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Who falls for fake news? The roles of bullshit receptivity, overclaiming, familiarity, and analytic thinking

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Abstract

Objective: Fake news represents a particularly egregious and direct avenue by which inaccurate beliefs have been propagated via social media. We investigate the psychological profile of individuals who fall prey to fake news.

Method: We recruited 1,606 participants from Amazon's Mechanical Turk for three online surveys.

Results: The tendency to ascribe profundity to randomly generated sentences—pseudo-profound bullshit receptivity—correlates positively with perceptions of fake news accuracy, and negatively with the ability to differentiate between fake and real news (media truth discernment). Relatedly, individuals who overclaim their level of knowledge also judge fake news to be more accurate. We also extend previous research indicating that analytic thinking correlates negatively with perceived accuracy by showing that this relationship is not moderated by the presence/absence of the headline's source (which has no effect on accuracy), or by familiarity with the headlines (which correlates positively with perceived accuracy of fake and real news).

Conclusion: Our results suggest that belief in fake news may be driven, to some extent, by a general tendency to be overly accepting of weak claims. This tendency, which we refer to as reflexive open-mindedness, may be partly responsible for the prevalence of epistemically suspect beliefs writ large.

KEYWORDS
analytic thinking, bullshit receptivity, fake news, news media, social media

1 | INTRODUCTION

Fake news has become a major aspect of the 21st century media ecosystem. According to one analysis, Facebook engagement (likes, comments, shares) was *greater* for the most viral fake news stories than the most viral real news stories in the 3 months leading up to the 2016 Presidential election (Silverman, Strapagiel, Shaban, & Hall, 2016, but see Grinberg, Joseph, Friedland, Swire-Thompson, and Lazer, 2019; Guess, Nagler, & Tucker, 2019; Guess, Nyhan, & Reifler, 2018). Similarly, a recent study found that, among articles that have been subject to fact-checking, false news stories actually spread faster and wider than do true news stories (Vosoughi, Roy, & Aral, 2018). Here we seek to shed light on this phenomenon by exploring the psychological profile of individuals who tend to fall for fake news.

1.1 | The psychology of fake news

Fake news is not a new phenomenon. Tabloid magazines have been around since the beginning of the 20th century for example. Nonetheless, fake news as it has been discussed recently (e.g., Allcott & Gentzkow, 2017) seems a new category of misinformation. Although there are many forms of "fake news," here we follow Lazer et al. (2018) who define fake news as:

… information that mimics the output of the news media in form, but not in organizational process or intent—e.g., lacking editorial norms and processes to weed out the untrue in favor of the true. Fake news is thus a subgenre of the broader category of misinformation—of incorrect information about the state of the world.

Given that the creators of fake news are not beholden to editorial norms, it is important to understand the cognitive factors that allow readers to weed out the untrue in favor of the true. In a classic study of wartime rumors, Allport and Lepkin (1945) found that individuals who had previously heard of a rumor were far more likely to believe it. This finding coincides with research on the illusory truth effect in which the repetition of, for example, obscure trivia statements increases perceptions of accuracy for those statements (Dechene, Stahl, Hansen, & Wanke, 2010; Fazio, Brashier, Payne, & Marsh, 2015; Hasher, Goldstein, & Toppino, 1977). Extending work on the illusory truth to the domain of fake news, Pennycook, Cannon, and Rand (2018) found that simply reading a fake news headline *once* is sufficient to increase later perceptions of its accuracy. It is perhaps surprising that familiarity plays an important role in belief about fake news, given that fake news content is often quite implausible. For example, the headline "Trump to Ban All TV Shows that Promote Gay Activity Starting with Empire as President" was only rated as accurate by 5% of Pennycook's et al. (2018) sample upon first exposure. A single prior exposure *doubled* the fraction of participants rating it as accurate—and these effects compounded with a subsequent exposure and were still present in a follow-up session 1 week later.

The dominant explanation for this illusory truth effect is that repetition facilitates rapid and fluent processing, which is then taken to imply that the repeated statement is true (Alter & Oppenheimer, 2009; Begg, Anas, & Farinacci, 1992; Fazio et al., 2015; Reber, Winkielman, & Schwarz, 1998; Unkelbach, 2007; Wang, Brashier, Wing, Marsh, & Cabeza, 2016; Whittlesea, 1993). Pennycook et al.'s (2018) fake news experiment indicates that this low-level fluency heuristic plays a role in accuracy judgments for even highly implausible, intensely partisan, and entirely fabricated news stories. This conclusion was supported by three notable lines of evidence: (a) The effect of repetition on accuracy judgments persisted even in cases where participants incorrectly forgot having seen the fake news item previously (i.e., the effect does not depend on explicit memory); (b) The effect of repetition was evident even in cases where participants were given political fake news stories that did *not* coincide with their political ideology (i.e., they had additional reason to reject the fake news stories apart from mere implausibility); and (c) Explicitly warning participants that fake news

stories have been disputed by third-party fact-checkers (an intervention previously used by Facebook to curb fake news) (Mosseri, 2016) did not undermine (or even interrupt) the effect of repetition. Interestingly, recent evidence indicates that the magnitude of the illusory truth effect was not moderated by an individual's cognitive style or ability (even in the context of fake news) (De Keersmaecker, Dunning, Pennycook, Rand, Sanchez, Unkelbach, & Roets, 2019).

These findings indicate that perceptions of fake news accuracy are influenced by low-level cognitive processing mechanisms (e.g., fluency) that are not apparently interrupted by high-level reasoning processes. Thus, these factors may explain why a particular headline is believed by a particular individual, but they do not explain why some people fall for fake news whereas others may not. Indeed, Pennycook et al. found that participants were generally skeptical of fake news stories, and were quite effective at distinguishing real from fake news. Moreover, Pennycook et al. found that giving participants an additional reason to be skeptical of fake news (in the form of an explicit warning) *did* decrease later perceptions of fake news accuracy (see also Clayton et al., 2019; Pennycook, Bear, Collins, & Rand, 2017)—it just did not interact with the boosting effect of familiarity. Thus, it appears that general skepticism may play an important role in determining who falls for fake news, despite the apparent fact that familiarity increases perceptions of accuracy. Indeed, fake news may be a case where the mere propensity to think in a skeptical and analytic way is a meaningful determinant of belief and, perhaps, social media engagement. A central question, then, is whether falling for fake news represents an interesting and consequential new example of the exercise of a common trait; namely, being overly and unskeptically accepting of a wide variety of claims (i.e., being gullible), a trait which we will refer to as *reflexive* open-mindedness (Pennycook, Cheyne, Barr, Koehler, & Fugelsang, 2015). Reflexive open-mindedness stands in contrast to *reflective* open-mindedness, which is the tendency to deliberate and question one's intuitions (Baron, 2018).

If reflexive open-mindedness is indeed an important determinant of a range of beliefs and behaviors—including belief in fake news—one would expect relevant conceptually related but quite distinct tasks to be associated. In what follows, we will outline a set of individual differences that are connected through a shared theoretical and, more specifically, explain why reflexive open-mindedness may be a particularly important component underlying these individual differences.

