



Self-Regulatory Aspects of Bullshitting and Bullshit Detection

John V. Petrocelli¹ , Haley F. Watson¹, and Edward R. Hirt²

¹Department of Psychology, Wake Forest University, Winston-Salem, NC, USA

²Department of Psychological and Brain Sciences, Indiana University, Bloomington, IN, USA

Abstract: Two experiments investigate the role of self-regulatory resources in bullshitting behavior (i.e., communicating with little to no regard for evidence, established knowledge, or truth; Frankfurt, 1986; Petrocelli, 2018a), and receptivity and sensitivity to bullshit. It is hypothesized that evidence-based communication and bullshit detection require motivation and considerably greater self-regulatory resources relative to bullshitting and insensitivity to bullshit. In Experiment 1 ($N = 210$) and Experiment 2 ($N = 214$), participants refrained from bullshitting only when they possessed adequate self-regulatory resources and expected to be held accountable for their communicative contributions. Results of both experiments also suggest that people are more receptive to bullshit, and less sensitive to detecting bullshit, under conditions in which they possess relatively few self-regulatory resources.

Keywords: accountability, bullshit, bullshitting, bullshit detection, self-regulation, self-regulatory resources

Bullshitting involves intentionally or unintentionally, consciously or unconsciously, communicating with little to no regard or concern for truth, genuine evidence, and/or established semantic, logical, systemic, or empirical knowledge (Frankfurt, 1986; Petrocelli, 2018a). As such, bullshitting is an insidious and common communicative behavior (Law, 2011; Penny, 2005; Spicer, 2013) often characterized by, but not limited to, using rhetorical strategies designed to disregard truth, evidence and/or established knowledge, such as exaggerating or embellishing one's knowledge, competence, or skills in a particular area or talking about things of which one knows nothing about in order to impress, fit in with, influence, or persuade others. Progress in the struggle against bullshit requires a deeper understanding of the conditions under which bullshit emerges (see Cohen, 2002; Crockett, Dhar, & Mayyasi, 2014). Although bullshit is likely to have numerous communicative functions (e.g., impression management, social desirability), little empirical knowledge about bullshitting and its consequences can be found in the existing literature.

Although commonly confused with lying, bullshitting is not the same as lying. Both the bullshitter and the liar appear to be genuinely concerned with the truth, but only the liar is actually concerned with truth. The liar knows the truth but communicates with the goal of diverting others from the truth (Frankfurt, 1986). The bullshitter has no regard for truth or evidence in support of what

he/she claims. In fact, that which the bullshitter communicates may be true, but the bullshitter would not know it because the bullshitter does not care what the truth actually is and is not paying any attention to truth.

To date, empirical examinations of bullshitting have emphasized its antecedents. Initial empirical examinations of bullshitting behavior, conducted by Petrocelli (2018a), showed that bullshitting emerges in at least five different contexts. First, people appear to engage in considerable bullshitting when social cues make them feel *obligated to provide an opinion* about something of which they know relatively little about. As Frankfurt (1986) noted, people often feel obligated to speak as though they possess "informed" opinions about everything, and people appear to be especially likely to engage in bullshitting when it is clear that the social expectations to have an opinion are relatively great. Second, people generally perceive themselves to engage in relatively less bullshitting behavior as their knowledge of the discussion topic increases. Third, people appear to bullshit when they expect it to be relatively *easy to pass bullshit*. That is, people will engage in bullshitting when they anticipate ease in receiving a "social pass" of acceptance or tolerance for their communicative contributions. Fourth (consistent with Petrocelli's *ease of passing bullshit hypothesis*), bullshitting appears to be attenuated under conditions of social accountability (see Tetlock, 1992; Tetlock, Skitka, & Boettger, 1989). For instance, when

people are expected to explain their reasoning for a position to another person, bullshitting can be attenuated. Finally, the effect of accountability on bullshitting is conditional upon the expected attitude of the audience. When the expected attitude of the audience is consistent with the speaker's attitude, speakers appear free to bullshit, but when the expected attitude of the audience is inconsistent with the speaker's attitude, speakers appear to attenuate their bullshitting.

Similar to bullshitting, very little is known about one's ability to detect bullshit. Frankfurt (1986) speculated that most people are not worried about bullshit because they think they can detect it and avoid its unwanted effects. Unfortunately, people are surprisingly bad at detecting bullshit (Grant, 2015; Randi, 1980; Sagan, 1997; Shermer, 1997). Initial empirical evidence concerning bullshit receptivity (i.e., general acceptance of bullshit as something profound and/or connected with truth), and bullshit sensitivity (i.e., ability to differentiate and discern bullshit from information communicated with a concern for truth), suggests that bullshit is often undetected and misperceived as something profound and connected to truth. Such perceived profundity is especially likely among individuals employing more intuitive cognitive styles as opposed to more analytic or reflective cognitive styles (Pennycook, Cheyne, Barr, Koehler, & Fugelsang, 2015; Pfattheicher & Schindler, 2016; Sterling, Jost, & Pennycook, 2016). For instance, some people judge the profundity of assortments of words with absolutely no concern for, or basis in, truth to be relatively great, such as "Hidden meaning transforms unparalleled abstract beauty." (Pennycook et al., 2015, p. 552). Bullshit can also have important social consequences and utilities; particularly, bullshit is found to be evaluated less negatively than lying and can be used as a successful persuasion tactic (Petrocelli, 2018b).

We propose that an additional antecedent of bullshitting behavior, as well as bullshit detection, involves one's available *self-regulatory resources*. Self-regulatory resources involve the psychological resources people use to manage and control their own thoughts, feelings, and behaviors (Baumeister, Schmeichel, & Vohs, 2007).¹ Under conditions of high social accountability, people are relatively motivated to attenuate their contributions to bullshit (Petrocelli, 2018a). Yet, one's ability to attenuate his/her own bullshit should be negatively affected when self-regulatory

resources are relatively unavailable, thereby contributing more bullshit relative to when self-regulatory resources are more available. Likewise, recognition, detection, and motivation to protect against the potential contamination of bullshit is a relatively difficult task requiring self-regulatory resources (see Wilson & Brekke, 1994), thereby people should be less successful at detecting bullshit when their self-regulatory resources are relatively unavailable.

Within the dual-process model tradition, one of the hallmark distinctions between intuitive (system 1) and systematic (system 2) processing is the reliance on self-regulatory resources: intuitive (system 1) processing runs autonomously and does not require the expenditure of working memory capacity and self-regulatory resources, whereas systematic (system 2) processing is deliberate, effortful, and dependent upon working memory capacity and self-regulatory resources to be successfully executed (Barbey & Sloman, 2007; Chaiken & Trope, 1999; De Neys, 2018; Evans & Stanovich, 2013; Kahneman, 2011; Kahneman & Frederick, 2002; Sherman, Gawronski, & Trope, 2014; Shiffrin & Schneider, 1977; Sloman, 1996). Indeed, one of the most common ways by which researchers are able to distinguish whether a given outcome is due to intuitive (system 1) or systematic (system 2) processing is to manipulate the availability of self-regulatory resources via a cognitive load manipulation. If the outcome is moderated by resource availability, the results indicate that systematic (system 2) processing is responsible for that outcome. On the other hand, if the outcome is unaffected by resource availability, results indicate that intuitive (system 1) processing is responsible. We argue that successful bullshit detection, as well as evidence-based communication in place of bullshit, requires the self-regulatory resources necessary to engage in systematic (system 2) processing as opposed to intuitive (system 1) processing (Chaiken, 1980; Chaiken & Maheswaran, 1994; Pennycook et al., 2015).

To our knowledge, the current investigation also marks the very first examination of the self-regulatory resources involved in bullshitting and detecting bullshit. Our approach draws on the assumption of "Brandolini's Law", or the *bullshit asymmetry principle* as it has become known: "...the amount of energy needed to refute bullshit is an order of magnitude bigger than to produce it." (Brandolini, 2013). In elaborating on methods to reduce the unwanted effects of bullshit and pseudoprofundity (i.e., sounding profound

¹ Concerns of the veracity of self-regulatory resource findings and their reliability have emerged (Carter, Kofler, Forster, & McCullough, 2015; Friese, Loschelder, Gieseler, Frankenbach, & Inzlicht, 2019; Hagger et al., 2016). However, research findings that warrant caution regarding the variability in self-regulatory resource attenuation and its link to psychological outcomes that require control do not indicate that self-regulatory resources do not exist or impact behavior. Instead, they warrant caution with regard to the link between the various methods used to reduce one's self-regulatory resources. Thus, the current research employed methods of attenuating self-regulatory resources that have been shown to successfully operate in our prior research and with the same population as that employed in the current research (i.e., Eyink, Hirt, Hendrix, & Galante, 2017; Petrocelli, Williams, & Clarkson, 2015).

while speaking utter nonsense; Law 2011), speculations have conclusively concurred with the principle that bullshit is much easier to create than it is to refute or challenge (Ball, 2017; d'Ancona, 2017; Davis, 2017; De keersmaecker & Roets, 2017). Likewise, we propose that refraining from bullshitting and accurate bullshit detection require more self-regulatory resources relative to that required to engage in bullshitting or to be duped by bullshit.²

Because people frequently appear to feel obligated to contribute their opinions (Petrocelli, 2018a) and because they seem unlikely to recognize the impact of self-regulatory resources on bullshitting and bullshit detection (let alone the consequences of these behaviors), we contend that communicating with regard to truth, evidence, or existing knowledge, and enhanced bullshit detection, require considerable self-regulatory resources. In line with this reasoning, research indicates that manipulations that usurp the available level of one's executive abilities reduces his/her ability to overcome a natural tendency to acquiesce (Burkley, 2008; Petrocelli, Williams, & Clarkson, 2015; Wheeler, Briñol, & Hermann, 2007). Furthermore, Pennycook et al.'s (2015) findings that bullshit receptivity is associated with an intuitive thinking style, as opposed to analytic/reflective thinking style, suggest that greater cognitive capacity and motivation is required to detect bullshit than to accept it. Regulatory resource attenuation also tends to reduce attention (Garrison, Finley, & Schmeichel, 2019), a seemingly necessary mental activity for successful bullshit detection. Because people should be less motivated to engage in cognitive elaboration when they are lacking in self-regulatory resources, we expected relative acquiescence to bullshit to under low resource availability conditions.

