



## Full length article

## Individual differences in susceptibility to financial bullshit

Mario Kienzler<sup>a,\*</sup>, Daniel Västfjäll<sup>b,c</sup>, Gustav Tinghög<sup>d,e</sup><sup>a</sup> Division of Industrial Management, Department of Management and Engineering, Linköping University, SE-581 83 Linköping, Sweden<sup>b</sup> Division of Psychology, Department of Behavioral Sciences and Learning, SE-581 83 Linköping, Sweden<sup>c</sup> Decision Research, Eugene, OR, USA<sup>d</sup> Division of Economics, Department of Management and Engineering, Linköping University, SE-581 83 Linköping, Sweden<sup>e</sup> Division of Health Care Analysis, Sweden National Center for Health Care Priority Setting, Linköping University, SE-581 83 Linköping, Sweden

## ARTICLE INFO

## Article history:

Received 17 September 2021

Received in revised form 18 February 2022

Accepted 25 March 2022

Available online 31 March 2022

## JEL classification:

G41

G51

G53

## Keywords:

Bullshit

Financial bullshit

Financial behavior

Financial well-being

Scale

## ABSTRACT

What is the effect of seemingly impressive verbal financial assertions that are presented as true and meaningful but are actually meaningless; that is, financial pseudo-profound bullshit? We develop and validate a novel measurement scale to assess consumers' ability to detect and distinguish financial bullshit. We show that this financial bullshit scale captures a unique construct that is only moderately correlated with related constructs such as financial knowledge, numeracy, and cognitive reflection. Consumers particular vulnerable to financial bullshit are more likely to be young, male, have a higher income, and be overconfident with regards to their own financial knowledge. The ability to detect and distinguish financial bullshit also predicts financial well-being while being less predictive of consumers' self-reported financial behavior, suggesting that susceptibility to financial bullshit is linked to affective rather than behavioral reactions. Our findings have implications for the understanding of how financial communication impacts consumer decision making and financial well-being.

© 2022 The Author(s). Published by Elsevier B.V. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

## 1. Introduction

“Doubled value-added bonds”<sup>1</sup>

The marketplace is filled with information about financial products and services. The language used to describe them is often not only factual and descriptive but includes many times seemingly impressive verbal assertions that are presented as true and meaningful but are actually meaningless (see e.g., Spicer, 2018). While some people may find such information about financial products and services meaningful and profound, others may (correctly) identify this as bullshit. The ability to detect and distinguish general bullshit from genuine information is linked to a range of positive outcomes such as being less likely to hold supernatural beliefs, be reflective, intelligent, and numerate (Pennycook et al., 2015). Given this, the ability to separate bullshit from meaningful information in the context of finance may also be linked to how individuals manage their household finance, and ultimately, their financial well-being. In the present research, we

(a) construct and validate a scale measuring individual difference in susceptibility to financial bullshit, and (b) examine if individual difference in susceptibility to financial bullshit can predict financial well-being and financial behaviors.

## 1.1. Prior research on bullshit

There has been a recent surge in academic interest in bullshit. But what do we mean when we talk about bullshit as an academic concept? In seminal work entitled “On Bullshit”, the Philosopher Harry Frankfurt (2005, pp. 47–48, highlights in original), asserted that: “[T]he essence of bullshit is not that it is false but that it is phony [...] although it is produced without concern with the truth, it need not be false”. Hence, bullshit is not necessarily a false but rather a non-genuine way of communicating about a matter. The growing body of research on bullshit has to a large extent examined to what degree statements consisting of impressive words (e.g., “Hidden meaning transforms unparalleled abstract beauty”) are seen as profound (called pseudo-profound bullshit; Pennycook et al., 2015; Walker et al., 2019). These pseudo-profound bullshit statements are constructed without any concern for the truth and typically have an ambiguous meaning. Some individuals are more likely to perceive pseudo-profound bullshit as meaningful (called bullshit receptivity; Pennycook et al., 2015), whereas others are more likely

\* Corresponding author.