1.2 | Theoretical framework

According to dual process theory, human cognition can be characterized by a distinction between autonomous, intuitive

(Type 1) processes and deliberative, analytic (Type 2) processes (De Neys, 2012; Evans & Stanovich, 2013; Kahneman, 2011; Pennycook, Fugelsang, & Koehler, 2015b). In an application of the broad dual process theoretical framework to the study of individual differences, a surge of recent research has linked the propensity to engage deliberative reasoning processes (rather than relying on "gut feelings" or intuitions) with a variety of beliefs and behaviors (Pennycook, Fugelsang, & Koehler, 2015a). Consider the following problem from the Cognitive Reflection Test (CRT; Frederick, 2005):

> A bat and ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost?

The problem elicits a fast, intuitive response (10 cents) that, upon reflection, can be shown to be obviously wrong (if the ball cost 10 cents, the bat would have to cost $1.10 and they would total $1.20). Nonetheless, the incorrect intuitive response is typically the modal response (e.g., 65% in Pennycook, Cheyne, Koehler, & Fugelsang, 2016), indicating an overall failure to engage in reflective reasoning processes (Pennycook & Ross, 2016).

It has been argued that the bat-and-ball problem—and others of its type—reflect a crucial individual difference that emerges from the dual process aspect of our cognitive architecture: the willingness or propensity to think analytically (Pennycook et al., 2015). Humans are cognitive misers, in that resource-demanding cognitive processes are typically avoided (Fiske & Taylor, 2013; Stanovich, 1999; Stanovich & West, 2000). Nonetheless, some are less miserly than others and participants who do well on the CRT also perform better on rational thinking tests (Toplak, West, & Stanovich, 2011, 2014). Moreover, despite only consisting of three items, CRT performance predicts a wide range of psychological factors (for various theoretical reasons)—including, for example, religious and paranormal disbelief (Gervais & Norenzayan, 2012; Pennycook, Cheyne, Seli, Koehler, & Fugelsang, 2012; Pennycook, Ross, Koehler, & Fugelsang, 2016; Shenhav, Rand, & Greene, 2012), moral judgments and values (Baron, Scott, Fincher, & Emlen Metz, 2015; Paxton, Ungar, & Greene, 2012; Pennycook, Cheyne, Barr, Koehler, & Fugelsang, 2014; Royzman, Landy, & Goodwin, 2014; Royzman, Landy, & Leeman, 2015; Yilmaz & Saribay, 2017), attitudes toward science (Gervais, 2015; Shtulman & McCallum, 2014; but see Kahan et al., 2012), altruism (Arechar, Kraft-Todd, & Rand, 2017), and smartphone use (Barr, Pennycook, Stolz, & Fugelsang, 2015), to name a few (see Pennycook, Fugelsang, & Koehler, 2015a for a review). CRT performance predicts various outcomes even after controlling for individual differences in cognitive ability (e.g., intelligence, working memory capacity, see: Pennycook, Fugelsang, & Koehler, 2015a; Shenhav et al., 2012).

This research is consistent with a "classical reasoning" or "reflectionist" perspective wherein analytic thinking is an influential component of everyday cognition (Pennycook, 2018). However, it is less clear how, specifically, analytic thinkers differ from people who are more intuitive. One possibility is that some individuals have a particularly strong faith in their intuition (Epstein, Pacini, Denes-Raj, & Heier, 1996); however, self-report measures of this trait do not appear to be indexed by the ability to resist intuitions on the CRT (Pennycook et al., 2016). This accords with the general idea that most people's first inclinations (if not their final answers) are the intuitive responses on the CRT problems (such as the bat-and-ball problem above) (Campitelli & Gerrans, 2014; Frederick, 2005), which implies that variation in performance is driven by nonintuitive (presumably, reflective) cognitive processes.

Interestingly, Baron et al. (2015) found that mere response time formed a common factor with accuracy on the CRT and that questions that are similar but that do not engender strong and incorrect intuitive answers were similarly predictive. Baron et al. concluded that poor performance on the CRT may index "reflective impulsivity"—that is, a mere lack of willingness to think analytically. This trait contrasts with actively open-minded thinking (Baron, 2018; Bronstein, Pennycook, Bear, Rand, & Cannon, 2018; Haran, Ritov, & Mellers, 2013), which refers to the more advanced tendency to reflect proactively on one's own biases and beliefs once formed. By way of contrast (and consistent with Pennycook et al., 2015), we will refer to the reflective impulsivity trait indexed by the CRT as "reflexively open-minded thinking" because it involves impulsively going with the reflexive response and failing to engage in reflection when encountering new information. As one would expect, reflexive and active (reflective) open-mindedness are strongly negatively correlated (Baron et al., 2015).

Reflexive open-mindedness is also conceptually distinct from need for cognition and faith in intuition (Cacioppo, Petty, Feinstein, & Jarvis, 1996; Epstein et al., 1996; Petty, Brinol, Loersch, & McCaslin, 2009). The need for cognition is conceptualized as the extent to which people "engage in and enjoy effortful cognitive activities" (Petty et al., 2009, p. 318). Reflexive impulsivity has naught to do with *enjoyment* of effortful thinking, but is rather a tendency to unthinkingly accept incoming information as being valid and true. Indeed, it might be that rejection of incoming information is done quickly and with relatively little effort in some cases. Moreover, the Need for Cognition scale is susceptible to systematic distortion because individuals who are genuinely unreflective are not reflective enough to recognize that they are unreflective (a Dunning-Kruger effect; Pennycook, Ross, Koehler, & Fugelsang, 2017). Relatedly, faith in intuition is conceptualized broadly as the tendency to trust one's initial impressions, but its measurement primarily pertains to social

judgment (e.g., "I trust my initial feelings about people"; Epstein et al., 1996). Thus, while reflexive open-mindedness has broad conceptual overlap with need for cognition and faith in intuition, it more specifically pertains to a tendency to accept incoming information as true (which may or may not be followed by sustained cognitive effort).

1.3 | Analytic thinking and partisan fake news

As mentioned, performance on the CRT (and related measures) has been associated with a wide range of beliefs—many of which might be considered "epistemically suspect," such as conspiratorial beliefs (Pennycook et al., 2015; Swami, Voracek, Stieger, Tran, & Furnham, 2014), delusional ideation (Bronstein et al., 2018), superstitious and paranormal beliefs (Pennycook et al., 2012), and belief in alternative medicine (Browne, Thomson, Rockloff, & Pennycook, 2015). However, less work has investigated the role of analytic thinking in the assessment of novel information—such as in the domain of fake news—which lies outside of standard judgment and decision-making tasks (but see Bouvet & Bonnefon, 2015). Moreover, the acceptance of political fake news—the category that has captured the majority of the public's attention—may be driven primarily by partisanship. For example, in the context of risk perceptions about climate science, there is evidence that the propensity to think analytically *increases* political polarization (Kahan et al., 2012; see also Drummond & Fischhoff, 2017). Similar results are found in the realm of gun control (Kahan, Peters, Dawson, & Slovic, 2017; but see Ballarini & Sloman, 2017) and selective exposure to political information (Knobloch-Westerwick, Mothes, & Polavin, 2017). Moreover, political misconceptions may be resistant to explicit corrections (Berinsky, 2017; Nyhan & Reifler, 2010; but see Ecker, Hogan, & Lewandowsky, 2017; Swire, Ecker, & Lewandowsky, 2017). In keeping with these results, and contrary to the hypothesis offered above, Kahan (2013) argues that cognitive reflection *increases* the propensity to engage in ideologically motivated reasoning—a conclusion that predicts a *positive* correlation between CRT performance and perceptions of politically consistent fake news headlines.