Therefore, we propose that communicating without bullshit, and detecting bullshit, requires analytic/systematic processing rather than heuristic/intuitive processing. When people are under cognitive load, it does not reduce their knowledge nor completely shut down cognitive processes. Rather, when individuals are under load, one possesses fewer resources to draw on that are necessary to refrain from bullshitting and successfully detecting bullshit from others. Thus, people may be more likely to bullshit and be less successful at detecting bullshit when their regulatory resources have been relatively attenuated. Under such conditions, both cognitive and motivational resources are not directed at evidence-based communicating and confronting bullshit because these activities take more effort and resources, inviting relatively easy communication modes (e.g., bullshitting) and receptivity to bullshit.

Experiment 1

Experiment 1 was designed to explore the role of regulatory resources in bullshitting behavior and bullshit detection in contexts varying in accountability. Participants completed a writing task designed to usurp or not usurp their regulatory resources. Participants were then asked to write about reasons for their attitudes toward nuclear weapons. Half of the participants were led to believe that they would need to justify and explain their opinions to one of three university professors of sociology, whereas the other half of the participants were not led to believe this. Participants were then assessed with respect to their degree of bullshitting behavior, by rating each thought they listed with respect to their level of concern for evidence when writing the thought. Finally, participants were assessed with respect to their receptivity to bullshit and their sensitivity to bullshit.

Consistent with Frankfurt's (1986) assertion that people frequently feel socially obligated to talk about things of which they know little to nothing about, and our contention that communicating with regard to truth, evidence, or existing knowledge requires considerably more effort than that required to bullshit, we hypothesized that refraining from bullshitting requires more regulatory resources than it does to engage in bullshitting behavior. That is, people are expected to bullshit more when they are relatively low in regulatory resources. Because people are also more likely to engage in bullshitting when they do not expect to be held accountable for the validity of their communicative contributions (see Petrocelli, 2018a), we also expected the difference in bullshitting associated with variation in regulatory resources to be especially salient when accountability is relatively high; bullshitting should be especially attenuated when people expect to be held accountable and they have the regulatory resources available to refrain from bullshitting.

With regard to receptivity and sensitivity to bullshit, we only expected to find an effect of regulatory resource condition. Specifically, we hypothesized that attenuation of one's executive resources should increase one's receptivity to bullshit but decrease one's sensitivity to bullshit. Although it is possible for high social accountability to heighten overall sensitivity to bullshit, we expected the accountability manipulation to be relevant only to one's own communication, and not to the communication of others. Thus, we did not expect to find accountability to affect receptivity and sensitivity to bullshit, nor did we expect it to moderate the effect of regulatory resources.

² To be clear, we do not suggest that bullshitting requires zero self-regulatory resources – communicating with others certainly requires some resources. However, because the subjective feelings of an obligation to share one's opinion may be very strong in some cases, it is not difficult to imagine that people may find refraining from communicating anything at all can sometimes require more self-control and resources than contributing pure bullshit.

Method

Participants and Design

A sample of 210 college undergraduates, enrolled in an introductory psychology course, were recruited to participate in exchange for partial course credit. An a priori power analysis using G*Power (Faul, Erdfelder, Buchner, & Lang, 2009) revealed a required sample size of $N = 128$ ($n = 32$ per cell) to detect any medium-sized main or interaction effects ($f = .25$) in an analysis of variance (ANOVA) test with a power of $1 - \beta = .80$. However, sample size was determined based on the recommendations of statisticians (Lakens & Evers, 2014; Simmons, Nelson, & Simonsohn, 2013), who advocated using an $n = 50$ per condition as a rule of thumb. Accordingly, every attempt was made to get at least 50 participants per between-subject condition of the design.³

A 2 (Writing Task: easy vs. difficult) \times 2 (Accountability: low vs. high) between-subject design was employed, whereby participants were randomly assigned to one of four conditions. The dependent variables included Total Bullshitting, Bullshitting Proportion, Bullshit Receptivity, and Bullshit Sensitivity.

Materials and Procedure

All experimental materials were presented through a self-administered computer questionnaire using MediaLab v2012 Research Software (Jarvis, 2012); participants advanced by clicking appropriate response keys.

Writing Task

Participants were first asked to complete a self-regulatory resource task, modified from Schmeichel (2007). All participants were asked to write three short essays, for five minutes each, focusing on: (1) the place you currently live; (2) what you do on a typical weekday; and (3) your hometown. Participants assigned to the *easy* writing task were instructed to not use the letters “x” and “z” anywhere in their essays, whereas participants assigned to the *difficult* writing task were instructed to not use the letters “a” and “n” anywhere in their essays. Schmeichel (2007) found that participants in the difficult letter restriction task were required to inhibit the tendency to use these letters, showing reduced performance on subsequent tasks.

Manipulation Check

Next, in order to measure Regulatory Resource Level, participants reported the extent to which they felt tired, had to override their typical way of writing during the writing task, had to control their responses during the writing task,

expended effort to adhere to the instructions for the writing task, experienced difficulty during the writing task, and followed the directions of the writing task, using response scales ranging from 1 = *not at all* to 7 = *very much*; Cronbach's $\alpha = .80$.

Attitude

Participants were then asked to report their attitudes toward nuclear weapons on a 6-point semantic differential scales anchored by *negative/positive*, *bad/good*, *unfavorable/favorable*, *harmful/beneficial*, *foolish/wise*, and *against/in favor*.

Thought-Listing Task and Accountability

After reporting their attitudes, participants were asked to complete a thought-listing task by typing their reasons for why they think and feel the way they do about nuclear weapons. Participants were permitted to write up to five thoughts and they were instructed to enter only one thought per screen frame.

The thought-listing task was paired with the manipulation of Accountability. Half of the participants were assigned to the *no accountability* condition whereby they were instructed to complete the thought-listing task with complete candor and honesty as the study was allegedly designed to survey thoughts that people generate when they do not have to worry about how other people will react to their views. The other half of the participants were assigned to the *accountability* condition whereby the study was described as one concerning interpersonal communication of opinions. Thus, these participants were informed that they would later be asked to briefly explain and justify their opinions with one of three university professors of sociology, all of which would be familiar to most any student enrolled at the college. To add to the feasibility of the accountability condition, the experimental administrator added a bit of subterfuge by peeking through a door and speaking “Are you ready?” as if speaking to an alleged sociology professor who might take part in the alleged discussion. However, no sociology professors were actually employed for the study and no participants were actually asked to discuss his/her reasons for their attitudes with a sociology professor.

Bullshitting Proportion

Bullshitting Proportion required asking participants to rate each thought they listed in the thought-listing task. Using Petrocelli's (2018a) method to measure bullshitting behavior, participants were presented with one of their earlier thought-listings at a time and asked: “Consider a thought

³ All measures, manipulations, and exclusions in Experiments 1 and 2 have been disclosed, as well as the method of determining the final sample size. In each experiment, data were first collected and then analyzed; no data were collected after data analysis.

you wrote regarding your opinion about Nuclear Weapons (listed below). When you wrote this thought with regard to Nuclear Weapons, to what degree would you say you were truly concerned with genuine evidence and/or established knowledge?" The response scale was an 11-point scale with *not at all* (0) to *entirely* (10) as the anchor labels. Participants were instructed to click "N/A" if they did not write a thought for the entry.

Bullshitting Proportion was calculated by first subtracting each thought-rating task response from 10 (i.e., bullshitting is the lack of concern for evidence). All difference scores were then summed, resulting in a possible summed score of 0 (no bullshit) – 50 (all bullshit). Bullshitting Proportion was finalized by dividing the summed score by the product of $10 \times$ the number of thoughts listed.

Bullshit Receptivity and Bullshit Sensitivity

Finally, participants completed Pennycook et al.'s (2015) Bullshit Receptivity (BSR) and Bullshit Sensitivity (BSS) scales.

