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Bullshit Ability as an Honest Signal of Intelligence

Martin Harry Turpin[1,*], Mane Kara-Yakoubian[2,*], Alexander C. Walker[1], Heather E. K. Walker[3], Jonathan A. Fugelsang[1], and Jennifer A. Stolz[1]

Abstract

Navigating social systems efficiently is critical to our species. Humans appear endowed with a cognitive system that has formed to meet the unique challenges that emerge for highly social species. Bullshitting, communication characterised by an intent to be convincing or impressive without concern for truth, is ubiquitous within human societies. Across two studies ($N = 1{,}017$), we assess participants' ability to produce satisfying and seemingly accurate bullshit as an honest signal of their intelligence. We find that bullshit ability is associated with an individual's intelligence and individuals capable of producing more satisfying bullshit are judged by second-hand observers to be more intelligent. We interpret these results as adding evidence for intelligence being geared towards the navigation of social systems. The ability to produce satisfying bullshit may serve to assist individuals in negotiating their social world, both as an energetically efficient strategy for impressing others and as an honest signal of intelligence.

Keywords

intelligence, social navigation, bullshit, social signaling, individual differences

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> [The Bullshitter] . . . is neither on the side of the true nor on the side of the false. His eye is not on the facts at all, as the eyes of the honest man and of the liar are, except insofar as they may be pertinent to his interest in getting away with what he says. He does not care whether the things he says describe reality correctly. He just picks them out, or makes them up, to suit his purpose.
>
> Harry G. Frankfurt (2009)

Human intelligence has been a long-standing mystery to psychologists: In particular, why humans differ so greatly in their intelligence compared not only to distantly related animals, but our closest primate cousins. Large brains are energetically expensive (Cunnane et al., 1993; Raichle & Gusnard, 2002) and necessitate that human children require inordinate levels of post-partum investment from caretakers (Rosenberg & Trevathan, 2002). Nevertheless, human brains have continued to increase in size over our evolutionary history until only recently (Beals et al., 1984; Bednarik, 2014). It remains a puzzle to explain why humans continue to support the steep investment of resources that comes with maintaining a large and powerful brain, with leading theories suggesting that the cognitive, social and cultural advantages afforded by such large brains outweigh the costs (Seyfarth & Cheney, 2002). Classically, intelligence has often been considered mostly—or sometimes solely—for its value in manipulating and understanding the physical world (Humphrey, 1976), the environment for an organism being a series of cognitive puzzles which intelligence assists them in completing. More recent developments have expanded on this classical understanding through acknowledging that the complexities of an organism's social life may

[1] Department of Psychology, University of Waterloo, Ontario, Canada
[2] Department of Psychology, Ryerson University, Ontario, Canada
[3] Department of Psychology, University of Guelph, Ontario, Canada
[*] These authors contributed equally

Corresponding Authors:
Martin Harry Turpin, Department of Psychology, University of Waterloo, 200 University Avenue West, Waterloo, Ontario N2L 3G1, Canada.
Email: mhturpin@uwaterloo.ca

Mane Kara-Yakoubian, Department of Psychology, Ryerson University, 350 Victoria St,Toronto, ON M5B 2K3, Canada.
Email: mkarayakoubian@ryerson.ca

place just as high of a demand on an organism's intelligence as the complexities of its physical life (if not more; Byrne, 1996; Byrne & Whiten, 1990; Whiten, 2018). Far removed from the relatively sterile cognitive puzzles with which we now test and study intelligence, there is reason to believe that the origin of intelligence is best understood for its social uses (Gavrilets & Vose, 2006; Geher & Miller, 2007; McNally, Brown, & Jackson, 2012). It is this perspective that grounds the current work.

Several theories have been forwarded to explain the high level of intelligence observed in humans. Some of the most promising among these theories have examined intelligence for its value in assisting us in navigating the complex social systems that characterize our species. Intelligence in the social world is theorized to have been formed primarily in response to three pressures. The first is the need to accurately signal intelligence in order to demonstrate genetic quality and fitness to potential mates (McKeown, 2013; Miller, 2000; Miller & Todd, 1998). The second, a pressure to manipulate, deceive, or influence others through the application of such social intelligence (Byrne, 1996; Byrne & Whiten, 1990; Handel, 1982; Sharma et al., 2013; Whiten, 2018). Third, the pressure to accurately maintain and manipulate mental models of complex social networks and interactions, as well as being able to simulate the mental states of others (Bjorklund & Kipp, 2002; Roth & Dicke, 2005; Stone, 2006). A cartoonish description of the hypothetical person who exemplifies all of these traits in the extreme would be one who shows off their intelligence whenever possible, tells lies when it is advantageous to do so, and is capable of keeping track of all the lies they have told.