To differentiate between these two cognitive accounts of fake news susceptibility—the classical reasoning account wherein Type 2 processing supports accurate belief formation in the context of news content and Kahan's (2017) motivated reasoning account wherein Type 2 processing is employed by political partisans to convince themselves that fake news stories that are congenial with their ideology are accurate—Pennycook and Rand (2018) assessed the role of analytic thinking in susceptibility to fake news. In support of the classical reasoning account (and contrary to the motivated reasoning account), Pennycook and Rand found that individuals who perform better on the CRT are better able to discern between fake (false) and real (true) news headlines in the context of accuracy judgments—regardless of whether the news headlines were consistent or inconsistent with the participants' political ideology. Furthermore, media truth discernment (higher ratings of accuracy for real news relative to fake news) was actually *stronger* among headlines that individuals had an ideological predisposition to accept as true.

This research indicates that fake news susceptibility is more a matter of non-reflectiveness than of political partisanship. However, it is unclear how, exactly, analytic thinking supports media truth discernment. One possibility is that individuals assess the content of the headlines and make judgments about plausibility (Pennycook & Rand, 2018). However, another possibility is that analytic individuals use a simple source-heuristic—that is, relative to more intuitive individuals, they think fake news is less accurate because they are more likely to pay attention to the fact that fake news stories do not come from trusted sources (something that people are good at discerning, when asked; Pennycook & Rand, 2019). Indeed, there is evidence that analytic thinking is associated with increased trust in high-quality (e.g., the New York Times) sources relative to low-quality (e.g., fake news) sources (Pennycook & Rand, 2019). Moreover, there is considerable evidence that source credibility plays a role in persuasion (Landrum, Lull, Akin, Hasell, & Jamieson, 2017; Pornpitakpan, 2004), including in political domains (Swire, Berinsky, Lewandowsky, & Ecker, 2017). It is possible that analytic thinking interacts with source credibility in the prediction of perceptions of news accuracy. If so, that would indicate that the association between analytic thinking and belief in fake news is merely a result of a simple heuristic that is present among relatively more analytic individuals. The implication of this is that the association does not, therefore, reflect an important personality dimension as it is potentially driven by a single idiosyncratic strategy. In the present manuscript, we will investigate the robustness of individual difference in analytic thinking as a key individual difference factor.

1.4 | Fake news and bullshit

As noted above, fake news stories are entirely fabricated—that is, they are constructed with the goal of going "viral" on social media, and therefore (obviously) without regard for the truth. This coincides with Frankfurt's (2005) influential distinction between bullshit and lying: Whereas lying involves a deliberate attempt at concealing the truth, which implies a concern for the truth, bullshit is constructed absent concern for the truth. Bullshit, such as in the case of fake news, is constructed to garner attention (or advertising revenue) or achieve some sort of social or political gain (regardless of its truthfulness). This distinction between lying and bullshitting is important, if understudied, as it implies that one's

receptivity toward bullshit (both in terms of consuming it and generating it) may be a unique psychological factor with consequences for what people believe and how they behave (Petrocelli, 2018). Moreover, as speculated by Pennycook et al. (2015), bullshit receptivity may be driven both by a failure to detect bullshit and a willingness to accept bullshit (and other) claims (i.e., reflexive open-mindedness).

In an initial investigation of this issue, Pennycook et al. (2015) presented participants with randomly generated sentences filled with abstract buzzwords ("Hidden meaning transforms unparalleled abstract beauty") and asked them to rate how profound they thought the sentences to be. These bullshit sentences, by virtue of being random, were literally constructed without concern for the truth. Pennycook et al. found that people do, in fact, rate the sentences as at least somewhat profound and, more importantly, this tendency was associated with a variety of conceptually related variables. Specifically, bullshit receptivity was associated with increased belief in religious, paranormal, conspiratorial, and dubious health-related claims (i.e., "epistemically suspect beliefs"). Moreover, individuals who perform better on tests of analytic thinking, such as the CRT, as well as intelligence measures, were less receptive to bullshit.

Importantly, CRT (and related measures) were associated with both the ability to detect bullshit and the overall willingness to see profundity in *any* type of sentence. For this, Pennycook et al. (2015) also gave their participants prototypically profound ("motivational") sentences—that is, statements that were not randomly generated and that have a clear, if trite, meaning (e.g., "A river cuts through a rock, not because of its power but its persistence"). The results indicated that analytic thinking and some epistemically suspect beliefs were associated with profundity ratings for bullshit sentences even after taking the prototypically profound sentences into account (indicating that some individuals were better at *detecting* bullshit per se). However, interestingly, there was also a general tendency for people who rated all sentences as relatively profound to score lower on the CRT and higher in epistemically suspect beliefs. This indicates that a broad personality factor—such as reflexive open-mindedness—might contribute to a lack of skepticism across the board. Naturally, however, it is an open question whether bullshit receptivity plays a unique role in susceptibility to fake news independent of analytic thinking.

We also set out to investigate another measure that is conceptually related to reflexive responding: Overclaiming (Paulhus, Harms, Bruce, & Lysy, 2003). Overclaiming refers to the tendency for some individuals to "self-enhance" when asked about familiarity with general knowledge questions. For example, participants may be presented with a list of historical names that includes a few items that are entirely made up. Although overclaiming has been taken to be a measure of self-enhancement per se—and, in fact, is

correlated with factors like narcissism and self-deceptive enhancement (Paulhus et al., 2003)—we note that, most centrally, participants who overclaim indicate that they are familiar with something that does not exist. Although this likely reflects self-enhancement to some extent, overclaiming may also reflect the general tendency to bullshit oneself—that is, individuals who are prone to overclaiming might be reflexively open (and unquestioning of) their impulse to indicate knowledge about something for which they have no knowledge. Indeed, there is evidence that relatively intuitive (nonanalytic) individuals tend to be overconfident and will rate themselves as being relatively reflective despite, based on performance measures, relying on gut feelings (Pennycook, Ross et al., 2017). Thus, it is possible that overclaiming will be associated with the willingness to rate fake news as accurate and to rate bullshit as profound. Moreover, analytic thinking may help guard against all three of these tendencies.

1.5 | Current work

Past research has shown that analytic thinking is associated with lower receptivity to pseudo-profound bullshit (Pennycook et al., 2015) and fake news (Pennycook & Rand, 2018); however, it is unclear what is driving these associations and whether pseudo-profound bullshit receptivity and fake news susceptibility reflect a similar underlying propensity to be reflexively open-minded to a wide range of content. We therefore report three studies that shed light on the relationship between susceptibility to fake news and other forms of bullshit, as well as the role that the propensity to think analytically plays in such a potential relationship. In Study 1, we establish a positive correlation between pseudo-profound bullshit receptivity, overclaiming, and perceptions of fake news accuracy, and test whether they form a single factor or not. In Study 2, we investigate the possibility that finding bullshit profound is merely linked with overall credulity toward news headlines, rather than fake news specifically, by including true ("real") news headlines. We also shed light on *how* analytic thinking impacts fake news by investigating whether the source of the news story and/or prior familiarity with the headline play a role in the association between CRT performance and the ability to differentiate real from fake news (as well as checking for main effects of source information and familiarity). Finally, in Study 3, we replicate Study 2's results regarding the link between pseudo-profound bullshit receptivity and selectively believing fake news by conducting a novel analysis of a previously published dataset (from Pennycook & Rand, 2018). We also investigate whether the predicted correlation between bullshit receptivity and belief in fake news varies based on the ideological alignment of the headlines.

