
CRT-3 (n = 3,056)	1.07 (.95)	-[4]	Fill-in-the-blank
CRT-4 (n = 3,533)	2.05 (1.26)	-[4]	Fill-in-the-blank
Open-minded vs. closeminded thinking			
Dogmatism (n = 3,533)	85.61 (29.47)	.92	1 (false) to 9 (true)
AOT (n = 958)	37.70 (6.54)	.80	1 (completely disagree) to 7 (completely agree)

Specific CTs = Belief in Conspiracy Theories Inventory; General CTs = Generic Conspiracist Belief Scale; Political CTs = Ideological conspiracy theories; Cont. CTs = Contradictory conspiracy theories; Vaccine CTs = Vaccine Conspiracy Theories Scale; REI = Rational-Experiential Inventory; CRT = Cognitive Reflection; AOT = Actively Open-Minded Thinking

[1]All items were standardized for the truth discernment scores; hence, the means are 0.

[2]We did not calculate the Cronbach's alpha coefficient for the ICAR, as it is not an appropriate index of reliability for timed administrations (Cronbach & Shavelson, 2004).

[3]These measures were analyzed using Signal Detection Theory analyses; thus, we did not calculate Cronbach's alpha coefficients for these measures. [4]In line with the

literature (Taber, 2018), we did not calculate Cronbach's alpha coefficients for the knowledge and performance-based measures.

of items on the questionnaire. To generate an overestimation score on each measure, we subtracted the actual number of correct items from the perceived number of correct items. Positive scores indicate overestimation, and thus overconfidence, and negative scores indicate underestimation. The overestimation scores are used in the correlation and latent class analyses.

Overplacement. Participants were shown an image of a normal distribution and asked to indicate how well they performed relative to the average person scoring at the 50th percentile (1st to 99th percentile). To generate an over placement score, we subtracted 50 (representing the 50th percentile) from the participant's self-placement rating (i.e., positive scores indicate over placement and negative scores indicate under-placement). The over placement scores are used in the correlation analyses.

Confidence. Participants also indicated how confident they were in the accuracy of their answers overall on a 0% (*not at all confident*) to 100% (*extremely confident*) scale. The confidence ratings are used in the correlation analyses.

Discernment measures
Bullshit receptivity. Participants in Samples 1 and 2 completed the *Profound Statements Questionnaire* (PSQ; Pennycook *et al*., 2015), a measure of one's ability to discriminate semantically meaningless sentences (e.g., "Wholeness quiets infinite phenomena") from semantically meaningful statements (e.g., "Only those who will risk going too far can possibly find out how far one can go"). Participants indicated the extent to which they found each statement to be "profound". A 30-item version was presented with 10 meaningless and 10 meaningful sentences; the remaining 10 items were filler items reflecting mundane, factual statements (e.g., "Newborn babies require constant attention"). We analyzed the PSQ using Signal Detection Theory (SDT). Regarding the accuracy parameter (d'), the larger the parameter, the greater the differentiation between meaningful and meaningless items. Regarding response bias (c), negative values reflect the tendency to endorse an item as profound, regardless of whether the item is meaningful or meaningless. The d' and c values are used in correlation analyses. In addition, the d' score is included in the latent class analyses.

In Sample 5, participants completed a version of the PSQ comprising 30 semantically meaningless sentences. Hence, we could not conduct SDT analyses. Instead, items were summed to yield a total score of endorsement of semantically meaningless statements as profound. This total score is used in the correlation analyses.

Overclaiming. Participants in Samples 1, 2, and 4 completed a 45-item version of the *Overclaiming Questionnaire* (OCQ; Paulhus *et al*., 2003), which comprised 33 "real" items (e.g., photon) and 12 "foil" items (e.g., ultra-lipid). We analyzed the OCQ using Signal Detection Theory (Paulhus *et al*., 2003). Participants indicated the extent to which they were familiar with each item (meaning they had "heard of" the item). Regarding the accuracy parameter (d'), the larger the parameter, the greater the differentiation between real and foil items. Regarding response bias (c), negative values reflect the tendency to endorse an item as familiar, regardless of whether

the item is real or a foil. The d' and c values are used in correlation analyses. In addition, the d' score is included in the latent class analyses.

False news headlines. We adapted Pennycook and Rand's (2019) stimuli and we updated the headlines to be relevant to current events at the time of data collection (e.g., headlines that were pertinent to the 2020 American presidential election). Participants in Samples 3 and 5 were presented with 15 real news headlines and 15 false news headlines (see *Extended data* for more information (Bowes & Fazio, 2023b)). All headlines, whether false or real, were presented in the format of a Facebook post thumbnail with a headline, a source, and a picture above the headline. Participants were presented with 10 Democratic- consistent, 10 Republican-consistent, and 10 politically neutral headlines. The ordering of headlines was randomized across participants. Participants answered the following question: "To the best of your knowledge, how accurate is the claim in the above headline?" (1 [*not at all accurate*] to 4 [*very accurate*] scale). We computed truth discernment scores, such that accuracy ratings for the false news headlines were subtracted from the accuracy ratings of real news headlines within each domain (Republican, Democratic, neutral); discernment scores across each domain were only weaklyto-moderately and positively interrelated (*rs* ranged from .10 to .30), so we analyze them separately in relation to conspiratorial ideation. The truth discernment scores are used in correlation analyses.

Reliance on intuition vs. rational thinking
Cognitive reflection. Participants in all samples completed the *Cognitive Reflection Test* (CRT). We used a 3-item (Frederick, 2005; Patel *et al.*, 2019) and a 4-item version (Thomson & Oppenheimer, 2016) in varying combinations across samples. Correct responses were coded as "1" whereas incorrect responses were coded as "0"; correct items were then summed to generate a total score. This score is used in the correlation analyses and the latent class analyses.

Confirmatory thinking. We administered a modified version of the *Confirmation Inventory* (Rassin, 2008) in Samples 1, 2, and 4. The *Confirmation Inventory* assesses the propensity to adhere to one's beliefs despite contradictory evidence and make decisions according to gut feelings. Items were summed to generate a total score. This score is used in correlation analyses and the latent class analyses.

Objectivism. Participants in Samples 1 and 2 completed the *Objectivism Scale* (Leary *et al*., 1986), an 11-item self-report measure of the propensity to base decisions and beliefs on empirical evidence. Items were summed to generate a total score. This score is used in correlation analyses and the latent class analyses.

Need for cognition. Participants in Samples 1 and 2 completed the *Need for Cognition Scale* (Cacioppo & Petty, 1982), a 34-item self-report measure of the tendency to seek out knowledge and enjoy thinking. Items were summed to generate a total score. This score is used in correlation analyses and the latent class analyses.

Rational/intuitive thinking. Participants in Samples 2 and 5 completed the *Rational-Experiential Inventory* (REI; Pacini &

Epstein, 1999). In Sample 2, participants completed a 40-item version of the REI, and, in Sample 5, participants completed a 10-item version of the REI. There are two domains on the REI: a rational thinking domain and an intuitive/experiential thinking domain. Items were summed within each domain to generate two domain scores: REI Rationality and REI
Intuition. These scores are used in the correlation analyses.