Completion of the scales involves first indicating how profound one finds 10 bullshit quotations (e.g., "Hidden meaning transforms unparalleled abstract beauty.") and 10 motivational quotations (e.g., "A river cuts through rock, not because of its power but its persistence.") using a 5-point scale with *not at all profound* (1) to *very profound* (5) as the anchor labels; Cronbach's α s = .87 and .77, respectively.

Bullshit Receptivity represents one's general acceptance and perceived profundity of bullshit; it is equivalent to the mean score on the bullshit quotations. Bullshit Sensitivity represents one's ability to detect bullshit and differentiate it from meaningful and profound information; it is equivalent to the difference between the mean score of the motivational quotations and the mean score for the bullshit quotations, such that greater scores signal greater Bullshit Receptivity and greater Bullshit Sensitivity.

Participants completed a brief demographics questionnaire, were debriefed and thanked for their participation in the study.

Results

Manipulation Check

The six items used to measure aspects of Regulatory Resource Level were averaged for each participant. The results of a one-way ANOVA revealed that participants reported less regulatory resources when asked to complete a difficult writing task ($M = 5.57$, $SD = 0.86$) than when asked to complete an easy one ($M = 3.58$, $SD = 1.06$), $F(1, 206) = 223.45$, $p < .001$, $\eta^2 = .52$, 95% CI [.42, .59]. Thus, participants who completed a difficult writing task

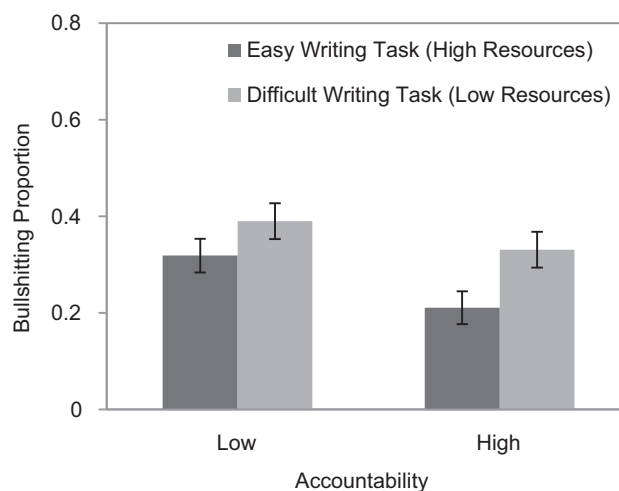


Figure 1. Bullshitting proportion means and standard errors by accountability and writing task condition (Experiment 1).

were considered to have fewer regulatory resources available relative to their easy writing task counterparts.

Bullshitting Proportion

Bullshitting Proportion data were subjected to two separate 2 (Writing Task: easy vs. difficult) \times 2 (Accountability: low vs. high) ANOVA tests. The ANOVA yielded statistically significant main effects of Writing Task and Accountability. Bullshitting Proportion was significantly greater when participants were asked to complete a difficult writing task ($M = .36$, $SD = 0.20$) than when they were asked to complete an easy one ($M = 0.26$, $SD = 0.19$), $F(1, 206) = 12.65$, $p < .001$, $\eta^2 = .06$, 95% CI [.01, .12]. Bullshitting Proportion was also significantly greater when Accountability was low ($M = 0.35$, $SD = 0.21$) than when it was high ($M = 0.27$, $SD = 0.19$), $F(1, 206) = 9.63$, $p = .002$, $\eta^2 = .05$, 95% CI [.01, .11]. These results were not qualified by a significant Writing Task \times Accountability interaction, $F(1, 206) = .82$, $p = .365$ (see Figure 1).

Bullshit Receptivity and Bullshit Sensitivity

Bullshit Receptivity and Bullshit Sensitivity data were subjected to two separate 2 (Writing Task: easy vs. difficult) \times 2 (Accountability: low vs. high) ANOVA tests. The analysis for Bullshit Receptivity yielded a statistically significant main effect of Writing Task. As expected, Bullshitting Receptivity was significantly greater when participants were asked to complete a difficult writing task ($M = 2.87$, $SD = 0.69$) than when they were asked to complete an easy one ($M = 2.45$, $SD = 0.75$), $F(1, 206) = 17.60$, $p < .001$, $\eta^2 = .08$, 95% CI [.02, .15]. As would also be expected, Accountability had no significant effect on Bullshit Receptivity, $F(1, 206) = 2.68$, $p = .103$, nor did the Writing Task \times Accountability interaction reach significance, $F(1, 206) = .04$, $p = .844$ (see Figure 2A).

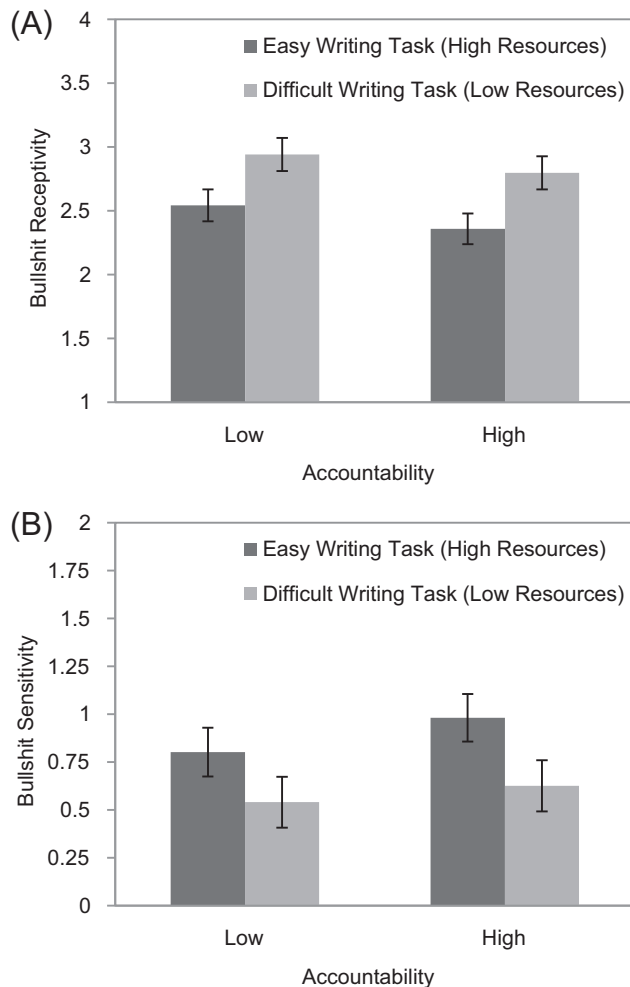


Figure 2. Bullshit receptivity (A) and bullshit sensitivity (B) means and standard errors by accountability and writing task condition (Experiment 1).

Bullshit Sensitivity data revealed results opposite to Bullshit Receptivity results. As expected, Bullshitting Sensitivity was significantly reduced when participants were asked to complete a difficult writing task ($M = 0.58$, $SD = 0.71$) than when they were asked to complete an easy one ($M = .88$, $SD = 0.70$), $F(1, 206) = 10.02$, $p = .002$, $\eta^2 = .05$, 95% CI [.01, .11]. As would also be expected, Accountability had no significant effect on Bullshit Sensitivity, $F(1, 206) = 1.85$, $p = .175$, nor did the Writing Task \times Accountability interaction reach significance, $F(1, 206) = .23$, $p = .630$ (see Figure 2B).

Discussion

Our findings in Experiment 1 were entirely consistent with our expectation that refraining from bullshitting (i.e., communicating with regard to truth, evidence, or existing knowledge), without simply refraining from communicating,

requires considerably more effort and executive abilities than that required to bullshit. A commonly employed manipulation of executive abilities affected bullshitting behavior such that bullshitting was relatively frequent when the social context lacked a cue to accountability or when regulatory resources were relatively unavailable. These results are consistent with the ease of passing bullshit hypothesis (Petrocelli, 2018a) and the bullshit asymmetry principle (Brandolini, 2013); apparently people can refrain from bullshitting when they do not expect to receive a social pass of tolerance for their bullshit and when they possess the resources to provide something better than bullshit to a discussion (i.e., evidence-based contributions).

However, as expected with regard to receptivity and sensitivity to bullshit, accountability appears to be irrelevant. Attenuation of one's regulatory resources appears to increase one's receptivity to bullshit but decreases one's sensitivity to bullshit. Such findings suggest that protecting oneself from any unwanted effects of bullshit is best accomplished when one is not particularly fatigued or when his/her regulatory resources are attenuated (e.g., not making important decisions and/or not surfing the Internet late at night, early in the morning, or when under relatively high levels of stress).

Although the results of Experiment 1 support the conclusion that executive abilities play an important role in bullshitting, bullshit receptivity, and sensitivity to bullshit, we questioned whether such findings are prevalent in more naturalistic settings. That is, people rarely decide, on their own, to complete difficult writing tasks such as the one we asked some of our participants to complete, let alone choosing to complete easy writing tasks. However, common experience suggests that people often find themselves completing tasks in either their preferred or non-preferred times of day. Previous research (Eyink et al., 2017) has demonstrated that performing relatively demanding tasks in the morning [evening] parallels the effects of manipulations of executive abilities for those who prefer the evening [morning] hours. We capitalized on this tendency to conduct a conceptual replication of our findings by placing participants in their preferred (circadian match) or non-preferred (circadian mismatch) context in Experiment 2.

