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Echo Chambers, Cognitive Thinking Styles, and Mistrust? Examining the Roles Information Sources and Information Processing Play in Conspiracist Ideation

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Researchers have proposed that conspiracy theory beliefs are fueled by isolation from counter-conspiracy theory information, reliance on intuitive thinking, and/or institutional mistrust. Prior work has not thoroughly explored these factors in the same study, making it difficult to ascertain the extent to which each factor influences conspiracist ideation and thus the necessary components for developing effective interventions. We conducted a survey (N = 1,374) to explore the relationship between each factor and conspiracist ideation. Based on OLS regressions, our findings counter the common portrayal of conspiracy theorists as residing in an isolated information space. We found that conspiracy theorists are more likely to rely on intuitive thinking styles and possess lower levels of institutional trust than nonbelievers. We conclude that efforts to reduce conspiracy theory beliefs through exposure to counter-conspiracy theory information may not suffice. Interventions must also encourage analytical thinking and strengthen institutional trust.

Keywords: conspiracy theories; selective exposure; cognitive thinking styles; information processing; echo chambers; institutional trust

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In 2016, a man drove to Washington, DC, to stop what he thought was an underground child sex trafficking ring masterminded by Hillary Clinton. What became known as "pizzagate" is one of many examples in which people relied on the affordances of social media to spread misinformation (Kang & Goldman, 2016). Researchers have proposed that social media platforms have fostered the growth of conspiracy theory echo chambers, insulated interpretive communities that protect inhabitants from counter-information (Cinelli et al., 2022; Dow, Johnson, Wang, Whitson, & Menon, 2021; Lewandowsky, Lloyd, & Brophy, 2018).

If conspiracy theorists reside in echo chambers, efforts to reduce conspiracy theory beliefs should focus on expanding conspiracy theorists' media diets to include exposure to counter-conspiracy theory information. Researchers have suggested, however, that other contributing factors may impede the efficacy of such interventions. They proposed that conspiracy theory believers may have a greater tendency to rely on an intuitive way of information processing that makes them less attentive to conspiracy theories' inaccuracies and their own cognitive biases (Swami, Voracek, Stieger, Tran, & Furnham, 2014; van Prooijen & Douglas, 2018). Researchers have also suggested that individuals who mistrust social institutions are prone to believing conspiracy theories since such explanations affirm their worldview (Abalakina-Paap, Stephan, Craig, & Gregory, 1999; Miller, Saunders, & Farhart, 2016; Pierre, 2020). These proposals suggest that an individual's media diet is not the only factor. How an individual processes conspiracy theory information affects whether and to what degree they believe in it. Prior work has not explored these three factors in the same study—cognitive processing, media diet, and trust—thus making it difficult to ascertain the extent to which each factor influences conspiracist ideation. A more precise understanding of the role each factor plays is essential since conspiracist ideation has real-world consequences.

Conspiracy theories explain events that involve clandestine actors colluding for nefarious purposes (van Prooijen & Douglas, 2018). While conspiracies among powerful and/or secretive groups can and have occurred (e.g., Watergate, the Tuskegee Syphilis Experiment), *conspiracy theories* involve alleged conspiracies that are presently unverified, highly implausible, based on weak to no evidence, and often rely on arguments that are not falsifiable (Brotherton, 2013; Uscinski & Parent, 2014; van Prooijen & Douglas, 2017). The growth of conspiracy theory beliefs can have detrimental effects on believers and the broader public, including increased prejudice and reduced support for important public policies (Jolley & Douglas, 2014; Jolley, Meleady, & Douglas, 2020).

To help determine the extent to which conspiracy theorists rely on different media sources or process information differently from nonconspiracy theory believers, we surveyed U.S. residents to explore the relationships between conspiracist ideation and individuals' self-reported media diets, cognitive thinking styles, and institutional trust. The following sections review the relevant literature, describe our data collection, and present our findings. We conclude by discussing the implications of our findings for efforts to reduce harmful conspiracy theory beliefs.

Conspiracy Theories, Echo Chambers, and Conspiracist Ideation

Conspiracy theory scholarship has focused on how information environments contribute to the growth and maintenance of conspiracy theory beliefs. Scholars have proposed that those who hold strong

beliefs in conspiracy theories isolate themselves into interpretive communities where they are exposed primarily to proconspiracy theory information and lack exposure to counter-conspiratorial information (Cinelli et al., 2022; Douglas et al., 2019; Dow et al., 2021; Lewandowsky et al., 2018; Sunstein & Vermeule, 2009). Scholars have used different terms to describe such environments, including crippled epistemologies (Sunstein & Vermeule, 2009) or echo chambers—a concept proposed by Jamieson and Cappella (2008) to describe information spaces that insulate inhabitants from opposing political views. For the sake of brevity, we will use the term *echo chamber* to refer to such insulated spaces.

Conceptually, the *echo chamber* relates to the broader communication scholarship on selective exposure, the idea that people will avoid information that does not align with their worldviews (see, for example, Hart et al., 2009). If conspiracy theorists limit their information exposure and reside in echo chambers, it would be essential for techniques to reduce conspiracy theory beliefs to involve exposure to information that counters these conspiracy theories. However, several studies have found that most Americans do not avoid counter-attitudinal information, even if they prefer to consume information congruent with preexisting beliefs (Barnidge, 2020; Bruns, 2019; Dubois & Blank, 2018; Guess, 2021). Within research on echo chambers and conspiracy theories, two studies on social media usage found that Facebook users who like or comment on conspiracy theory Facebook pages tend not to comment, like, or share posts from science news Facebook pages (Bessi et al., 2015; Del Vicario et al., 2016), although their research designs did not examine conspiracy theory believers' media diets in total. It is possible that individuals may be exposed to counter-conspiracy theory information but choose not to engage with it via Facebook.