Illusory pattern perception. Participants in Sample 5 completed three measures of illusory pattern perception. First, participants were told they would see the results of the same coin being flipped 10 times (with "H" reflecting heads and "T" reflecting tails). Participants indicated the extent to which each of the 10 sequences (e.g., HTHHHHHHTH) were random vs. determined (van Prooijen *et al.*, 2018) on a 0 (*completely random*) to 6 (*completely determined*) scale. Participants also completed a modified version of the snowy pictures task; 12 of 24 pictures displayed an embedded image that was grainy but possible to perceive whereas the other 12 images did not contain any embedded image (Whitson & Galinsky, 2008). Participants indicated the extent to which they saw an object in each picture on a 0 (*not at all*) to 6 (*very much*) scale. Ratings were summed within category, namely stimuli with an image and stimuli without an image. Finally, participants were presented with a series of 18 different modern art paintings; participants were told that 9 of the paintings were from a painter "well-known for his regular design" and participants were told that the other 9 paintings were from a painter "well known for his random brush strokes" (van Prooijen *et al.*, 2018). The former paintings were structured with a pattern and the latter paintings were unstructured with no pattern. Participants indicated the extent to which they saw a pattern in each image on a 0 (*not at all*) to 6 (*very much*) scale. Ratings were summed within category, namely images with a pattern and images without a pattern. Measures of illusory pattern perception are used in the correlation analyses.

Open-minded thinking vs. closemindedness
Actively open-minded thinking. Participants in Sample 5 completed a 7-item version of the *Actively Open-Minded Thinking Scale*, which measures tendencies to seek out disconfirmatory information, use rational thinking strategies, and update one's beliefs in the face of new evidence (e.g., "People should take into consideration evidence that goes against their beliefs"; Haran *et al.*, 2013). Items were summed to generate a total score. This measure is used in the correlation analyses.

Dogmatism. Participants in all samples completed the *Dogmatism Scale*, which is a 22-item measure of unjustified certainty in one's beliefs and inflexibility in the face of new evidence (e.g., "My opinions are right and will stand the test of time"; Altemeyer, 2002). Items were summed to generate a total score. This measure is used in the correlation analyses and the latent class analyses.

Demographic variables
Political ideology. Participants indicated the extent to which they identified as liberal or conservative on a 1 (*extremely liberal*) to 7 (*extremely conservative*) scale.

Religiosity. Participants indicated the strength of their religious beliefs on a 0 (*not at all strong*) to 100 (*extremely strong*) scale.

Age. Participants reported their age in a fill-in-the-blank question.

Gender. Participants were asked to select their gender from a list of options: male, female, transgender, and other – please provide your answer.

Race. Participants were asked to select their race from a list of options: White, Asian, Black or African-American, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, and other – please provide your answer.

Ethnicity. Participants indicated whether they were Hispanic or Latino ("yes") or not ("no"). Data analytic plan

All analyses were preregistered unless noted as exploratory. First, we examined the zero-order correlations between conspiratorial ideation and accuracy (intelligence, knowledge, discernment), overconfidence, and cognitive styles (intuition vs. rational thinking, closemindedness vs. open-mindedness). These correlations were examined in the collapsed sample (the publicly available dataset has each sample labeled for interested readers). We used Gignac & Szodorai's (2016) meta-analytically derived effect size benchmarks for individual differences researchers: $r = .10$ is small, $r = .20$ is medium, and $r = .30$ is large.

The smallest effect size of interest in the present investigation was $r = .10$ (a small effect size per Gignac & Szodorai, 2016). A sensitivity analysis based on an effect size of .10 and an alpha of .05 in our smallest sample ($N = 477$) revealed that we had at least 71% power to detect the smallest effect size of interest. In our largest sample size ($N = 3,056$), we had 99% power to detect the smallest effect size of interest. Statistical significance was interpreted based on two-tailed *p*-values with a cut-off criterion of .05. We accounted for Type I error using the Hommel-Bonferonni correction method within conspiratorial ideation measure (e.g., BCTI) and within outcome category (e.g., accuracy). In another set of analyses, we examined the partial correlations between conspiratorial ideation and the aforementioned variables after controlling for demographic variables.

We also conducted latent class analyses and latent profile analyses in R using the *mclust, mix*, and *mixture* packages. For the latent class and profile analyses, we constrained variances and covariances to be proportional. All solutions were fit with 1,000 random starts. To evaluate which solution (latent class vs. profile) fits best, we conducted likelihood ratio tests. We preregistered that if the difference is not significant at the $p < .05$ threshold, we would retain the latent class solution (as it is more parsimonious). If the difference is significant at the $p < .05$ threshold, we would retain the solution with the smallest log-likelihood value. As described earlier, all analyses were conducted using Samples 1 and Samples 2, as these two samples comprised most of the variables of interest for

Table 3. Correlations between conspiratorial ideation and intelligence.

	ICAR Total	ICAR VR	ICAR LN	ICAR MR	ICAR 3DR
BCTI	**-.18**	**-.19**	*-.07*	**-.15**	**-.11**
Vaccine CTs	**-.25**	**-.27**	*-.10[a]*	**-.19**	**-.16**
Mut. Cont. CTs	**-.27**	**-.29**	**-.16**	**-.18**	**-.16**
Political CTs	-.13*[a]	-.12*[a]	-.04	*-.14*	-.09
GCBS	**-.15**	**-.13**	**-.10**	**-.10**	**-.11**

Note. Ns ranged from 477 to 3,056. Bolded is *p* < .001, italicized is *p* < .01, and * is *p* < .05. ICAR = Intelligence, VR = Verbal Reasoning, LN = Letter-Number Series, MR = Matrix Reasoning, 3DR = 3D Rotation; BCTI = Belief in specific conspiracy theories; Vaccine CTs = Vaccine conspiracy theories; Mut. Cont. CTs = Mutually contradictory conspiracy theories; Political CTs = Political conspiracy theories; GCBS = Belief in generic conspiracy theories [a]Indicates that the correlation was not significant after controlling for demographic variables.

this research question[2]. All variables were standardized to aid interpretation, and all missing cases were removed (*N* = 702).

These analyses are person-centered, affording the opportunity to examine whether there are classes of individuals that vary at high, medium, and low levels of conspiratorial ideation; as such, we tested a solution with 3 classes (compared to 2 class and 4 class solutions). We examined an array of fit indices, specifically information criteria, to ascertain whether a 3-profile solution fits the data. The BIC tends to be the most well-supported for class selection, so we preregistered that we would retain the solution with the lowest BIC.

After choosing the model with the best fit, we then used MPlus (mixture modeling with the "ML" estimator) to run the model with the best fit and extract the posterior probabilities for each class. This exploratory analysis allowed us to assign class membership to each individual and ascertain whether the mean-level differences between groups were statistically significant per two-tailed independent samples *t*-tests.

Results

RQ1: Is conspiratorial ideation related to less intelligence, knowledge, and truth discernment?

In line with our hypothesis, we found broad evidence that conspiratorial ideation was related to less accuracy, including less intelligence, knowledge, and truth discernment.

Intelligence. Conspiratorial ideation was consistently related to less intelligence (total score) with effect sizes ranging from small to medium (Table 3). Across measures, conspiratorial ideation was also significantly related to lower scores on verbal reasoning and matrix reasoning, with effect sizes ranging from small to medium. Conspiratorial ideation was weakly related to lower performance on

letter-number series and three-dimensional rotation, although the correlations were not significant for political conspiracy theories.

Knowledge. There was some evidence that conspiratorial ideation was related to less knowledge (Table 4). Conspiratorial ideation was weakly to moderately related to less science literacy, although the correlation with political conspiracy theories was not significant. Belief in specific conspiracy theories

Table 4. Correlations between conspiratorial ideation and knowledge measures.