E-mail addresses: [mario.kienzler@liu.se](mailto:mario.kienzler@liu.se) (M. Kienzler), [daniel.vastfjall@liu.se](mailto:daniel.vastfjall@liu.se) (D. Västfjäll), [gustav.tinghog@liu.se](mailto:gustav.tinghog@liu.se) (G. Tinghög).<sup>1</sup> This concept was generated with the help of [www.makebullshit.com](http://www.makebullshit.com). Although, at first glance, it sounds meaningful it is phony. It is an example of what could be referred to as financial bullshit.

to perceive genuinely profound statements (e.g., “You are not only responsible for the things you say, but also for the things you do not say”) as meaningful (called *profoundness receptivity*; Erlandsson et al., 2018). Further, when presented at the same time, some people are better at distinguishing bullshit from genuinely profound statements (called *bullshit sensitivity*; Pennycook et al., 2015). Individual differences in bullshit receptivity and sensitivity has both been linked to other individual difference factors and behaviors. For example, individuals high in bullshit receptivity tend to be less analytic, lower in numeracy, and lower in verbal intelligence (Pennycook et al., 2015). These individuals also fall prey to fake news (Pennycook and Rand, 2020) and support conspiratorial ideation to a larger extent (Pennycook et al., 2015). Moreover, people who are better at distinguishing the pseudo-profound from the actually profound are more prosocial (Erlandsson et al., 2018). People with a high ability to produce bullshit are also judged as more intelligent by others (Turpin et al., 2020). Other work has investigated how often people turn to bullshit in interactions (Littrell et al., 2021), the conditions that foster the production of bullshit (Petrocelli, 2018), and how to successfully use bullshit to convince others about own competence (McCarthy et al., 2020; Turpin et al., 2019).

### 1.2. Financial bullshit

Although a growing body of literature has started to investigate people’s ability to detect and distinguish general bullshit from genuine statements, minimal work has been done on this topic in the financial domain. This is surprising given that pseudo-profound bullshit, in the form of empty talk, lingo and jargon, is commonly experienced by consumers when seeking out financial products and services.

When it comes to lingo and jargon, the Financial Conduct Authority (FCA)<sup>2</sup> in the UK – highlighted *the fog* that surrounds consumers when making financial decisions. Stating that: “[t]he way financial products are communicated and marketed can make it difficult for consumers to understand and identify the right products for them” (Rowe et al., 2015, p. 31). In that report – frustrated about the opaque language employed for terms and conditions of financial products and services – one consumer complained: “You try and read them and it’s all legalese. Jargon this and jargon that, and all these vague sentences [...]” (Rowe et al., 2015, p. 32). Similarly, VisibleThread (2019)<sup>3</sup> recently investigated the language used on the websites of 50 major U.S. banks. The report shows that 58% of the communication is so complicated that the average customer in the United States has a hard time understanding it. Another recent survey focusing on insurance policies shows that 73% of the surveyed U.S. millennials believe that insurance policies are intentionally designed to be opaque (Patel, 2019). Thus, a substantial proportion of consumers suspect’s insurance companies to purposely use bullshit to undermine common sense and sell their financial products.<sup>4</sup>

### 1.3. The present study

The original bullshit scale (Pennycook et al., 2015) was based on general pseudo-profound statements, such as “The invisible is beyond new timelessness”. In this study, we extend research on bullshit to the financial domain by developing a new scale

<sup>2</sup> The FCA is the organization that regulates the financial markets and its products and services.

<sup>3</sup> VisibleThread is a language analysis company that focuses on improving business content.

<sup>4</sup> It is perhaps not surprising that an award-winning car insurance comparison webpage is [www.confused.com](http://www.confused.com).

with pseudo-profound and genuinely profound statements in the financial context. Moreover, we examine how individual differences in the ability to detect and distinguish financial bullshit predicts financial well-being and behaviors.

## 2. Method

In the following, we describe the scale development process, the general data collection set-up, and other measures included in our survey. Data used in this paper are available at the project’s OSF repository: <https://osf.io/mbjdx/>.

