On the reception and detection of pseudo-profound bullshit

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Abstract

Although bullshit is common in everyday life and has attracted attention from philosophers, its reception (critical or ingenuous) has not, to our knowledge, been subject to empirical investigation. Here we focus on pseudo-profound bullshit, which consists of seemingly impressive assertions that are presented as true and meaningful but are actually vacuous. We presented participants with bullshit statements consisting of buzzwords randomly organized into statements with syntactic structure but no discernible meaning (e.g., "Wholeness quiets infinite phenomena"). Across multiple studies, the propensity to judge bullshit statements as profound was associated with a variety of conceptually relevant variables (e.g., intuitive cognitive style, supernatural belief). Parallel associations were less evident among profundity judgments for more conventionally profound (e.g., "A wet person does not fear the rain") or mundane (e.g., "Newborn babies require constant attention") statements. These results support the idea that some people are more receptive to this type of bullshit and that detecting it is not merely a matter of indiscriminate skepticism but rather a discernment of deceptive vagueness in otherwise impressive sounding claims. Our results also suggest that a bias toward accepting statements as true may be an important component of pseudo-profound bullshit receptivity.

Keywords: bullshit, bullshit detection, dual-process theories, analytic thinking, supernatural beliefs, religiosity, conspiratorial ideation, complementary and alternative medicine.

1   Introduction

"It is impossible for someone to lie unless he thinks he knows the truth. Producing bullshit requires no such conviction." – Harry Frankfurt

In *On Bullshit*, the philosopher Frankfurt (2005) defines bullshit as something that is designed to impress but that was constructed absent direct *concern* for the truth. This distinguishes bullshit from lying, which entails a deliberate manipulation and subversion of truth (as understood by the liar). There is little question that bullshit is a real and consequential phenomenon. Indeed, given the rise of communication technology and the associated increase in the availability of information from a variety of sources, both expert and otherwise, bullshit may be more pervasive than ever before. Despite these seemingly commonplace observations, we know of no psychological research on bullshit. Are people able to detect blatant bullshit? Who is most likely to fall prey to bullshit and why?

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2   Pseudo-profound bullshit

The Oxford English Dictionary defines bullshit as, simply, "rubbish" and "nonsense", which unfortunately does not get to the core of bullshit. Consider the following statement:

> "Hidden meaning transforms unparalleled abstract beauty."

Although this statement may *seem* to convey some sort of potentially profound meaning, it is merely a collection of buzzwords put together randomly in a sentence that retains syntactic structure. The bullshit statement is not merely nonsense, as would also be true of the following, which is not bullshit:

> "Unparalleled transforms meaning beauty hidden abstract".

The syntactic structure of a), unlike b), implies that it was constructed to communicate *something*. Thus, bullshit, in contrast to mere nonsense, is something that implies but does not contain adequate meaning or truth. This sort of phenomenon is similar to what Buekens and Boudry (2015) referred to as *obscurantism* (p. 1): "[when] the speaker... [sets] up a game of verbal smoke and mirrors to suggest depth and insight where none exists." Our focus, however, is somewhat different from what is found in the philosophy of bullshit and related phenomena (e.g., Black, 1983; Buekens & Boudry, 2015; Frankfurt; 2005). Whereas philosophers

have been primarily concerned with the goals and intentions of the *bullshitter*, we are interested in the factors that predispose one to become or to resist becoming a *bullshittee*. Moreover, this sort of bullshit – which we refer to here as pseudo-profound bullshit – may be one of many different types. We focus on pseudo-profound bullshit because it represents a rather extreme point on what could be considered a spectrum of bullshit. We can say quite confidently that the above example (a) is bullshit, but one might also label an exaggerated story told over drinks to be bullshit. In future studies on bullshit, it will be important to define the type of bullshit under investigation (see Discussion for further comment on this issue).

Importantly, pseudo-profound bullshit is not trivial. For a real-world example of pseudo-profound bullshit and an application of our logic, consider the following:

> "Attention and intention are the mechanics of manifestation."

This statement bears a striking resemblance to (a), but is (presumably) not a random collection of words. Rather, it is an actual "tweet" sent by Deepak Chopra, M.D., who has authored numerous books with titles such as *Quantum Healing* (Chopra, 1989) and *The Soul of Leadership* (Chopra, 2008) and who has been accused of furthering "woo-woo nonsense" (i.e., pseudo-profound bullshit; e.g., Shermer, 2010). The connection between (a) and (c) is not incidental, as (a) was derived using the very buzzwords from Chopra's "Twitter" feed.[1] The vagueness of (c) indicates that it may have been constructed to impress upon the reader some sense of profundity at the expense of a clear exposition of meaning or truth.

Despite the lack of direct concern for truth noted by Frankfurt (2005), pseudo-profound bullshit betrays a concern for verisimilitude or truthiness. We argue that an important adjutant of pseudo-profound bullshit is vagueness which, combined with a generally charitable attitude toward ambiguity, may be exacerbated by the nature of recent media. As a prime example, the necessary succinctness and rapidity of "Twitter" (140 characters per "Tweet") may be particularly conducive to the promulgation of bullshit. Importantly, vagueness and meaning are, by definition, at cross purposes, as the inclusion of vagueness obscures the meaning of the statement and therefore must undermine or mask "deep meaning" (i.e., profundity) that the statement purports to convey. The concern for "profundity" reveals an important defining characteristic of bullshit (in general): that it attempts to impress rather than to inform; to be engaging rather than instructive.

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[1]This example came from http://wisdomofchopra.com. See Method section of Study 1 for further details.

3   Bullshit receptivity

What might cause someone to erroneously rate pseudo-profound bullshit as profound? In our view, there are two candidate mechanisms that might explain a general "receptivity" to bullshit. The first mechanism relates to the possibility that some people may have a stronger bias toward accepting things as true or meaningful from the outset. According to Gilbert (1991, following Spinoza), humans must first believe something to comprehend it. In keeping with this hypothesis, Gilbert, Tafarodi and Malone (1993) found that depleting cognitive resources caused participants to erroneously believe information that was tagged as false. This indicates that people have a response bias toward accepting something as true. This asymmetry between belief and unbelief may partially explain the prevalence of bullshit; we are biased toward accepting bullshit as true and it therefore requires additional processing to overcome this bias. Nonetheless, it should be noted that previous work on belief and doubt focused on meaningful propositions such as "The heart produces all mental activity." The startling possibility with respect to pseudo-profound bullshit is that people will first accept the bullshit as true (or meaningful) and, depending on downstream cognitive mechanisms such as conflict detection (discussed below), either retain a default sense of meaningfulness or invoke deliberative reasoning to assess the truth (or meaningfulness) of the proposition. In terms of individual differences, then, it is possible that some individuals *approach* pseudo-profound bullshit with a stronger initial expectation for meaningfulness. However, since this aspect of bullshit receptivity relates to one's mindset when approaching (or being approached with) bullshit, it is therefore not specific to bullshit. Nonetheless, it may be an important component of bullshit receptivity. Put differently, some individuals may have an excessively "open" mind that biases them to make inflated judgments of profundity, regardless of the content.