Research examining conspiracy theory believers' complete media diet has yielded mixed results. Two studies found that belief in COVID conspiracy theories is negatively associated with exposure to traditional/legacy media outlets (e.g., television, radio, newspapers) and positively associated with exposure to digital media (e.g., social media, the Internet; Allington, Duffy, Wessely, Dhavan, & Rubin, 2021; De Coninck, Frissen, Matthijs, d'Haenens, & Lits, 2021). Another study found that exposure to Fox News, a conservative-leaning cable news network, was associated with stronger beliefs in conspiracy theories about President Obama and reduced beliefs in conspiracy theories about President George W. Bush. The study also found that exposure to CNN and MSNBC, two liberal-leaning cable news networks, was associated with reduced beliefs in President Obama conspiracy theories but was not associated with beliefs in President George W. Bush conspiracy theories (Hollander, 2018). In contrast, a different study found that strong believers in the 9/11 conspiracy theories were more likely to read blogs but no less likely to consume media from other sources (Stempel, Hargrove, & Stempel, 2007).

One of the challenges of trying to draw conclusions about conspiracy theory beliefs and echo chambers from prior work is that past work has primarily focused on beliefs in specific conspiracy theories rather than on the general tendency to believe in conspiracy theories. Nonetheless, prior work has found that belief in a specific conspiracy theory is itself influenced by conspiracist ideation—a generalized predisposition to believe in conspiracy theories (Brotherton, French, & Pickering, 2013; Bruder, Haffke, Neave, Nouripanah, & Imhoff, 2013). Based on the *echo chamber* argument, it is possible that those high in conspiracist ideation—which we refer to as *conspiracy theorists*—may seek out proconspiracy theory media sources and avoid counter-conspiracy theory sources. Alternatively, conspiracist ideation may not be

a major influence on media consumption but instead shape how individuals process the information they are exposed to.

Research on conspiracist ideation (as opposed to beliefs in specific conspiracy theories) and media consumption has been limited. Xiao, Borah, and Su (2021) found a positive association between social media use and general conspiracy theory beliefs but did not explore other types of media use. Enders et al. (2021) found that greater reliance on social media as a primary news source was positively correlated with beliefs in specific conspiracy theories, but only for those already high in conspiracist ideation. Although Enders et al.'s (2021) study helped examine the relationship between conspiracist ideation and media consumption, it relied on what participants identified as their "primary" source for news rather than measuring how often participants relied on different media sources. To gauge whether conspiracy theorists truly ignore counter-attitudinal media sources, research that provides a more complete depiction of media usage patterns is necessary.

Many prominent conspiracy theories expand over time to rebuke new contradictory information (Keeley, 1999; Uscinski & Parent, 2014), further calling into question the claim that conspiracy theorists avoid anticonspiracy theory media outlets. At least some conspiracy theorists must monitor counter-attitudinal media outlets. Otherwise, how would conspiracy theorists notice the existence of new, contradictory information? Nonetheless, it seems likely that conspiracy theorists rely on alternative media outlets and platforms, given that some conspiracy theories receive minimal to no positive coverage or coverage in general in mainstream media outlets.

Although some scholarship suggests conspiracy theorists may reside in echo chambers, the literature on selective exposure and the scholarship charting the evolution of conspiracy theories indicates that conspiracy theorists are not entirely isolated but are sensitive to accounts offered in mainstream media outlets. In other words, the media diet of conspiracy theorists and non-conspiracy theorists may differ in breadth and depth rather than result in isolated interpretive islands. To determine whether this is the case, we need to examine the relationship between conspiracist ideation and the media diet in general. Consequently, we seek to answer the following research question:

RQ1: What is the relationship between media diet and conspiracist ideation?

Conspiracy Theory Beliefs and Information Processing

Whether or not conspiracy theorists reside in echo chambers, exposing conspiracy theorists to information that debunks conspiracy theories they believe may not be a sufficient strategy for reducing their conspiracy theory beliefs. The mixed results of research regarding participants exposed to information that debunks conspiracy theories suggest that strong conspiracy theory beliefs are not simply because of a lack of accurate knowledge, but also are based on how individuals process conspiracy theory-related information (Jolley & Douglas, 2017; Orosz et al., 2016; Warner & Neville-Shepard, 2014). Prior work has drawn from dual-process models of cognition (Kahneman, 2011) to suggest that beliefs in conspiracy theories may be grounded in the more intuitive and effortless form of information processing (i.e., System 1) rather than the more deliberative and effortful form of information processing

(i.e., System 2; Swami et al., 2014; van Prooijen & Douglas, 2018). An overreliance on System 1 processing renders individuals susceptible to cognitive biases—mental shortcuts that result in judgment errors in certain situations (Kahneman, 2011). Individuals with a tendency to rely on System 1 processing may find conspiracy theories' claims to be persuasive since conspiracy theories' evocative content grabs their attention as they underutilize the more deliberative form of information processing that might otherwise cause them to cogitate on logical fallacies and factual inaccuracies (Swami et al., 2014; van Prooijen & Douglas, 2018).

Past studies have found an association between certain cognitive biases and conspiracy theory beliefs (Brotherton & French, 2014; Dagnall, Denovan, Drinkwater, Parker, & Clough, 2017; Douglas & Sutton, 2011; McHoskey, 1995; Pennycook, Cheyne, Barr, Koehler, & Fugelsang, 2015). The cognitive bias findings are encouraging, but these studies did not directly measure participants' information-processing styles. The small set of studies that have examined this relationship generally found a positive association between an intuitive thinking style (i.e., System 1) and conspiracist ideation (Georgiou, Delfabbro, & Balzan, 2019; Lobato & Zimmerman, 2019; Swami et al., 2014), as well as a negative association between an analytical or rational thinking style (i.e., System 2) and conspiracist ideation (Barron et al., 2018; Georgiou et al., 2019; Swami et al., 2014; but Lobato & Zimmerman, 2019 found no association). Inconsistencies in how conspiracist ideation was measured, however, limit their generalizability. Barron et al. (2018), Georgiou et al. (2019), and Swami et al. (2014) used the Belief in Conspiracy Theories Inventory (Swami et al., 2010). This inventory measures how much a respondent believes in a range of prominent conspiracy theories. By measuring beliefs in specific conspiracy theories, however, this inventory offers limited generalizability since the conspiracy theories an individual endorses may be influenced by a range of psychological and social factors (Brotherton et al., 2013; Goreis & Voracek, 2019). Recognizing this limitation, researchers have developed scales aimed at measuring conspiracist ideation by surveying beliefs in abstract conspiracist claims (Brotherton et al., 2013; Bruder et al., 2013). Two of the studies examining thinking styles used these more general conspiracist ideation scales. Lobato and Zimmerman (2019) used the Conspiracy Mentality Questionnaire (Bruder et al., 2013), and Georgiou et al. (2019) used the Generic Conspiracist Beliefs Scale (Brotherton et al., 2013).