### 2.1. Scale development: The financial bullshit scale

To measure susceptibility to financial bullshit, we created an initial list of items consisting of both profound and pseudo-profound financial statements. We followed established guidelines in the psychometric literature during the scale development process (Churchill, 1979). The initial profound items were generated by searching for actual quotes related to the financial domain. Among others, the ones used in the final version of the scale are attributed to people like Benjamin Franklin, Robert Shiller, and Milton Friedman. The initial pseudo-profound items were generated by following the structure of existing general bullshit scales (Pennycook et al., 2015; Erlandsson et al., 2018) and by using bullshit generators like [www.makebullshit.com](http://www.makebullshit.com). Across items, our goal was to include statements that capture different aspects of the financial domain (e.g., savings, loans, investments, and general relations with money), but maintain the overall structure of sentences used in the Pennycook et al. (2015) general bullshit scale. Items were gradually revised and refined in several iterations among the author team. Unclear or unfocused items were continuously deleted, replaced or rewritten. The final set of items in the financial bullshit scale are shown in Table 1.

### 2.2. Participants and procedure

To validate the financial bullshit scale, we conducted an online survey with 1058 adults in the United States ( $M_{\text{age}} = 38.07$ , 95% CI [37.38, 38.75]; 47% female, 53% male) through Amazon Mechanical Turk. We ensured that only participants with a valid U.S. American Internet Protocol (IP) address participated. Since the survey included rating scales that would have been hard to read on mobile devices, we allowed only participants on non-mobile devices to start the survey.

We excluded 161 participants (initial  $N = 1219$ ) from analysis who (a) failed an attention check within the survey, and/or a comprehension check at the end of the survey (129 participants), (b) provided incomplete responses or participated twice (32 participants). In the beginning of the survey, we collected self-reported demographic information about the respondents’ age, gender, religiosity, income, and education.

To establish convergent and discriminant validity of the financial bullshit scale, we administered questions measuring people’s general bullshit and profoundness receptivity, their financial knowledge, their numeracy, and we also administered the cognitive reflection task (CRT). We report more details on these scales in the Supplementary Materials. To explore the predictive ability of the financial bullshit scale we collected data on people’s financial well-being, financial behavior, and a financial buzzword task.

To measure financial well-being, we assessed respondents’ anxiety and security using the two subscales from the Financial Wellbeing Scale (Strömbäck et al., 2017; see Table 2). In so doing we follow prior work on financial well-being that conceptualizes it as individuals’ subjective assessment (Brüggen et al., 2017) and

**Table 1**  
The Financial bullshit scale.

No	Item(s)	Mean rating of Meaningfulness	SD	Range
<i>Profound financial statements</i>				
1.	A fool and his money are soon parted. – Thomas Tusser	4.29	1.40	1–6
2.	A budget tells us what we can't afford, but it doesn't keep us from buying it. – William Feather	3.86	1.45	1–6
3.	All money is a matter of belief. – Adam Smith (EX)	2.58	1.49	1–6
4.	Finance is not merely about making money. It's about achieving our deep goals and protecting the fruits of our labor. – Robert Shiller	3.74	1.42	1–6
5.	Every time you borrow money, you are robbing your future self. – Nathan W. Morris	3.75	1.55	1–6
6.	Inflation is taxation without legislation. – Milton Friedman	3.25	1.51	1–6
7.	Wealth is not his that has it, but his that enjoys it. – Benjamin Franklin	3.69	1.44	1–6
<i>Pseudo-profound financial statements</i>				
1.	A cheap loan is beyond all new destiny.	2.03	1.24	1–6
2.	Your money transforms universal actions.	2.45	1.37	1–6
3.	Money eases the costs of those who borrow.	2.63	1.36	1–6
4.	The future holds universal capital for those who save. (EX)	3.32	1.45	1–6
5.	Wealth and perseverance provide money for the poor.	2.62	1.43	1–6
6.	Good investors spread large shares beyond size.	2.72	1.47	1–6
7.	Freedom and space transform the abstract meaning of money.	2.70	1.47	1–6

Note: The meaningfulness of each item was measured on a six-point scale (1 = not at all meaningful/worth considering; 2 = hardly meaningful/worth considering; 3 = slightly meaningful/worth considering; 4 = rather meaningful/worth considering; 5 = meaningful/worth considering; 6 = very meaningful/worth considering); attribution of the profoundness receptivity quotes was not shown to the respondents; EX = item was excluded from final scale.