	Science Literacy	Trivia Knowledge	Political Knowledge
BCTI	**-.24**	-.04	**-.32**
Vaccine CTs	**-.27**	-	-
Mut. Cont. CTs	**-.22**	-	-
Political CTs	-.05	-	-.08
GCBS	**-.11**	-	.02

Note. Ns ranged from 477 to 1,123. Bolded is *p* < .001, italicized is *p* < .01, and * is *p* < .05. BCTI = Belief in specific conspiracy theories; Vaccine CTs = Vaccine conspiracy theories; Mut. Cont. CTs = Mutually contradictory conspiracy theories; Political CTs = Political conspiracy theories; GCBS = Belief in generic conspiracy theories

was not related to trivia knowledge but it was strongly related to less political knowledge. Belief in political conspiracy theories and

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[2] In secondary and exploratory analyses, we subset the data to include participants who scored at least one standard deviation above the mean on conspiratorial ideation (*N* = 178). Fit statistics are presented in supplemental materials (Supplemental Figure 2). Bootstrapped log-likelihood tests based on 999 replications (McLachlan, 1987) indicated that additional classes (2, 3, and 4) were not significant over-and-above a 1 class solution. Thus, a 1 class solution fit best and, as such, we did not proceed further with these secondary analyses.

general conspiracy theories were not significantly related to political knowledge.

Truth discernment. Overall, conspiratorial ideation was related to worse discernment between real and false information (Table 5). Belief in specific conspiracy theories was moderately related to less accuracy on the overclaiming task, although it was not related to accuracy on the bullshit receptivity task. Belief in specific conspiracy theories was also weakly to moderately related to response bias on these discernment measures, such that those scoring higher on conspiratorial ideation generally (a) rated themselves as more familiar with all topics and (b) perceived all items as more meaningful. Across measures, conspiratorial ideation was strongly related to perceiving "bullshit" statements as meaningful (bullshit receptivity total).

Conspiratorial ideation also tended to be related to worse discernment on the false news task across Republican, Democratic, and Neutral news headlines, with effect sizes mostly being medium; belief in political conspiracy theories was not related to discernment on the false news task, and belief in general conspiracy theories tended to only be weakly related to lower discernment.

Partial correlations. Of 57 correlations across measures of intelligence, knowledge, and discernment, just four (7%) were reduced to non-significance after controlling for demographic variables and all were originally small ($rs < .20$). Of these correlations, three were in relation to intelligence and one was in relation to discernment. The correlations that were reduced to non-significance are denoted in Table 1 and Table 3.

RQ2: Is conspiratorial ideation related to more overconfidence regarding one's intelligence and knowledge?

Contrary to our hypothesis, there was limited evidence that conspiratorial ideation was related to more confidence and overconfidence (Table 6). Indeed, there was only evidence for a positive link between conspiratorial ideation and overestimation on the intelligence task—conspiratorial ideation was weakly to moderately related to perceiving that one performed better on the intelligence test than they did in reality. In contrast, conspiratorial ideation was not significantly related to overestimation for the trivia knowledge and political knowledge measures.

Our analyses regarding the over placement (percentile ranking) and confidence ratings were exploratory. Regarding over placement, conspiratorial ideation tended to not be significantly related to over placement. The exception was the relation between belief in specific conspiracy theories and over placement on the political knowledge measure; these relations were negative and weak, meaning that individuals scoring higher on conspiratorial ideation assigned lower percentile

Table 5. Correlations between conspiratorial ideation and discernment measures.

	Overclaimingd'	Overclaiming$c$	Bullshit Receptivityd'	Bullshit Receptivity$c$	Bullshit Receptivity Total
BCTI	**-.27**	**-.10**	-.05	**-.24**	**.47**
Vaccine CTs	-	-	-	-	**.35**
Mut. Cont. CTs	-	-	-	-	**.42**
Political CTs	-	-	-	-	-
GCBS	-	-	-	-	**.37**
	Rep. TD	**Dem. TD**	**Neutral TD**		
BCTI	-.11*[a]	**-.27**	**-.18**		
Vaccine CTs	**-.15**	**-.25**	**-.18**		
Mut. Cont. CTs	**-.19**	**-.33**	**-.18**		
Political CTs	-.08	.01	-.06		
GCBS	-.07*	**-.12**	-.05		

Note. Ns ranged from 477 to 1,621. Bolded is $p < .001$, italicized is $p < .01$, and * is $p < .05$. d' = Accuracy parameter; c = response bias; Rep. TD = Republican Truth Discernment, Dem. TD = Democratic Truth Discernment, Neutral TD = Neutral Truth Discernment; BCTI = Belief in specific conspiracy theories; Vaccine CTs = Vaccine conspiracy theories; Mut. Cont. CTs = Mutually contradictory conspiracy theories; GCBS = Belief in generic conspiracy theories [a]Indicates that the correlation was not significant after controlling for demographic variables.

Table 6. Correlations between conspiratorial ideation and confidence measures.

	ICAR OE	ICAR OP	ICAR Conf.	Trivia OE	Trivia OP	Trivia Conf.	PK OE	PK OP	PK Conf.
BCTI	**.19**	-.01	.03	.06	-.01	.07*[d]	.02	*-.13*[a,b]	-.08[c]
Vaccine CTs	**.15**[b]	**-.12**[b]	-.07	-	-	-	-	-	-
Mut. Cont. CTs	**.22**	-.05[c]	-.02[c]	-	-	-	-	-	-
Political CTs	.11*[d]	.03	.02	-	-	-	.09[e]	.04	.04
GCBS	.07*[b,d]	-.07[c,d]	-.04[c]	-	-	-	.05	.09	.09

Note. Ns ranged from 477 to 3,056. Bolded is $p < .001$, italicized is $p < .01$, and * is $p < .05$. ICAR = Intelligence, OE = Overestimation, OP = Overplacement, Conf. = Confidence; PK = Political Knowledge; BCTI = Belief in specific conspiracy theories; Vaccine CTs = Vaccine conspiracy theories; Mut. Cont. CTs = Mutually contradictory conspiracy theories; Political CTs = Political conspiracy theories; GCBS = Belief in generic conspiracy theories [a]Indicates that the correlation was not significant after controlling for demographic variables. [b]Indicates that the correlation was not significant after controlling for performance on the measure. [c]Indicates that the correlation became significant after controlling for performance on the measure. [d]Indicates that the correlation was not significant after a Hommel-Bonferroni correction. [e]Indicates that the correlation became significant after controlling for demographic variables.

ranks to their performance. Similarly, conspiratorial ideation tended to not be significantly related to confidence ratings on these tasks.

Demographic partial correlations. Of 27 correlations, just one (4%) was reduced to non-significance after controlling for demographic variables (Table 6); this correlation was small ($rs <$ .20). In addition, one (4%) correlation became significant after controlling for demographic variables, specifically the correlation between political conspiracy theories and overestimation on the political knowledge measure (Table 6); this relation was small, positive, and significant after controlling for demographic variables.

Accuracy partial correlations. Of 27 correlations, four (15%) were reduced to non-significance after controlling for performance on the intelligence and political knowledge measures (Table 6). Moreover, five (19%) correlations became significant after controlling for performance. First, the correlations between (a) mutually exclusive conspiracy theories and general conspiracy

negatively related to seeing a pattern when there was a real pattern present (art – pattern). That is, conspiratorial ideation is more strongly related to detecting false patterns than real patterns.

Not only was conspiratorial ideation related to more reliance on intuition but also less rational thinking. The correlations with self-

Table 7. Correlations between conspiratorial ideation and cognitive styles.