Given the small number of works that have studied the potential association between cognitive thinking styles and conspiracy ideation and the inconsistencies in how these works have measured conspiracy theory ideation, more research is needed. Moreover, prior works have not explored thinking styles and media diet in the same study, thus making it difficult to ascertain the extent to which individuals are susceptible to conspiracist ideation because of their media diet (e.g., they have not been exposed to counter-conspiracy information) versus their information-processing style. Consequently, we seek to answer the following research question:

RQ2: What is the relationship between cognitive thinking styles and conspiracist ideation?

Conspiracy Theory Beliefs and Institutional Trust

Institutional trust (e.g., trust in major social institutions, such as state authorities, politicians, experts, and the media) is another factor that may play a prominent role in conspiracist ideation. Prior

research has found a negative association between institutional trust and the tendency to believe in conspiracy theories (Abalakina-Paap et al., 1999; Bruder & Kunert, 2022; Goertzel, 1994; Golec de Zavala & Federico, 2018; Jensen et al., 2021; Miller et al., 2016; van Prooijen & Acker, 2015). Scholars have drawn from these findings to propose that individuals who mistrust major social institutions may be prone to endorse conspiracy theories since conspiracy theories allege sinister acts by major authority figures and thus support their worldview (Abalakina-Paap et al., 1999; Miller et al., 2016).

Pierre (2020) proposed a "two-component, socio-epistemic" model involving an interaction between mistrust and how individuals process misinformation (p. 617). According to this model, mistrust in conventional authorities leads individuals to seek alternative explanations, including conspiracy theories. Mistrusting individuals that are also prone to what Pierre (2020) described as "information-processing biases," such as racial prejudices, cognitive biases, and a lack of analytic thinking will be particularly susceptible to conspiracy theories since conspiracy theories support their preexisting beliefs and intuitions (p. 625). Pierre's account of information-processing biases is similar to the argument put forward by those emphasizing thinking styles. Both accounts suggest that a greater reliance on intuitive thinking styles renders individuals more prone to conspiracy theory beliefs because of information-processing errors, but Pierre's model includes institutional trust as an additional key factor.

If trust plays a central role in conspiracist ideation, intervention efforts that focus on exposing individuals to counter-information and/or encouraging more analytical thinking may not be effective since the information individuals are encouraged to carefully consider comes from the same established authorities that conspiracy theorists distrust. Efforts would also need to focus on strengthening individuals' institutional trust (Harambam, 2021; Pierre, 2020). Although previous work has found an association between institutional trust and conspiracy theory beliefs, prior research has not explored trust and thinking styles, thus making the particular relationship each has with conspiracist ideation unclear. Moreover, the interaction effect Pierre (2020) proposed between mistrust and cognitive thinking styles has yet to be empirically examined. Consequently, we seek to also answer the following two research questions:

RQ3: What is the relationship between institutional trust and conspiracist ideation?

RQ4: Do cognitive thinking styles moderate the relationship between institutional trust and conspiracist ideation?

Methods

Data Collection

The data for this study are drawn from a survey of Facebook users in the United States in 2019. The survey involved a nonprobabilistic sample of Internet users in the United States (total survey N = 1,374), using quotas for race, gender, and education to match the online population.[3] Participants who did

[3] Data available on request.

not use Facebook were screened out of the survey. Participants were recruited by Qualtrics, a professional human research recruitment and data collection firm. Our original total was 1,713 participants. Given the risk of low attention of online survey takers, we embedded an attention-check item in the questionnaire, specifically in our key dependent variable. Participants who failed the attention check were removed from further analysis (n = 339).[4]

Measures

Dependent Variable: Conspiracy Theory Beliefs

We used the Generic Conspiracist Beliefs Scale (GCBS) to measure participants' conspiracist ideation (Brotherton et al., 2013), a widely used scale (Goreis & Voracek, 2019). The GCBS is a 15-item, five-factor measure. The five factors correspond to different forms of conspiracist ideation, including government malfeasance, extraterrestrial cover-up, malevolent global conspiracies, personal well-being, and control of information. All items were rated on a five-point Likert-type scale (1 = definitely not true; 5 = definitely true). Scores for each factor were calculated by taking the mean of the survey items associated with each factor. An overall score was calculated by taking the mean of all the items.

Consistent with Swami et al.'s (2017) guidance, we conducted an exploratory factor analysis to examine the structures of the GCBS. Although Brotherton et al. (2013) suggested that it is a five-factor measure, the results of our exploratory factor analysis loaded on only two factors with $\lambda > 1.0$ (8.31 and 1.09), and the scree plot demonstrated a drastic decline between the first and second factors. The first factor included conspiracies that focused on the actions of secretive government agencies or shadowy organizations (see Table 1). The second factor focused on conspiracies involving extraterrestrials and advanced technology. Factor loadings were interpreted following Swami et al.'s (2017) implementation of Tabachnick and Fidell's (2007) guidelines. To be treated as successfully loading onto a factor, an item needed a score greater than 0.45. We dropped three items that loaded onto both factors with scores greater than 0.45 and treated the two factors as separate measurements for conspiracy theory beliefs. We refer to the first factor as *shadow conspiracist ideation* (M = 3.03, SD = 0.92, α = 0.9) and the second factor as *science fiction (sci-fi) conspiracist ideation* (M = 2.48, SD = 1.05, α = 0.86).

[4] We included the attention check as the last item in a matrix table question with five items from the scale measuring our dependent variable, conspiracist ideation. The attention check item read: "It's important that participants pay close attention while completing this study. Please select 'Definitely not true' for this question." Participants who did not select "Definitely not true" were removed from further analysis.

Table 1. Factor Loadings for the Generic Conspiracist Beliefs Scale.