The second mechanism relates to a potential inability to *detect* bullshit, which may cause one to confuse vagueness for profundity. In the words of Sperber (2010): "All too often, what readers do is judge profound what they have failed to grasp" (p. 583). Here, the *bullshittee* is simply unaware that the relevant stimulus requires special consideration. This mechanism is linked to what has been labelled as "conflict monitoring" failures (e.g., De Neys, 2014; Pennycook, Fugelsang & Koehler, 2015). In the context of reasoning research, for example, conflict monitoring is necessary when two sources of information in a problem cue conflicting responses (e.g., logical validity and conclusion believability in a syllogism). Recent research indicates that people are capable of detecting these sorts of conflicts (see De Neys, 2012 for a review), but that conflict monitoring failures are nonetheless an important source of bias in reasoning and decision making (Pennycook, Fugelsang & Koehler,

2015). Moreover, conflict detection is viewed as an important low-level cognitive factor that causes at least some people to engage deliberative, analytic reasoning processes (Pennycook, Fugelsang & Koehler, 2015). With respect to bullshit, there are likely many factors that may lead an individual to successfully detect the need for skepticism that will depend on the type of bullshit encountered and the bullshit context. For example, the source (perhaps a known *bullshitter*) may be particularly untrustworthy. Or, perhaps, the bullshit may conflict with common knowledge or specific knowledge or expertise of the recipient. For the present investigation, we focus on pseudo-profound bullshit that is missing any obvious external cue that skepticism is required. The goal is to investigate whether there are consistent and meaningful individual differences in the ability to spontaneously discern or detect pseudo-profound bullshit. Unlike response bias, this mechanism involves distinguishing bullshit from non-bullshit.

4   The current investigation

Here we report four studies in which we ask participants to rate pseudo-profound bullshit and other statements on a profundity scale. Our primary goal is to establish this as a legitimate measure of bullshit receptivity. For this, bullshit profundity ratings are correlated with a collection of individual difference factors that are conceptually related to pseudo-profound bullshit in a variety of ways.

4.1   Analytic thinking

Dual-process theories of reasoning and decision making distinguish between intuitive ("Type 1") processes that are autonomously cued and reflective ("Type 2") processes that are effortful, typically deliberative, and require working memory (Evans & Stanovich, 2013). A crucial finding that has emerged from the dual-process literature is that the ability to reason involves a discretionary aspect (Stanovich, 2011; Stanovich & West, 2000); a distinction that has long historical precedent (Baron, 1985). Namely, to be a good reasoner, one must have both the *capacity* to do whatever computation is necessary (i.e., cognitive ability, intelligence) and the *willingness* to engage deliberative reasoning processes (i.e., analytic cognitive style; thinking disposition). Moreover, individual differences in analytic cognitive style are positively correlated with conflict detection effects in reasoning research (Pennycook, Cheyne, Barr, Koehler & Fugelsang, 2014; Pennycook, et al., 2015), indicating that more analytic individuals are either better able to detect conflict during reasoning or are more responsive to such conflict. Consistent with Sagan's (1996) argument that critical thinking facilitates "baloney detection", we posit that reflective thinking should be linked to bullshit receptivity, such that

people who are better at solving reasoning problems should be more likely to consider the specific meaning of the presented statements (or lack thereof) and judge failure to discern meaning as a possible defect of the statement rather than of themselves. In other words, more analytic individuals should be more likely to detect the need for additional scrutiny when exposed to pseudo-profound bullshit. More intuitive individuals, in contrast, should respond based on a sort of first impression, which will be inflated due to the vagueness of the pseudo-profound bullshit. Analytic thinking is thus the primary focus of our investigation, as it is most directly related to the proposed ability to detect blatant bullshit.

4.2   Ontological confusions

Both children and adults tend to confuse aspects of reality (i.e., "core knowledge") in systematic ways (Lindeman, Svedholm-Hakkinen & Lipsanen, 2015). Any category mistake involving property differences between animate and inanimate or mental and physical, as examples, constitutes an ontological confusion. Consider the belief that prayers have the capacity to heal (i.e., spiritual healing). Such beliefs are taken to result from conflation of mental phenomenon, which are subjective and immaterial, and physical phenomenon, which are objective and material (Lindeman, Svedholm-Hakkinen & Lipsanen, 2015). On a dual-process view, ontological confusions constitute a failure to reflect on and inhibit such intuitive ontological confusions (Svedholm & Lindeman, 2013). Ontological confusions may also be supported by a bias toward believing the literal truth of statements. Thus, ontological confusions are conceptually related to both detection and response bias as mechanisms that may underlie bullshit receptivity. As such, the propensity to endorse ontological confusions should be linked to higher levels of bullshit receptivity.

4.3   Epistemically suspect beliefs

Beliefs that conflict with common naturalistic conceptions of the world have been labelled *epistemically suspect* (e.g., Lobato et al., 2014; Pennycook, Fugelsang & Koehler, in press). For example, the belief in angels (and the corresponding belief that they can move through walls) conflicts with the common folk-mechanical belief that things cannot pass through solid objects (Pennycook et al., 2014). Epistemically suspect beliefs, once formed, are often accompanied by an unwillingness to critically reflect on such beliefs. Indeed, reflective thinkers are less likely to be religious and paranormal believers (e.g., Gervais & Norenzayan, 2012; Pennycook et al., 2012; Shenhav, Rand & Greene, 2012), and are less likely to engage in conspiratorial ideation (Swami et al., 2014) or believe in the efficacy of alternative medicine (Browne et al., 2015; Linde-

man, 2011). Ontological confusions are also more common among believers in the supernatural (e.g., Lindeman, Svedholm-Hakkinen & Lipsanen, 2015; Svedholm & Lindeman, 2013). Although epistemically suspect claims may or may not *themselves* qualify as bullshit, the lack of skepticism that underlies the acceptance of epistemically suspect claims should also promote positive bullshit receptivity.

5 Study 1

We presented participants with ten statements that have syntactic structure but that consist of a series of randomly selected vague buzzwords. Participants were asked to indicate the relative profundity of each statement on a scale from 1 (not at all profound) to 5 (very profound). We argue that high ratings indicate receptivity toward bullshit. Participants also completed a series of relevant cognitive and demographic questions.

6 Method

In all studies, we report how we determined our sample size, all data exclusions, and all measures.

6.1 Participants

University of Waterloo undergraduates (N = 280, 58 male, 222 female, M_{age} = 20.9, SD_{age} = 4.8) volunteered to take part in the study in return for course credit. Only participants who reported that English is their first language (on a separate pre-screen questionnaire) were allowed to participate. The sample size was the maximum amount allowed for online studies in the University of Waterloo participant pool. This study was run over two semesters.

One of the participants was removed due to a large number of skipped questions. Participants were also given an attention check. For this, participants were shown a list of activities (e.g., biking, reading) directly below the following instructions: "Below is a list of leisure activities. If you are reading this, please choose the "other" box below and type in 'I read the instructions'". This attention check proved rather difficult with 35.4% of the sample failing (N = 99). However, the results were similar if these participants were excluded. We therefore retained the full data set.