Experiment 2

The primary purpose of Experiment 2 was to provide a conceptual replication of our findings, regarding the effects of self-regulatory resources on bullshitting and bullshit detection, reported in Experiment 1. We also sought to test our hypotheses in a context mirroring more natural circumstances that may affect one's level of self-regulatory

resources, namely, in preferred versus non-preferred times of day.

Similar to Eyink et al. (2017), we operationally defined self-regulatory resource availability in terms of an individual's circadian cycle. Research indicates that people have different types of circadian rhythms that can affect experience and performance (Colquhoun, 1971; Kleitman & Jackson, 1950; Lavie, 1980; Monk et al., 1997); some people experience morning "peaks" and evening "troughs" (i.e., "morning people"), and others experience morning troughs and evening peaks (i.e., "evening people"). Because of their effects on processing resources, several social psychological outcomes are affected by circadian processes. For example, Bodenhausen (1990) demonstrated that people more effectively inhibit stereotype responses when making judgments at their preferred (circadian match) than at their non-preferred times of day (circadian mismatch). Bodenhausen (1990) argued that increased reliance upon stereotypes served as a resource-saving heuristic during circadian mismatch, when we are "less motivated or less able to engage in more systematic and careful judgment strategies" (p. 321).

More recent studies, using a match versus mismatch of preferred circadian rhythm to performance time, have shown that people can exhibit more immoral behavior (Gunia, Barnes, & Sah, 2014) and transference effects (Kruglanski & Pierro, 2008). Such outcomes are demonstrated under conditions of circadian mismatch than circadian match. Based on these findings, and the results of Experiment 1, we hypothesized that bullshitting would occur more frequently under conditions of circadian mismatch than conditions of circadian match. We also hypothesized that bullshit receptivity would be greater under conditions of circadian mismatch than conditions of circadian match, whereas bullshit sensitivity would be greater under conditions of circadian match than conditions of circadian mismatch.

Because accountability has already been established as an antecedent of bullshitting (Petrocelli, 2018a), and because accountability did not interact with resource level in Experiment 1, we chose to simplify the test of the effect of self-regulatory resources on bullshitting and bullshit detection. Thus, accountability was not manipulated in Experiment 2.

Method

Participants and Design

A primary sample of 214 college undergraduates, enrolled in an introductory psychology course, were recruited to participate in exchange for partial course credit. An a priori power analysis using G*Power (Faul et al., 2009) revealed a required sample size of $N = 77$ to detect any medium-sized

main or interaction effects ($f^2 = .15$) in multiple regression test with three predictors with a power of $1 - \beta = .80$. However, sample size was determined based on the recommendations of statisticians (Lakens & Evers, 2014; Simmons et al., 2013), who advocated using an $n = 50$ per condition as a rule of thumb. We assumed that half of the participants would report preferring morning and half would report preferring the evening. Accordingly, every attempt was made to get at least 50 participants per "between-subject condition" of the design.

A single-factor design was employed, whereby participants were randomly assigned to one of two Experimental Time of Day conditions (morning vs. evening). The dependent variables included Self-Perceived Total Bullshitting, Socially Perceived Total Bullshitting, Bullshit Receptivity, and Bullshit Sensitivity.

Materials and Procedure

All experimental materials were presented through a self-administered computer questionnaire using MediaLab v2012 Research Software (Jarvis, 2012); participants advanced by clicking appropriate response keys.

Experimental Time of Day

Before participants were recruited for participation, students from a university participant pool were first randomly assigned to one of two eligibility groups. One half of the students was only eligible to complete the study in the morning hours beginning at either 8:00 am or 8:30 am whereas the other half was only eligible to complete the study in the evening hours beginning at either 8:00 pm or 8:30 pm.

Attitude

Participants were then asked to report their attitudes toward nuclear weapons using the same method used in Experiment 1.

Self-Perceived Total Bullshitting

Participants listed reasons for their attitudes toward nuclear weapons and rated each thought with regard to its bullshit content using the same methods employed in Experiment 1.

Socially Perceived Total Bullshitting

A secondary and separate sample of 152 college undergraduates were recruited to rate a random selection of 192 thought-listings taken from the 768 thoughts provided by the other sample. These participants were informed that students from another study provided written responses explaining their attitudes toward nuclear weapons. Participants were asked to rate each thought-listing with respect to their views of the author's genuine concern with evidence and/or established knowledge using the same 11-point response scale provided to the primary participants who recorded their thoughts.

Bullshit Receptivity and Bullshit Sensitivity

Participants completed the BSR and BSS scales.

Circadian Rhythm

Finally, Circadian Rhythm was measured using the Morningness/Eveningness Questionnaire (MEQ; Smith, Reilly, & Midkiff, 1989). The MEQ consists of 13 items measuring the preference for morning or evening hours. Examples of items include: “One hears about ‘morning’ and ‘evening’ type people. Which one of these types do you consider yourself to be?” and “When would you prefer to rise (provided you have a full day’s work – 8 hours) if you were totally free to arrange your time?” Each of the items has a unique response label, and 10 items have 1–4 response scale, whereas three items have 1–5 response scale. Thus, the possible range on the MEQ is 13 (extreme evening) to 55 (extreme morning), such that greater scores indicate stronger preference for morning; Cronbach’s $\alpha = .85$.

Participants completed a brief demographics questionnaire, were debriefed and thanked for their participation in the study.

Results

Importantly, circadian rhythm did not appear to influence participation. Participants who participated in the morning hours reported a relatively similar average on the MEQ ($M = 33.25$, $SD = 6.69$) as did participants who participated in the evening hours ($M = 31.93$, $SD = 6.39$), $F(1, 212) = 2.16$, $p = .143$.

Self-Perceived Total Bullshitting

Following the recommendations of Cohen, Cohen, West, and Aiken (2003), we conducted separate hierarchical regression analyses for the dependent variables, treating Circadian Rhythm (continuous, mean centered) and Experimental Time of Day condition (dummy coded: $-.50 = \text{evening}$, $.50 = \text{morning}$) as predictors of Total Bullshitting entered in step 1 and their interaction entered in step 2. Regression slopes were plotted at one standard deviation above and below the mean of Circadian Rhythm.

As expected, for Self-Perceived Total Bullshitting ($M = 10.75$, $SD = 9.11$), this analysis revealed only a statistically significant Experimental Time of Day \times Circadian Rhythm interaction, $\beta = .32$, 95% CI [.04, .68], $t(210) = 4.83$, $p < .001$. As illustrated in Figure 3A, when the experiment was conducted in the evening, participants bullshitted significantly more as their preference for morning became stronger, $b = .37$, 95% CI [.04, .69], $t(210) = 4.10$, $p < .001$. However, when the experiment was conducted in the morning, participants bullshitted to a significantly lesser extent as their preference for morning

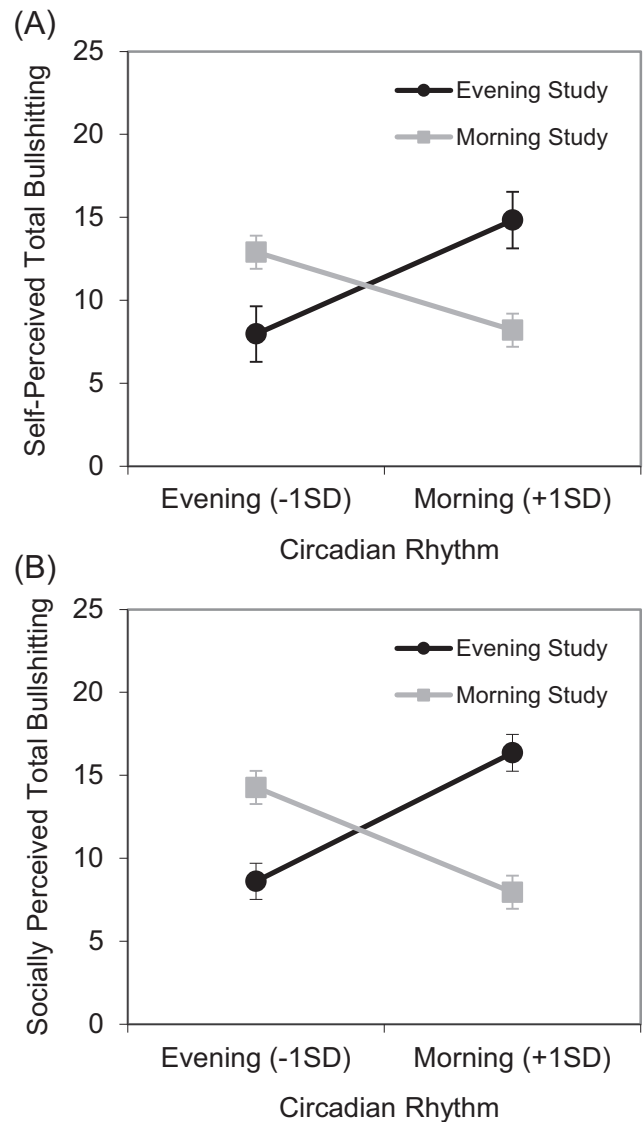


Figure 3. Self-perceived total bullshitting (A) and socially perceived total bullshitting (B) predicted means and standard errors by circadian rhythm and experimental time of day (Experiment 2).

became stronger, $b = -.26$, 95% CI $[-.59, -.07]$, $t(210) = -2.76$, $p = .006$. From another angle, among participants with a relatively strong preference for the evening, more Self-Perceived Total Bullshitting was reported when the experiment was conducted in the morning than when it was conducted in the evening, $b = -.27$, 95% CI $[-.52, -.01]$, $t(210) = -2.86$, $p = .004$. However, among participants with a relatively strong preference for the morning, more Self-Perceived Total Bullshitting was reported when the experiment was conducted in the evening than when it was conducted in the morning, $b = .36$, 95% CI $[.12, .59]$, $t(210) = 4.10$, $p < .001$. Thus, participants showed significantly greater evidence of bullshitting when their regulatory resources were expected to be relatively attenuated.