	Factor 1	Factor 2
1. The government is involved in the murder of innocent citizens and/or well-known public figures, and keeps this a secret.	0.63	0.47
2. The power held by heads of state is second to that of small unknown groups who really control world politics.	0.67	
5. Groups of scientists manipulate, fabricate, or suppress evidence in order to deceive the public.	0.53	0.47
6. The government permits or perpetrates acts of terrorism on its own soil, disguising its involvement.	0.59	
7. A small, secret group of people is responsible for making all major world decisions, such as going to war.	0.61	
10. New and advanced technology which would harm current industry is being suppressed.	0.52	
11. The government uses people as patsies to hide its involvement in criminal activity.	0.74	
12. Certain significant events have been the result of the activity of a small group who secretly manipulate world events.	0.69	
14. Experiments involving new drugs or technologies are routinely carried out on the public without their knowledge or consent.	0.59	
15. A lot of important information is deliberately concealed from the public out of self-interest.	0.62	
3. Secret organizations communicate with extraterrestrials, but keep this fact from the public.		0.77
4. The spread of certain viruses and/or diseases is the result of the deliberate, concealed efforts of some organization.	0.53	0.63
8. Evidence of alien contact is being concealed from the public.		0.75
9. Technology with mind-control capacities is used on people without their knowledge.		0.61
13. Some UFO sightings and rumors are planned or staged in order to distract the public from real alien contact.		0.68

Note. This table reports items that loaded onto a factor with a value greater than 0.45. Items that loaded onto both factors with a value greater than 0.45 were dropped.

Independent Variables

Media Diet

To measure media diet, we asked participants how often they received information about political and social issues from several sources, using a 5-point Likert-type scale (1 = never, 2 = less than once a month, 3 = a few times a month, 4 = once or twice a week, 5 = every day or almost every day). The sources included the following:

A. Radio (*M* = 2.90, *SD* = 1.50)
B. National newspapers (*M* = 2.34, *SD* = 1.48)
C. Local newspapers (*M* = 2.84, *SD* = 1.56)
D. National evening network television news (*M* = 3.41, *SD* = 1.54)
E. Local television news (*M* = 3.81, *SD* = 1.42)
F. Cable news (e.g., Fox News, CNN, MSNBC) (*M* = 3.29, *SD* = 1.57)
G. Social media (e.g., Twitter, Facebook, Snapchat) (*M* = 3.06, *SD* = 1.59)
H. Online forums (e.g., Reddit, Digg) (*M* = 1.70, *SD* = 1.16)

Liberal/Conservative Opinion-Based Online News and Commentary Sites

Participants were asked how often they used opinion-based online news and commentary sites using a 5-point Likert-type scale (1 = never, 2 = less than once a month, 3 = a few times a month, 4 = once or twice a week, and 5 = every day or almost every day). Participants who answered "a few times a month" or more were asked to select all the sources they received news about politics and social issues at least a few times per month from a list that included liberal outlets (*Occupy Democrats*, *The Intercept*, *Talking Points Memo*, *Being Liberal*, *Addicting Info*, *Huffington Post*, and *The Daily Beast*) and conservative outlets (*Breitbart*, *Infowars*, *Daily Caller*, and *The Blaze*). We converted participants' responses into two dummy variables: *liberal sites* and *conservative sites* (0 = No; 1 = Yes).

Cognitive Thinking Styles

To measure thinking styles, participants completed the 12-item rational (*M* = 3.71, *SD* = 0.68, α = 0.87) and 10-item intuitive subscales (*M* = 3.49, *SD* = 0.51, α = 0.68) from the Rational/Experiential Multimodal Inventory (REIm; Norris & Epstein, 2011). The full REIm comprises 42 survey items, including a 12-item subscale to measure a rational thinking style (i.e., System 2), and three 10-item subscales measuring thinking styles associated with intuition, emotionality, and imagination (i.e., System 1). Past research has used REIm to explore the relationship between conspiracy theory beliefs and cognitive thinking styles (Barron et al., 2018; Georgiou et al., 2019; Lobato & Zimmerman, 2019; Swami et al., 2014), and prior work has found REIm to exhibit strong psychometric properties (Norris & Epstein, 2011). We chose these two subscales, given that prior work focused on one or both subscales when not administering the entire inventory (Barron et al., 2018; Lobato & Zimmerman, 2019). All REIm survey items are rated on a 5-point scale (1 = definitely not true of myself; 5 = definitely true of myself). The subscale scores are calculated by taking the mean of the corresponding survey items.

Institutional Trust[5]

We asked participants how much trust they had in the following groups and institutions: Congress, Church, the news media, Experts and scientists, and the Justice System. All items are rated on a 4-point

[5] Our original scale for institutional trust included trust in the president. We did not include trust in the president in our final scale because it lowered Cronbach's alpha to .59, suggesting a poor fit. Additionally, the function alpha in the psych package (Revelle, 2018) warned that the item was negatively correlated with the total scale.

scale (1 = Not at all, 2 = A little trust, 3 = Some trust, and 4 = A lot of trust). Participants' overall institutional trust score was calculated as the mean of all five items (M = 2.45, SD = 0.61, α = 0.67).

Additional Variables

We measured potential control variables and factors used in past conspiracy theory research, including political ideology/extremism, political knowledge, and education (Golec de Zavala & Federico, 2018; Oliver & Wood, 2014).

Political Ideology/Extremism

We asked participants whether they considered themselves a Strong Democrat, Lean Democrat, Independent, Lean Republican, or Strong Republican (M = 2.83, SD = 1.37). Responses were converted into a dummy variable indicating whether they identified as Republican (0 = Strong Democrat, Lean Democrat, Independent; 1 = Lean Republican, Strong Republican, M = 0.32, SD = 0.47). To measure political extremism, we recoded participants' answers to the political ideology item as follows: 0 = Independent; 1 = Lean Democrat or Lean Republican; 2 = Strong Democrat or Strong Republican. Higher scores indicated more extreme ideological positions (M = 1.13, SD = 0.79).

Political Knowledge

Political knowledge was calculated as the sum of correct answers to five items, including multiple-choice questions about the party currently in control of the U.S. House of Representatives, the majority amount necessary for U.S. Congress to override a presidential veto, the name of the current speaker of the U.S. House of Representatives, the political office held by Mike Pence, and the name of the current Prime Minister of Great Britain (M = 3.64, SD = 1.19).