6.2 Materials

Ten novel meaningless statements were derived from two websites and used to create a Bullshit Receptivity (BSR) scale. The first, http://wisdomofchopra.com, constructs meaningless statements with appropriate syntactic structure by randomly mashing together a list of words used in

Deepak Chopra's tweets (e.g., "Imagination is inside exponential space time events"). The second, "The New Age Bullshit Generator" (http://sebpearce.com/bullshit/), works on the same principle but uses a list of profound-sounding words compiled by its author, Seb Pearce (e.g., "We are in the midst of a self-aware blossoming of being that will align us with the nexus itself"). A full list of items for the BSR scale can be found in Table S1 in the supplement. The following instructions were used for the scale:

> We are interested in how people experience the profound. Below are a series of statements taken from relevant websites. Please read each statement and take a moment to think about what it might mean. Then please rate how "profound" you think it is. Profound means "of deep meaning; of great and broadly inclusive significance."

Participants rated profoundness on the following 5-point scale: 1= Not at all profound, 2 = somewhat profound, 3 = fairly profound, 4 = definitely profound, 5 = very profound. A bullshit receptivity score was the mean of the profoundness ratings for all bullshit items.

At the beginning of the study (following demographic questions), participants completed five cognitive tasks intended to assess individual differences in analytic cognitive style and components of cognitive ability. The Cognitive Reflection Test (CRT; Frederick, 2005) consists of 3 mathematical word problems that cue an incorrect intuitive response. The CRT has been shown to reflect the tendency to avoid miserly cognitive processing (Campitelli & Gerrans, 2013; Toplak, West & Stanovich, 2011), presumably because those with an analytic cognitive style are more likely to question or avoid the intuitive response. We also included a recent 4-item addition to the CRT (Toplak, West & Stanovich, 2014). The 7-item CRT measure had acceptable internal consistency (Cronbach's α = .74).

As an additional measure of reflective thinking, we included a "heuristics and biases" battery (Toplak et al., 2011). The heuristics and biases battery involves a series of questions derived from Kahneman and Tversky, such as the gambler's fallacy and the conjunction fallacy (Kahneman, 2011). Much like the CRT, each item cues an incorrect intuitive response based on a common heuristic or bias. However, the heuristics and biases task was not as reliable (α = .59). This likely reflects the fact that the heuristics and biases items are more diverse than are the CRT problems.

We also included two cognitive ability measures. We assessed verbal intelligence using a 12-item version of the Wordsum test. For this, participants were presented with words and asked to select from a list the word that most closely matches its meaning (e.g., CLOISTERED was presented with miniature, bunched, arched, malady, secluded). The Wordsum has been used in many studies (see Malhotra, Krosnick & Haertel, 2007 for a review), including the Gen-

Table 1: Pearson product-moment correlations (Study 1; N = 279). BSR = Bullshit Receptivity scale; CRT = Cognitive Reflection Test. Cronbach's alphas are reported in brackets. *** $p < .001$, ** $p < .01$, * $p < .05$.

	1	2	3	4	5	6	7
1. BSR	(.82)						
2. CRT	−.33***	(.74)					
3. Heuristics/biases	−.28***	.50***	(.59)				
4. Verbal intelligence	−.37***	.41***	.31***	(.65)			
5. Numeracy	−.13*	.38***	.27***	.30***	(.47)		
6. Ontological confusions	.31***	−.33***	−.38***	−.26***	−.16**	(.74)	
7. Religious belief	.27***	−.21***	−.20**	−.15*	−.17**	.29***	(.94)

eral Social Survey (starting in 1974). The Wordsum measure had acceptable reliability (α = .65). We also assessed numeracy using a 3-item measure (Schwartz, Woloshin, Black & Welch, 1997). The frequently used 3-item numeracy scale is strongly related to an expanded and more difficult 7-item numeracy scale, suggesting that both scales loaded on a single construct (labelled "global numeracy" by Lipkus, Samsa, and Rimer, 2001). However, we employed the shorter 3-item version for expediency, but it did not achieve acceptable reliability (α = .47).

We used a 14-item ontological confusions scale (Lindeman & Aarnio, 2007; Lindeman, et al., 2008; Svedholm & Lindeman, 2013), translated into English from Finnish. Participants were given the following instructions: "Do you think the following statements can be literally true, the way a sentence such as 'Wayne Gretzky was a hockey player' is true? Or are they true only in a metaphorical sense, like the expression 'Friends are the salt of life'?". They were then presented items such as "A rock lives for a long time" and asked to rate how metaphorical/literal the statement is on the following scale: 1= fully metaphorical, 2 = more metaphorical than literal, 3 = in between, 4 = more literal than metaphorical, 5 = fully literal. Those who rate the statements as more literal are considered more ontologically confused. Participants were also given 3 metaphors (e.g., "An anxious person is a prisoner to their anxiety") and 3 literal statements (e.g., "Flowing water is a liquid") as filler items that did not factor into the mean ontological confusion score. The ontological confusions scale had acceptable internal consistency (α = .74).

Finally, participants completed an 8-item religious belief questionnaire (Pennycook et al., 2014). Participants were asked to rate their level of agreement/disagreement (1 – strongly disagree to 5 – strongly agree) with 8 commonly held religious beliefs (afterlife, heaven, hell, miracles, angels, demons, soul, Satan). The scale had excellent internal consistency (α = .94).

6.3 Procedure

Following a short demographic questionnaire, participants completed the tasks in the following order: heuristics and biases battery, Wordsum, numeracy, CRT2, CRT1, ontological confusion scale, bullshit receptivity, and religious belief questionnaire.

7 Results

The Bullshit Receptivity (BSR) scale had good internal consistency (α = .82). A summary of descriptive statistics for each item and the full BSR scale is reported in Table S1. The mean profoundness rating was 2.6, which is in-between "somewhat profound" and "fairly profound" on the 5-point scale. Indeed, the mean profoundness rating for each item was significantly greater than 2 ("somewhat profound"), all t's > 5.7, all p's < .001, indicating that our items successfully elicited a sense of profoundness on the aggregate. Moreover, only 18.3% (N = 51) of the sample had a mean rating less than 2. A slight majority of the sample's mean ratings fell on or in-between 2 and 3 (54.5%, N = 152) and over a quarter of the sample (27.2%, N = 76) gave mean ratings higher than 3 ("fairly profound"). These results indicate that our participants largely failed to detect that the statements are bullshit.

Next we investigate the possible association between reflective thinking and bullshit receptivity. Pearson product-moment correlations can be found in Table 1. BSR was strongly negatively correlated with each cognitive measure except for numeracy (which was nonetheless significant). Furthermore, both ontological confusions and religious belief were positively correlated with bullshit receptivity.

8 Study 2

In Study 1, at least some participants appeared to find meaning in a series of statements that contained a random collec-

tion of vague buzzwords organized in a sentence with syntactic structure. This tendency was significantly related to cognitive variables of conceptual interest in expected ways. In Study 2 we set out to replicate this pattern of results using real-world examples of bullshit. For this, we created an additional scale using particularly vague "tweets" from Deepak Chopra's "Twitter" account (see Table S2). We also expanded our measures of analytic cognitive style by including self-report measures of analytic and intuitive thinking disposition. Finally, we expanded our cognitive ability measures by increasing the number of items on the numeracy test and including a common measure of fluid intelligence.