	Conf. Think.	REI-I Full	REI-I Short	Coin Toss	SP – Pattern	SP – Illusory	Art – Pattern	Art – Illusory	REI-R Full	REI-R Short	CRT-3
BCTI	**.23**	**.16**[a]	**.29**	**.31**	**.16**	**.22**	*-.12*[a]	**.20**	*-.13*	*-.15*[a]	**-.24**
Vaccine CTs	-	-	**.24**	**.23**	.08*	**.18**	-.07	**.20**	-	**-.16**	**-.24**
Mut. Cont. CTs	-	-	**.23**	**.24**	.08*	**.19**	**-.15**	**.23**	-	**-.15**	**-.21**
Political CTs	-	-	-	-	-	-	-	-	-	-	-
GCBS	-	-	**.27**	**.15**	*.09*	**.14**	-.05	**.15**	-	**-.11**	**-.22**
	CRT-4	**Dog.**	**AOT**	**Obj.**	**Need Cog.**						
BCTI	**-.21**	**.15**	**-.35**	**-.16**	**-.11**						
Vaccine CTs	-.15	.27	-.39	-	-						
Mut. Cont. CTs	**-.14**	**.18**[a]	**-.36**	-	-						
Political CTs	-.08	.12*[a]	-	-	-						
GCBS	-.05[b]	.06*[a,c]	**-.29**	-	-						

Note. Ns ranged from 596 to 3,056. Bolded is $p < .001$, italicized is $p < .01$, and * is $p < .05$. Conf. Think. = Self-reported confirmatory thinking; REI-I = Self-reported intuition; SP = Snowy picture; Art = Art evaluation task; REI-R = Self-reported rationality; CRT = Cognitive reflection; Dog. = Dogmatism; AOT = Actively open-minded thinking; Obj. = Objectivism; Need Cog. = Need for cognition; BCTI = Belief in specific conspiracy theories; Vaccine CTs = Vaccine conspiracy theories; Mut. Cont. CTs = Mutually contradictory conspiracy theories; Political CTs = Political conspiracy theories; GCBS = Belief in generic conspiracy theories. Positive correlations with Coin Toss, Snowy Pictures – Illusory, and Art – Illusory, indicate that conspiratorial ideation is related to more illusory pattern perception/detection of nonrandomness. Snowy Pictures – Pattern and Art – Pattern indicate that a pattern was actually present. [a]Indicates that the correlation was not significant after controlling for demographic variables. [b]Indicates that the correlation became significant after controlling for demographic variables. [c]Indicates that the correlation was not significant after a Hommel-Bonferroni correction.

theories and (b) over placement and confidence on the intelligence measure (ICAR) became weakly positive. Finally, the correlation between belief in specific conspiracy theories and confidence on the political knowledge measure became positive and weak. These results are denoted in Table 6.

RQ3: Is conspiratorial ideation related to more (a) reliance on intuition and (b) close-minded cognition?

There was generally support for the hypothesis that conspiratorial ideation is related to more reliance on intuition and more close-minded cognition (Table 7). Regarding reliance on intuition, conspiratorial ideation, across measures, was moderately related to more confirmatory thinking and reliance on intuition. In addition, conspiratorial ideation, across measures, tended to be moderately to strongly related to illusory pattern perception (coin toss, snowy pictures – illusory, art – illusory). Conspiratorial ideation was either (a) weakly positively related to seeing a pattern when there was a real pattern present (snowy pictures – pattern) or (b) weakly

reported reliance on rationality, objectivism (i.e., tendency to base one's conclusions on evidence and rationality), and need for cognition (i.e., tendency to seek out and enjoy complexities and problem-solving tasks) tended to be negative, significant, and small. Cognitive reflection (i.e., ability to override intuition when solving problems) tended to be moderately negatively related to conspiratorial ideation, although two of the correlations (political conspiracy theories, general conspiracy) were not significant.

Turning to close-minded cognition, conspiratorial ideation, across measures, was weakly to moderately related to more dogmatism (i.e., tendency to be certain of one's beliefs and remain closeminded to new evidence). Conspiratorial ideation, across measures, was strongly related to less actively openminded thinking (i.e., tendency to be open to alternative perspectives and update one's beliefs if evidence calls to do so). Hence, conspiratorial ideation was related to more reliance on intuition and more closemindedness whereas conspiratorial ideation was related to less rational thinking and less open-mindedness.

Partial correlations. Of 51 correlations, six (12%) correlations were reduced to non-significance after controlling for demographic variables (Table 7). All correlations were small ($rs < .20$). Moreover, 1 (2%) correlation, namely the correlation

between the GCBS and cognitive reflection, became weak, negative, and significant after controlling for demographic variables (Table 7).

RQ4: Is there a class of individuals who score highly on conspiratorial ideation, and is this class characterized by less knowledge, more reliance on intuition, and more close-mindedness?

First, we compared a latent class analysis with 3 classes to a latent profile analysis with three classes using 1,000 random starts. The likelihood ratio test was significant ($LR = 610.08$, $df = 66$, $p < .001$), thus rejecting the null hypothesis that the fit is equal across the two models. The log-likelihood was smallest for the latent class solution ($LL = -11,274.50$) compared with the latent profile solution ($LL = -11,579.54$), so we proceeded with the latent class solution.

We examined the fit indices for a 1, 2, 3, and 4 class solution (see *Extended data* (Bowes & Fazio, 2023b)). Unexpectedly, and in contrast with our hypothesis, a 2 class and a 4 class solution were best supported by most fit indices. As preregistered, we focused on the BIC indices, given that they are best supported for identifying a class solution (Bauer & Steinley, 2022). The BIC and ssBIC (i.e., sample-size adjusted BIC) were lowest with the 4 class solution compared to other solutions whereas the ICL.BIC (i.e., integrated completed likelihood criterion with BIC approximation) was lowest with the 2 class solution (2 class ICL.BIC = 23,506; 4 class ICL.BIC = 23,720). That said, the BIC was minimally smaller for the 4 class (BIC = 23,274) solution compared with the 2 class solution (BIC =

23,298), and the ssBIC tends to improve with more classes rather than fewer classes (2 class ssBIC = 22,968; 4 class ssBIC = 22,855).

To further probe into these discrepancies, we used a bootstrapped likelihood-ratio test based on 999 replications (McLachlan, 1987) and tested whether the addition of a fourth class would contribute to better fit. The addition of a second class significantly improved fit ($LR = 16.04$, $p = .01$) whereas the addition of a third ($LR = 10.65$, $p = .05$) and fourth ($LR = 4.07$, $p = .48$) class did not result in significant improvement in fits. Thus, we proceeded with the more parsimonious 2 class solution. One class indicated a "high conspiratorial ideation" (high CI, 10% of sample) group whereas the second class indicated a "low conspiratorial ideation" (low CI, 90% of sample) group (Figure 1, Table 8).

The class means are in Table 9, and the *t*-test statistics for all mean-differences between classes are in Table 10. The high CI group scored approximately 1 standard deviation higher on conspiratorial ideation than the low CI group. In line with our overarching hypothesis, the high CI group tended to be characterized by less accuracy, more overconfidence, more reliance on intuition, less rational thinking, and more closemindedness.