2 | STUDY 1

As an initial test of the potential correlation between perceptions of fake news accuracy, bullshit receptivity, and cognitive reflection, we selected six fake news items from Snopes.com, a well-known fact-checking Web site. The headlines were presented in the format of a Facebook post—namely, with a picture accompanied by a headline, byline, and a source (e.g., "countercurrentnews.com"). Given that much of the public's engagement with news on social media involves only reading article headlines (Gabielkov, Ramachandran, & Chaintreau, 2016), we follow other recent studies on fake news (Bronstein et al., 2018; Clayton et al., 2019; Pennycook, Bear et al., 2017; Pennycook & Rand, 2018; Pennycook et al., 2018) and focus on judgments about news headlines and not full articles. Bullshit receptivity was measured using the scale developed by Pennycook et al. (2015), overclaiming was measured using a shortened version of the questionnaire developed by Paulhus et al. (2003), and analytic thinking was measured using the CRT originally developed by Frederick (2005). We predicted that perceptions of fake news accuracy would correlate positively with bullshit receptivity and overclaiming, and negatively with analytic thinking.

2.1 | Method

We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study. Our data are available online (https://osf.io/8xbhu/).

2.2 | Participants

Our target sample for Study 1 was 400 participants from Amazon Mechanical Turk. We completed the study in two batches, separated by a week (participants could not complete the study more than once).[1] In total, 447 participants completed some portion of the study. We had complete data for 402 participants (45 participants dropped out). The final sample (Mean age = 37.7) included 205 males and 196 females (1 did not respond to the gender question).

2.3 | Materials

We presented participants with six news headlines that have all been deemed to be false by an independent fact-checker (snopes.com). Our news items can be found in Supplementary Materials (SM). Participants were asked the following question for each item: "To the best of your knowledge, how accurate is the claim in the above headline." They responded on the following scale: 1—Not at all accurate, 2—Not very accurate, 3—Somewhat accurate, 4—Very accurate. The order of the fake news items was randomized for each participant.

Participants completed seven items from two versions of the CRT. First, they received a reworded version of the original Frederick (2005) CRT (via Shenhav et al., 2012). Second, we administered the 4-item non-numeric CRT from Thomson and Oppenheimer (2016). The two versions were strongly correlated, $r(400) = 0.53$, and the full 7-item CRT had acceptable reliability, Cronbach's $\alpha = 0.77$.

For the pseudo-profound bullshit receptivity task, participants were presented with 10 randomly generated sentences filled with abstract buzzwords (e.g., "We are in the midst of a high-frequency blossoming of interconnectedness that will give us access to the quantum soup itself") and were asked to rate how profound they took them to be on a 5-point scale (from "not at all profound" to "very profound"). The items were taken from Pennycook et al. (2015), Study 1.

The overclaiming questionnaire was adapted from Paulhus et al. (2003). Participants were asked to rate their familiarity with a set of items on a questionnaire using a scale from "0—Never heard of it" to "6—Very familiar." They were given the following instructions: "For example, if the item said 'Bill Clinton' or 'Mexico', or 'the Bible', you would probably write a '6' beside it because it is very familiar. However, if the item said 'Fred Gruneberg' (my next door neighbor) you would write a '0' to indicate you never heard of him. In other words, the difficulty of the items ranges from easy to impossible. We want to determine if individuals who are knowledgeable about one area are also knowledgeable about other areas." They were then given two lists: (a) Historical names and events, and (b) Topics in physical sciences. Participants were presented with 15 items for each, 3 of which were entirely made-up. Responses were recoded such that any indication of familiarity was given a "1" and "never heard of it" was scored as "0." Paulhus et al. (2003) computed an overclaiming accuracy score by subtracting false alarms (indicating familiarity with something that does not exist) from hits (indicating familiarity with a genuine target). For ease of exposition, we simply reversed this equation so that a higher score indicates more overclaiming (i.e., a higher incidence of reporting impossible knowledge relative to actual knowledge). Results for the overclaiming measure are similar if false alarms are used as the primary measure instead of computing the overall accuracy score.

Demographic questions came at the end of the survey. These included age, sex, education, proficiency in English, political party (Democratic, Republican, Independent, other), and two questions about the 2016 election. For this, participants were first asked to indicate who they voted for (given the following options: Hillary Clinton, Donald Trump, Other Candidate (such as Jill Stein or Gary Johnson), I did not vote for reasons outside my control, I did not vote but I could have, and I did not vote out of protest. Participants were then asked "If you absolutely had to choose between only Clinton and Trump, who would you prefer to be the next President of the United States?"

2.4 | Procedure

We varied the order of presentation in two respects: (a) The CRT was either presented as the very first task or following the fake news and pseudo-profound bullshit task (this had no effect), and (b) The fake news task was either before or after the pseudo-profound bullshit task. There were no order effects on any of the key dependent variables (DV) (all p's > 0.125). The overclaiming questionnaire was always after the three primary tasks and followed directly by demographics.

2.5 | Results and discussion

Correlations among primary variables can be found in Table 1 (descriptive statistics can be found in SM). As predicted, perceived accuracy of fake news was positively correlated with receptivity to pseudo-profound bullshit and the willingness to overclaim, and negatively correlated with CRT performance. Moreover, all four variables were independently associated with each other (Table 1, above diagonal). That is, all partial correlations in the top diagonal were produced by entering each measure as a DV in a multiple regression analysis with each other measure as the predictors. To gain additional insight into the possibility of a common underlying trait, we conducted an exploratory factor analysis (using the iterated principal factor method) of the four scales. Both inspection of the scree plot and retention of factors with eigenvalue greater than 1 (the metrics we use for factor selection throughout this paper) indicated that there was a single factor (eigenvalue = 1.33, 95% of variance explained), onto which all four scales loaded heavily in the expected directions: fake news accuracy = 0.58, CRT = −0.55, bullshit receptivity = 0.51, overclaiming = 0.67. This is consistent with a common factor underlying these four measures.

3 | STUDY 2

Study 2 extends the findings of Study 1 in numerous ways. A limitation of Study 1 was that we only presented participants with fake news stories, and thus could not tell whether the correlations we observed were reflective of belief in news stories in general, rather than specifically about falling for fake news. To investigate this possibility, in Study 2 we included a contemporary set of real news stories (also in "Facebook format"). Similarly, we differentiated between a general tendency to see statements as profound and a particular proclivity toward pseudo-profound bullshit by including a bullshit receptivity control (Pennycook et al., 2015). For this, participants were asked to rate the profundity of both pseudo-profound bullshit (random sentences comprised primarily of buzzwords) and prototypically profound (non-bullshit) sentences (e.g., "The first step toward getting somewhere is to decide that you are not going to stay where you are"). Together, these two extensions allowed us to investigate whether bullshit receptivity per se predicts perceptions of fake news accuracy per se. That is, profundity ratings for random sentences (i.e., bullshit receptivity) should positively predict perceived accuracy of fake news even after taking into account profundity ratings for prototypically profound sentences (i.e., the baseline tendency to rate actually profound things as profound)—but the same should not be true for perceived accuracy of real news.