Socially Perceived Total Bullshitting

An average score, ranging from 0 to 10, was calculated by averaging all 38 secondary sample, for each of the 768 thought-listings. Socially Perceived Total Bullshitting was then calculated in the same way as was the self-perceived bullshitting measure. Socially Perceived Total Bullshitting ($M = 11.49$, $SD = 6.71$) was statistically equivalent to that found for the self-perceived bullshitting measure, $t(213) = -1.42$, $p = .158$.

As expected, for Socially Perceived Total Bullshitting, this analysis revealed only a statistically significant Experimental Time of Day \times Circadian Rhythm interaction, $\beta = .52$, 95% CI [.28, .75], $t(210) = 8.97$, $p < .001$. As illustrated in Figure 3B, when the experiment was conducted in the evening, participants were viewed by social perceivers to have bullshitted significantly more as their preference for morning became stronger, $b = .58$, 95% CI [.36, .79], $t(210) = 7.09$, $p < .001$. However, when the experiment was conducted in the morning, participants were viewed by social perceivers to have bullshitted significantly less as their preference for morning became stronger, $b = -.47$, 95% CI [-.68, -.25], $t(210) = -5.67$, $p < .001$. From another angle, social perceivers viewed participants with a relatively strong preference for the evening to engage in significantly more bullshitting when the experiment was conducted in the morning than when it was conducted in the evening, $b = -.42$, 95% CI [-.57, -.26], $t(210) = -4.99$, $p < .001$. However, viewed participants with a relatively strong preference for the morning to engage in significantly more bullshitting when the experiment was conducted in the evening than when it was conducted in the morning, $b = .63$, 95% CI [.47, .78], $t(210) = 7.42$, $p < .001$. Thus, in comparison to self-perceived bullshit, participants were viewed by social perceivers to contribute even more bullshit when they explained reasons for their attitudes under conditions in which their regulatory resources were expected to be relatively attenuated.

Bullshit Receptivity and Bullshit Sensitivity

Separate hierarchical regression analyses were also computed for the Bullshit Receptivity and Bullshit Sensitivity. As expected, for Bullshit Receptivity, this analysis revealed only a statistically significant Experimental Time of Day \times Circadian Rhythm interaction, $\beta = .19$, 95% CI [.16, .21], $t(210) = 2.74$, $p = .007$. As illustrated in Figure 4A, when the experiment was conducted in the evening, participants were significantly more receptive to bullshit as their preference for morning became stronger, $b = .22$, 95% CI [.10, .33], $t(210) = 4.66$, $p < .001$. However, when the experiment was conducted in the morning, participants were significantly less receptive to bullshit as their preference for morning became stronger, $b = -.27$, 95% CI [-.38, -.15],

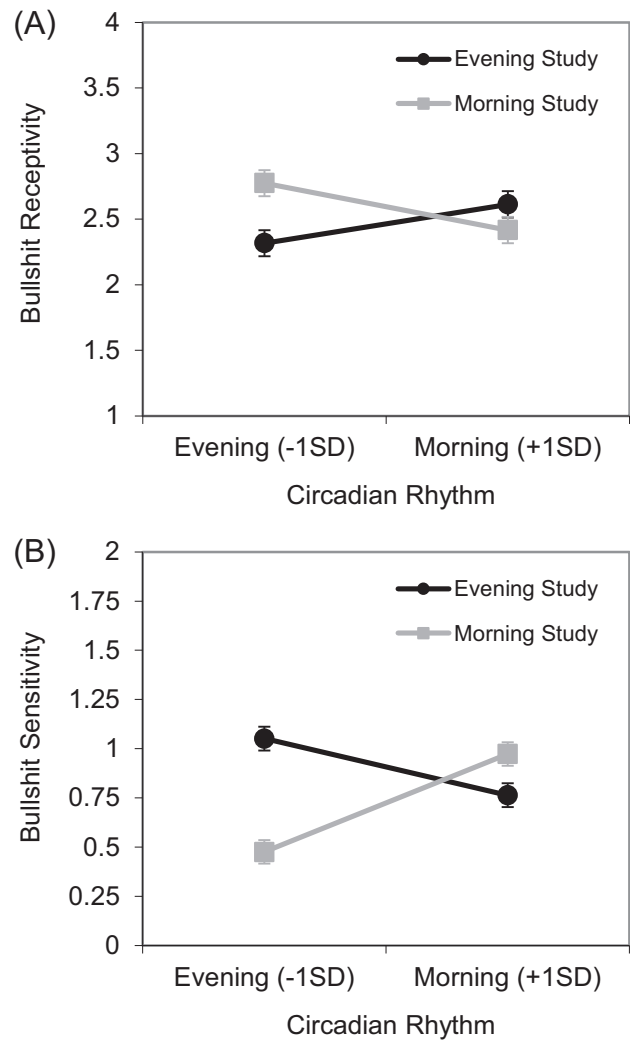


Figure 4. Bullshit receptivity (A) and bullshit sensitivity (B) predicted means and standard errors by circadian rhythm and experimental time of day (Experiment 2).

$t(210) = -5.25$, $p < .001$. From another angle, among participants with a relatively strong preference for the evening, greater receptivity to bullshit was observed when the experiment was conducted in the morning than when it was conducted in the evening, $b = -.34$, 95% CI [-.35, -.23], $t(210) = -3.91$, $p < .001$. However, among participants with a relatively strong preference for the morning, marginally greater receptivity to bullshit was observed when the experiment was conducted in the evening than when it was conducted in the morning, $b = .15$, 95% CI [.01, .28], $t(210) = 1.83$, $p = .068$. Thus, participants showed significantly greater receptivity to bullshit when their regulatory resources were expected to be relatively attenuated.

As was anticipated, the results for Bullshit Sensitivity were the very opposite of those found for Bullshit Receptivity. As expected, for Bullshit Sensitivity, the analysis revealed only a statistically significant Experimental Time

of Day \times Circadian Rhythm interaction, $\beta = -.21$, 95% CI $[-.24, -.17]$, $t(210) = -3.10$, $p = .002$. As illustrated in Figure 4B, when the experiment was conducted in the evening, participants were significantly less sensitive to bullshit as their preference for morning became stronger, $b = -.18$, 95% CI $[-.29, -.06]$, $t(210) = -4.57$, $p < .001$. However, when the experiment was conducted in the morning, participants were significantly more sensitive to bullshit as their preference for morning became stronger, $b = .32$, 95% CI $[.20, .43]$, $t(210) = 7.20$, $p < .001$. From another angle, among participants with a relatively strong preference for the evening, greater sensitivity to bullshit was observed when the experiment was conducted in the evening than when it was conducted in the morning, $b = .36$, 95% CI $[.24, .47]$, $t(210) = 4.41$, $p < .001$. However, among participants with a relatively strong preference for the morning, marginally greater sensitivity to bullshit was observed when the experiment was conducted in the morning than when it was conducted in the evening, $b = -.13$, 95% CI $[-.17, -.09]$, $t(210) = -1.76$, $p = .078$. Thus, participants showed significantly less sensitivity to bullshit when their regulatory resources were expected to be relatively attenuated.

Discussion

These findings help to elucidate the causal effect that self-regulatory resources have on both bullshitting and bullshit detection. As anticipated, bullshitting occurred more frequently under conditions of circadian mismatch than conditions of circadian match. Bullshit receptivity tended to be greater under conditions of circadian mismatch than conditions of circadian match, and bullshit sensitivity tended to be greater under conditions of circadian match than conditions of circadian mismatch.

These empirical solutions have relevance for understanding the potential influence of daily occurrences. That is, common experience suggests that people frequently find themselves engaging in tasks and activities outside of their preferred or peak day times. When people find themselves in such contexts, our data suggest that their tendency to bullshit will be increased and their ability to detect bullshit from others will be significantly diminished.