Possessing a high level of intelligence allows humans to meet the intense demands placed on them by complex social systems. Beyond the Machiavellian value of social savvy, evidence suggests that large brains and their corresponding cognitive advantages may have been selected for as a result of their sexual appeal (Crow, 1993; McKeown, 2013; Miller, 2000; Miller & Todd, 1998; Schillaci, 2006). In line with signaling accounts, charisma in the form of humor and leadership abilities has been argued to function as an honest signal of desirable qualities, including cognitive ability (Greengross & Miller, 2011; Grabo et al., 2017). In biology, an "honest signal" is one that conveys accurate information about an unobservable trait to another organism. For example, a brightly colored frog that is poisonous honestly signals its toxicity to predators; it looks dangerous, because it is. In contrast, a dishonest signal is an attempt to mislead another organism into believing that the signaler possesses a trait which it does not. For example, a harmless insect may possess the same coloration as a harmful wasp, falsely signaling that it is just as dangerous as a wasp in order to avoid predation; it looks dangerous, but it is not. In the context of sexual signaling in humans, a person of high intelligence who is able to communicate this to others is giving an honest signal that they possess this desirable trait. In this case, the "honesty" of a signal is independent of the truth content of the specific communication used to signal. For example, a smooth and intelligent liar may give the impression that they are intelligent even while saying nothing true.

The ability to produce satisfying bullshit, with its emphasis on impressing others without regard for truth or meaning (Frankfurt, 2009; Pennycook et al., 2015), may represent an energetically inexpensive strategy for both signaling one's intelligence, and deceiving others to one's advantage. Indeed, past work provides initial evidence for this claim, demonstrating that indiscriminately attaching meaningless pseudo-profound bullshit titles to artworks increases their perceived profundity (Turpin et al., 2019). On this basis, it has been hypothesized that bullshit can be used to gain a competitive advantage in any domain of human competition where the criteria for determining who succeeds and fails at least partially relies on impressing others. In this way, bullshit may serve as an honest signal of a person's intelligence (and therefore their fitness), even though the specific content of the bullshit itself may be false.

A growing body of literature has investigated peoples' receptivity to bullshit, specifically computer-generated pseudo-profound bullshit consisting of random arrangements of superficially impressive words in a way that maintains syntactic structure (e.g., "*Wholeness quiets infinite phenomena*"; Pennycook et al., 2015; Pennycook & Rand, 2019; Walker et al., 2019). Other work has begun to examine the frequency of bullshit production (Littrell et al, 2020; 2021), including investigation of the conditions under which people are most likely to produce bullshit (Petrocelli, 2018). Yet, minimal work has assessed how bullshit can be used to navigate social systems (McCarthy et al., 2020; Turpin et al., 2019). For example, a person who is capable of producing good bullshit may be perceived as especially charming, convincing, or competent as long as their deception is left undiscovered. Relatedly, styles of bullshitting that allow one to avoid awkward or uncomfortable social situations may go far in fostering social harmony (Littrell et al., 2020). This type of bullshitting (i.e., evasive bullshitting) could be employed to avoid lying, while replacing the direct response with a less relevant truth (Carson, 2016; Littrell et al., 2020). For example, a friend gifts you a sweater that you find hideous, but when asked how you like it, you respond with *"thank you, this is very thoughtful of you!"* Given the potential usefulness of bullshit as a method for navigating social systems, and with evidence that human intelligence may be set up largely for navigating the social world, an open question is whether bullshit ability as a behavioral feature reveals something about one's relative intelligence. If our brains have evolved for the purpose of manipulating information about social relationships (e.g., using tactical deception; Dunbar, 1998), then it is plausible that intelligent people will produce bullshit that is of higher quality, as a means of efficiently navigating their social surroundings.

The current work investigates the role which bullshit ability plays in signaling intelligence. We assess both how the quality of bullshit reveals the true intelligence of bullshit producers as well as how bullshit quality is received as a signal of intelligence by observers. To examine these questions, we had a sample of participants attempt to explain fictional concepts in a way that appeared satisfying and accurate (i.e., with bullshit), while other

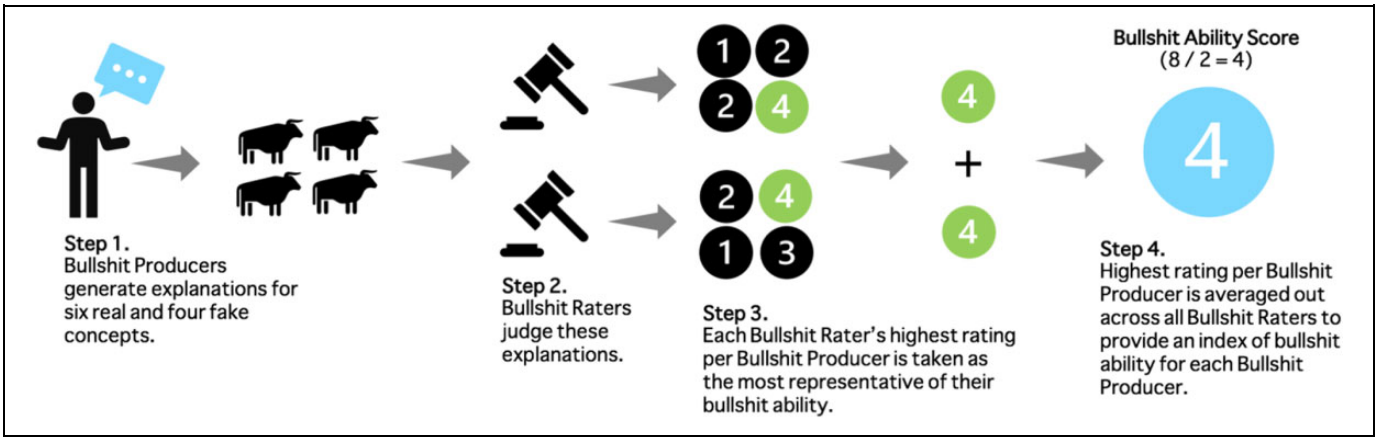

Figure 1. Summary diagram for methods used in Studies 1 and 2.
Note. Visual depiction of how bullshit ability was computed in the present study. This figure is only a representation of the process and does not align to the total number of explanations generated by Bullshit Producers or the number of Bullshit Raters assigned to evaluate Bullshit Producers.