In addition to these deeper investigations of the relationship between falling for fake news and pseudo-profound bullshit, Study 2 also shed further light on how cognitive reflection protects against belief in fake news. There are at least two broad ways in which this can be accomplished. First, analytic individuals may be assessing the content of the headlines and making judgments about plausibility (as argued by Pennycook & Rand, 2018). Second, analytic individuals may be using a simple source-heuristic—that is, they may think fake news is less accurate than more intuitive individuals simply because they are more likely to pay attention to the fact that fake news stories do not come from trusted sources. This possibility is supported by evidence that higher CRT people are more trusting of reputable sources (Pennycook & Rand, 2019), and that source credibility plays a role in persuasion (Landrum et al., 2017; Pornpitakpan, 2004), including in political domains (Swire et al., 2017). To test whether more analytic individuals rely on the source to make judgments

TABLE 1 Correlations among primary variables in Study 1

	1	2	3	4
1. Fake news (perceived accuracy)	–	*−0.15***	*0.17****	*0.27****
2. Cognitive reflection test	−0.30***	–	*−0.14***	*−0.28****
3. Bullshit receptivity	0.30***	−0.27***	–	*0.18****
4. Overclaiming	0.39***	−0.38***	0.33***	–

Note. Zero-order correlations (Pearson's r) are shown below the diagonal. Partial correlations r_p (i.e., the correlation between stated variables while controlling for the other two variables) are italicized and shown above the diagonal. $N = 402$.

***$p < 0.001$; **$p < 0.01$.

about news accuracy, we removed the source of the news stories (both fake and real) for half of the participants. This manipulation allows us to test for an interaction between CRT and presence of the source, as predicted by the source-heuristic account of CRT-based discernment—if the previously observed relationship between CRT and media truth discernment (e.g., Pennycook & Rand, 2018) was driven by a source-heuristic, then removing the source should reduce or eliminate the correlation between media truth discernment and CRT.

Furthermore, as discussed above, prior work on fake news susceptibility indicates that familiarity is used as a heuristic to infer accuracy (Pennycook et al., 2018). Thus, it is possible that analytic individuals are less susceptible to fake news because they are less likely to judge accuracy based on familiarity. Alternatively, it might be that more analytic individuals are more news literate and thus more likely to have previously encountered the headlines (along with information about their veracity)—in which case, once again, the correlation between CRT and media truth discernment might not reflect a real psychological effect. To assess these possibilities, we asked participants to indicate whether they were familiar with the news articles. If the negative correlation between analytic thinking and perceptions of fake news accuracy is due to familiarity, the correlation should be reduced or eliminated when considering familiar and unfamiliar news stories separately. To facilitate this analysis, we used a set of particularly viral fake news stories (via Silverman et al., 2016). This also allows us to look for a main effect of familiarity, and thereby to test whether the link between familiarity and accuracy which has been demonstrated experimentally by Pennycook et al. (2018) extends to naturally occurring familiarity judgments.

Finally, we also asked participants to indicate whether they would be willing to share the news stories on social media (e.g., Facebook, Twitter). This allows us to extend our investigation of all of the various characteristics described above from accuracy judgments to sharing intentions (although the fact that we asked about the accuracy of the headlines before assessing sharing intentions may limit the generalizability of the sharing results to actual social media use).

3.1 | Method

We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study. Although we did create a preregistration for this experiment (which is available, along with our data, at https://osf.io/8xbhu/), it was our first time using preregistration. As a result, we did not do a particularly good job of fully and precisely articulating our analysis plan. Therefore, we will essentially ignore the analysis preregistration for Study 2, and use independent replications in Study 3 as evidence of the validity of the results.

3.2 | Participants

Our preregistered sample for Study 2 was 400 participants from Amazon Mechanical Turk. In total, 416 participants completed some portion of the study. We had complete data for 402 participants (14 participants did not finish). The final sample (Mean age = 36.4) included 208 males and 191 females (3 did not respond to the gender question).

3.3 | Materials

We presented participants with five stories that were factually accurate (*real news*) and five that were entirely untrue (*fake news*). Fake news stories were taken from a previous analysis of some of the most widely circulated during the 2016 Presidential election (along with contemporary real news stories) (Silverman et al., 2016). We did not attempt to balance the partisan leanings of the stories and therefore cannot draw inferences about partisanship here. Headlines were presented in a random order for each participant. All news stimuli can be found in SM. For each headline, participants answered three questions (in the following order): (a) "Have you seen or heard about this story before?" (response options: no/unsure/yes), (b) "To the best of your knowledge, how accurate is the claim in the above headline?" (response options: not at all accurate/ not very accurate/somewhat accurate/very accurate), and (c) "Would you consider sharing this story online (for example, through Facebook or Twitter)?" (response options: I would never share something political online (data removed), no, maybe, yes).

Participants completed the CRT and bullshit receptivity tasks from Study 1. Following Pennycook et al. (2015), participants were also presented with 10 prototypically profound sentences and 10 mundane sentences (e.g., "Human cultures often differ from each other quite a bit"). The former are intended as a control for the baseline tendency to rate things as profound. The mundane sentences are filler items and will not be analyzed here.

Demographic questions came at the end of the survey and were identical to Study 1, with two exceptions: (a) The dichotomous choice between Clinton and Trump was not included, and (b) Participants were asked to indicate their political ideology with respect to economic and social issues (in two separate questions).

3.4 | Procedure

Participants were randomly assigned to one of two conditions: (a) News stories included a source (e.g., "nytimes. com," "uconservative.com"), as in Study 1, or (b) No source was listed (we merely deleted the source from the image).

3.5 | Results and discussion

As in Study 1, we found evidence for a positive association between pseudo-profound bullshit receptivity and perceptions of fake news accuracy (see Table 2). Moreover, the association between bullshit receptivity and perceived accuracy of fake news was driven, to some extent, by bullshit *detection* (as opposed to a general tendency to find motivational-sounding things profound), and extends to fake news detection (media truth discernment, as opposed to a general tendency to believe news regardless of veracity): A regression with mean fake news accuracy judgment as the dependent variable and profundity ratings for bullshit and prototypically profound items, as well as perceptions of accuracy for real news, as the predictors found that profundity ratings for bullshit sentences were significant predictors, $\beta = 0.14$, $SE = 0.04$, $p = 0.013$ as were perceptions of real news accuracy, $\beta = 0.30$, $SE = 0.05$, $p < 0.001$; whereas profundity ratings of prototypically profound sentences were merely "marginally significant", $\beta = 0.10$, $SE = 0.04$, $p = 0.078$. Thus, belief in fake news (after controlling for belief in real news) was uniquely predicted by both the tendency to fall prey to pseudo-profound bullshit and (potentially) the broader tendency to rate things as profound. Moreover, in a parallel regression with perceptions of real news accuracy as the DV (and perceptions of fake news accuracy as an IV), profundity ratings for bullshit sentences were not significant predictors, $\beta = -0.08$, $SE = 0.03$, $p = 0.147$ (whereas profundity ratings for prototypically profound sentences, $\beta = 0.15$, $SE = 0.04$, $p = 0.006$, and perceived accuracy of fake news $\beta = 0.33$, $SE = 0.04$, $p < 0.001$, were significant predictors). This again emphasizes the specific link between pseudo-profound bullshit and perceived accuracy of fake news.