General Discussion

The concept of bullshitting first arose through an analytical philosopher's critique of a common form of communication (Frankfurt, 1986). Although it has received attention in philosophy (Cohen, 2002; Hardcastle & Reisch, 2006; Law, 2011; Penny, 2005), and has been used as an explanation for varying organizational behaviors (Allen, Allen, &

McGoun, 2012; Morgan, 2010; Spicer, 2013), it has virtually escaped empirical examination. Understanding bullshitting is not simply an attempt to understand the conditions under which bullshitting is most prevalent but is also an attempt to understand the psychological processes that underlie bullshitting and acceptance of bullshit. Bullshitting and being receptive to bullshit can be very seductive because they are so easy to accomplish relative to the mental resources required for evidence-based communication and adequate detection of bullshit.

The experimental studies reported here provide important information relevant to the social psychology of bullshitting and bullshit detection. The current findings are consistent with prior demonstrations suggesting that bullshit detection, and detection of fake news, require analytic/reflective thinking rather than "lazy" (Pennycook & Rand, 2019, 2020) and intuitive thinking (e.g., Pennycook et al., 2015). Likewise, our findings suggest that bullshitting and bullshit detection will be enhanced and diminished, respectively, when people find their self-regulatory resources to be relatively attenuated. Evidence-based communication (i.e., no bullshit) and successful bullshit detection appear to require deliberate and effortful thinking that harnesses available working memory capacity and self-regulatory resources. Only when our participants appeared to possess the adequate executive abilities did they refrain from bullshitting, as evidenced by providing relatively more evidence-based contributions (from their own perspective as well as that of others). People appear to be especially likely to curb their bullshit if they possess adequate self-regulatory resources in contexts in which they do not expect to gain a social pass of acceptance or tolerance for bullshit contributions.

Like dual-process models of attitudes and persuasion (Chen & Chaiken, 1999; Fazio & Olson, 2014; Petty & Briñol, 2014; Petty & Wegener, 1999), impression formation and attributional inferences (McCarthy & Skowronski, 2014; Trope & Gaunt, 1999; Uleman, 1999), stereotyping and prejudice (Bodenhausen, Macrae, & Sherman, 1999; Devine & Monteith, 1999; Forscher & Devine, 2014), and other self-regulatory models incorporating dual-processes (e.g., Förster & Liberman, 2014; Gollwitzer & Bayer, 1999; Higgins, 1999), we argue that bullshitting and bullshit detection are additional behaviors influenced by dual-processes. Indeed, the dual-process model provides unique conceptualizations of the emergence of bullshitting behavior and successful bullshit detection. Intuitive processing is efficient, running autonomously without requiring the expenditure of working memory capacity and self-regulatory resources. Systematic processing is deliberate, effortful, and dependent upon working memory capacity and self-regulatory resources to be successfully executed. When systematic processing was disrupted in our

experiments by taxing executive abilities, we observed greater amounts of bullshit. We can only conclude that bullshitting behavior operates as an intuitive process, whereas evidence-based communication operates as a systematic process, as both self-perceived and socially perceived bullshitting was found under conditions in which executive functioning abilities were relatively constrained. Likewise, our data suggest that bullshit detection also requires relatively great executive abilities and self-regulatory resources to be executed successfully, making it a relatively analytic and systematic process.

Such conclusions have very practical prescriptions for future behavior to the extent that bullshitting is unlikely to be viewed as a particularly positive or admired behavior and to the extent that people wish to avoid the unwanted effects of bullshit. Specifically, one may choose to refrain from talking about things of which they know little to nothing about under any conditions that would be expected to attenuate self-regulatory resources (e.g., contributing to an important discussion when feeling fatigued or unmotivated to process shared content accurately). Likewise, to the extent that one desires to be unaffected by bullshit, one may again choose to refrain from processing information under any conditions that would be expected to attenuate self-regulatory resources (e.g., surfing the Internet when feeling fatigued or unmotivated to process shared content accurately).

Limitations

Three limitations to these conclusions deserve consideration. First, the current research does not address the possibility that perceptions of bullshitting behavior may depend on whether the perceiver is an active participant in the interaction (as is the case in many instances of bullshit exposure) or merely a passive observer. Presumably, due to the additional cognitive demands placed on active participants (Gilbert, Pelham, & Krull, 1988; Jones & Nisbett, 1971; Patterson, 1995; Patterson & Stockbridge, 1998), active participants and mere observers often differ in their evaluations of social interactions (Street, 1985; Street, Mulac, & Wiemann, 1988) and the social targets themselves (Monahan, 1995; Monahan & Zuckerman, 1999). Thus, that which appears to be bullshitting from an observer's perspective may not be considered so by those actively engaged in the encounter. To the extent that the current studies placed participants in relatively passive positions, the generalizability of the findings to more involved discussants should be examined.

Second, the conclusions reported here must be tempered by the fact that participants were not sampled with respect

to their cognitive abilities. Pennycook et al. (2015) demonstrated that one's receptivity to pseudo-profound bullshit is negatively associated with cognitive ability measures. Furthermore, Sá, Kelley, Ho, and Stanovich (2005) found participants with lower cognitive ability and close-minded thinking tended to use relatively unsophisticated forms of evidence (e.g., reiteration or elaboration of the original theory). Future research would do well to examine the possibility that cognitive abilities moderate the links between bullshitting antecedents and consequences. For instance, bullshitting and being receptive to bullshit may be especially likely under conditions of a heightened need for cognitive closure (Kruglanski, 1989; Kruglanski & Fishman, 2009), as such conditions invite individuals to foreclose on the first (not necessarily the best or most accurate) answer to questions (Holmes, 2015). Furthermore, laypeople rarely think and talk about why they believe what they believe (Sloman & Fernbach, 2017).

Finally, our findings offer very little in the way of identifying moderators of the links between self-regulatory resources and bullshitting and bullshit detection. Future research would do well to identify boundaries and moderators. One possibility appears to be that people may rely more heavily on their domain-specific knowledge when their regulatory resources are relatively attenuated or find the fluidity of their cognitive processing to be diminished. Yet, recent research on the illusory truth effects suggests that people often fail to rely on their knowledge when communicating their positions or determining truth (Fazio, Brashier, Payne, & Marsh, 2015). Furthermore, if people are more likely to draw on their knowledge base when their regulatory resources are relatively attenuated, knowledge can be a double-edged sword. On one hand, knowledge should aid in reducing one's own bullshit (Petrocelli, 2018a) and enhance bullshit detection. However, if knowledge is employed in a strategic or biased way, knowledge may be used to further confirm bullshit fitting with one's preconceived notions while ignoring disconfirming evidence. A considerable body of evidence suggests that people tend to be overconfident in their own knowledge (see Kruger & Dunning, 1999; Sloman & Fernbach, 2017). When people produce tentative answers to questions, their natural inclination is to search memory for evidence to support their initial answers as they fail to consider possible alternative answers (Graesser & Hemphill, 1991; Griffin, Dunning, & Ross, 1990; Hoch, 1985; Koriat, Lichtenstein, & Fischhoff, 1980; Shaklee & Fischhoff, 1982). Thus, the possibility that having more knowledge in a domain can exacerbate confirmation biases (see Gardner, 2010; Nickerson, 1998; Robson, 2019) should be investigated.

Future Directions

The current studies are the first to deal with self-regulatory antecedents of bullshitting behavior and bullshit detection, but much research focus is needed. We suggest three general directions. First, there is currently little to no empirical knowledge regarding the potential communicative functions, purposes, or intents of bullshitting. Not only may bullshitting be used in the context of persuasion, but bullshitting would appear to be quite useful for enhancing social bonding, expressing opinions for which one feels obligated to have and express, entertainment, killing awkward silence, or predictions, expressions or claims for which there is no readily available evidence (e.g., “Baby, I’ll love you forever.”). A better understanding of the many reasons why people engage in bullshitting would provide important insights into this behavior.

Second, the bullshitting antecedents identified by Petrocelli (2018a) and self-regulatory resources identified in the present research are unlikely to constitute an exhaustive list of causes. Future research should further examine the antecedents of bullshitting to elucidate the conditions under which people use bullshit in their social interactions. Answering this question will require investigating the various motives that eliminate a concern for evidence and truth.

Finally, research focusing on how to reduce reliance on bullshit and its negative consequences is warranted. That which Frankfurt (1986) claimed to be the opposite of bullshitting (i.e., thinking and communicating with a concern for truth) is essential to sound judgment, reasoning and decision making; sound judgment and decision making simply cannot do without evidence-based information. A fundamental characteristic of information, critical to sound judgment, reasoning and decision making, is the validity of the information (Grice, 1975). However, the bullshitter possesses little regard for the actual validity of his or her claims; thus, bullshitting is a violation of Grice’s (1975) maxim of quality. Understanding the communicative functions of bullshitting, the conditions under which bullshitting is most likely to occur, and the most effective ways to reduce bullshit and its unwanted effects are critical to the human condition.

Whether they be claims or expressions of opinions about the effects of vaccinations, the causes of success and failure, or political ideation, making such claims with little to no concern for evidence or truth is wrong. With their reliance on empirical evidence, it is estimated that social scientists are well positioned to “call bullshit” (i.e., identify it) when they see it. What happens when people are called on their bullshit? Future research will also do well to answer such questions and determine effective ways of enhancing the concern for evidence and truth.