samples judged the quality of these explanations and the intelligence of their creators. We hypothesized that bullshit would behave as an honest signal of one's intelligence such that those able to create the most satisfying and seemingly accurate bullshit would also score higher on tests of cognitive ability. Furthermore, we predicted that those judged as producing high quality bullshit would also be perceived as more intelligent. Therefore, we expected bullshit ability to relate positively with measures of cognitive ability as well as perceptions of intelligence.

Study 1

Method

Participants

A sample of 483 undergraduates from the University of Waterloo, located in Ontario, Canada, volunteered to complete Study 1 in exchange for course credit.

Materials and Measures

A full list of the materials and measures presented in Study 1 can be viewed in the Online Supplemental materials (Part A).

Bullshit willingness and generation task. Inspired by Jerrim and colleagues (2019), we presented participants with ten concepts (e.g., cognitive dissonance) four of which were fake (i.e., subjunctive scaling, declarative fraction, genetic autonomy, neural acceptance). Participants' first task (bullshit willingness task) was to rate their knowledge of each concept on a 5-point scale ranging from "*never heard of it*" to "*know it well, understand the concept*." Responses given to fake concepts were summed to create an index of participants' bullshit willingness, with higher scores indicating a greater tendency to bullshit (i.e., feign knowledge of fake concepts). Next, a subset of participants (Bullshit Producers) were presented with each of the ten concepts individually and—consistent with descriptions of bullshit as being characterized by a lack of concern for the truth (Frankfurt, 2009) —were instructed to "produce the most convincing and satisfying explanation" they could for each concept. For concepts they were unfamiliar with, participants were instructed to "be creative and make up an explanation that you think others will find convincing and satisfying." The verbatim instructions were as follows:

> Your task is to try to produce the most convincing and satisfying explanation that you can for each term.
>
> For terms that you are **knowledgeable** about, we ask that you simply explain them as best you can (that is, in the most convincing and satisfying way).
>
> For terms that you are **unfamiliar** with, we ask that you **be creative and make up an explanation** that you think others will find convincing and satisfying.
>
> **Do not worry about the truth of your claims** when making up your explanations, rather, you may treat this as a creative writing exercise.

Explanation evaluations. We had a sample of participants (Bullshit Raters) judge the accuracy and satisfactoriness of 120 explanations of fictitious concepts produced by Bullshit Producers in our bullshit generation task. Participants evaluated the accuracy of each explanation with the prompt "How accurate is this explanation," responding on a 5-point scale ranging from "*Not at all Accurate*" to "*Very Accurate*." Similarly, for each explanation, participants were asked "How satisfying is this explanation," providing responses on a 5-point scale that ranged from "*Not at all Satisfying*" to "*Very Satisfying*." This resulted in each Bullshit Producer having one "satisfyingness" and "accuracy" judgement for each of the bullshit statements that they generated. The highest scoring item out of these bullshit statements was selected to be the best indicator of their bullshit ability. The "accuracy" and "satisfyingness" ratings of this item was averaged to create a "Bullshit Ability" score which was then averaged across all Bullshit Raters who rated that Bullshit Producer's statements (see Figure 1). This method of calculating bullshit ability was adapted from Greengross and

Miller (2011) who used a similar process to calculate participants' humour ability.

Wordsum task. The Wordsum task is a 10-item vocabulary test commonly used as a measure of verbal intelligence (see Malhotra et al., 2007 for a review). In this task, a word in large print (e.g., "CLOISTERED") appears above a series of smaller print words (e.g., bunched, secluded, malady, miniature, arched). Participants' objective is to pick a small print word that is the best synonym for the large print target word. Scores on the Wordsum task were equal to the total number of correct responses provided. Additional information concerning how participants in these studies compared to typical performance can be found in Part A of the Online Supplemental Materials.

Raven's progressive matrices. We administered Raven's Progressive Matrices (RPM) as a measure of abstract reasoning and non-verbal fluid intelligence (Bilker et al., 2012). In this task, participants are presented with a partially obscured visual pattern and must select the available pattern fragment that will successfully complete the pattern. The RPM is comprised of 60 items broken up into five levels of difficulty. In order to decrease time demands on participants, we randomly selected four items from each of the five difficulty levels, resulting in 20 RPM items being presented in Study 1. We calculated an RPM score for each participant by calculating the number of correct responses they provided. Additional information concerning how participants in these studies compared to typical performance can be found in Part A of the Online Supplemental Materials.