To gain further insight into whether the common factor underlying the measures in Study 1 was specific to fake news and/or bullshit, we conducted another exploratory factor analysis with the scales from Study 2. That is, we included perceived accuracy for both fake and real news as separate scales with the prediction that judgments for fake news but *not* real new will form a common factor with bullshit receptivity and CRT. We once again found evidence for only a single factor (eigenvalue = 1.42, 61% of variance explained) with loadings as follows: fake news accuracy = 0.53, CRT = −0.40, bullshit receptivity = 0.67, prototypically profound sentences = 0.66, real news accuracy = 0.31. These results suggest a common factor underlying the tendency to believe fake news, find any kind of statement profound, and perform poorly on the CRT—but, interestingly, not so much to believe real news.

Participants rated the real news headlines as substantially more accurate ($M = 2.64$) than the fake news headlines ($M = 1.95$), $t(401) = 20.9$, $p < 0.001$, $d = 1.04$—that is, participants were fairly good at discerning fake from real.

TABLE 2 Correlations (Pearson r) among primary variables in Study 2

	1	2	3	4	5	6	7	8	9
1. Fake news (perceived accuracy)	–								
2. Real news (perceived accuracy)	0.32***	–							
3. Media truth discernment (accuracy)	−0.58***	0.58***	–						
4. Fake news (social media sharing)	0.56***	0.20**	−0.30***	–					
5. Real news (social media sharing)	0.38***	0.37***	−0.02	0.73***	–				
6. Media truth discernment (sharing)	−0.24***	0.22***	0.39***	−0.37***	0.37***	–			
7. Cognitive reflection test	−0.26***	0.02	0.24***	−0.19**	−0.13*	0.08	–		
8. Bullshit receptivity	0.20***	0.06	−0.12*	0.21**	0.13*	−0.10	−0.27***	–	
9. Prototypically profound quotations	0.22***	0.18***	−0.04	0.21**	17**	−0.05	−0.17**	0.52***	–

Note. Media truth discernment scores were computed by subtracting z-scores for fake news (false alarms) from z-scores for real news (hits). Participants who indicated an unwillingness to ever share political news on social media were removed from the social media sharing analysis (Participants who indicated that they "would never share something political online" on the majority of items did not contribute data to the social media variables. Thus, these variables measure the willingness to share the news stories given that the individual is willing to share political news online. This led to the removal of 119 participants. Interestingly, participants who indicated a willingness to share political news online scored lower on the CRT ($M = 0.53$, $SD = 0.29$) than those who indicated that they would never share something political online ($M = 0.59$, $SD = 0.28$), $t(400) = 2.16$, $p = 0.031$). Perceived accuracy: $N = 402$. Social media sharing: $N = 283$.

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

Replicating the findings of Pennycook and Rand (2018), headline type (0 = real, 1 = fake) interacted with CRT score (continuous), $\beta = -0.297$, $t(400) = -4.23$, $p < 0.001$,[2] such that CRT performance was negatively correlated with lower perceptions of fake news (but not real news) accuracy (Table 2; descriptive statistics can be found in SM). In contrast, removing the source from the news stories had no effect on perceptions of accuracy (Source: $M_{\text{fake}} = 1.98$, $M_{\text{real}} = 2.65$; No Source: $M_{\text{fake}} = 1.93$, $M_{\text{real}} = 2.62$), regardless of CRT (i.e., no significant main effect or interactions, $p > 0.05$ for all). Moreover, CRT interacted with headline type whether or not the source was shown (Source: $\beta = -0.222$, $t(202) = -2.85$, $p = 0.005$; No Source: $\beta = -0.374$, $t(202) = -4.41$, $p < 0.001$).[3] Thus, the relationship between CRT and media truth discernment does not seem to be the result of a simple look-at-the-source heuristic. Rather, the correlation between the propensity to think analytically and perceptions of fake news accuracy indicates that—at least in this context—an active reasoning strategy is (to some extent) an effective inoculation against political disinformation.

Similarly, although familiar headlines were rated as more accurate ($M = 2.96$) than unfamiliar ones ($M = 2.15$),[4] $F(1, 153) = 185.29$, $p < 0.001$, $\eta^2 = 0.55$, this familiarity effect did not interact with CRT performance (nor was there a three-way interaction between CRT, familiarity, and type of headline), p's > 0.600. That is, CRT was negatively correlated with fake news that was both familiar, $r(173) = -0.23$, $p = 0.002$, and unfamiliar, $r(398) = -0.25$, $p < 0.001$. There was also no association between CRT and familiarity with fake, $r(400) = -0.06$, $p = 0.274$, or real, $r(400) = 0.03$, $p = 0.553$, news headlines. Thus, the correlation between CRT and media truth discernment is not the result of familiarity effects, be it resistance to fluency effects or increased likelihood of having encountered fact-checking information. This observation is in line with a previously observed lack of interaction between CRT and manipulated familiarity (De Keersmaecker et al., 2019). Interestingly, there *was* an interaction between familiarity (familiar, unfamiliar) and type of news (fake, real), $F(1, 153) = 17.53$, $p < 0.001$, $\eta^2 = 0.10$, such that media truth discernment was greater for headlines that participants were familiar with ($M = 0.82$) than for unfamiliar headlines ($M = 0.43$), $t(153) = 4.19$, $p < 0.001$, $d = 0.34$. (Note that the smaller degrees of freedom for these analyses is because of missing data for participants who were unfamiliar or familiar with all fake or real news items).

Bullshit receptivity was associated with more fake news sharing on social media, whereas CRT performance was associated with a lowered willingness to share fake news (see Table 2). However, unlike for perceptions of accuracy, bullshit receptivity and CRT performance were also associated with the willingness to share real news, and neither were related to sharing discernment (real minus fake).

4 | STUDY 3

Study 3 provides a replication of the results of Study 2 regarding the relationship between pseudo-profound bullshit receptivity and media truth discernment, using a different set of stimuli that were politically balanced between liberal and conservative slants (see Pennycook & Rand, 2018). This allowed us to also investigate whether the association between bullshit receptivity and belief in fake news varies based on the ideological alignment of the headlines (i.e., politically consistent vs. inconsistent headlines). Pennycook and Rand (2018) focused on the potential interaction between CRT and fake news partisanship and found (as described in more detail above) that more analytic individuals were more skeptical of fake news (and better able to discern between real and fake news) regardless of whether the headlines were politically consistent (i.e., Pro-Democratic headlines for Democrats/Pro-Republican headlines for Republicans), politically inconsistent (i.e., Pro-Democratic headlines for Republicans/Pro-Republican headlines for Democrats), or politically neutral.