**Table 2**  
The financial well-being scale.

No	Item(s)	Mean rating	SD	Range
<i>Anxiety</i>				
1.	I get unsure by the lingo of financial experts	3.00	1.24	1–5
2.	I am anxious about financial and money affairs	3.23	1.30	1–5
3.	I tend to postpone financial decisions	2.45	1.25	1–5
4.	After making a decision, I am anxious whether I was right or wrong	2.98	1.27	1–5
<i>Security</i>				
1.	I feel secure in my current financial situation	2.79	1.30	1–5
2.	I feel confident about my financial future	2.88	1.29	1–5
3.	I feel confident about having enough to support myself in retirement, no matter how long I live	2.60	1.33	1–5

Note: Items were measured on a five-point scale (1 = not at all; 5 = completely).

as having two dimensions (Netemeyer et al., 2017; Strömbäck et al., 2017). For the anxiety dimension of financial well-being, the scale includes four items originally developed by Fünfgeld and Wang (2009). For these items respondents rate their anxiety regarding personal finances (e.g., “I get unsure by the lingo of financial experts” on a five-point scale (1 = not at all; 5 = completely). We averaged them to create a construct (Cronbach's  $\alpha = 0.82$ ).

For the security dimension of financial well-being, the scale includes three items originally developed by Strömbäck et al. (2017). For these items respondents rate their confidence regarding personal finances (e.g., “I feel confident about my financial future”) on a five-point scale (1 = not at all; 5 = completely). We averaged them to create a construct (Cronbach's  $\alpha = 0.91$ ).

We measured financial behavior with the Financial Management Behavior Scale (FMBS; Dew and Xiao, 2011; see Table 3). The FMBS asks respondents to rate how often they engaged in 15 beneficial financial activities (e.g., “paid all your bills on time”) within the last months on a five-point scale (1 = never; 5 = always). We averaged the items to create a construct (Cronbach's  $\alpha = 0.83$ ).

Given that the statements from the Financial Management Behavior Scale measure a relatively broad range of financial behaviors that are not necessarily related to financial products and services, we also designed a task with true or false claims about financial products which pertain financial buzzwords (e.g., hedging, diversification) – the financial buzzword task (Table 4). We relied on information sourced from the business press (e.g., Financial Times). Respondents were asked to indicate whether they believed a statement was true or false. Half of the statements were true (e.g., “a company's stock price is influenced by the market's expectation regarding the company's future performance”) and

the other half was false (e.g., “a distinct feature of all stocks is that stock owners have the right to receive annual dividends”). We created a score by summing the total number of correct answers (Cronbach's  $\alpha = 0.51$ ).

### 3. Results

#### 3.1. Validation of the financial bullshit scale

We started with testing the dimensionality, validity, and reliability of the new financial bullshit scale. To do so, we followed established guidelines in the literature (Hair et al., 2014) in using a number of standard psychometric tests and procedures (for more details, see the Supplementary Materials, Part B).

We started with an initial two-factor model in a confirmatory factor analysis (CFA)<sup>5</sup> with all indicators loading on their respective construct. However, this initial factor analysis revealed low standardized loadings and high values on the modification indices for one indicator for each construct. Thus, we dropped both of these indicators from their respective construct in the final model (see Table B1). Interestingly enough, it was Adam Smith's famous quote *All money is a matter of belief* that was considered least profound and one pseudo-profound statement (*The future holds universal capital for those who save*) was judged as profound as many of the quotes by Noble Prize winners (see Table 1).

Next, an investigation into model fit showed that a two-factor model (i.e., financial profoundness receptivity and financial

<sup>5</sup> We used JAMOMI (The Jamovi Project, 2020) for this and all subsequent confirmatory factor analyses.