9 Method

9.1 Participants

A total of 198 participants (98 male, 100 female, M_{age} = 36, SD_{age} = 11.4) were recruited from Amazon's Mechanical Turk in return for pay. Only American residents were permitted to sign up for the study. All participants reported speaking fluent English. Given the novelty of the phenomenon, we chose 200 participants as an arbitrary target sample size, as we determined this would provide adequate power and stability of the correlations. These data were not analyzed until the full sample was completed.

Eleven participants were removed because they responded affirmatively when asked if they responded randomly at any time during the study. In addition, 23 participants failed at least one of three attention check questions. The instruction check questions included the one used in Study 1 as well as the following question inserted into questionnaires at the middle and end of the survey: "I have been to every country in the world" (all participants who selected any option but "strongly disagree" were removed). However, as in Study 1, the results were similar when these participants were excluded and we therefore retained the full sample.

9.2 Materials

In addition to the 10 meaningless statements used in Study 1, we obtained 10 novel items from http://wisdomofchopra.com and http://sebpearce.com/bullshit/. As noted, we also obtained 10 items from Deepak Chopra's Twitter feed (http://twitter.com/deepakchopra; e.g. "Nature is a self-regulating ecosystem of awareness"). These items can be found in Table S2. We excluded hash tags and expanded any shortened words and abbreviations, but the tweets were not otherwise altered. We emphasize that we deliberately selected tweets that seemed vague and, therefore, the selected statements should not be taken as representative of Chopra's tweet history or body of work. Also, to reiter-

ate, we focus on Chopra here merely because others have claimed that some of the things that he has written seem like "woo-woo nonsense" (e.g., Shermer, 2010) and because of the connection between these claims and the bullshit generator websites that we used. None of this is intended to imply that every statement in Chopra's tweet history is bullshit. Participants were given the same instructions as Study 1 and, therefore, we did not indicate the author of the statements.

Participants completed one cognitive task and one self-report questionnaire intended to assess individual differences in analytic cognitive style. Participants were given the heuristics and biases battery (as in Study 1; α = .75) along with Pacini and Epstein's (1999) Rational-Experiential Inventory. The latter includes the 20-item Need for Cognition (NFC) scale and the 20-item Faith in Intuition scale (FI). Both scales had excellent reliability: α = .93 (NFC) and .94 (FI). Participants were given questions such as "reasoning things out carefully is not one of my strong points" (NFC, reverse scored) and "I like to rely on my intuitive impressions" (FI). They were asked to respond based on a 5 point scale from 1-Definitely not true of myself to 5-Definitely true of myself.

To assess cognitive ability, we retained the Wordsum (α = .63), and the numeracy test from Study 1. However, given the low reliability for the 3-item numeracy test in Study 1, we used an additional 6 items (Lipkus et al., 2001), which lead to better reliability for the full 9-item scale (α = .63). We also added a short form of Raven's Advanced Progressive Matrices (APM) that consists of 12 problems. The APM are a widely used measure of fluid intelligence and the short form has been validated in multiple studies (Arthur & Day, 1994; Chiesi, Ciancaleoni, Galli, Morsanyi & Primi, 2012). It had acceptable internal consistency in our sample (α = .69).

We used the same ontological confusion (α = .75) and religious belief measure (α = .96) as in Study 1. Finally, we administered the Paranormal Belief Scale (Tobacyk, 2004; Pennycook et al., 2012) with the religious belief items excluded. The scale consisted of 22 items sampled from 6 categories of supernatural belief (example items in parentheses): Psi ("Mind reading is possible"), Witchcraft ("Witches do exist"), Omens of luck ("Black cats can bring bad luck"), Spiritualism ("It is possible to communicate with the dead"), Extraordinary life forms ("The Loch Ness monster of Scotland exists") and Precognition ("Astrology is a way to accurately predict the future"). The full scale had excellent internal consistency (α = .96).

Participants also completed wealth distribution and political ideology measures. These measures were included as part of separate investigations and will not be analyzed or discussed further.

Table 2: Pearson product-moment correlations (Study 2). BSR = Bullshit Receptivity scale; H&B = Heuristics and Biases; NFC = Need for Cognition; FI = Faith in Intuition; Num. = Numeracy; VI = Verbal Intelligence; APM = Advanced Progressive Matrices; OC = Ontological Confusions; RB = Religious Belief; PB = Paranormal Belief. Bottom diagonal = full sample ($N = 187$). Top diagonal = Participants with knowledge of Deepak Chopra excluded ($N = 102$). Cronbach's alphas for the full sample are reported in brackets. *** $p < .001$, ** $p < .01$, * $p < .05$.

	1	2	3	4	5	6	7	8	9	10
1. BSR	(.96)	−.36***	−.08	.32**	−.12	−.30**	−.26**	.46***	.25*	.31**
2. H&B	−.34***	(.75)	.08	−.28**	.42***	.43***	.40***	−.41***	−.31**	−.46***
3. NFC	−.13	.20**	(.93)	−.32**	.17	.24*	.19	−.18	−.15	−.10
4. FI	.30***	−.37***	−.28***	(.94)	−.17	−.34***	−.05	.24*	.34***	.37***
5. Num.	−.25**	.46***	.22**	−.27***	(.63)	.34***	.45***	−.20*	−.07	−.21*
6. VI	−.30***	.40***	.27***	−.31***	.31***	(.63)	.27**	−.38***	−.16	−.30**
7. APM	−.27***	.45***	.24**	−.14	.46***	.36***	(.69)	−.33**	−.07	−.12
8. OC	.45***	−.41***	−.29***	.34***	−.26**	−.33***	−.34***	(.75)	.12	.34**
9. RB	.27***	−.34***	−.20**	.35***	−.17*	−.24**	−.14	.22**	(.96)	.34**
10. PB	.35***	−.45***	−.10	.44***	−.33***	−.26**	−.18*	.38***	.44***	(.96)

9.3 Procedure

In contrast to Study 1, participants evaluated the meaningless statements *before* completing the cognitive tasks. Moreover, the Chopra-Twitter items followed directly *after* the meaningless statements. We asked participants if they knew who Deepak Chopra is (yes / maybe / no) and, if so, whether they follow him on "Twitter" or have read any of his books. The cognitive tasks were then completed in the following order: heuristics and biases battery, Wordsum, numeracy, and APM. Participants then completed the ontological confusions scale, followed by the religious and paranormal belief scales (in that order). The NFC and FI questionnaires came at the very end of the study.

10 Results

Of the 187 participants, 85 (45.5%) indicated that they know who Deepak Chopra is ("uncertain": $N = 26$, 13.9%; "no": $N = 76$, 40.6%). This knowledge was associated with lower profoundness ratings for the pseudo-profound bullshit items ("no/maybe" $M = 2.6$; "yes" $M = 2.3$), $t(185) = 2.84$, $SE = .11$, $p = .005$, and Chopra-Twitter items ("no/maybe" $M = 2.9$; "yes" $M = 2.6$), $t(185) = 2.32$, $SE = .12$, $p = .022$. Below we report key analyses with the full and restricted (i.e., those with knowledge of Chopra being excluded) samples.