4.1 | Method

Study 3 is a novel analysis of a dataset that has been published previously as Study 1 of Pennycook and Rand (2018) (for data and preregistration, see https://osf.io/8xbhu/). Bullshit receptivity and familiarity measures were collected in that study, but have not been previously analyzed (all analyses presented here are novel). As discussed above, we use Study 3 to assess the replicability of the bullshit- and familiarity-related results of Study 2 by replicating these analyses using the Pennycook and Rand (2018) dataset.

4.2 | Participants

Our preregistered sample for Study 3 was 800 participants from Amazon Mechanical Turk. In total, 843 participants completed some portion of the study. We had completed data for 802 participants (41 participants did not finish). The final sample (Mean age = 37.2) included 387 males and 414 females (3 did not respond to the gender question).

4.3 | Materials and procedure

We presented participants with 15 fake and 15 real news headlines. As mentioned, the stories were selected to be Democrat-consistent, Republican-consistent, or politically neutral (see Pennycook & Rand, 2018 for details about the pretest). Headlines were presented in a random order for each participant. Participants were asked the same three questions as in Study 2. All news stimuli can be found in SM.

Participants completed the CRT and bullshit receptivity tasks from Study 2. Demographic questions came at the end of the survey and included all political ideology questions from Studies 1 and 2.

4.4 | Results and discussion

As in Studies 1 and 2, participants who rated bullshit sentences as more profound were more likely to judge fake news to be accurate (Table 3). Although there was also a slight tendency for individuals who are more receptive to bullshit to rate real news as accurate, media truth discernment (the difference between real and fake) was negatively associated with bullshit receptivity. Furthermore, profundity ratings for prototypically profound quotations were positively associated with perceived accuracy for both fake and real news—and, in fact, did not significantly associate with media truth discernment. To analyze this in a different way, fake news accuracy was entered as a DV in a multiple regression model with perceived accuracy of real news, and profundity ratings for bullshit and prototypically profound items as separate predictors. As in Study 2, bullshit receptivity, $\beta = 0.23$, $SE = 0.02$, $p < 0.001$, and perceived accuracy of real news, $\beta = 0.16$, $SE = 0.03$, $p < 0.001$, emerged as independent predictors. As in Study 2, ratings of prototypically profound sentences did not significantly independently predict perceived accuracy of fake news, $\beta = -0.03$, $SE = 0.02$, $p = 0.463$. Moreover, as in Study 2, bullshit receptivity was positively associated with the willingness to share both fake and real news on social media (Table 3). Thus, the findings from Study 3 provide strong support for the conclusions of Study 2 regarding a negative relationship between pseudo-profound bullshit receptivity and belief in fake news per se.

We also investigated whether bullshit receptivity correlated with fake that was both politically consistent *and* inconsistent (as was the case for the CRT, see Pennycook & Rand, 2018). Results supported a consistent correlation regardless of political concordance: Bullshit receptivity correlated positively with fake news that was politically consistent, $r(798) = 0.17$, $p < 0.001$, and politically inconsistent, $r(798) = 0.23$, $p < 0.001$.

We also performed a confirmatory factor analysis based on the factor analysis results from Study 2 (in which all scales except real news accuracy loaded heavily on a single factor). In Study 3, we once again found evidence for a single factor (eigenvalue = 1.30, 56% of variance explained) and the factor loadings were similar, although the CRT loading was relatively weaker than in Study 2: fake news accuracy = 0.44, CRT = −0.29, bullshit receptivity = 0.73, prototypically profound sentences = 0.63, real news accuracy = 0.27. These results generally support the conclusions of Studies 1 and 2 and provide some additional evidence for a common factor underlying receptivity to fake news and bullshit.

Familiarity was again a strong determinant of accuracy judgments for news headlines. As in Study 2, familiar headlines were rated as more accurate ($M = 3.02$) than unfamiliar ones ($M = 2.19$), $F(1, 338) = 672.47$, $p < 0.001$, $\eta^2 = 0.67$. However, this familiarity effect did not interact with CRT performance (nor was there a three-way interaction between CRT, familiarity, and type of headline), p's > 0.24. CRT was negatively correlated with fake news that was both familiar, $r(348) = -0.18$, $p = 0.001$, and unfamiliar, $r(800) = -0.15$, $p < 0.001$. (Note that the smaller degrees of freedom for these analyses are because of missing data for participants who were unfamiliar or familiar

TABLE 3 Correlations (Pearson's r) among primary variables in Study 3

	1	2	3	4	5	6	7	8
1. Fake news (perceived accuracy)	–							
2. Real news (perceived accuracy)	0.25***	–						
3. Media truth discernment (accuracy)	−0.61***	0.61***	–					
4. Fake news (sharing)	0.55***	0.04	−0.41***	–				
5. Real news (sharing)	0.26***	0.25***	−0.03	0.68***	–			
6. Media truth discernment (sharing)	−0.36***	0.26***	0.48***	−0.41***	0.41***	–		
7. Bullshit receptivity	0.25***	0.08*	−0.13***	0.30***	0.29***	−0.02	–	
8. Prototypically profound quotations	0.14***	0.18***	0.03	0.23***	0.29***	0.08	0.49***	–

Note. For correlations between CRT performance and perceptions of news accuracy, see Pennycook and Rand (2018). Participants who indicated an unwillingness to ever share political news on social media were removed from the social media sharing analysis. Perceived accuracy: $N = 801$. Social media sharing: $N = 667$.

***$p < 0.001$; *$p < 0.05$.

with all fake or real news items). In addition, there was again an interaction between familiarity and type of news, $F(1, 338) = 11.23$, $p = 0.001$, $\eta^2 = 0.03$. However, contrary to Study 2, media truth discernment was greater for headlines that participants were *unfamiliar* with ($M = 0.75$) than for *familiar* headlines ($M = 0.59$), $t(338) = 3.35$, $p = 0.001$, $d = 0.18$.

5 | GENERAL DISCUSSION

Across 3 studies with 1,606 participants, we find consistent support for an association between perceived accuracy of fake news and the tendency to rate random pseudo-profound sentences (e.g., "Wholeness quiets infinite phenomena") as profound. Furthermore, the tendency to overclaim was also associated with perceived accuracy of fake news, and all three of these factors were also negatively correlated with the disposition to think analytically (as indexed by the CRT). Although belief in fake news, bullshit receptivity, overclaiming, and (more generally) analytic thinking were all measured in quite different ways, factor analyses revealed that a common factor accounted for a reasonable amount of variance across the tasks (from ~56% to 95% of variance explained). Thus, we provide evidence for a common factor, consistent with the general lack of skepticism or reflexive open-mindedness that helps to explain why some people fall for fake news (and other bullshit).

In addition, we extend previous work showing a negative association between the tendency to think analytically and fake news susceptibility (Bronstein et al., 2018; Pennycook & Rand, 2018). Specifically, we showed that this association was evident regardless of whether the news source was present or absent (which had no effect), and for both familiar and unfamiliar headlines (despite familiar headlines being rated as more accurate than unfamiliar ones). These findings support the idea that analytic thinking facilitates the recognition of fake news via considerations of headline *content*, such as implausibility (Pennycook & Rand, 2018), and are not merely the result of higher CRT people paying more attention to sources, being more resistant to fluency effects, or being more likely to have already learned about the veracity of the headlines prior to our study.