Profundity ratings. We assessed participants' receptivity and sensitivity to pseudo-profound bullshit by having them assess the profundity of 30 statements originating from Pennycook and colleagues (2015). These 30 statements consisted of 10 pseudo-profound bullshit statements, 10 motivational quotations, and 10 mundane statements. Pseudo-profound bullshit statements were originally retrieved from websites able to create meaningless statements by randomly arranging a list of profound-sounding words in a way that preserves syntactic structure (e.g., *"Wholeness quiets infinite phenomena"*). These statements, while perhaps superficially impressive, were created such that they lack an intended meaning. Contrasting meaningless pseudo-profound statements were motivational quotations and mundane statements. Motivational quotations were designed to capture a true attempt at communicating something meaningful and profound (e.g., *"A wet man does not fear the rain"*) while mundane statements were designed to be easily interpretable, yet not contain truth of a grand or profound nature (e.g., *"Newborn babies require constant attention"*). Participants assessed the profundity of all 30 statements on a 5-point scale which ranged from 1 *(Not at all profound)* to 5 *(Very profound)*. A bullshit receptivity score (BSR) was calculated for each participant by averaging the profundity ratings provided to pseudo-profound bullshit statements. Additionally, a bullshit sensitivity score (BSS) measuring participants' ability to distinguish pseudo-profound bullshit from motivational quotations was calculated by subtracting participants' average profundity rating given to motivational quotations from their average profundity rating given to pseudo-profound bullshit statements.

Design and Procedure

Study 1 was conducted in two phases (see Figure 2). First, we had 220 participants (Bullshit Producers) complete a bullshit willingness task in which they reported their knowledge of ten (six real and four fake) concepts. Next, participants were presented with these same concepts independently and attempted to generate convincing and satisfying explanations of each concept (bullshit generation task). Following the completion of these tasks, participants assessed the profundity of 30 statements (10 pseudo-profound bullshit, 10 motivational quotations, and 10 mundane statements) and completed the RPM and Wordsum.

In a second phase, 263 participants (Bullshit Raters) were presented with and evaluated how accurate and satisfying they found 120 explanations of both real and fake concepts. All explanations were generated by participants in our Bullshit Producers sample, with each participant in our Bullshit Raters sample evaluating the explanations generated by a random subset of 12 Bullshit Producers. Participants in this sample completed the bullshit willingness task prior to all explanation evaluations and completed our profundity task, the RPM, and Wordsum following these evaluations.

Results and Discussion

We conducted correlational analyses between our main variables of interest (see Table 1). As our primary focus was on the characteristics (e.g., intelligence) of those producing bullshit, we focus exclusively on the associations within our Bullshit Producers sample here. Although note that the bullshit ability of each participant in our Bullshit Producers sample was judged exclusively by our Bullshit Raters sample. All analyses focused on individual differences within our Bullshit Raters sample can be viewed in the Online Supplemental Materials (Part B). Of primary interest was to assess whether participants' ability to bullshit (i.e., produce seemingly satisfying and accurate explanations of fake concepts as indexed by the average of these two ratings) would correlate positively with measures of their intelligence. To this end we observed significant positive correlations between participants' bullshit ability and Wordsum scores, $r(203) = .23$, $p < .001$, as well as between bullshit ability and RPM scores, $r(202) = .15$, $p = .032$. Therefore, we find initial evidence of bullshit ability sharing a modest positive association with measures of intelligence.

Additionally, we find that participants' bullshit ability was uncorrelated with their willingness to bullshit (i.e., feign knowledge of fake concepts), $r(216) = .04$, $p = .544$, and their receptivity to pseudo-profound bullshit (i.e., endorse meaningless pseudo-profound statements as profound), $r(216) = -.09$, $p = .217$. Furthermore, participants' willingness to bullshit was negatively associated with scores on the Wordsum, $r(204) = -.17$, $p = .014$, and RPM, $r(203) = -.33$, $p < .001$, suggesting that those scoring higher on our measures of cognitive ability