Focusing on the full sample, the 20-item BSR scale had excellent internal consistency ($\alpha = .93$) and the 10-item Chopra-Twitter scale was also reliable ($\alpha = .89$). A summary of descriptive statistics for each item is reported in Table S2. Participants rated the Chopra-Twitter items ($M = 2.77$, $SD = .84$) as more profound than the bullshit statements ($M = 2.46$, $SD = .76$), participant-level: $t(187) = 10.6$, $SE = .03$, $p < .001$, item-level: $t(28) = 3.98$, $SE = .08$, $p < .001$. However, mean ratings for the two scales were very strongly correlated ($r = .88$). Moreover, the pattern of correlations for the scales was identical (see supplementary materials, Table S3). We therefore combined all of the items for both scales into a single Bullshit Receptivity (BSR) scale, which had excellent internal consistency ($\alpha = .96$).

The BSR scale significantly correlated with each variable apart from Need for Cognition (Table 2, bottom diagonal), which (curiously) was only modestly correlated with heuristics and biases performance. Specifically, BSR was negatively correlated with performance on the heuristics and biases battery and positively correlated with Faith in Intuition. The cognitive ability measures, including numeracy, were also negatively correlated with BSR. Finally, BSR was positively correlated with ontological confusions, and both religious and paranormal belief. The pattern of results was very similar when the correlations are restricted only to participants who did not report having any knowledge of Deepak Chopra (Table 2, top diagonal).

11 Study 3

In Studies 1 and 2, we established a statistically reliable measure of bullshit receptivity that correlated with a variety of conceptually related variables. It remains unclear, however, whether these associations are driven by a bias toward accepting pseudo-profound bullshit as meaningful or a failure to detect the need for skepticism (or both) when skepticism is warranted (i.e., sensitivity, as distinct from bias,

in the sense of signal-detection theory). It may be that increased profundity ratings are associated with lower reflective thinking (for example), regardless of the presented content.

The goal of Study 3 was to test the possibility that some people may be particularly insensitive to pseudo-profound bullshit, presumably because they are less capable of detecting conflict during reasoning. For this, we created a scale using ten motivational quotations that are conventionally considered to be profound (e.g., "A river cuts through a rock, not because of its power but its persistence") in that they are written in plain language and do not contain the vague buzzwords that are characteristic of the statements used in Studies 1 and 2. The difference between profundity ratings between legitimately meaningful quotations and pseudo-profound bullshit will serve as our measures of bullshit sensitivity. Secondarily, we also included mundane statements that contained clear meaning but that would not be considered conventionally profound (e.g., "Most people enjoy some sort of music"). If the association between analytic thinking and profundity ratings for pseudo-profound bullshit is due to bullshit detection in particular, analytic thinking should not be associated with profundity ratings for mundane statements.

12 Method

12.1 Participants

A total of 125 participants (52 male, 73 female, $M_{age} = 36.4$, $SD_{age} = 13.3$) were recruited from Amazon's Mechanical Turk in return for pay. Only American residents were permitted to sign up for the study. All participants reported speaking fluent English. Given the strength (and accumulating cost) of the previous findings, 125 participants was deemed a sufficient sample. These data were not analyzed until the full sample was completed.

Eleven participants were removed because they responded affirmatively when asked if they responded randomly at any time during the study. Fourteen participants failed an attention check question but were retained, as in Studies 1 and 2.

12.2 Materials

We created four 10-item scales. For the BSR, we used the original 10 items from Study 1 and the 10 Chopra-Twitter items from Study 2. We created a scale with 10 statements that convey meaning, but that are mundane (e.g., "Newborn babies require constant attention"; see Table S4 for full list). Finally, ten motivational quotations were found through an internet search and used to form a second scale (e.g., "A wet person does not fear the rain"; see Table S5 for full list). Par-

ticipants completed the heuristics and biases measure from Studies 1 and 2 ($\alpha = .61$).

12.3 Procedure

The four types of statements were intermixed in a unique random order for each participant. The statements were presented at the beginning of the study. Participants then completed the heuristics and biases battery.

13 Results

Of the 114 participants, 47 (41.2%) indicated that they know who Deepak Chopra is ("uncertain": $N = 7$, 6.1%; "no": $N = 60$, 52.6%). This knowledge was not associated with lower profoundness ratings for bullshit or Chopra-Twitter items, t's < 1.4, p's > .17. Nonetheless, we report our correlational analyses with the full and restricted sample.

Focusing on the full sample, profoundness ratings for the BSR items ($\alpha = .91$) and for Deepak Chopra's actual tweets ($\alpha = .93$) were very highly correlated ($r = .89$). We combined the two sets of items into a single BSR scale, which had excellent internal consistency ($\alpha = .96$). The motivational quotation scale had acceptable internal consistency ($\alpha = .82$) and the mundane statement scale was also reliable ($\alpha = .93$). However, the distribution of profoundness ratings for each of the mundane statements was highly skewed (see Table S4). Further inspection revealed that the vast majority of ratings (80.1%) for mundane statements were 1 (not at all profound) and many participants ($N = 52$, 46%) responded with 1 for every statement. Three standard deviations above the mean for the mundane statement scale was *not* larger than 5, indicating that there were outliers. There were no outliers for the other scales. A recursive outlier analysis revealed 22 participants who had profoundness ratings for mundane statements that were statistical outliers. Evidently, these participants found the ostensibly mundane statements at least somewhat profound. This may reflect a response bias toward excess profundity among some participants. Indeed, relative to the remainder of the sample, the 22 outlying participants had higher profundity ratings for the pseudo-profound bullshit, $t(112) = 2.50$, $SE = .21$, $p = .014$, and (marginally) the motivational quotations, $t(112) = 1.83$, $SE = .16$, $p = .071$. Moreover, the outlying participants also scored lower on the heuristics and biases task, $t(112) = 3.23$, $SE = .13$, $p = .002$. Key analyses below are reported with outliers both retained and removed for the mundane statement scale. The mundane statement scale had low reliability ($\alpha = .35$) when the outlying participants were removed, as would be expected given the low variability in ratings.

The mean profoundness rating was lower for the BSR items ($M = 2.72$, $SD = .90$) than for the motivational quotations ($M = 3.05$, $SD = .69$), participant-level: $t(113) = 3.90$,

Table 3: Pearson product-moment correlations (Study 3). BSR = Bullshit Receptivity scale; a = full scale, b = outliers (N = 22) removed. Bottom diagonal = full sample (N = 114). Top diagonal = Participants with knowledge of Deepak Chopra excluded (N = 67). Cronbach's alphas for the full sample are reported in brackets. *** $p < .001$, ** $p < .01$, * $p < .05$.

	1	2	3	4	5	6
1. BSR	(.96)	.40**	.26*	.21	−.38**	−.71***
2. Motivational quotations	.38***	(.82)	.15	.14	−.10	.36**
3. Mundane statements a	.26**	.17	(.93)	.	−.28*	−.15
4. Mundane statements b	.19	.14	.	(.35)	−.13	−.10
5. Heuristics/biases	−.33***	−.12	−.24**	−.08	(.61)	.31*
6. BS sensitivity (Var2–Var1)	−.71***	.38***	−.13	−.08	.23*	.