First, regarding accuracy, the high CI group was characterized by significantly less intelligence and worse discernment on the overclaiming measure than the low CI group; the high CI group also performed worse on discernment than the low CI group for the bullshit receptivity measure, although the difference was not statistically significant. Turning to
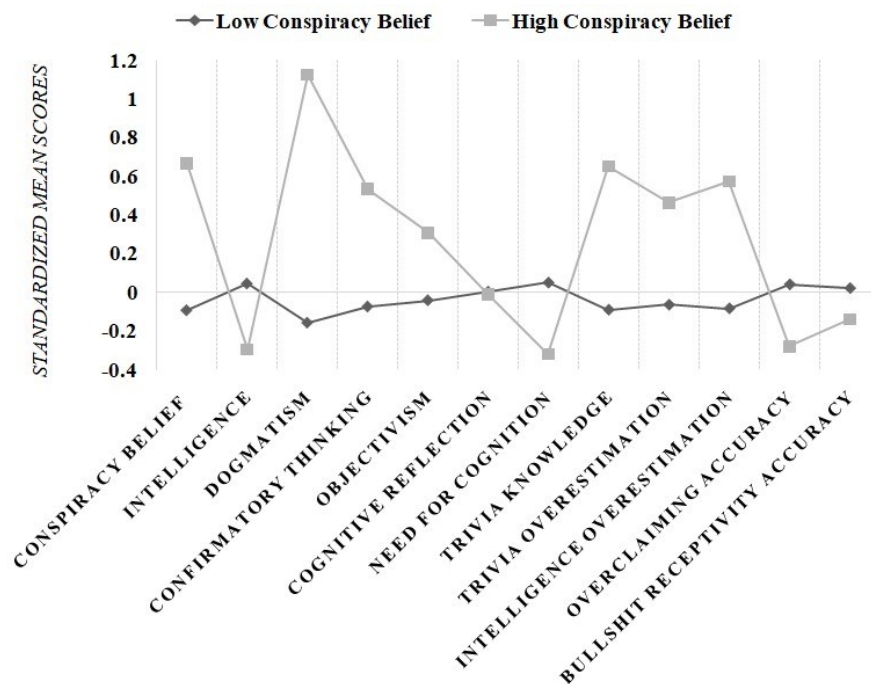

Figure 1. Standardized means for the two latent classes. *Note.* All differences are statistically significant at a *p* < .05 threshold with the exceptions of cognitive reflection and bullshit receptivity accuracy.

Table 8. Latent class probabilities.

	Percentage of Sample – Estimated Model	Percentage of Sample – Estimated Posterior Probabilities	Final Class Percentages – Most Likely Latent Class Membership

High BCTI	12.5%	12.5%	10.0%
Low BCTI	87.5%	87.5%	90.0%

Note. BCTI = Belief in specific conspiracy theories

Table 9. Unstandardized latent class means.

	BCTI	ICAR	Dog.	CThink	Obj.	Cog. Reflection	NFCog	Trivia	Trivia OE	ICAR OE	OCQ d'	PSQ d'
Total Sample	35.59 (15.02)	8.20 (3.30)	81.03 (27.51)	40.26 (14.64)	40.49 (6.21)	1.24 (1.03)	235.94 (45.65)	7.07 (2.47)	-1.08 (2.95)	-.36 (3.42)	1.24 (.59)	.60 (.77)
High BCTI	48.69 (20.56)	6.94 (3.69)	118.23 (32.81)	49.78 (16.76)	42.93 (8.59)	1.19 (1.16)	218.70 (53.94)	9.00 (3.29)	.63 (3.83)	2.25 (4.65)	1.02 (.74)	.45 (.94)
Low BCTI	34.14 (13.56)	8.35 (3.22)	76.90 (23.51)	39.21 (14.02)	40.22 (5.84)	1.25 (1.02)	238.01 (44.17)	6.86 (2.26)	-1.28 (2.77)	-.68 (3.10)	1.26 (.57)	.61 (.75)

Note. Standard deviations are presented in parentheses. BCTI = Belief in specific conspiracy theories; ICAR = Intelligence; Dog = Dogmatism; CFT = Self-reported confirmatory thinking; Obj = Objectivism; Cog. Reflection = Cognitive reflection; NF = Need for cognition; Trivia = Trivia knowledge; TrOE = Overestimation on trivia measure; IcOE = Overestimation on ICAR; OCQd = OCQ *d'*; PSQd = PSQ *d'*

Table 10. Independent samples t-test statistics for the latent classes.

	Levene's *F*	*t*	Std. Error of the Difference
Conspiracy Belief	**43.91**	**6.70**	2.17
Intelligence	2.58	**3.84**	.36
Dogmatism	**12.74**	**12.00**	3.44
Confirmatory Thinking	*10.61*	**5.95**	1.78
Objectivism	**46.93**	*2.98*	.91
Cognitive Reflection	*9.20*	.47	.12
Need for Cognition	**12.22**	**3.34**	2.78
Trivia	**34.99**	**6.22**	.34
Trivia Overestimation	**14.46**	**4.71**	.40
Intelligence Overestimation	**29.57**	**5.76**	.51
Overclaiming Accuracy (*d'*)	**15.19**	*3.07*	.24
Bullshit Receptivity Accuracy (*d'*)	5.49*	1.60	.10

Note. Bolded is *p* < .001, italicized is *p* < .01, and * is *p* < .05. If the Levene's *F* test was significant, then we included the adjusted *t* statistic.

overconfidence, the high CI group significantly overestimated lower on need for cognition (less rational thinking) than the their performance on the trivia and intelligence tasks more high CI group. Finally, regarding closemindedness, the high CI than the low CI group. The high CI group also scored signifi- group scored significantly higher on dogmatism than the low cantly higher on confirmatory thinking (more intuition) and CI group.

Nevertheless, in contrast with our overarching hypothesis, the high CI group was characterized by significantly more trivia knowledge (accuracy) than the low CI group. In addition, the high CI group scored significantly higher on objectivism (rational thinking) than the low CI group and there were no significant differences between the two groups on cognitive reflection (rational thinking).

Discussion

In the current study, we sought to (a) clarify the relations among conspiratorial ideation, accuracy, overconfidence, and motivations to be rational and open-minded and (b) investigate whether there are multiple types of conspiracy theorists. Most of our hypotheses were broadly supported. First, conspiratorial ideation, across measures, tended to be weakly to moderately related to less of an ability to be accurate (e.g., intelligence, science literacy, truth discernment) and strongly related to more endorsement of pseudo-profound statements. Not only was conspiratorial ideation generally related to less ability, but it was also related to more overconfidence on the intelligence measure. There was also evidence that conspiratorial ideation was moderately to strongly related to more intuitive thinking styles, ranging from more engagement in confirmatory thinking to increased detection of illusory patterns. In addition, conspiratorial ideation was weakly to moderately related to less rational thinking, spanning cognitive reflection and self-report measures of rational thinking. Similarly, conspiratorial ideation was weakly to moderately related to more dogmatism and strongly related to less actively open-minded thinking; these findings collectively demonstrate that conspiratorial ideation is related to more closemindedness. The aforementioned results tended to remain robust to controlling for demographic variables. These results also closely mirror the literature, providing further evidence that conspiratorial ideation is characterized by less accuracy, more overestimation (for intelligence), more intuitive thinking and closemindedness, and less rational thinking and open-mindedness (e.g., Bowes *et al*., 2023; Pennycook *et al*., 2022).

That said, some of our hypotheses were not supported. First, conspiratorial ideation was not invariably related to less knowledge (accuracy). Although conspiratorial ideation tended to be consistently related to less science literacy, it was not related to trivia knowledge and tended to not be related to political knowledge. One potential reason for this discrepancy across knowledge-based measures is the extent to which a participant is required to understand the topic beyond factual recall. Specifically, science literacy typically requires at the least a rudimentary understanding of scientific processes to answer a factual question correctly – for instance, to know whether antibiotics kill viruses, an individual needs to understand both the definition of an antibiotic (e.g., a prescribed medicine for an infection) and how antibiotics in general work (e.g., they kill bacteria). In contrast, trivia knowledge, in many ways, represents a collection of random facts that could

readily be acquired in the search of new information. Similarly, our measure of political knowledge also represented whether people understood political facts (e.g., who is the current US Secretary of Energy?) rather than whether people possessed a mechanistic understanding of political processes (e.g., how are bills passed in the US Senate?).