5.1 | Bullshit receptivity and overclaiming

According to Frankfurt (2005), bullshit is defined as something constructed without *concern* for the truth. It is in this way that bullshit is distinct from lying: Whereas the liar cares deeply about the truth (in order to subvert it), the bullshitter is relatively unconstrained. This is a very broad definition and, as a consequence, there are surely many different types of bullshit. What is less clear is whether there is a common

psychological factor (or factors) that link receptivity or susceptibility to accepting different types of bullshit together. The evidence presented here suggests that this is indeed the case. Notably, the pseudo-profound bullshit investigated by Pennycook et al. (2015), which comes in the form of abstract buzzwords (common in new age publishing) that are arranged randomly in a sentence that retains syntactic structure (e.g., "We are in the midst of a high-frequency blossoming of interconnectedness that will give us access to the quantum soup itself") are quite different from fake news headlines, which do not consist of random sentences and certainly do not rely on abstract buzzwords. Nonetheless, fake news is bullshit in that it is characterized by a lack of concern or regard for the truth. Consistent with this characterization, the propensity to rate random bullshit sentences as profound was positively correlated with perceived accuracy of fake (but not real) news. In contrast, prototypically profound (non-bullshit) sentences did not consistently correlate with fake news accuracy judgments once bullshit receptivity was taken into account. Moreover, although CRT performance was negatively correlated with susceptibility to both types of bullshit, they were nonetheless independently associated with each other. This suggests that some individuals may be better able to detect bullshit over and above their capacity or willingness to think analytically.

We also found a strong positive association between overclaiming (Paulhus et al., 2003) and perceptions of fake news accuracy. The tendency to indicate prior knowledge about fabricated historical names/events and topics in physical sciences was positively associated with perceptions of fake news accuracy (along with analytic thinking and bullshit receptivity). It seems that what Pennycook et al. (2015) referred to as *reflexively* open-minded thinking—that is, being overly open and agreeable toward ideas or claims that, with some consideration, might be considered wanting—may be an important underlying factor that bridge all of these different dimensions of bullshit.

5.2 | Familiarity

In a classic study of wartime rumors, Allport and Lepkin (1945) found that people were more likely to believe rumors that they were familiar with. Later experiments using uncertain content, such as difficult trivia statements, found that repetition is sufficient to increase later perceptions of accuracy (either in the same session or after multiple weeks) (Dechene et al., 2010; Hasher et al., 1977). More recently, Fazio et al. (2015) found that repeated exposure even increases perceptions of accuracy for trivia statements that participants are able to later identify as false. Our results indicate, consistent with a recent experiment on prior exposure (Pennycook et al., 2018), that familiarity is also a strong predictor of perceptions of accuracy even for entirely fabricated (and quite implausible) news headlines (see also,

Fazio, Rand, & Pennycook, 2019) . Interestingly, the difference between familiar and unfamiliar headlines observed in our study in terms of perceived accuracy did not interact with analytic thinking performance. This is consistent with recent work showing that cognitive style and ability measures do not interact with the effect of experimentally induced familiarity (i.e., repeated exposure) on accuracy (De Keersmaecker et al., 2019). This supports the idea that the influence of prior exposure is driven by low-level cognitive processes, such as fluency (Alter & Oppenheimer, 2009; Begg et al., 1992; Unkelbach, 2007; Whittlesea, 1993); and that familiarity-related effects are not driving the correlation between CRT and media truth discernment.

5.3 | Social media sharing

Our results indicate that the willingness to share fake news on social media was positively associated with pseudo-profound bullshit receptivity. However, unlike for perceptions of accuracy, sharing real news on social media was also (and similarly) positively associated with bullshit receptivity. This implies that, at least for real news stories, perceptions of accuracy and social media sharing are not two versions of the same judgment. Indeed, the correlation between social media sharing and perceptions of real news accuracy was relatively modest (e.g., $r = 0.38$ in Study 2). Evidently, sharing intentions in our studies are not driven primarily by perceived accuracy. Given the social aspect of social media sharing, we speculate that the decision to share a news article—whether it is fake or real—is driven by concerns about reputation or virtue signaling (Jordan, Sommers, & Bloom, 2017; Nowak & Sigmund, 2005). Importantly, however, the social media sharing intentions indicated by subjects in our studies may have been influenced by the fact that they were simultaneously asked about accuracy and familiarity for each story. Thus, the correlation between bullshit receptivity and sharing intentions observed here may not generalize. Naturally, more research is needed.

5.4 | Limitations

In the present work, we gave participants actual fake and real news headlines and asked them to judge their accuracy (and, in some cases, to indicate whether they would share them on social media). This approach is limited for two reasons. First, participants were not given the option of reading the actual articles (an option available to them when coming across fake and real news on social media). Our choice to just present headlines was based on evidence that individuals rarely actually read news articles (relative to just reading the headlines) on social media (Gabielkov et al., 2016). Nonetheless, this restricts the generalizability of our results and future research is needed to determine

the factors that predict when individuals will read actual fake news articles. Moreover, it is unclear if perceptions of news *article* accuracy is similarly influenced by reflexive open-mindedness, or rather if there is something specific about judgments about *headlines* that produces the correlations we report here.

Second, directly asking individuals about accuracy may cause them to reflect on headlines in a way that they might not otherwise do. Thus, the finding that people are generally good at discerning between real (true) and fake (false) news may only be true in cases where people are given this explicit task. It is unclear how much people might believe fake (and real) news if not prompted to report this belief. Future research using, for example, implicit attitude measures might reveal different effects.

6 | CONCLUSION

Who falls for fake news? We found evidence for an important individual difference that manifests across a wide range of different (but conceptually related) tasks. Individuals who fall for fake news are also more receptive to pseudo-profound bullshit, more willing to overclaim knowledge, and score lower on the CRT (a test of analytic thinking). These measures, in conjunction with the general tendency to rate prototypically motivational sentences as profound, loaded on a single factor, which we speculate to be the tendency to be reflexively open-minded. That is, to unskeptically accept a broad range of claims regardless of their epistemic value. Indeed, this may also explain why the CRT is a predictor of a wide range of epistemically suspect beliefs (Pennycook et al., 2015a). Although future research is needed to further isolate this potentially important individual difference factor, the present results suggest that there is hope for education or training—aimed at shifting people from reflexive open-mindedness to reflective open-mindedness—to improve the tendency of individuals to fall for fake news and other types of bullshit.

CONFLICT OF INTEREST

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

ENDNOTES

[1] The first wave was completed on April Fool's Day (April 1st) and the second was completed a week after. We ran two waves to test the hypothesis that people would be more discerning of bullshit content on April Fool's Day. There were no significant differences between our samples and they are therefore combined here.

[2] All regression results produced from models in which there are two observations per subject, one indicating average accuracy of real headlines and another indicating average accuracy of fake headlines, and robust standard errors are clustered on subject to account for nonindependence of observations from the same subject.

[3] Nor was there a significant three-way interaction between headline type, source manipulation, and subject partisanship (preference for Clinton vs. Trump in a forced choice), $\beta = -0.002$, $t(303) = -0.06$, $p = 0.954$, indicating that the source was equally ineffective at improving discernment for both Clinton and Trump supporters.

[4] Those who indicated being "unsure" about seeing a headline previously were coded as unfamiliar.

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SUPPORTING INFORMATION

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