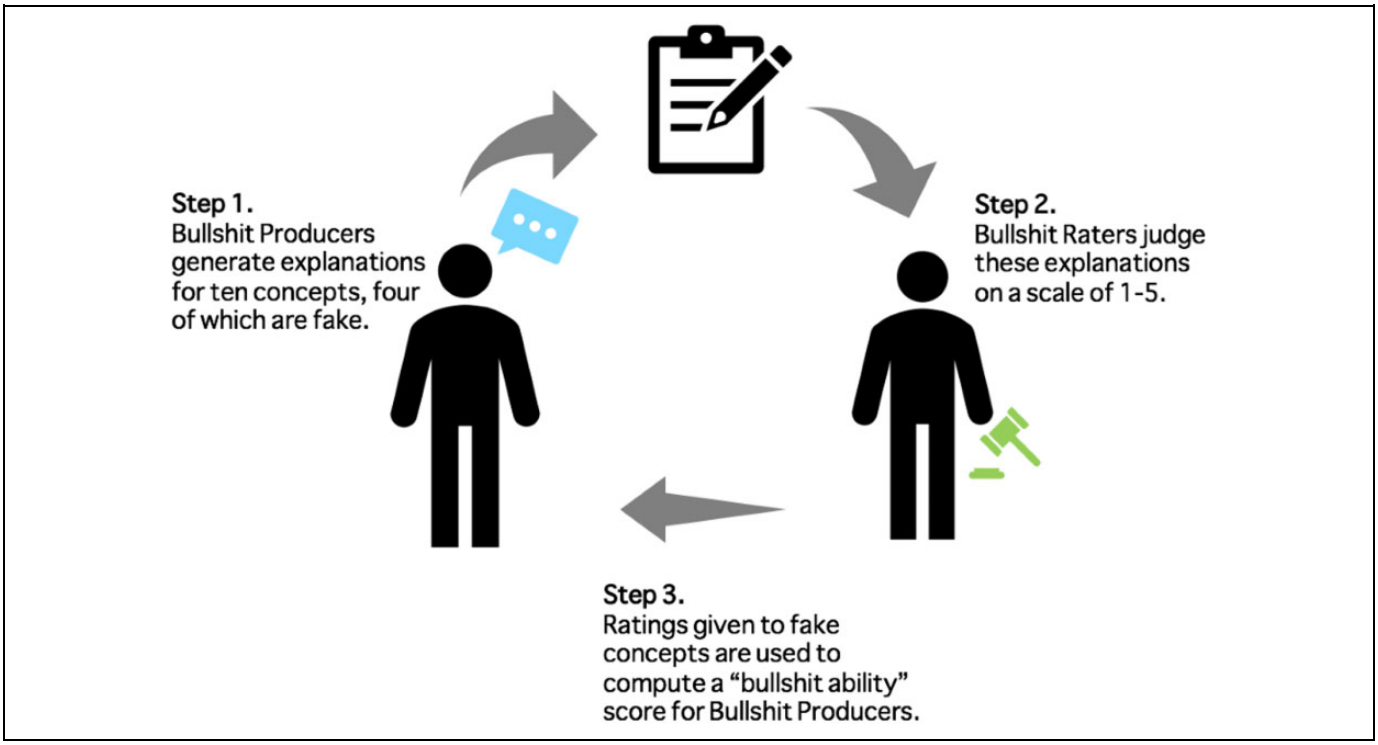

Figure 2. General overview of bullshit production task.
Note. Visual depiction of the methodology used in the present research. Participants in our Bullshit Producers sample ($n = 220$) generated explanations of both real and fake concepts which were then judged by the Bullshit Raters sample of Study 1 ($n = 263$) and Study 2 ($n = 534$). These judgments were used to calculate a bullshit ability score for each Bullshit Producer.

Table 1. Study 1 Correlations.

Measures	*M*	*SD*	1	2	3	4	5	6
1. Bullshit Ability	2.72	0.65	—					
2. Bullshit Willingness	6.27	2.95	.04	—				
3. Bullshit Receptivity	2.59	0.90	−.09	.32**	—			
4. Bullshit Sensitivity	−0.79	0.77	−.03	−.22**	−.66**	—		
5. Raven's Progressive Matrices	14.61	2.93	.15*	−.33**	−.32**	−.20**	—	
6. Wordsum	6.27	1.77	.23**	−.17*	−.36**	−.29**	.40**	—

Note. Pearson correlations (Study 1 Bullshit Producers; $N = 220$). In Study 1, Bullshit Ability was judged by our Study 1 Bullshit Raters sample ($N = 263$).
*$p < .05$. **$p < .001$.

were less willing to bullshit. Finally, we find that those more willing to bullshit were also more likely to be receptive to pseudo-profound bullshit (i.e., rate pseudo-profound bullshit items higher on profoundness), $r(217) = .32$, $p < .001$, as well as were less likely to distinguish between meaningless pseudo-profound bullshit and meaningful motivational quotations (bullshit sensitivity: calculated as the difference between pseudo-profound bullshit ratings and ratings of motivational quotations for their profoundness), $r(217) = -.22$, $p = .002$. Thus, contrary to the common expression, it may indeed be possible to "bullshit a bullshitter."

Study 2

Study 1 provides initial evidence suggesting that bullshit ability serves as an honest yet modest signal of a person's cognitive ability. However, what may be more important from the perspective of social navigation is how that signal of intelligence is *received* by others. Independent of one's true intelligence, having others believe that one is intelligent may confer reputational and social advantages. Therefore, in Study 2, we assessed whether those able to generate convincing bullshit are viewed as more intelligent than those less able to generate convincing bullshit.

Method

Participants

A sample of 534 University of Waterloo undergraduates completed Study 2 in exchange for course credit. Originally, 278 participants were collected, however, during the Covid-19

Table 2. Study 2 Correlations.

Measures	*M*	*SD*	1	2	3	4	5	6	7
1. Bullshit Ability	2.66	0.56	—						
2. Bullshit Willingness	6.27	2.95	−.05	—					
3. Perceived Intelligence	2.75	0.60	.95**	−.02	—				
4. Bullshit Receptivity	2.59	0.90	−.17*	.32**	−.20**	—			
5. Bullshit Sensitivity	−0.79	0.77	−.17*	−.22**	−.16*	−.66**	—		
6. Raven's Progressive Matrices	14.61	2.93	.31**	−.33**	.32**	−.32**	−.20**	—	
7. Wordsum	6.27	1.77	.38**	−.17*	.38**	−.36**	−.29**	.40**	—

Note. Pearson correlations (Study 1 Bullshit Producers; $N = 220$). In Study 2, Bullshit Ability and BS Intelligence were judged exclusively by our Study 2 sample ($N = 534$). Specifically, variables 2, 4, 5, 6, and 7 (and the relations between them), are reproduced here from Study 1 (and Table 1) for ease of comparison with the new Study 2 Bullshit Rating sample scores (variables 1 and 3).
*$p < .05$. **$p < .001$.

outbreak in March of 2020, all researchers in the Department of Psychology were requested to collect more data online so that students could have the opportunity to receive course credits. As a result, an additional 256 participants were collected. These additional participants were collected before any analyses were conducted.