These findings may provide broad evidence in support of the notion that conspiracy theorists are "anomaly hunters" (e.g., Brotherton, 2015), meaning conspiracy theorists are dedicated to the pursuit of knowledge surrounding their conspiracy theory of choice and other perceived anomalies. Indeed, "the most committed conspiracists possess an intricate knowledge of their subject, often far in excess of their debunkers" (Brotherton, 2015). Hence, anomaly hunting could give rise to average or even above average levels of knowledge for certain measures, perhaps typically those that pertain most closely to conspiracy theories and other anomalies. Anomaly hunting, however, would not contribute to a deeper understanding of processes and mechanisms for a particular topic nor would it give rise to a stronger ability to discern amongst strong and weak forms of evidence.

Moreover, conspiratorial ideation was not invariably related to more overconfidence. Previous research has found that conspiratorial ideation is related to more overestimation on problem-solving tasks, including on measures of numeracy, cognitive reflection, and visual reasoning (Pennycook *et al*., 2022). Previous research had not investigated whether conspiratorial ideation was related to more overestimation on knowledge-based measures. Parallel to the literature, we found that conspiratorial ideation was related to more overestimation on the intelligence measure, which required participants to solve problems. We did not, however, find evidence that conspiratorial ideation was correlated to more overestimation on the trivia and political knowledge measures. Thus, conspiratorial ideation may only be related to more overconfidence on problem-solving tasks than on knowledge-based tasks.

Our person-centered analyses also add to our knowledge of conspiratorial ideation. We conjectured that there would be three classes of conspiracy theorists, falling at low, medium, and high levels of conspiratorial ideation, as has been identified in previous research (Jones *et al*., 2023). Instead, there was instead evidence for just two classes (believers and nonbelievers). Largely consistent with the variable-centered results, those prone to conspiratorial ideation (a) had less of an ability to be accurate (e.g., intelligence, discernment on the overclaiming measure), (b) were more overconfident, (c) engaged in more intuitive thinking, (d) had less need for cognition, and (e) were more dogmatic than those who were not prone to conspiratorial ideation. Nevertheless, conspiracy theorists (a) had more trivia knowledge and (b) self-reported that they engaged in more objective thinking than non-conspiracy

theorists, and (c) the two classes of individuals did not differ in their levels of cognitive reflection or discernment on the bullshit receptivity measure.

If a 2-class solution (characterized by high and low levels of conspiratorial ideation) replicates in confirmatory research, then such a result would raise the intriguing and important possibility that there is no class characterized by "moderate" levels of belief in conspiracy theories. A recent dissertation, for instance, found that there were just 2 classes of believers in unwarranted claims, with one class scoring high in belief in unwarranted claims and one class scoring low in belief in unwarranted claims (Waymire, 2019). Although this finding has not yet been subject to peer review, it provides additional evidence that belief in unwarranted claims writ large may be best captured by two classes. That said, there may be evidence for more than two classes of conspiracy theorists when burrowing into specific conspiracy beliefs, such as COVID-19 conspiracy theories (Jones *et al*., 2023). Person- centered research is needed that employs different measures of conspiratorial ideation to clarify who conspiracy theorists are in the real world.

In sum, to answer our primary question of whether conspiracy theorists are inaccurate, unmotivated to accurate, or both, it seems that the answer to this question is "it depends". Most of the results pointed to an answer of "both" (inaccurate and unmotivated to be accurate)—conspiracy theorists seem to be generally lacking in capacities to be accurate, tend to be overconfident, and tend to rely on intuition and be closeminded. Other results, however, revealed that conspiracy theorists are neither inaccurate nor unmotivated to be accurate—conspiracy theorists seem to possess a large amount of trivia knowledge, perceive that they engage in objective thinking, and have intact cognitive reflection abilities. Putting these results together across levels of analysis, *conspiratorial ideation* is not related to all measures of accuracy and overconfidence, and *conspiracy theorists* are not unknowledgeable and irrational across all measures. Altogether, it seems that those who score higher on conspiratorial ideation possess a blend of intuition-based and rationality-based motives. Limitations

Our findings should be interpreted in light of several limitations. First, this study was a secondary data analysis; as such, this study was in the context of hypothesis generation and confirmatory research aiming to replicate our findings is needed. Along these lines, because of the way the data was collected, we were only able to conduct a latent class analysis in two of the five samples. As a result, we only conducted a latent class analysis using a measure of belief in specific conspiracy theories. It is possible that a different class profile would emerge when using other measures of conspiratorial ideation (see Jones *et al*., 2023), especially when considering that there may be important differences across measures of belief in specific and general conspiracy theories (see Imhoff *et al*., 2022). For instance, our findings suggested that belief in contradictory political conspiracy theories was the weakest correlate of accuracy, overconfidence, and motivations to be accurate compared with other measures of conspiratorial ideation. As such, it is unclear whether a similar solution would be found for this measure of conspiratorial ideation as identified with our measure of belief in specific conspiracy theories.

We also did not directly recruit for those prone to conspiratorial ideation. Instead, our participants were either online community participants or college students. Because of our original recruitment strategy, mean-levels of conspiratorial ideation were low and positively skewed (Supplemental Figure 1). For four of the five conspiratorial ideation measures used, the means were below half of the maximum value (the exception was the belief in mutually exclusive conspiracy theories scale). What is more, the conspiracy theorist class had a mean-level score of just slightly above half of the maximum possible score on the conspiratorial ideation measure. In aggregate, our participants were not dedicated conspiracy theorists. Thus, it is unclear whether our results, both variable-centered and personcentered, would generalize to those who are committed to conspiracy narratives. Given that committed conspiracy theorists are ostensibly the most likely to seek out additional conspiracy narratives (see van Prooijen & Douglas, 2018), it is possible that they may differ from those who are less committed to conspiracy theories in their accuracy, overconfidence, and motivations to be accurate. Future research should strive to recruit those already committed to conspiracy theorists (see Franks *et al*., 2017) to investigate the generalizability of our findings.

Future research is also needed to examine whether our findings generalize to non-American and non-Western populations. The vast majority of our participants were American. In our lone international sample (Sample 5), most participants were either American or Canadian. Recent research indicates that certain cultural variables, such as individualism-collectivism, are related to conspiratorial ideation in Chinese samples (e.g., van Prooijen & Song, 2021) and in samples comprising dozens of nationalities (65 nationalities; Biddlestone *et al*., 2021). Indeed, a recent review identified that conspiratorial ideation may be elevated in nations with more collectivist values, more corrupt governments, and lower GDPs than other nations (see Hornsey & Pearson, 2022). The relations between conspiratorial ideation and certain variables, such as climate change skepticism (Hornsey *et al*., 2018), may also vary across nations, with relations being stronger in some nations over others. Still, additional research suggests that the relations between conspiratorial ideation and other variables, such as political extremism (e.g., Imhoff *et al*., 2022b), are relatively consistent across nations. Hence, it is not possible to determine whether our findings would hold (in terms of significance, magnitude of effect sizes, and direction of effect sizes) outside of American and Western contexts. Cross-cultural replication of our research is warranted. Future directions

Our findings raise several intriguing open questions for future research. Chief among these questions is when, why, and how are rationality/accuracy motives elicited versus intuitive/heuristic motives elicited in conspiracy theorists. Yet, it remains unclear how these different motives manifest in conspiracy theorists. For instance, social media platforms encourage reliance on intuition-based motives; fact checks and accuracy cues are notably absent from most social media interactions whereas identity-related and emotion cues are commonly present (Brady *et al*., 2020). When individuals who score higher on conspiratorial ideation engage in a social media platform, they may be even more likely than the average person to rely on intuitive thinking strategies when

engaging with information, given their existing tendency to rely on intuitive thinking strategies in general.