$SE = .08$, $p < .001$, item-level: $t(28) = 3.44$, $SE = .10$, $p = .002$. Moreover, the mundane statements (outliers retained, $M = 1.44$, $SD = .78$) were judged to be less profound than the BSR items, participant-level: $t(113) = 13.24$, $SE = .10$, $p < .001$, item-level: $t(28) = 14.60$, $SE = .09$, $p < .001$, and the motivational quotations, participant-level: $t(113) = 18.13$, $SE = .09$, $p < .001$, item-level: $t(18) = 19.56$, $SE = .08$, $p < .001$.

Focusing on the full sample (Table 3, bottom diagonal), BSR was negatively associated with heuristics and biases performance. This replicates Studies 1 and 2. However, there was no such association between profoundness ratings for motivational quotations and heuristics and biases performance ($p = .192$). To further explore the *specific* association between heuristics and biases performance and profundity ratings for pseudo-profound bullshit, we created a "bullshit sensitivity" score by subtracting the BSR from motivational quotation means (Table 3). Heuristics and biases was positively correlated with this measure ($r = .23$, $p = .013$), indicating an association between analytic thinking and the ability to spontaneously *detect* pseudo-profound bullshit. These results were similar when the sample was restricted to those with no knowledge of Deepak Chopra (Table 3, top diagonal). Indeed, the association between bullshit sensitivity and heuristics and biases performance was nominally larger in the restricted sample ($r = .31$, $p = .012$).

The BSR was correlated with profoundness ratings for motivational quotations and mundane statements (Table 3, bottom diagonal; although only marginally when outliers are removed in the latter case, $p = .072$). Profoundness ratings for motivational quotations and mundane statements were also marginally correlated ($p = .067$; $p = .170$ when outliers are removed), indicating a potential disposition toward higher profoundness ratings among some participants (i.e., response bias). There was also an association between heuristics and biases performance and profoundness ratings for mundane statements ($p = .009$), but it did not remain significant once the outliers were removed ($p = .476$). This pattern of results is identical in the restricted sample. These

results indicate that, at least for some participants, response bias plays a role in bullshit receptivity and explains some of its association with analytic thinking.

14 Study 4

The results of Study 3 indicate that the association between profoundness ratings and reflective thinking is largely specific to bullshit items. The lack of correlation between heuristics and biases performance and profoundness ratings for motivational quotations, in particular, indicates that more reflective participants are not merely more skeptical toward all manner of profound-sounding statements. However, there was an unequal number of bullshit ($N = 20$) and motivational ($N = 10$) items in Study 3. Moreover, it is unclear whether the inclusion of mundane statements interacted in some way with participants' evaluation of the bullshit and motivational statements. Thus, in Study 4, we asked participants to rate the relative profoundness of 20 randomly intermixed statements (10 bullshit and 10 motivational).

In Study 3, we did not include any measures of epistemically suspect beliefs. Thus, in Study 4, participants completed the heuristics and biases battery, along with measures of paranormal belief, conspiracist ideation, and endorsement of complementary and alternative medicine.

15 Method

15.1 Participants

We recruited 242 participants (146 male, 107 female, M_{age} = 33.9, SD_{age} = 10.6) from Amazon's Mechanical Turk in return for pay. Only American residents were permitted to sign up for the study. All participants reported speaking fluent English. We chose a larger target of 250 participants given some of the marginal results in Study 3. These data were not analyzed until the full sample was completed.

Twenty-three participants were removed because they responded affirmatively when asked if they responded randomly at any time during the study. Twelve participants failed an attention check question but were retained as removing them had no effect on the pattern of results.

15.2   Materials

We used the BSR (10 items) from Study 1. We used the same motivational quotation scale from Study 3 (see Table S6 for full list). Participants also completed the heuristics and biases battery ($\alpha = .67$) from Studies 1-3 and the paranormal belief scale (including religious belief items; $\alpha = .96$) from Study 2. We measured conspiracy ideation using a 15-item general conspiracy beliefs scale (Brotherton, French & Pickering, 2013). The scale included items such as "A small, secret group of people is responsible for making all major world decisions, such as going to war" ($\alpha = .95$). Responses were made on the following 5-point scale: 1) Definitely not true, 2) Probably not true, 3) Not sure/cannot decide, 4) Probably true, 5) Definitely true. For the complementary and alternative medicine scale, we asked participants to rate the degree to which they believe in the efficacy of 10 common types of alternative medicines (CAM; Complementary and Alternative Medicine, e.g., homeopathy) on the following 5-point scale (Lindeman, 2011): 0) Don't know/cannot say [removed from analysis], 1) Do not believe at all, 2) Slightly believe, 3) Moderately believe, 4) Believe fully. An overall CAM score was created by summing the responses ($\alpha = .94$).

Participants also completed a ten item personality scale (Gosling, Rentfrow & Swann, 2003) that indexes individual differences in the Big Five personality traits (extraversion, agreeableness, conscientiousness, emotional stability, and openness). These data will not be considered further.

15.3   Procedure

The bullshit and motivational statements were presented first in a unique random order for each participant. Participants then completed the remainder of the tasks in the following order: Heuristics and biases battery, personality scale, paranormal belief scale, conspiracy ideation scale, and CAM scale.

16   Results

Of the 217 participants, 98 (42.2%) indicated that they know who Deepak Chopra is ("uncertain": $N = 33$, 14.2%; "no": $N = 101$, 43.5%). This knowledge was not associated with lower profundity ratings for bullshit statements ("yes" $M = 2.2$; "no/maybe" $M = 2.35$), $t(230) = 1.34$, $SE = .10$, $p = .182$. Nonetheless, in keeping with Studies 2 and 3, we re-

port our correlational analyses with the full and restricted sample.

Focusing on the full sample, the 10-item BSR scale had good internal consistency ($\alpha = .89$) and the 10-item motivational quotation scale was also reliable ($\alpha = .80$). The mean profoundness rating was higher for the motivational quotations ($M = 3.13$, $SD = .67$) than the BSR items ($M = 2.29$, $SD = .82$), participant-level: $t(231) = 15.93$, $SE = .05$, $p < .001$, item-level: $t(18) = 9.45$, $SE = .09$, $p < .001$, although the motivational quotations were far from ceiling.

BSR was negatively correlated with heuristics and biases performance and positively correlated with paranormal belief, conspiracist ideation, and belief in the efficacy of complementary and alternative medicine. However, the mean profoundness ratings for the BSR and motivational quotations was strongly correlated ($r = .43$) and, in contrast to Study 3, the motivational quotation scale was correlated with heuristics and biases performance ($p = .035$). The mean profoundness rating for motivational quotations was also positively correlated with conspiracist ideation, complementary and alternative medicine, and (marginally) paranormal belief ($p = .088$). Thus, as in Study 3, we computed a "bullshit sensitivity" variable by subtracting the mean profundity ratings for the motivational quotations from the bullshit items. Unlike in Study 3, however, heuristics and biases performance was not significantly correlated with bullshit sensitivity in the full sample ($r = .10$, $p = .121$). There was also no correlation between bullshit sensitivity and conspiracist ideation ($r = -.03$, $p = .652$) or complementary and alternative medicine ($r = -.08$, $p = .218$). In contrast, paranormal belief remained negatively correlated with bullshit sensitivity ($r = -.21$, $p = .002$).