Materials and Measures

The materials and measures used in Study 2 mirrored that of Study 1. The only difference was that in Study 2 participants also judged the intelligence of the producer of each explanation. Study 2 made use of the same fictious explanations generated by the "Producer" sample in Study 1, and recruited new sample of Bullshit Raters to rate those explanations.

Explanation evaluations. As in Study 1, we had participants judge how accurate and satisfying they found explanations of various concepts. However, in Study 2 participants were also asked "How intelligent is the person who provided this explanation." All responses to this item were made on a 5-point scale that ranged from "*Not at all Intelligent*" to "*Very Intelligent*." In the same fashion as Study 1, the highest rated bullshit explanation for each bullshit producer was taken to calculate a bullshit ability score (average of satisfyingness and accuracy ratings) as well as their perceived intelligence.

Design and Procedure

As in Study 1, participants began Study 2 by completing a bullshit willingness task in which they self-reported their knowledge of 10 (six real and four fake) concepts. Next, they were presented with 120 explanations of these concepts (produced by the Bullshit Producer sample of Study 1) and made judgments regarding the satisfactoriness and accuracy of each explanation and the intelligence of each explanation producer. Following all evaluation judgments, participants rated the profundity of 30 statements (10 pseudo-profound bullshit statements, 10 motivational quotations, and 10 mundane statements) and completed both the Raven's Progressive Matrices and Wordsum tasks.

Results and Discussion

We conducted correlational analyses between our main variables of interest (see Table 2). As our focus remained on the characteristics (e.g., intelligence) of those producing bullshit, we once again focused exclusively on the associations within our Study 1 Bullshit Producers sample. Importantly, the results reported here feature judgments of Bullshit Producers' bullshit ability and perceived intelligence, as judged exclusively by our Study 2 sample. Analyses examining the associations between the bullshit willingness, bullshit receptivity, and cognitive ability of our Study 2 (i.e., Bullshit Rater) sample can be viewed in the Online Supplemental Materials (Part B).

Examining the hypothesized positive association between bullshit ability and intelligence, we find that bullshit ability was positively associated with verbal intelligence (as measured by the Wordsum), $r(204) = .38$, $p < .001$. Similarly, we observe a positive association between bullshit ability and abstract reasoning (as measured by RPM), $r(203) = .31$, $p < .001$. Furthermore, the perceived intelligence of Bullshit Producers was positively correlated with assessments of their bullshit ability, $r(217) = .95$, $p < .001$. This association is consistent with the hypothesis that producing satisfying and seemingly accurate explanations of completely fictional concepts is perceived by individuals as a signal of intelligence. Interestingly, the perceived intelligence of Bullshit Producers was negatively associated with their receptivity to pseudo-profound bullshit, $r(217) = -.20$, $p = .003$. Thus, those perceived as more intelligent on the basis of the bullshit they produced were less likely to themselves judge pseudo-profound bullshit as profound. Lastly, consistent with Study 1, we observed no association between bullshit ability and bullshit willingness, $r(217) = -.05$, $p = .480$. Therefore, those able to produce convincing bullshit were no more likely to report knowledge of fake concepts. This is surprising as one might expect that a person naturally skilled in producing bullshit would bullshit more often. However, individual factors such as honesty may prevent