Yet, other processes may make rational thinking salient. Considering that conspiracy theorists, in the present study, at least perceive themselves to be objective in their thinking, they may be more likely than the average person to base their reasoning on evidence, logic, and fact. Although they will likely remain closeminded in terms of updating their beliefs, they may be more likely than the average person to initially seek out different perspectives. Along these lines, conspiracy theorists may be characterized by more sensation seeking and may perceive conspiratorial information as having strong entertainment value (e.g., van Prooijen, 2022; van Prooijen *et al*., 2022). These psychological characteristics and emotional reactions may promote a higher frequency of engaging with different pieces of information, as this information search may prove rewarding and exciting for conspiracy theorists. In aggregate, seeking out multiple perspectives and new information coupled with finding new information exciting may cue rational thinking motives.

Making rational motives salient, however, does not beget a rational decision. Future research, thus, not only should identify the psychological and contextual factors that make certain motives more salient than others but also whether these motives then give rise to more accuracy (vs. inaccuracy). For instance, it may be exciting for conspiracy theorists to find new information, which in turn may cue rational thinking motives, but conspiracy theorists may not have the capacity to discern whether this information is true or false. In the end, then, an irrational conclusion may still be reached even in the presence of heightened attention to rational thinking motives.

To gain a deeper understanding of when, why, and how different motives are elicited in conspiracy theorists, it will also be essential to use longitudinal designs in future research. It remains unclear whether less accuracy precedes more reliance on intuition or vice-versa in the context of conspiratorial ideation. In identifying the developmental trajectories of these relations, it will be possible to illuminate points for intervention. For instance, if less accuracy precedes more reliance on intuition, and not the other way around, in predicting conspiratorial ideation, then providing conspiracy theorists with the tools necessary to identify errors and falsehoods would likely be more effective than motivation-based interventions. Interventions such as the Bad News (Roozenbeek & Van Der Linden, 2019) or Go Viral! (Basol *et al*., 2021) games could be modified to prevent or reduce acceptance of new conspiracy theories. If, however, the relations between accuracy and motives to be rational/open-minded are bidirectional, then comprehensive interventions that address skills and motivation may be most effective. Skills-based interventions could be coupled with motivation-based interventions, the latter of which may include encouraging consideration of accuracy (e.g., Pennycook *et al*., 2020) or slowing down in one's thinking process (e.g., Fazio, 2020); these interventions make rational thinking motives salient and can reduce acceptance of new falsehoods. Thus, in employing longitudinal designs, the ways in which conspiratorial ideation arises and how to change it will become clearer.

Conclusion

Across thousands of participants and multiple measures of conspiratorial ideation, our findings revealed that conspiratorial ideation is generally related to less accuracy, more overconfidence, more closemindedness and reliance on intuition, and less open-mindedness and rational thinking. That said, correlations were not invariably large or significant across measures. To gain insights into these complexities, person-centered analyses were conducted to identify whether there are types of conspiracy theorists. Instead of identifying multiple classes of conspiracy theorists, we instead identified just one class of individuals characterized by higher levels of conspiratorial ideation. Results indicated that those prone to conspiratorial ideation are less intelligent and discerning, more overconfident, more reliant on intuition, and more dogmatic, but they also were more knowledgeable about trivia and perceived that they were more objective in their thinking than those who score lower on conspiratorial ideation. Thus, conspiracy theorists are not consistently unknowledgeable or irrational. Future research is needed to identify how different motives are made salient in conspiracy theorists and subsequently leverage these findings to identify how to reduce susceptibility to misinformation. Because conspiracy theorists are perhaps not as simple as originally presumed, it is essential to understand how accuracy, overconfidence, and motivations both manifest in conspiracy theorists and serve to maintain conspiratorial ideation.

Data availability

Underlying data
Open Science Framework: Are Conspiracy Theorists Inaccurate, Unmotivated to be Accurate, or Both?: A Latent Class Analysis

https://doi.org/10.17605/OSF.IO/YGD4M (Bowes & Fazio, 2023a)

This project contains the following underlying data:

- fulldatasetforcorrelations.sav
- ocqcomb.sav
- psqdata.sav
- stddataforLCA.csv
- unstddataforLCA.csv
- unstddatawithclasses.csv

Extended data
Open Science Framework: Are Conspiracy Theorists Inaccurate, Unmotivated to be Accurate, or Both?: A Latent Class Analysis

https://doi.org/10.17605/OSF.IO/YGD4M (Bowes & Fazio, 2023b)

This project contains the following extended data:
- surveys&stimuli.docx
- Latent Class Code folder
- Osfpreregistration.pdf
- supplementals.docx

Software availability

Source code available from: https://doi.org/10.17605/OSF.IO/YGD4M

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Open Peer Review

Current Peer Review Status:

✓ ✓ ✓ ✓ ✓

Version 1

Reviewer Report 13 October 2023

https://doi.org/10.21956/routledgeopenres.19212.r27526

✓

Scott Radnitz (iD)

University of Washington, Seattle, Washington, USA

This study seeks to identify whether levels of conspiracy ideation correspond to a wide array of variables, in an effort to impose some clarity on a field that has identified most of these variables in isolation. The authors are commended for their comprehensive view of the existing literature and inclusion of so many variables in a single analysis. They are also commended for their humility in acknowledging that their findings fall short of their hopes, and that conspiracy belief remains an evasive concept to pin down empirically.

One concern the authors should address is how confident we should be that respondents maintained enough cognitive focus throughout the survey to provide valid responses. There are a large number of question batteries, each with many items, sometimes 15, sometimes 30, sometimes 40. How long did the survey take to answer, how did placement of the questions affect failure to respond or indications of flagging engagement, and how much did this affect substantive findings? In other words, are more conspiracist people more or less likely to remain focused on answering so many questions?

There is also the fact that conspiratorial people would be less likely to fill out this survey by being part of this panel. They are distrustful of institutions (and university professors in particular), so what can the authors say about how the failure to recruit true conspiracists might bias the results?

It seems one of the incidental findings is that results vary depending on whether the outcome variables are general or (some) specific CTs. This would seem to echo other findings that people may be drawn to some CTs for different reasons. If the authors limited their study to general CTs only, they might have a purer test of their hypotheses. Otherwise, they should defend including questions from the BCTI, which risks opening the door to political and ideological cues that trigger different psychological processes than for general CTs.

Is the work clearly and accurately presented and does it engage with the current literature? Yes

Is the study design appropriate and does the work have academic merit? Yes

Are sufficient details of methods and analysis provided to allow replication by others?
Yes

Are all the source data and materials underlying the results available? Yes

If applicable, is the statistical analysis and its interpretation appropriate? Yes

Are the conclusions drawn adequately supported by the results? Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Political behavior.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 10 October 2023 https://doi.org/10.21956/routledgeopenres.19212.r27454

✔️ **Ricky Green** 🆔

University of Kent, Canterbury, England, UK

Pooling together existing data to conduct high-powered secondary data analyses, the authors examined various cognitive factors associated with belief in various conspiracy theories. To do so, they used a broad range of predictors (e.g., intelligence, confidence, rational vs. intuitive thinking) and outcomes (e.g., generic conspiracist beliefs, vaccine, and political conspiracy beliefs). Notably, the authors investigated these relationships through both variable-centred and person-centred approaches. Variable-centred analyses largely replicated existing findings (e.g., conspiracy belief was associated with intuitive thinking). However, contrary to the authors' expectations, the person-centred analyses revealed only two classes of believers: believers and non-believers. In the Limitations section, the authors noted that future research with participants exhibiting higher levels of conspiracy belief might reveal the anticipated three classes of believers (low, medium, and high believers), who then might show differential relationships with various cognitive variables.