Deeper understandings of bullshitting, bullshit detection, and bullshit disposal may be among the most important intellectual and social issues that we face. Altering the concern for truth, what is said (and how it is being said) are likely to be the most straightforward but significant means of improving the integrity and overall impact of empirical knowledge.

References

- Allen, D. E., Allen, R. S., & McGoun, E. G. (2012). Bull markets and bull sessions. *Culture and Organization*, 18, 15–31.
- Ball, J. (2017). *Post-truth: How bullshit conquered the world*. London, UK: Biteback Publishing.
- Barbey, A. K., & Slovic, S. A. (2007). Base-rate respect: From ecological validity to dual processes. *Behavioral and Brain Sciences*, 30, 241–297.
- Baumeister, R. F., Schmeichel, B. J., & Vohs, K. D. (2007). Self-regulation and the executive function: The self as controlling agent. In A. W. Kruglanski & E. T. Higgins (Eds.), *Social psychology: Handbook of basic principles* (2nd ed., pp. 516–539). New York, NY: Guilford Press.
- Bodenhausen, G. V. (1990). Stereotypes as judgmental heuristics: Evidence of circadian variations in discrimination. *Psychological Science*, 1, 319–322.
- Bodenhausen, G. V., Macrae, C. N., & Sherman, J. S. (1999). On the dialectics of discrimination: Dual processes in social stereotyping. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 271–290). New York, NY: Guilford Press.
- Brandolini, A. (2013, January 11). [@ziobrando]. *The bullshit asymmetry* [Twitter moment]. Retrieved from <https://twitter.com/ziobrando/status/289635060758507521>
- Burkley, E. (2008). The role of self-control in resistance to persuasion. *Personality and Social Psychology Bulletin*, 34, 419–431.
- Carter, E. C., Kofler, L. M., Forster, D. E., & McCullough, M. E. (2015). A series of meta-analytic tests of the depletion effect: Self-control does not seem to rely on a limited resource. *Journal of Experimental Psychology: General*, 144, 796–815.
- Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology*, 39, 752–766.
- Chaiken, S., & Maheswaran, D. (1994). Heuristic processing can bias systematic processing: Effects of source credibility, argument ambiguity, and task importance on attitude judgment. *Journal of Personality and Social Psychology*, 66, 460–473.
- Chaiken, S. & Trope, Y. (Eds.). (1999). *Dual-process theories in social psychology*. New York, NY: Guilford Press.
- Chen, S., & Chaiken, S. (1999). The heuristic-systematic model in its broader context. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 73–96). New York, NY: Guilford Press.
- Cohen, G. A. (2002). Deeper into bullshit. In S. Buss & L. Overton (Eds.), *Contours of agency: Essays on themes from Harry Frankfurt* (pp. 321–339). Cambridge, MA: MIT Press.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Erlbaum.
- Colquhoun, W. P. (1971). Circadian variations in mental efficiency. In W. P. Colquhoun (Ed.), *Biological rhythms and human performance* (pp. 39–107). London, UK: Academic Press.

- Crockett, Z., Dhar, R., & Mayyasi, A. (2014). *Everything is bullshit*. Columbia, SC: Priceonomics.
- d'Ancona, W. (2017). *Post-truth: The new war on truth and how to fight back*. London, UK: Ebury Press.
- Davis, E. (2017). *Post-truth: Why we have reached peak bullshit and what we can do about it*. London, UK: Little Brown.
- De keersmaecker, J., & Roets, A. (2017). "Fake news": Incorrect, but hard to correct. The role of cognitive ability on the impact of false information on social impressions. *Intelligence*, 65, 107–110.
- De Neys W. (Ed.). (2018). *Dual process theory 2.0*. New York, NY: Routledge.
- Devine, P. G., & Monteith, M. J. (1999). Automaticity and control in stereotyping. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 339–360). New York, NY: Guilford Press.
- Evans, J., & Stanovich, K. E. (2013). Dual-process models of higher cognition: Advancing the debate. *Perspectives in Psychological Science*, 8, 223–241.
- Eyink, J., Hirt, E. R., Hendrix, K. S., & Galante, E. (2017). Circadian variations in claimed self-handicapping: Exploring the strategic use of stress as an excuse. *Journal of Experimental Social Psychology*, 69, 102–110.
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41, 1149–1160.
- Fazio, L. K., Brashier, N. M., Payne, B. K., & Marsh, E. J. (2015). Knowledge does not protect against illusory truth. *Journal of Experimental Psychology: General*, 144, 993–1002.
- Fazio, R. H., & Olson, M. A. (2014). The MODE Model: Attitude-behavior processes as a function of motivation and opportunity. In J. W. Sherman, B. Gawronski, & Y. Trope (Eds.), *Dual-process theories of the social mind* (pp. 155–171). New York, NY: Guilford Press.
- Forscher, P. S., & Devine, P. G. (2014). Breaking the prejudice habit: Automaticity and control in the context of a long-term goal. In J. W. Sherman, B. Gawronski, & Y. Trope (Eds.), *Dual-process theories of the social mind* (pp. 468–482). New York, NY: Guilford Press.
- Förster, J., & Liberman, N. (2014). Beyond control versus automaticity: Psychological processes driving postsuppression rebound. In J. W. Sherman, B. Gawronski, & Y. Trope (Eds.), *Dual-process theories of the social mind* (pp. 439–453). New York, NY: Guilford Press.
- Frankfurt, H. (1986). On bullshit. *Raritan Quarterly Review*, 6, 81–100.
- Friese, M., Loschelder, D. D., Gieseler, K., Frankenbach, J., & Inzlicht, M. (2019). Is ego depletion real? An analysis of arguments. *Personality and Social Psychology Review*, 23, 107–131.
- Gardner, D. (2010). *Future babble: Why expert predictions are next to worthless, and you can do better*. New York, NY: Dutton.
- Garrison, K. E., Finley, A. J., & Schmeichel, B. J. (2019). Ego depletion reduces attention control: Evidence from two high-powered preregistered experiments. *Personality and Social Psychology Bulletin*, 45, 728–739.
- Gilbert, D. T., Pelham, B. W., & Krull, D. S. (1988). On cognitive busyness: When person perceivers meet persons perceived. *Journal of Personality and Social Psychology*, 54, 733–740.
- Gollwitzer, P. M., & Bayer, U. (1999). Deliberative versus implemental mindsets in the control of action. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 403–422). New York, NY: Guilford Press.
- Graesser, A. C., & Hemphill, D. (1991). Question answering in the context of scientific mechanisms. *Journal of Memory and Language*, 30, 186–209.
- Grant, J. (2015). *Bullsh*t: How to detect junk science, bogus claims, wacky theories, and general human stupidity*. New York, NY: MJF Books.
- Grice, H. P. (1975). Logic and conversation. In P. Cole & J. L. Morgan (Eds.), *Syntax and semantics: Vol. 3. Speech acts* (pp. 41–58). New York, NY: Academic Press.
- Griffin, D. W., Dunning, D., & Ross, L. (1990). The role of construal processes in overconfident predictions about the self and others. *Journal of Personality and Social Psychology*, 59, 1128–1139.
- Gunia, B. C., Barnes, C. M., & Sah, S. (2014). The morality of larks and owls: Unethical behavior depends on chronotype as well as time of day. *Psychological Science*, 25, 2272–2274.
- Hagger, M. S., Chatzisarantis, N. L. D., Alberts, H., Anggono, C. O., Batailler, C., Birt, A. R., ... Zwienerberg, M. (2016). A multilab preregistered replication of the ego-depletion effect. *Perspectives on Psychological Science*, 11, 546–573.
- Hardcastle, G. L. & Reisch, G. A. (Eds.). (2006). *Bullshit and philosophy: Guaranteed to get perfect results every time* (pp. 137–150). Chicago, IL: Open Court.
- Higgins, E. T. (1999). Promotion and prevention as a motivational duality: Implications for evaluative processes. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 503–525). New York, NY: Guilford Press.
- Hoch, S. J. (1985). Counterfactual reasoning and accuracy in predicting personal events. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 11, 719–731.
- Holmes, J. (2015). *Nonsense: The power of not knowing*. New York, NY: Crown.
- Jarvis, W. B. G. (2012). *MediaLab v2012*. New York, NY: Empirisoft.
- Jones, E. E., & Nisbett, R. E. (1971). The actor and the observer: Divergent perceptions of the causes of behavior. In E. E. Jones, E. Kanouse, H. H. Kelley, R. E. Nisbett, S. Valins, & B. Weiner (Eds.), *Attribution: Perceiving causes of behavior* (pp. 79–94). Hillsdale, NJ: Erlbaum.
- Kahneman, D. (2011). *Thinking, fast and slow*. New York, NY: Farrar, Straus and Giroux.
- Kahneman, D., & Frederick, S. (2002). Representativeness revisited: Attribute substitution in intuitive judgment. In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), *Heuristics and biases: The psychology of intuitive judgment* (pp. 49–81). Cambridge, MA: Cambridge University Press.
- Kleitman, N., & Jackson, D. P. (1950). Body temperature and performance under different routines. *Journal of Applied Physiology*, 3, 309–328.
- Koriat, A., Lichtenstein, S., & Fischhoff, B. (1980). Reasons for confidence. *Journal of Experimental Psychology: Human Learning and Memory*, 6, 107–118.
- Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it: How difficulties in recognizing One's own incompetence lead to inflated self-assessments. *Journal of Personality and Social Psychology*, 77, 1121–1134.
- Kruglanski, A. W. (1989). *Lay epistemics and human knowledge: Cognitive and motivational bases*. New York, NY: Plenum Press.
- Kruglanski, A. W., & Fishman, S. (2009). The need for cognitive closure. In M. R. Leary & R. H. Hoyle (Eds.), *Handbook of individual differences in social behavior* (pp. 343–353). New York, NY: Guilford Press.
- Kruglanski, A. W., & Pierro, A. (2008). Night and day, you are the one: On circadian mismatches and the transference effect in social perception. *Psychological Science*, 19, 296–301.
- Lakens, D., & Evers, E. R. K. (2014). Sailing from the seas of chaos into the corridor of stability: Practical recommendations to increase the informational value of studies. *Perspectives on Psychological Sciences*, 9, 278–292.