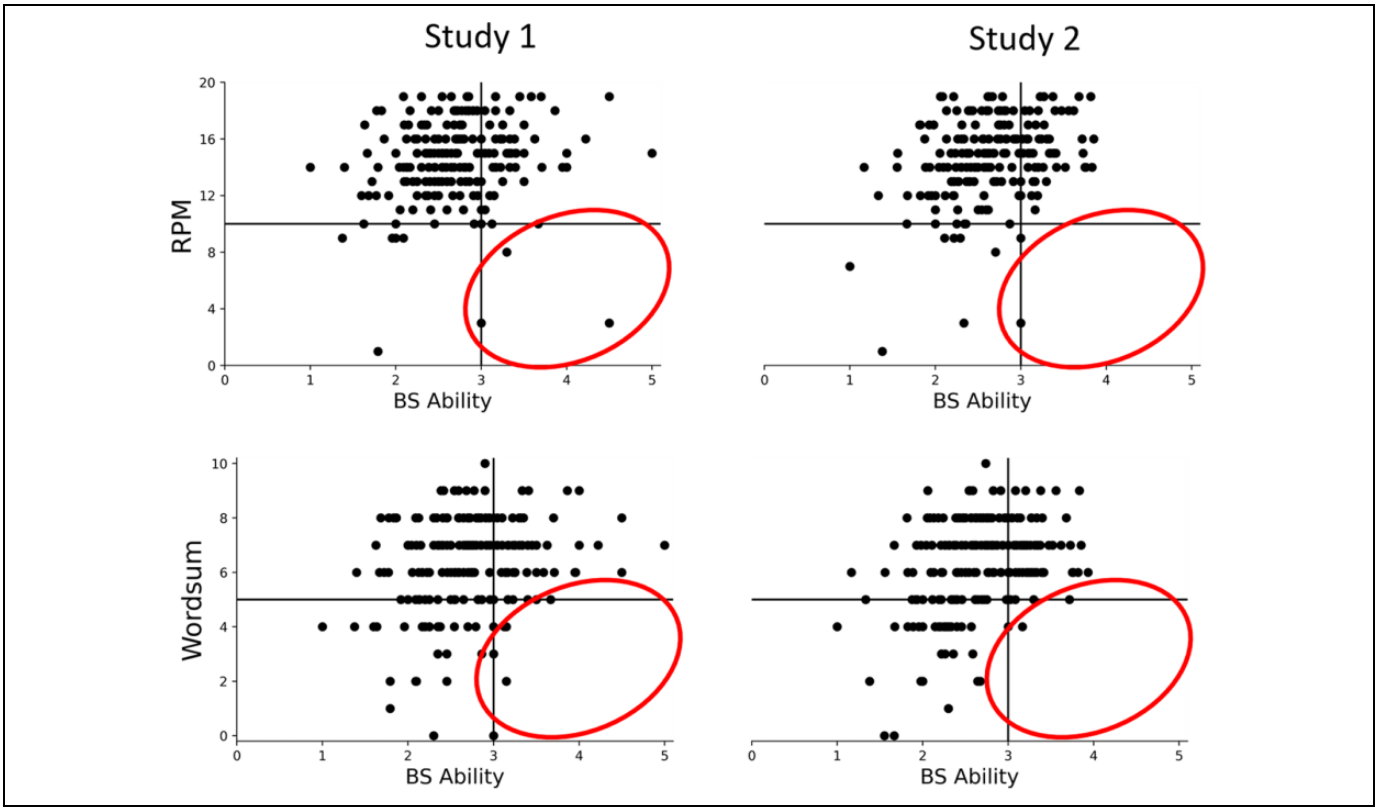

Figure 3. Overview of Intelligence and bullshitting ability results.
Note. Scatterplots comparing measures of cognitive ability to scores of bullshit ability for both Studies 1 and 2. Circled is the region representing people who score low on measures of intelligence but high on ability to bullshit. Note that this region is very sparsely populated.

someone who would otherwise be a skilled bullshitter from fully making use of bullshit as a strategy.

A possible explanation for the observed modest associations between bullshit ability and cognitive ability is that while good bullshit producers may often be highly intelligent, the reverse inference may not be true. That is, a person who is unable to bullshit in a satisfying manner may not necessarily be *unintelligent*. By analogy to humor, a person who is funny is likely to be rather intelligent, however one can identify many brilliant people who are profoundly unfunny. This asymmetry may have resulted in an underestimation of the true strength of the association between bullshit ability and intelligence. Lending support to this claim, across both studies and both measures of cognitive ability, it is rare to find people who score low on measures of intelligence while simultaneously demonstrating high bullshit ability (circled regions in Figure 3). We interpret this as a demonstration that bullshit ability is a reliable indicator of when someone is intelligent, but that having low bullshitting ability does not necessarily mean that one is unintelligent.

General Discussion

The current work provides initial evidence for bullshit ability as an honest signal of intelligence. We find that the ability to create satisfying and seemingly accurate bullshit (e.g., explanations of fake concepts) was associated with obtaining higher scores on two measures of cognitive ability (i.e., the Wordsum and RPM). Interestingly, we find that one's *ability* to produce satisfying bullshit is independent of one's *willingness to produce* bullshit. Indeed, the two were uncorrelated in our studies, and had opposite associations with measures of intelligence. Others have found similar negative associations with measures of intelligence. For example, Pennycook and Rand (2019) found that overclaiming (arguably a form of bullshitting very similar to our bullshit willingness measure) was negatively correlated with performance on the Cognitive Reflection Task. Additionally, in a study by Littrell and colleagues (2021), intelligence (as indexed by Numeracy and Wordsum) was found to be negatively associated with persuasive bullshitting frequency.

It would seem logical that those who are better at bullshitting would opt to use it more frequently, however, we do not find this here. A possible explanation may be one which appeals to Theory of Mind models of intelligence. Of the three evolutionary pressures discussed in the introduction, the current set of studies has largely focused on a Machiavellian view, that intelligence affords us opportunities to deceive others to our advantage, as well as an IQ-signaling perspective, whereby bullshitting may be useful as an honest signal of a person's quality or fitness through signaling their intelligence. We may lean on the third pressure to explain why it is that despite their

superior ability to create bullshit, intelligent people seem to display less willingness to spontaneously engage in bullshitting. Part of this explanation may be that increased intelligence also results in a more sophisticated ability to simulate the mental states of others. In casual language, this may be described as "knowing your audience" and as such, they may possess a more sophisticated understanding of when and where bullshitting will work if attempted. Further, if highly intelligent people tend to associate with similarly intelligent people due to factors related to assortative mating, for example, intelligent people preferring intelligent mates or, "like pairs with like" (Thiessen & Gregg, 1980) or general homophily (McPherson et al., 2001) they may often find themselves around people who are likely to detect attempts at bullshitting, lowering its appeal as a first-order social strategy. As previous research has argued, a determiner of whether people will make an attempt to bullshit someone is whether they believe it will go undetected (Petrocelli, 2018). If smarter people are better able to know the contents of other people's thoughts, they may be more carefully calibrated to the conditions under which an attempt at bullshitting will be unsuccessful. Of note, "bullshit ability," as measured in our studies, involved the production of explanations for fake concepts, while "bullshit willingness" only required that the participant be willing to rate their knowledge of such fake concepts higher than "none." Therefore, the lack of association we observed could be due to the specific methods selected to measure these two constructs. Future work should further dissociate the processes underlying one's ability and willingness to produce bullshit.