Political Interest

Participants were asked how much they considered themselves to be interested in politics and political affairs in general, using a 5-point Likert-type scale (1 = not interested at all, 2 = slightly interested, 3 = moderately interested, 4 = very interested, 5 = extremely interested; M = 3.33, SD = 1.25).

Frequency of Facebook Use

Participants were asked how often they used Facebook (1 = Never, 2 = Less than once a month, 3 = At least once a month, 4 = Once or twice a week, 5 = Every day or almost every day, 6 = Several times a day; M = 5.40, SD = 0.88).

Education

To measure education, we asked participants to select from the following choices: some high school, high school diploma, some college, associate's degree, bachelor's degree, some graduate school,

master's degree, MD, JD, Ph.D., and other. We recoded participants' responses into the following categories: high school or lower, associate degree or some college, college, advanced degree, and other. We removed participants who selected other (M = 2.41, SD = 1).

Demographics

We measured participants' age with an open-ended question (M = 53.3, SD = 18.06).[6] Gender was treated as a dummy variable (0 = male, 1 = female), with 45.85% of the sample identifying as male and 54.15% as female.

Results

To answer our first three research questions, we used two ordinary least-squares (OLS) regressions to examine the predictors of holding general conspiracy beliefs—namely, *shadow conspiracist ideation* and *sci-fi conspiracist ideation*—including the same independent variables around media diet, cognitive thinking styles, and institutional trust, and the same control variables in both models (see Figure 1 for a correlation table). The results are reported in Table 2.

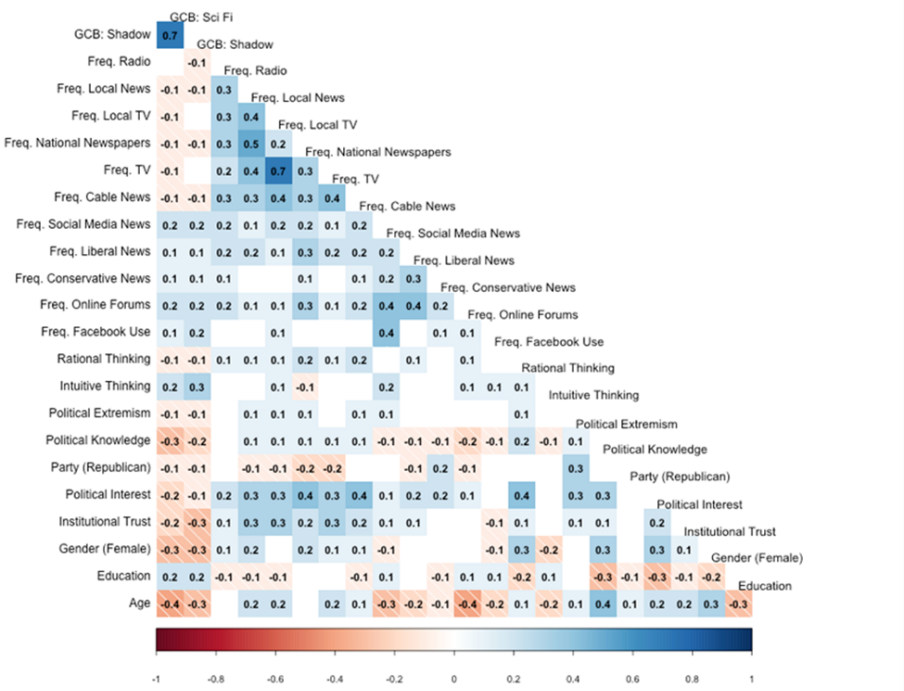

Figure 1. Correlation table. The table only displays correlations with p < .05.

[6] One participant reported their age as 557 years old. We recoded their age as NA and treated it as missing in the analysis.

Table 2. Ordinary Least-Squares (OLS) Regressions for Shadow and Sci-Fi Conspiracist Ideation.

	Shadow	Sci-Fi
Constant	3.15 ***	3.25 ***
	SE: 0.27, [2.62, 3.68]	SE: 0.31, [2.64, 3.86]
Freq. Radio	−0.04 *	−0.03
	SE: 0.02, [−0.07, −0.01]	SE: 0.02, [−0.06, 0.01]
Freq. TV	0.03	0.02
	SE: 0.02, [−0.01, 0.07]	SE: 0.02, [−0.03, 0.07]
Freq. National Newspapers	−0.04	−0.04
	SE: 0.02, [−0.07, 0.00]	SE: 0.02, [−0.08, 0.01]
Freq. Cable News	0.01	0.02
	SE: 0.02, [−0.02, 0.05]	SE: 0.02, [−0.02, 0.05]
Freq. Local News	0.01	0.00
	SE: 0.02, [−0.03, 0.04]	SE: 0.02, [−0.03, 0.04]
Freq. Local TV	0.02	−0.00
	SE: 0.02, [−0.03, 0.06]	SE: 0.03, [−0.06, 0.05]
Freq. Liberal News	0.08	0.10
	SE: 0.07, [−0.05, 0.21]	SE: 0.08, [−0.05, 0.25]
Freq. Conservative News	0.18 *	0.08
	SE: 0.08, [0.03, 0.33]	SE: 0.09, [−0.10, 0.25]
Freq. Social Media News	0.04 *	0.04
	SE: 0.02, [0.01, 0.07]	SE: 0.02, [−0.00, 0.07]
Freq. Online Forums	0.03	0.06 *
	SE: 0.02, [−0.02, 0.08]	SE: 0.03, [0.00, 0.11]
Freq. Facebook Use	0.04	0.04
	SE: 0.03, [−0.01, 0.09]	SE: 0.03, [−0.02, 0.10]
Rational Thinking	0.00	−0.09 *
	SE: 0.04, [−0.07, 0.07]	SE: 0.04, [−0.17, −0.01]
Intuitive Thinking	0.34 ***	0.33 ***
	SE: 0.04, [0.26, 0.43]	SE: 0.05, [0.23, 0.43]
Institutional Trust	−0.39 ***	−0.26 ***
	SE: 0.04, [−0.47, −0.31]	SE: 0.05, [−0.34, −0.17]
Gender (Female)	0.05	−0.01
	SE: 0.05, [−0.04, 0.15]	SE: 0.06, [−0.12, 0.10]
Education	−0.10 ***	−0.14 ***
	SE: 0.02, [−0.15, −0.05]	SE: 0.03, [−0.20, −0.09]
Age	−0.01 ***	−0.01 ***
	SE: 0.00, [−0.01, −0.00]	SE: 0.00, [−0.01, −0.01]
Political Interest	−0.02	−0.01