- Lavie, P. (1980). The search for cycles in mental performance from Lombard to Kleitman. *Chronobiologia*, 7, 247–256.
- Law, S. (2011). *Believing bullshit: How not to get sucked into an intellectual black hole*. New York, NY: Prometheus Books.
- McCarthy, R. J., & Skowronski, J. J. (2014). Controlled processing and automatic processing in the formation of spontaneous trait inferences. In J. W. Sherman, B. Gawronski, & Y. Trope (Eds.), *Dual-process theories of the social mind* (pp. 221–234). New York, NY: Guilford Press.
- Monahan, J. L. (1995). Information processing differences of conversational participants and observers: The effects of self-presentation concerns and cognitive load. *Communication Monographs*, 62, 265–281.
- Monahan, J. L., & Zuckerman, C. E. (1999). Intensifying the dominant response: Participant-observer differences and non-conscious effects. *Communication Research*, 26, 81–110.
- Monk, T. H., Buysse, D. J., Reynolds, C. F., Berga, S. L., Jarrett, D. B., Begley, A. E., & Kupfer, D. J. (1997). Circadian rhythms in human performance and mood under constant conditions. *Journal of Sleep Research*, 6, 9–18.
- Morgan, W. J. (2010). Bullshitters, markets, and the privatization of public discourse about sports. *American Behavioral Scientist*, 53, 1574–1589.
- Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *Review of General Psychology*, 2, 175–220.
- Patterson, M. L. (1995). Invited article: A parallel process model of nonverbal communication. *Journal of Nonverbal Behavior*, 19, 3–29.
- Patterson, M. L., & Stockbridge, E. (1998). Effects of cognitive demand and judgment strategy on person perception accuracy. *Journal of Nonverbal Behavior*, 22, 253–263.
- Penny, L. (2005). *Your call is important to us: The truth about bullshit*. Toronto, Canada: McClelland and Stewart.
- Pennycook, G., Cheyne, J. A., Barr, N., Koehler, D. J., & Fugelsang, J. A. (2015). On the reception and detection of pseudo-profound bullshit. *Judgment and Decision Making*, 10, 549–563.
- Pennycook, G., & Rand, D. G. (2019). Lazy, not biased: Susceptibility to partisan fake news is better explained by lack of reasoning than by motivated reasoning. *Cognition*, 188, 39–50.
- Pennycook, G., & Rand, D. G. (2020). Who falls for fake news? The roles of bullshit receptivity, overclaiming, familiarity, and analytic thinking. *Journal of Personality*, 88, 185–200.
- Petrocelli, J. V. (2018a). Antecedents of bullshitting. *Journal of Experimental Social Psychology*, 76, 249–258.
- Petrocelli, J. V. (2018b, March). *Some antecedents and consequences of bullshitting behavior*. Paper presented at the 19th annual meeting of the Society for Personality and Social Psychology, Atlanta, GA.
- Petrocelli, J. V., Williams, S. A., & Clarkson, J. J. (2015). The bigger they come, the harder they fall: The paradoxical effect of regulatory depletion on attitude change. *Journal of Experimental Social Psychology*, 58, 82–94.
- Petty, R. E., & Briñol, P. (2014). The elaboration likelihood and metacognitive models of attitudes: Implications for prejudice, the self, and beyond. In J. W. Sherman, B. Gawronski, & Y. Trope (Eds.), *Dual-process theories of the social mind* (pp. 172–187). New York, NY: Guilford Press.
- Petty, R. E., & Wegener, D. T. (1999). The Elaboration Likelihood Model: Current status and controversies. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 41–72). New York, NY: Guilford Press.
- Pfafftheicher, S., & Schindler, S. (2016). Misperceiving bullshit as profound is associated with favorable views of Cruz, Rubio, Trump and conservatism. *PLoS One*, 11, e0153419. <https://doi.org/10.1371/journal.pone.0153419>
- Randi, J. (1980). *Flim-flam! The truth about unicorns, parapsychology and other delusions*. New York, NY: Lippincott and Crowell.
- Robson, D. (2019). *The intelligence trap: Why smart people make dumb mistakes*. New York, NY: W. W. Norton & Company.
- Sá, W. C., Kelley, C. N., Ho, C., & Stanovich, K. E. (2005). Thinking about personal theories: Individual differences in the coordination of theory and evidence. *Personality and Individual Differences*, 38, 1149–1161.
- Sagan, C. (1997). *The demon-haunted world: Science as a candle in the dark*. New York, NY: Ballantine Books.
- Schmeichel, B. J. (2007). Attention control, memory updating, and emotion regulation temporarily reduce the capacity for executive control. *Journal of Experimental Psychology: General*, 136, 241–255.
- Shaklee, H., & Fischhoff, B. (1982). Strategies of information search in causal analysis. *Memory and Cognition*, 10, 520–530.
- Shermer, M. (1997). *Why people believe weird things: Pseudoscience, superstition, and other confusions of our time*. New York, NY: Henry Holt and Co.
- Sherman, J. W., Gawronski, B., & Trope, Y. (Eds.). (2014). *Dual-process theories of the social mind*. New York, NY: Guilford Press.
- Shiffrin, R. M., & Schneider, W. (1977). Controlled and automatic human information processing II: Perceptual learning, automatic attending and a general theory. *Psychological Review*, 84, 127–189.
- Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2013). *Life after p-hacking*. Paper presented at the 2013 meeting of the Society for Personality and Social Psychology, New Orleans, LA.
- Slooman, S. A. (1996). The empirical case for two systems of reasoning. *Psychological Bulletin*, 119, 3–22.
- Slooman, S., & Fernbach, P. (2017). *The knowledge illusion: Why we never think alone*. New York, NY: Riverhead Books.
- Smith, C. S., Reilly, C., & Midkiff, K. (1989). Evaluation of three circadian rhythm questionnaires with suggestions for an improved measure of morningness. *Journal of Applied Psychology*, 74, 728–738.
- Spicer, A. (2013). Shooting the shit: The role of bullshit in organisations. *Management*, 16, 653–666.
- Sterling, J., Jost, J. T., & Pennycook, G. (2016). Are neoliberals more susceptible to bullshit? *Judgment and Decision Making*, 11, 352–360.
- Street, R. L. (1985). Participant-observer differences in speech evaluation. *Journal of Language and Social Psychology*, 4, 125–130.
- Street, R. L., Mulac, A., & Wiemann, J. M. (1988). Speech evaluation differences as a function of perspective (participant versus observer) and presentational medium. *Human Communication Research*, 14, 333–363.
- Tetlock, P. E. (1992). The impact of accountability on judgment and choice: Toward a social contingency model. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 25, pp. 331–376). New York, NY: Academic Press.
- Tetlock, P. E., Skitka, L., & Boettger, R. (1989). Social and cognitive strategies for coping with accountability: Conformity, complexity, and bolstering. *Journal of Personality and Social Psychology*, 57, 632–640.
- Trope, Y., & Gaunt, R. (1999). A dual-process model of overconfident attributional inferences. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 161–178). New York, NY: Guilford Press.
- Uleman, J. S. (1999). Spontaneous versus intentional inferences in impression formation. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 141–160). New York, NY: Guilford Press.

- Wheeler, S. C., Briñol, P., & Hermann, A. D. (2007). Resistance to persuasion as self-regulation: Ego-depletion and its effects on attitude change processes. *Journal of Experimental Social Psychology, 43*, 150–156.
- Wilson, T. D., & Brekke, N. (1994). Mental contamination and mental correction: Unwanted influences on judgments and evaluations. *Psychological Bulletin, 116*, 117–142.

History

Received October 2, 2019
Revision received March 18, 2020
Accepted March 19, 2020
Published online April 30, 2020

Authorship

All authors were involved in all parts of the research; each author was closely involved in designing the experiments, collecting the data, and writing the report.

ORCID

John V. Petrocelli
 <https://orcid.org/0000-0003-2827-468X>

John V. Petrocelli

Department of Psychology
Wake Forest University
PO Box 7778
Winston-Salem, NC 27109
petrocjv@wfu.edu