Unlike in Studies 2 and 3, the pattern of results was different when the analysis was restricted to those with no knowledge of Deepak Chopra. Namely, when the analysis was restricted, bullshit sensitivity was significantly positively correlated with heuristics and biases performance ($r = .19$, $p = .032$). Moreover, conspiracist ideation was marginally negatively associated with bullshit sensitivity ($r = -.16$, $p = .070$). Paranormal belief remained negatively correlated ($r = -.23$, $p = .009$) and complementary and alternative remained uncorrelated ($r = -.06$, $p = .497$) with bullshit sensitivity. These results support the idea that the *difference* between profundity ratings for genuine motivational quotations and pseudo-profound bullshit can be used as a measure of bullshit sensitivity. However, they also indicate that caution is required – at least when the 10-item scales are used – as familiarity with Deepak Chopra may limit the usefulness of the scale. Chopra has a distinct style and it is possible that prior knowledge may have confounded our bullshit measure. For example, it may have helped some people detect the bullshit. Conversely, among those who have a favorable opinion of Chopra, this may have artificially inflated profoundness ratings for the bullshit.

Table 4: Pearson product-moment correlations (Study 4). BSR = Bullshit Receptivity scale; CAM = Complementary and alternative medicine. Bottom diagonal = full sample ($N = 232$). Top diagonal = Participants with knowledge of Deepak Chopra excluded ($N = 134$). Cronbach's alphas for the full sample are reported in brackets. *** $p < .001$, ** $p < .01$, * $p < .05$.

	1	2	3	4	5	6	7
1. BSR	(.89)	.38***	−.68***	−.30***	.23**	.15	.17
2. Motivational quotations	.43***	(.80)	.42***	−.14	.01	−.01	.13
3. BS Sensitivity (Var2–Var1)	−.66***	.40***	.	.19*	−.23**	−.16	−.06
4. Heuristics/Biases	−.21**	−.14*	.10	(.67)	−.40***	−.11	−.37***
5. Paranormal Belief	.30***	.11	−.21**	−.33***	(.96)	.47***	.54***
6. Conspiracist Ideation	.17**	.17**	−.03	−.10	.49***	(.95)	.26**
7. CAM	.24***	.19**	−.08	−.29***	.58***	.22**	(.94)

17 General discussion

The present study represents an initial investigation of the individual differences in receptivity to pseudo-profound bullshit. We gave people syntactically coherent sentences that consisted of random vague buzzwords and, across four studies, these statements were judged to be at least somewhat profound. This tendency was also evident when we presented participants with similar real-world examples of pseudo-profound bullshit. Most importantly, we have provided evidence that individuals vary in conceptually interpretable ways in their propensity to ascribe profundity to bullshit statements; a tendency we refer to as "bullshit receptivity". Those more receptive to bullshit are less reflective, lower in cognitive ability (i.e., verbal and fluid intelligence, numeracy), are more prone to ontological confusions and conspiratorial ideation, are more likely to hold religious and paranormal beliefs, and are more likely to endorse complementary and alternative medicine. Finally, we introduced a measure of pseudo-profound bullshit *sensitivity* by computing a difference score between profundity ratings for pseudo-profound bullshit and legitimately meaningful motivational quotations. This measure was related to analytic cognitive style and paranormal skepticism. However, there was no association between bullshit sensitivity and either conspiratorial ideation or acceptance of complementary and alternative medicine (CAM). Nonetheless, our findings are consistent with the idea that the tendency to rate vague, meaningless statements as profound (i.e., pseudo-profound bullshit receptivity) is a legitimate psychological phenomenon that is consistently related to at least some variables of theoretical interest.

17.1 Response bias and sensitivity

We proposed two mechanisms that explain why people might rate bullshit as profound. The first is a type of response bias wherein some individuals are simply more prone to relatively high profundity ratings. Although this mechanism is not specific to bullshit, it may at least partly explain why our pseudo-profound bullshit measure was so consistently positively correlated with epistemically suspect beliefs. Some people may have an uncritically open mind. As the idiom goes: "It pays to keep an open mind, but not so open your brains fall out". In Study 3, some people even rated entirely mundane statements (e.g., "Most people enjoy at least some sort of music") as at least somewhat profound. Our results suggest that this tendency – which resembles a general gullibility factor – is a component of pseudo-profound bullshit receptivity. There is, of course, a great deal of research on this sort of mechanism. As a prominent example, consider the "Barnum effect". In his classic demonstration of gullibility, Forer (1949) had introductory psychology students complete a personality measure (the "Diagnostic Interest Blank", DIB). One week later, he gave each of the students an ostensibly personalized personality sketch that consisted of 13 statements and asked them to rate both the accuracy of the statements and the overall efficacy of the DIB. Unbeknownst to the students, Forer had actually given every student the same personality sketch that consisted entirely of vague, generalized statements taken from a newsstand astrology book (e.g., "You have a great need for other people to like and admire you."). Although some people were more skeptical than others, the lowest number of specific statements accepted was 8 (out of 13). Moreover, the students were quite convinced of the personality tests' efficacy – "All of the students accepted the DIB as a good or perfect instrument for personality measurement" (Forer, 1949, *p.* 121). Meehl (1956) first referred to this as the Barnum effect, after the notorious hoaxer (*bullshitter*) P. T. Barnum.[2]

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[2]In an amusing irony, P. T. Barnum is often erroneously attributed the phrase "There's a sucker born every minute." This is true even in at least one review of research on the Barnum effect (Furnham & Shofield, 1987).

As a secondary point, it is worthwhile to distinguish uncritical or reflexive open-mindedness from thoughtful or reflective open-mindedness. Whereas *reflexive* open-mindedness results from an intuitive mindset that is very accepting of information without very much processing, *reflective* open-mindedness (or *active* open-mindedness; e.g., Baron, Scott, Fincher & Metz, 2014) results from a mindset that searches for information as a means to facilitate critical analysis and reflection. Thus, the former should cause one to be more receptive of bullshit whereas the latter, much like analytic cognitive style, should guard against it.

The foregoing highlights what appears to be a strong general susceptibility to bullshit, but what cognitive mechanisms inoculate against bullshit? Drawing on recent dual-process theories that posit a key role for conflict detection in reasoning (De Neys, 2012; Pennycook et al., 2015), we proposed that people may vary in their ability to *detect* bullshit. Our results modestly support this claim. Namely, we created a bullshit "sensitivity" measure by subtracting profundity ratings for pseudo-profound bullshit from ratings for legitimate motivational quotations. Increased bullshit sensitivity was associated with better performance on measures of analytic thinking. This is consistent with Sagan's (1996) famous claim that critical thinking facilitates "baloney detection".