	SE: 0.02, [−0.06, 0.03]	SE: 0.03, [−0.06, 0.04]
Political Knowledge	−0.04 *	−0.10 ***
	SE: 0.02, [−0.08, −0.00]	SE: 0.02, [−0.15, −0.05]
Political Extremism	−0.01	−0.06
	SE: 0.03, [−0.07, 0.05]	SE: 0.04, [−0.13, 0.01]
Party (Republican)	−0.14 **	−0.08
	SE: 0.05, [−0.24, −0.04]	SE: 0.06, [−0.20, 0.04]
N	1364	1366
R^2	0.26	0.26

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

Our first research question focused on the relationship between media diet and conspiracist ideation. Our findings suggest that the relationship between media diet and conspiracist ideation is weak to nonexistent, with the exception that shadow conspiracist ideation is positively associated with frequent consumption of conservative news outlets (B = 0.18) and social media (B = 0.04), and negatively associated with frequent consumption of radio (B = −0.04).[7] No significant associations existed between most types of media consumption and sci-fi conspiracist ideation—which is only associated with the use of online forums (B = 0.06).

Our second research question inquired into the relationship between rational and intuitive thinking styles and the two types of conspiracist ideation. We found that thinking styles matter: Participants who were more emotional and intuitive in their information processing were much more likely to believe in both shadow (B = 0.34) and sci-fi conspiracy theories (B = 0.33). We also found a negative relationship between rational thinking style and sci-fi conspiracist ideation (B = 0.09).

Our third research question examined the relationship between institutional trust and conspiracist ideation. We found a negative association between institutional trust and shadow (B = −0.39) and sci-fi (B = −0.26) conspiracist ideation. Our findings thus suggest that lower levels of institutional trust are associated with both types of conspiracist ideation.

We found significant relationships between each type of conspiracist ideation and certain control variables. Political knowledge was negatively associated with shadow (B = −0.04) and sci-fi (B = 0.10) conspiracist ideation. Partisanship (Republican identification) was negatively associated with shadow conspiracist ideation (B = −0.14). Finally, age and education were significant predictors of shadow and sci-fi conspiracist ideation, with respondents less likely to hold such beliefs when they were older (B = −0.01; −0.01, respectively) and more educated (B = −0.10; −0.14, respectively).

To answer our fourth research question, we ran separate OLS regressions to explore each potential interaction between thinking style (e.g., rational, intuitive) and institutional trust with each type of conspiracist ideation (shadow, sci-fi). The interaction OLS regressions included the same variables as the base OLS models without interactions included. We found no significant interaction between institutional trust and intuitive

[7] B refers to the unstandardized regression coefficient.

thinking for shadow (*B* = −0.11, 95% CI: −0.24, 0.02) and sci-fi (*B* = −0.11, 95% CI: −0.25, 0.04) conspiracist ideation. However, we found a significant negative interaction between institutional trust and rational thinking on shadow (*B* = −0.24) and sci-fi (*B* = −0.12) conspiracist ideation. Table 3 presents the full results of the OLS regressions, including the interactions between institutional trust and rational thinking style. The negative interaction coefficient suggests that participants who score high on both institutional trust and rational thinking style are less likely to believe in both types of conspiracy theories, with the coefficient being larger for shadow conspiracy theories. It is worth noting that the significant relationships found in the original noninteraction OLS regressions remain significant and in the same direction, except that the relationship between political knowledge and shadow conspiracist ideation is no longer significant.

To explore this interaction further, we created interaction plots for institutional trust and conspiracist ideation based on the level of rational thinking (see Figures 2 and 3). We used the mean values of the rational thinking scale with ±1 standard deviation to visualize the interaction effects. The plots indicate that individuals scoring high on institutional trust and rational thinking are less likely to exhibit strong conspiracist ideation. However, the plots also indicate that participants scoring low on institutional trust and high on rational thinking are more likely to hold stronger levels of conspiracist ideation, a finding that we return to in the discussion.

Table 3. Ordinary Least-Squares (OLS) Regressions for Shadow and Sci-Fi Conspiracist Ideation.

	Shadow	Sci-Fi
Constant	1.01	2.21 ***
	SE: 0.53, [−0.03, 2.04]	SE: 0.61, [1.01, 3.41]
Freq. Radio	−0.04 *	−0.03
	SE: 0.02, [−0.07, −0.01]	SE: 0.02, [−0.06, 0.01]
Freq. TV	0.03	0.02
	SE: 0.02, [−0.01, 0.07]	SE: 0.02, [−0.03, 0.07]
Freq. National Newspapers	−0.03	−0.04
	SE: 0.02, [−0.07, 0.00]	SE: 0.02, [−0.08, 0.01]
Freq. Cable News	0.01	0.02
	SE: 0.02, [−0.02, 0.04]	SE: 0.02, [−0.02, 0.05]
Freq. Local News	0.01	0.00
	SE: 0.02, [−0.03, 0.04]	SE: 0.02, [−0.03, 0.04]
Freq. Local TV	0.01	−0.00
	SE: 0.02, [−0.03, 0.06]	SE: 0.03, [−0.06, 0.05]
Freq. Liberal News	0.08	0.10
	SE: 0.07, [−0.05, 0.21]	SE: 0.08, [−0.05, 0.25]
Freq. Conservative News	0.17 *	0.07
	SE: 0.08, [0.02, 0.32]	SE: 0.09, [−0.10, 0.25]
Freq. Social Media News	0.04 *	0.04
	SE: 0.02, [0.01, 0.07]	SE: 0.02, [−0.00, 0.07]
Freq. Online Forums	0.03	0.06 *
	SE: 0.02, [−0.02, 0.08]	SE: 0.03, [0.00, 0.11]