**Table 3**  
Financial management behavior scale.

No	Item(s)	Mean rating	SD	Range
1.	Comparison shopped when purchasing a product or service	4.22	0.91	1–5
2.	Paid all your bills on time	4.41	0.93	1–5
3.	Kept a written or electronic record of your monthly expenses	3.42	1.45	1–5
4.	Stayed within your budget or spending plan	3.88	0.96	1–5, N/A
5.	Paid off credit card balance in full each month	3.35	1.60	1–5, N/A
6.	Maxed out the limit on one or more credit cards (R)	4.34	1.12	1–5, N/A
7.	Made only minimum payments on a loan (R)	3.60	1.38	1–5
8.	Began or maintained an emergency savings fund	3.20	1.46	1–5
9.	Saved money from every paycheck	3.32	1.36	1–5
10.	Saved for a long term goal such as a car, education, home, etc.	3.20	1.37	1–5
11.	Contributed money to a retirement account	2.91	1.66	1–5
12.	Bought bonds, stocks, or mutual funds	2.09	1.29	1–5
13.	Maintained or purchased an adequate health insurance policy	3.83	1.52	1–5
14.	Maintained or purchased adequate property insurance like auto or homeowners insurance	3.95	1.50	1–5
15.	Maintained or purchased adequate life insurance	2.72	1.73	1–5

Note: Items were measured on a five-point scale (1 = never; 5 = always); R = reverse worded item. The values of these reverse worded items were reversed before calculating these summary statistics. N/A options allowed respondents to choose *I never make a budget, I do not have a credit card, and I do not have a credit card*, respectively. We excluded the N/A answers from the scale. For instance, if a respondent answered N/A on all three N/A items we used the mean of the 12 remaining items.

**Table 4**  
True or false statements using financial buzzwords.

True or false financial statements	Percent correct answers
1. When you buy a bond you are lending a company money. <sup>a</sup> TRUE	76.09
2. A distinct feature of all stocks is that stock owners have the right to receive annual dividends. FALSE	46.41
3. Liabilities represent the cumulative costs of operating in a market. FALSE	34.40
4. Diversification means combining different investment types into a portfolio to reduce risks and increase returns. <sup>d</sup> TRUE	92.06
5. Assets are single-period sources of income. FALSE	74.86
6. Leverage is the strategy to use borrowed capital to finance the purchase of assets. <sup>e</sup> TRUE	79.11
7. Hedging is a risk reduction strategy based on offsetting different investments against each other. <sup>b</sup> TRUE	83.36
8. The current price of an asset should reflect its future discounted cash flow. <sup>c</sup> TRUE	51.04
9. Bonds are a risk-free investment for your money. FALSE	59.74
10. Hedging means investing your money in a single stock. FALSE	82.23
11. A liability is an unpaid debt that the debtor is obligated to settle. <sup>a</sup> TRUE	82.61
12. The term “diversified” refers to a financial service firm that provides services to both corporate and private clients. FALSE	72.59
13. The dividends of undervalued stocks are called discounted cash flow. FALSE	64.18
14. A company’s stock price is influenced by the market’s expectation regarding the company’s future performance. <sup>a</sup> TRUE	91.12
15. Your assets are items of value. <sup>a</sup> TRUE	95.37
16. A company has leverage when its return on investment exceeds the industry average. FALSE	28.83

Note: True or false answer format; the correct answer (in capital) was not shown to the respondents. Statements were directly taken or adapted from the following sources:

<sup>a</sup> <https://www.forbes.com/sites/rent/2015/06/05/money-talk-a-breakdown-of-financial-terms-for-beginners/?sh=2b4b36a529ae>.

<sup>b</sup> [https://en.wikipedia.org/wiki/Hedge\\_\(finance\)](https://en.wikipedia.org/wiki/Hedge_(finance)).

<sup>c</sup> [www.ft.com/cms/s/aa6c3ae7-5be2-36b7-9e863ee83f6743f7.html?sectionid=alphaville](http://www.ft.com/cms/s/aa6c3ae7-5be2-36b7-9e863ee83f6743f7.html?sectionid=alphaville).

<sup>d</sup> <https://www.investopedia.com/terms/d/diversification.asp>.