Overall, I think this paper is well-written, and the methodology and analyses are good and well thought out. I also believe that the person-centred approach taken by the authors is a great direction to take. Further, whilst the authors did not find the anticipated three classes of conspiracy believer, I agree with some of their reasoning for why did not. I suspect also that if the samples had a higher range of conspiracy believers, then three classes of conspiracy believer may have been found.

Indeed, my only suggestion (which may or may not be taken) for this paper would be to include Franks et al.'s (2017) paper in the introduction to build the narrative more. Although Franks et al. reported there being five types of believers, they can be broadly broken down to three types, which can align with the authors' three classes of believers: lower/non-believer (type 0), medium believer (type 1-3), and high believer (types 4-5). Franks et al. argues that an
awakening/conversion process happens when transitioning from a medium believer to high believer. This suggests that the cognitive motivations of conspiracy belief might change when one's level of conspiracy belief increases, as the authors suspect. Further, this could also be likened to falling further and further down the "rabbit hole" (Sutton & Douglas, 2022).

Other than these suggestions for adding to the narrative, I think the paper is in a great place to be indexed.

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Is the work clearly and accurately presented and does it engage with the current literature?
Yes

Is the study design appropriate and does the work have academic merit? Yes

Are sufficient details of methods and analysis provided to allow replication by others?
Yes

Are all the source data and materials underlying the results available? Yes

If applicable, is the statistical analysis and its interpretation appropriate? Yes

Are the conclusions drawn adequately supported by the results? Yes

Competing Interests: No competing interests were disclosed.
Reviewer Expertise: My area of research is the psychology of conspiracy theories.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 09 October 2023 https://doi.org/10.21956/routledgeopenres.19212.r27529

✔   **Shawn Smallman** (iD)

Portland State University, Portland, Oregon, USA

This article is a psychological study of the factors that shape conspiratorial thinking, such as overconfidence, reliance on intuition, dogmatism, and open-mindedness. The authors are particularly interested in learning the differences amongst conspiracy theorists. This is important because we need to tease out the complexity of conspiratorial thinking in order to address the challenges that they create, such as with public health communication.

This is a thoughtfully organized study with a sound methodology. The literature review was particularly well done. The authors have a clear, organized writing style, which makes their argument easy to follow. The article addresses not only whether there are different classes of conspiracy theorists, but also the different groups of conspiracy theories that they may espouse.

Studying conspiracy theories is an inherently interdisciplinary task, but much of the best work is currently being done in psychology. This article meets the standard of the best contemporary literature in the field. I could see this article being used in undergraduate classrooms, as it could lead to a deeper understanding of conspiratorial thinking.

My one minor comment is that the authors could more clearly explain why conspiracy theories are harmful. For example, why would someone wear insect repellent in an endemic Zika area if they believe that the disease is spread by chemicals that Monsanto has put into the ground water? This would not require much text, but would underline the relevance of their work.

In sum, this is a carefully designed and nuanced study that merits publication.

Is the work clearly and accurately presented and does it engage with the current literature?
Yes

Is the study design appropriate and does the work have academic merit? Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

Are all the source data and materials underlying the results available? Yes

If applicable, is the statistical analysis and its interpretation appropriate? Yes

Are the conclusions drawn adequately supported by the results? Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: I am a social scientist -with training in history and political science- who has published articles on global health and epidemic disease, particularly conspiracy theories related to pandemics. I do not have expertise in psychology.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 05 October 2023 https://doi.org/10.21956/routledgeopenres.19212.r27532

✔ **Eirikur Bergmann**
Bifrost University, Bifrost, Iceland

In this paper, the authors objective is to conduct a thorough evaluation of conspiratorial thinking. To accomplish this goal, they incorporated assessments related to belief in particular conspiracy theories, such as those pertaining to vaccines, contradictions, and politics, as well as assessments related to general conspiracy theories.

In the study, they replicate and extend previous research on conspiratorial thinking with a large sample and various measures. They examine the relationship between conspiratorial thinking and factors like intelligence, knowledge, truth discernment, overconfidence, intuition vs. rationality, and open-mindedness vs. close-mindedness.

Although the results provide perhaps limited new knowledge into conspiratorial thinking, this is a meticulous study which provides meaningful data results for further understanding of conspiratorialism.

Is the work clearly and accurately presented and does it engage with the current literature?

Yes

Is the study design appropriate and does the work have academic merit? Yes

Are sufficient details of methods and analysis provided to allow replication by others?
Yes

Are all the source data and materials underlying the results available? Yes

If applicable, is the statistical analysis and its interpretation appropriate? Yes

Are the conclusions drawn adequately supported by the results? Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: I am a qualitative political scientist and I do not have sufficient knowledge of quantitative methods nor social psychology,

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 15 September 2023 https://doi.org/10.21956/routledgeopenres.19212.r27451

✔   **Alejandro Romero Reche** (iD)
University of Granada, Granada, Spain
Alba Taboada Villamarín
Department of Sociology, Autonomous University of Madrid, Madrid, Spain

This is a substantive contribution to the social psychology of conspiracy beliefs, showing a full command of the literature on the topic and delving into pending issues that have been delineated by the latest research on the field. The approach, based on latent class analysis, is methodologically sound, although the conclusions must be framed within limitations stemming from the sampling process, which the authors have thoughtfully acknowledged.

In our view, one of the key strengths of the paper, which makes it relevant beyond the disciplinary boundaries of social psychology, lies in the identification of different types of believers (conspiracy theorists) in relation to attributes such as overconfidence, accuracy, reliance on intuition, etc. The common-sense view tends to lump all believers together in the single category of conspiracy theorists, and scholarly approaches too often indulge in this sort of over-simplification that obscures, rather than illuminate, the problem they are meant to clarify. Scientific knowledge on conspiracy beliefs is often further distorted by the a *priori* assumption that conspiracy theorists are particularly irrational or share a number of cognitive shortcomings that would explain why they indulge in conspiracy accounts. In its nuanced analysis of the diverse attribute structures to be found in different conspiracy theorists, the paper is helping overcome these foundational errors in the field of conspiracy theory studies: some conspiracy theorists seem driven by a genuine desire to be rational and keep an open mind, while others seem to essentially look for confirmation for their preexisting beliefs.

The methodological approach is more than adequate in that regard, since its innovative implementation of latent class analysis highlights the heterogeneity within the broad category of conspiracy believers or conspiracy theorists. This is strengthened by a sizeable sample (if somehow shaded by the limitations mentioned above) and the use of five different measures for conspiratorial ideation.

We have two suggestions to make. First, it might be interesting to complement these findings, in further research, with an examination of contextual phenomena, taking the effect of uncertainty into account as established by other social psychology studies. In addition, several studies in the field of emotional analysis have shown how the emotions elicited by social and political events plays a highly influential role in the propensity to believe in conspiracy theories. Exploring how different types of believers react to different contexts and situations seems a natural development from this paper.

Secondly, the authors use, among other measures of conspiratorial ideation (as noted above), a measure of belief in mutually incompatible conspiracy theories from the highly influential paper "Dead and alive" by Wood, Douglas and Sutton (2012). Its findings have been recently disputed in a new paper by van Prooijen *et al.* (2023), "Just dead, not alive", which the authors mention in passing. It would seem advisable to consider, at least briefly, if the alleged mistakes in statistical interpretation that call the results in Wood, Douglas and Sutton's valuable work into question are related in any way to the measures they used and that this paper is drawing on.

Is the work clearly and accurately presented and does it engage with the current literature?
Yes

Is the study design appropriate and does the work have academic merit? Yes

Are sufficient details of methods and analysis provided to allow replication by others?
Yes

Are all the source data and materials underlying the results available? Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are the conclusions drawn adequately supported by the results? Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Sociology of conspiracy theories

We confirm that we have read this submission and believe that we have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.