Freq. Facebook Use	0.05	0.04
	SE: 0.03, [−0.01, 0.10]	SE: 0.03, [−0.02, 0.10]
Rational Thinking	0.60 ***	0.20
	SE: 0.13, [0.34, 0.85]	SE: 0.15, [−0.10, 0.50]
Intuitive Thinking	0.33 ***	0.32 ***
	SE: 0.04, [0.24, 0.41]	SE: 0.05, [0.22, 0.42]
Institutional Trust	0.50 **	0.17
	SE: 0.19, [0.12, 0.87]	SE: 0.22, [−0.26, 0.61]
Gender (Female)	0.06	−0.00
	SE: 0.05, [−0.04, 0.15]	SE: 0.06, [−0.11, 0.11]
Education	−0.10 ***	−0.14 ***
	SE: 0.02, [−0.15, −0.05]	SE: 0.03, [−0.20, −0.09]
Age	−0.01 ***	−0.01 ***
	SE: 0.00, [−0.01, −0.00]	SE: 0.00, [−0.01, −0.01]
Political Interest	−0.02	−0.01
	SE: 0.02, [−0.06, 0.03]	SE: 0.03, [−0.06, 0.04]
Political Knowledge	−0.04	−0.10 ***
	SE: 0.02, [−0.08, 0.00]	SE: 0.02, [−0.15, −0.05]
Political Extremism	−0.01	−0.06
	SE: 0.03, [−0.07, 0.05]	SE: 0.04, [−0.13, 0.01]
Party (Republican)	−0.15 **	−0.09
	SE: 0.05, [−0.26, −0.05]	SE: 0.06, [−0.21, 0.03]
Rational Thinking x Institutional Trust	−0.24 ***	−0.12 *
	SE: 0.05, [−0.34, −0.14]	SE: 0.06, [−0.23, −0.00]
N	1364	1366
R^2	0.28	0.26

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

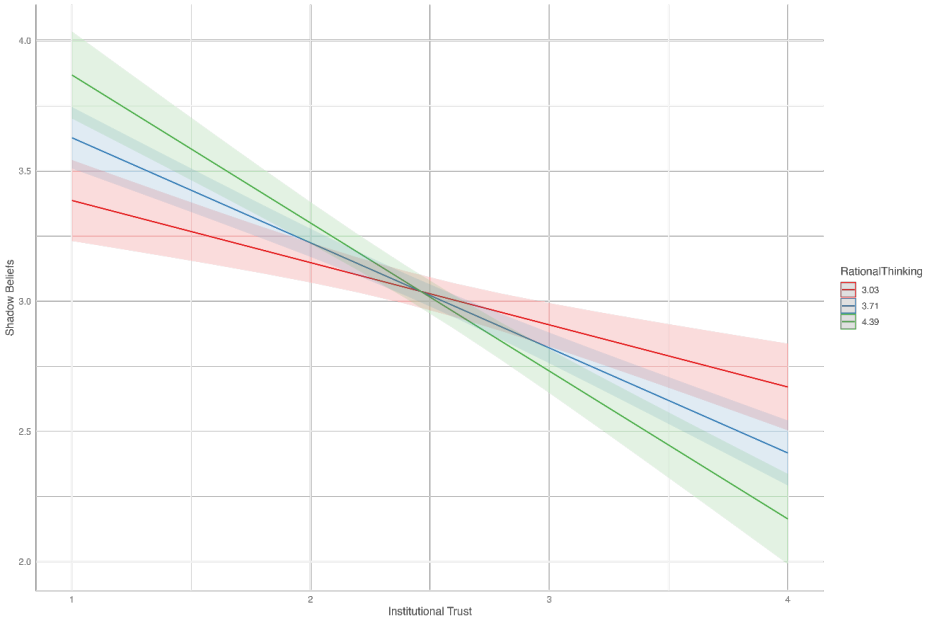

Figure 2. Interaction effect of institutional trust and level of rational thinking on shadow conspiracist ideation.

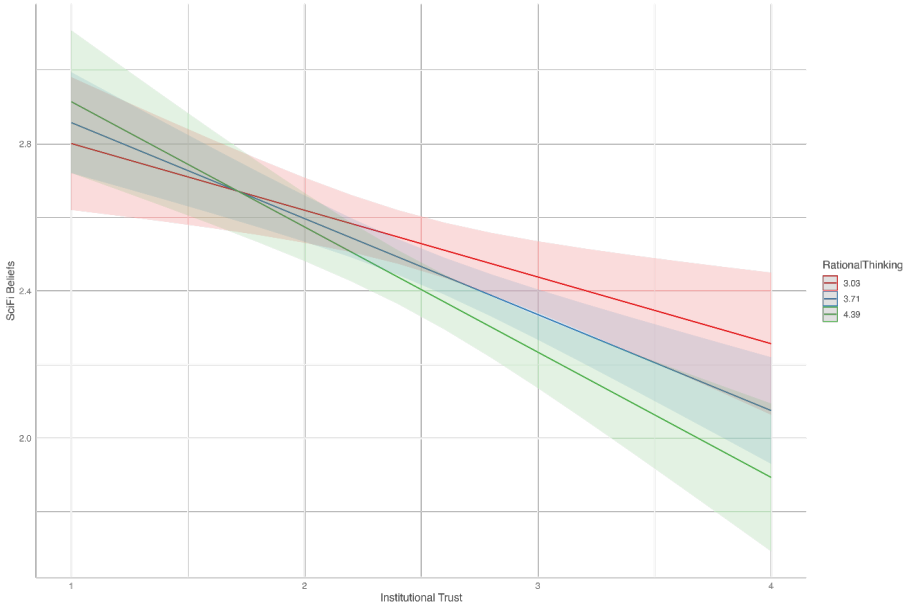

Figure 3. Interaction effect of institutional trust and level of rational thinking on sci-fi conspiracist ideation.