Further, bullshit sensitivity was associated with lower paranormal belief, but not conspiratorial ideation or acceptance of complementary and alternative medicine. This was not predicted as all three forms of belief are considered "epistemically suspect" (e.g., Pennycook, et al., in press). One possible explanation for this divergence is that supernatural beliefs are a unique subclass because they entail a conflict between some immaterial claim and (presumably universal) intuitive folk concepts (Atran & Norenzayan, 2004). For example, the belief in ghosts conflicts with folk-mechanics – that is intuitive belief that objects cannot pass through solid objects (Boyer, 1994). Pennycook et al. (2014) found that degree of belief in supernatural religious claims (e.g., angels, demons) is negatively correlated with conflict detection effects in a reasoning paradigm. This result suggests that the particularly robust association between pseudo-profound bullshit receptivity and supernatural beliefs may be because *both* response bias and conflict detection (sensitivity) support *both* factors. Further research is needed to test this claim.

17.2 Future directions

The focus of this work was on investigating individual differences in the tendency to accept bullshit statements, and our initial evidence indicates that reflectiveness may be a key individual difference variable. At a very basic level, the willingness to stop and think analytically about the actual meanings of the presented words and their associations

would seem an *a priori* defense against accepting bullshit at face value (i.e., to avoid an excessively open-minded response bias). Moreover, increased detection of bullshit may reinforce a critical attitude and potentially engender a more restrained attitude to profundity judgments. The present findings also provide evidence that an increased knowledge of word meaning (via verbal intelligence) may assist in critical analysis. An understanding of more precisely nuanced meanings of words may reveal inconsistencies, incongruities, and conflicts among terms in bullshit statements. Conflict detection is a key aspect of dual-process theories (e.g., De Neys, 2012; Pennycook, et al., 2015), though in this case it remains unclear precisely what features of bullshit statements might cue reflective thinking. What is it about a statement like "good health imparts reality to subtle creativity" that might cause someone to stop and consider the meaning of the sentence more deeply?

Although a reflective thinking style appears to militate against bullshit acceptance, other cognitive processes that underlie the propensity to find meaning in meaningless statements remain to be elucidated. It may be that people naturally assume that statements presented in a psychology study (vague or otherwise) are constructed with the goal of conveying some meaning. Indeed, the vagueness of the statements may imply that the intended meaning is so important or profound that it cannot be stated plainly (Sperber, 2010). In the current work, we presented the participants with meaningless statements without cueing them to the possibility that they are complete bullshit. Although this is likely how bullshit is often encountered in everyday life, it may be that some skepticism about the *source* of the statement is the key force that may guard against bullshit acceptance. For example, poems attributed to prestigious sources are evaluated more positively (Bar-Hillel, Maharshak, Moshinsky & Nofech, 2012). Interpretation is difficult and humans surely rely on simple heuristics (e.g., "do I trust the source?") to help with the task.

In this vein, psychological research should aim to elucidate contextual factors that interact with individual differences in the reception and detection of bullshit. As noted by philosophers studying the topic, the *bullshitter* oft has the intention of implying greater meaning than is literally contained in the message, though the nature of the intent can vary. For example, the literary critic Empson (1947) describes the use of ambiguity in literature, including a type of intentional ambiguity used by poets in which a passage "says nothing, by tautology, by contradiction, or by irrelevant statements; so that the reader is forced to invent statements of his own ..." (p. 176). The employment and reception of such literary devices in the context of a broader meaningful work seems related to but dissociable from isolated statements such as those used here. By examining pseudo-profound bullshit in an empirical fashion, we set the stage for further refinement of this important conceptual

variable as it converges with and diverges from other related uses of vagueness. We anticipate that there are many variations of vague, ambiguous, or otherwise unclear statements that have unique psychological correlates in varied contexts that are amenable to study.

18 Limitations and caveats

Bullshit comes in many forms and we have focused on only one type. Frankfurt (2005) discusses the so-called *bull session* wherein "people try out various thoughts and attitudes in order to see how it feels to hear themselves saying such things and in order to discover how others respond, without it being assumed that they are committed to what they say: It is understood by everyone in a *bull session* that the statements people make do not necessarily reveal what they really believe or how they really feel" (p. 9). This qualifies as bullshit under Frankfurt's broad definition because the content is being communicated absent a *concern* for the truth. Nonetheless, the character of conversational bullshit is likely quite different from pseudo-profound bullshit, and by extension the reception and detection of it may be determined by different psychological factors. It is important for researchers interested in the psychology of bullshit to be clear about the type of bullshit that they are investigating.

Our bullshit receptivity scale was quite successful overall, but future work is needed to refine and improve it. In particular, the bullshit sensitivity measure would be improved if there was a more direct mapping between the pseudo-profound bullshit and the genuinely meaningful control items. Naturally, more items would improve both scales. Finally, knowledge of Deepak Chopra may subtly confound experiments using our bullshit sensitivity scale (or, at least, slightly restrict the effect size).

Finally, we have focused on an individual differences approach given that our primary goal was to demonstrate that bullshit receptivity is a consequential thing that can be reliably measured. This preliminary work is required for experiments to be meaningful. Future work should focus on the dual goals of further refining our measure of bullshit receptivity and experimentally modulating profundity ratings for pseudo-profound bullshit.

19 Conclusion

Bullshit is a consequential aspect of the human condition. Indeed, with the rise of communication technology, people are likely encountering more bullshit in their everyday lives than ever before. Profundity ratings for statements containing a random collection of buzzwords were very strongly correlated with a selective collection of actual "Tweets" from Deepak Chopra's "Twitter" feed (r's = .88–89). At

the time of this writing, Chopra has over 2.5 million followers on "Twitter" and has written more than twenty *New York Times* bestsellers. Bullshit is not only common; it is popular.[3] Chopra is, of course, just one example among many. Using vagueness or ambiguity to mask a lack of meaningfulness is surely common in political rhetoric, marketing, and even academia (Sokal, 2008). Indeed, as intimated by Frankfurt (2005), bullshitting is something that we likely all engage in to some degree (p. 1): "One of the most salient features of our culture is that there is so much bullshit. Everyone knows this. Each of us contributes his share." One benefit of gaining a better understanding of how we reject *other's* bullshit is that it may teach us to be more cognizant of our *own* bullshit.

The construction of a reliable index of bullshit receptivity is an important first step toward gaining a better understanding of the underlying cognitive and social mechanisms that determine if and when bullshit is detected. Our bullshit receptivity scale was associated with a relatively wide range of important psychological factors. This is a valuable first step toward gaining a better understanding of the psychology of bullshit. The development of interventions and strategies that help individuals guard against bullshit is an important additional goal that requires considerable attention from cognitive and social psychologists. That people vary in their receptivity toward bullshit is perhaps less surprising than the fact that psychological scientists have heretofore neglected this issue. Accordingly, although this manuscript may not be truly profound, it is indeed meaningful.

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[3]And profitable. Deepak Chopra is one of the wealthiest holistic-health "gurus" (Perry, 1997). This is not to say that everything Deepak Chopra has written is bullshit. Nonetheless, *some of it* seems to meet our definition of pseudo-profound bullshit. Our goal here is to simply raise the possibility that Chopra's tendency to bullshit (as claimed by others, Shermer, 2010) may have played an important role in his popularity.

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