While work has begun examining the degree to which personality may predict receptivity to bullshit (Bainbridge et al., 2019; Čavojová et al., 2020), it has yet to be explored how personality influences the tendency or ability to bullshit. It could be the case that different personality traits (e.g., openness, honesty-humility, agreeableness; Lee & Ashton, 2004), moderate one's willingness to engage in bullshitting. For example, a person who scores high in honesty-humility, a personality dimension which captures traits like sincerity, fairness, or modesty, may be less willing to bullshit, given that bullshitting is characterized by the desire to impress others without regard for the truth. The reverse may be true for those who are low in agreeableness, they may, especially when confronted with a disagreement, be more likely to deemphasize the importance of truth in favor of self-advancement through the use of bullshit. The numerous ways that common personality factors may interact in predicting the tendency and ability to bullshit makes for a promising topic of future exploration.

Regardless of whether bullshit ability honestly signals one's intelligence, of potentially greater importance is that skilled bullshit producers are *perceived* by others as highly intelligent. From the perspective of navigating social systems, being perceived as intelligent may be just as valuable to an agent as actually being intelligent, as this perception may afford one opportunities to obtain status and form relationships as well as have greater trust placed in their competence. To this point, we observed a strong positive association between bullshit ability and *perceived* intelligence. However, this association was found in a situation in which those judging the intelligence of bullshit producers knew nothing of these individuals except their ability to produce satisfying explanations of real and fake concepts. Thus, it is likely that the strength of this association was overestimated in the present work as–with limited information–any signal of quality may have been exaggerated. In addition, as Bullshit Raters rated bullshit ability and perceived intelligence using similar 5-point scales, the strength of this association may be inflated due to unthoughtful responding by some participants (i.e., some participants may be inclined to simply select the same values on the scales).

Overall, we interpret these results as initial evidence that the ability to bullshit well provides an honest signal of a person's ability to successfully navigate social systems, fitting the current work into existing frameworks whereby human intelligence is geared towards efficiently navigating such systems (Dunbar, 1998; Crow, 1993). More specifically, we propose that the ability to produce satisfying bullshit may have emerged as an energetically efficient strategy for achieving an individual's goals (such as acquiring status or impressing mates). That is, a person can engage in the arduous process of acquiring expert skills in domains that they could then leverage to accomplish certain goals, or can use bullshit as a strategy that potentially produces the same benefits at a much smaller cost (Turpin et al., 2019). Of course, these strategies need not be mutually exclusive, as the ability to produce satisfying bullshit may help even highly skilled individuals achieve their goals over equally skilled peers. This may be especially true in domains in which success depends largely on the subjective evaluations of others (e.g., art, advertising, politics, life coaching, journalism, humanities).

Limitations

An obvious limitation of the current work is its correlational nature, meaning that we cannot conclude that being more intelligent *causes* a person to be a better bullshitter. The current study merely provides preliminary evidence consistent with one plausible causal model. Future work should seek to explicitly probe the causal relation between intelligence and bullshit ability if any such relation exists. In addition, as noted above, the association between perceived intelligence and bullshit ability is likely overestimated in our sample due to the limited information available to the raters and the means of assessment. With respect to the latter, future research should include alternative metrics to assess perceived intelligence (e.g., estimating the actual IQ of bullshit producers using a number rather than a rating scale) to limit the possibility of unthoughtful responding contributing to the association.

The use of the WordSum and Raven's Progressive Matrices made the conduct of the study possible given constraints on time. Independently, they predict IQ fairly well with correlations ranging between $r = .55$ and $r = .66$ between scores on the Wechsler Adult Intelligence Scale and Raven's Matrices, and a correlation between Wordsum performance and IQ of

$r = .88$ (Burke, 1985; Malhotra et al., 2007; McLaurin et al., 1973). However, more sophisticated measures for IQ would improve the accuracy of any cognitive ability measurement and therefore provide a more exact picture of the true relation between bullshit ability and cognitive ability. Relatedly, more opportunities to assess bullshit ability through either increasing the number of fake concepts participants were to bullshit about, or even better, using multiple different tasks which meet the criteria for "bullshitting" would improve our ability to draw conclusions about "bullshitting" behavior generally.

The bullshit generation task required participants to produce bullshit by explicitly directing them to ignore the truth. This is, under a Frankfurtian definition, "bullshit," but this task is merely a substitute for the truly interesting question of how bullshit ability and cognitive ability relate in naturalistic settings, where bullshitting happens spontaneously. This artificial task is sufficient for establishing some initial evidence of the link between bullshit ability and cognitive ability, but more work is required to identify the nature of this relation.

Conclusion

The current work provides initial evidence for bullshit ability as an honest signal of intelligence. While much research has focused on the cognitive shortcomings of those receptive to bullshit (Čavojová et al., 2020; Pennycook et al., 2015; Walker et al., 2019), the current work focuses on the cognitive properties of bullshit producers. We find that those more skilled in producing satisfying and seemingly accurate bullshit score higher on measures of cognitive ability and are perceived by others as more intelligent. Overall, the ability to produce satisfying bullshit may serve to assist individuals in navigating social systems, both as an energetically efficient strategy for impressing others and as an honest signal of one's intelligence.

Authors' Note

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ORCID iD

Martin Harry Turpin https://orcid.org/0000-0001-9655-4726

Supplemental Material

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