Discussion

This study examined media diet, cognitive thinking styles, and institutional trust to better understand the relative impact each has on conspiracist ideation. Despite the suggestion in prior scholarship that conspiracy theorists reside in echo chambers, we find little evidence that conspiracy theorists consume mainstream media sources for political information less frequently. The one caveat is radio consumption: Shadow conspiracy theorists relied on radio for political and social information slightly less frequently than nonbelievers. Our findings indicate, however, that there are certain *types* of media sources that conspiracy theorists rely on to a greater extent than nonconspiracy theory believers. Consistent with prior studies suggesting a positive association between social media and conspiratorial thinking (Enders et al., 2021; Xiao et al., 2021), we found that shadow conspiracy theorists use social media for news more frequently than nonbelievers.

This finding of high levels of social media use for news among conspiracy theorists is noteworthy. Past research has suggested that conspiracy theorists find communities of interest with like-minded others online who also believe in, and discuss, conspiracies (Enders et al., 2021; Min, 2021). When factoring social media use within a broader media diet, however, an alternative explanation might be that the diversity of viewpoints encountered on social media compared with mainstream news sources caters to the informational needs of conspiracy theorists insofar as it may allow them to find views that are rarely present in mainstream sources (Barnidge, 2020).

Looking at conservative and liberal news consumption, we found some noteworthy patterns. Shadow conspiracy theorists used conservative news sites more frequently than nonbelievers. Shadow conspiracy theorists may be drawn to these conservative news sites given the "deep state" that narratives conservative websites, such as *Breitbart,* have promoted in recent years (Horwitz, 2021). We also found that sci-fi conspiracy theorists used online forums for news more frequently than nonbelievers. Sci-fi conspiracy theorists may be drawn to online forums, given that it is rare for conventional news sources to devote significant coverage to topics involving extraterrestrials.

Collectively, our findings counter the common portrayal of conspiracy theorists as residing in an echo chamber that is isolated from mainstream sources of news and instead suggest that conspiracy theorists gather their information from various sources, including the sources that nonbelievers rely on, as well as alternative outlets.

Turning our attention to the role of different thinking styles, our results indicate that conspiracy theorists may process information differently from nonbelievers. Both shadow and sci-fi conspiracy theorists were more likely to rely on intuitive thinking styles. Conspiracy theorists may be more prone to agree quickly with information that supports their conspiracy theory worldview and dismiss counter-conspiracy theory information without devoting much cognitive deliberation, which is a common cognitive bias known as confirmation bias (Nickerson, 1998).

Our results further suggest that conspiracy theorists are likely to possess lower levels of institutional trust relative to nonbelievers. Because of this, conspiracy theorists may be less likely to agree with counter-

conspiracy theory information provided by or attributed to major social institutions. The interaction effect we found between institutional trust and rational thinking offers partial support for Pierre's (2020) socio-epistemic model. Conspiracist ideation was weakest among those high in institutional trust and rational thinking. Still, the finding that conspiracist ideation is strongest among rational thinkers suggests that encouraging a rational thinking style alone is not enough to counter the impact mistrust has on conspiracist ideation. Individuals low in institutional trust but high in rational thinking may engage in biased elaboration (Petty & Cacioppo, 1986) when encountering conspiracy theory messages, devoting considerable cognitive effort to process the message but in a way that seeks to maintain their mistrust of social institutions.

For those interested in reducing beliefs in harmful conspiracy theories, our results indicate that efforts focused on exposing conspiracy theorists to counter-conspiracy theory information may be insufficient. This might be especially problematic if the counter information comes from institutional sources, such as government agencies, because of their inclination to mistrust prominent institutions altogether. Moreover, conspiracy theorists do not rely less on conventional media sources than nonconspiracy theory believers and thus may be as likely to encounter counter-conspiracy theory information as nonbelievers. The difference appears to be how conspiracy theorists and nonconspiracy theory believers *process* the information to which they are exposed. Past work has found that stimulating analytical thinking through priming (Adam-Troian, Caroti, Arciszewski, & Ståhl, 2019; Bonetto, Troïan, Lo Monaco, & Girandola, 2018) or inoculation treatments (Banas & Miller, 2013) can reduce beliefs in conspiracy theories. Our findings suggest that promoting analytical thinking when encountering conspiracy theory information may not be effective if using "official" sources of information and that interventions also need to consider ways to bolster individuals' institutional trust.

Although we did not set out to test the factorial validity of the GCBS, our findings provide valuable guidance for researchers studying conspiracist ideation. The developers of GCBS described the scale as a five-factor model (Brotherton et al., 2013), but studies have generally treated GCBS as a single factor (for a review of research using GCBS, see Swami et al., 2017). We did not find support for treating GCBS as either a five-factor or single-factor model. Consistent with prior work (Swami et al., 2017), our factor analysis indicated that GCBS is a two-factor model, with the second factor containing the GCBS items involving extraterrestrials and advanced technology. We agree with Swami et al. (2017) that researchers interested in using GCBS to measure conspiracist ideation should examine the factor structure of their data rather than assume that it is a one- or five-dimensional measure.

Our study has limitations that future research should address. First, our study was limited to Facebook users in the United States. Although an estimated 69% of U.S. adults used Facebook during the year we conducted our study (Perrin & Anderson, 2019), it is possible that non-Facebook users exhibit different patterns of media use and conspiracist ideation. It is also possible that the relationships between conspiracist ideation and media diets, thinking styles, and institutional trust may differ in other countries, given that prior work has suggested that unique structural factors make the United States especially vulnerable to disinformation (Humprecht, Esser, & Van Aelst, 2020). Future work should explore whether our findings hold for a more representative U.S. population and populations in other countries. Second, we relied on self-reports to measure participants' media diets. Although self-reports are insightful, they are still

subjective measures and may not be entirely accurate. Ideally, future work should include more objective measures of media diets, such as having participants install apps that record what they view.

In spite of these limitations, we consider our findings to offer a valuable contribution given how much journalists and scholars focus on media as a key contributor to the growth of conspiracy theory beliefs. Our results suggest that conspiracy theorists do not reside in isolated mediated worlds, so future research should focus on better understanding how conspiracy theorists process conspiracy theory-related information, effective efforts to promote institutional trust, and methods to reduce beliefs in harmful conspiracy theories.

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