<sup>e</sup> <https://www.investopedia.com/terms/l/leverage.asp>.

bullshit receptivity as *separate constructs*) fits the data better than a one factor model (i.e., financial profoundness receptivity and financial bullshit receptivity as a *single construct*) on a number of fit indices.<sup>6</sup> That is, on all fit indices the two-factor model provides a better fit than the one factor model. This shows acceptable dimensionality of the two constructs.

Next, we investigated the constructs’ validity along three dimensions. First, we tested for convergent validity. All indicators’ standardized loadings were above the minimum recommendation of 0.50 and statistically significant; they ranged between 0.51 to 0.82 (see Table B.1). Next, we calculated the Average Variance Extracted (AVE) and Cronbach’s alpha for financial profoundness receptivity (AVE = 0.36;  $\alpha$  = 0.77) and financial bullshit receptivity (AVE = 0.56;  $\alpha$  = 0.88). While the AVE value for financial profoundness receptivity was below the common cut-off value of 0.50, the construct still showed convergent validity. In particular, a combination of a high alpha and lower AVE value shows that the

<sup>6</sup> For instance, comparative fit index [CFI] = 0.97 vs. 0.86; Tucker-Lewis index [TLI] = 0.96 vs. 0.83; standardized root mean square residual [SRMR] = 0.04 vs. 0.08; root mean square error of approximation [RMSEA] = 0.05 vs. 0.11 (see Table B.2).

financial profoundness receptivity indicators reliably represent the latent construct but that they are broad in their dimension (i.e., they cover a wider range of financial profoundness aspects) and hence the construct had a lower AVE value. Since the results showed convergent validity, we averaged the items to build the respective construct.

Second, we tested for discriminant validity. The first and foremost indication for discriminant validity is that the proposed two factor model had a better fit than a one factor model. Furthermore, the squared correlation ( $r^2$  = 0.28) between the financial profoundness receptivity construct and the financial bullshit receptivity construct was below both their respective AVE values.<sup>7</sup>

<sup>7</sup> Note, when using the squared correlation of the estimated constructs from the confirmatory factor analysis ( $r^2$  = 0.43) instead of the averaged constructs’ squared correlation, the AVE of financial profoundness receptivity is lower than that value. Generally, this level of shared variance is not surprising given that both constructs measure similar aspects (i.e., meaningfulness of communication in the financial domain). However, due to this circumstance, we will focus our investigation on the difference score of the financial bullshit scale in the following analyses (i.e., the difference score between the averaged

Third, we investigated nomological validity by showing that financial profoundness receptivity and financial bullshit receptivity were different to two similar constructs not included in the measurement model; that is, general profoundness receptivity and general bullshit receptivity. The shared variance with their general counterparts were  $r^2 = 0.45$  (profoundness receptivity) and  $r^2 = 0.61$  (bullshit receptivity). Importantly, the shared variance between the financial bullshit difference score (i.e., profoundness receptivity score – bullshit receptivity score) and its general counterpart accounted for less than half of the total variance (i.e.,  $r^2 = 0.44$ ). These results show that the two constructs, while understandably related, capture unique aspects.

Respondents' financial bullshit score was calculated by subtracting the bullshit receptivity score from the profoundness receptivity score. A lower financial bullshit score indicates higher susceptibility to financial bullshit and higher scores less susceptibility to financial bullshit (i.e., greater ability to distinguish bullshit from genuine statements). The final financial bullshit scale includes six profound statements and six pseudo-profound statements. To foreshadow some of our empirical results, a paired sample *t*-test showed that the average meaningfulness rating of the six profound statements ( $M = 3.76$   $SD = 1.00$ ) was significantly higher than the average meaningfulness rating of the six pseudo-profound ones ( $M = 2.53$   $SD = 1.11$ );  $t(1057) = 39.17$ ,  $p < 0.01$ .<sup>8</sup>

### 3.2. Who is susceptible to financial bullshit?

Most respondents were able to detect and distinguish bullshit from genuine financial statements. That is, 86 percent scored higher than zero on the financial bullshit scale. Thus, these people can – to various degrees – distinguish profound from pseudo-profound (i.e., bullshit) statements in the financial domain.

The results in Table 5 show that people's ability to detect and distinguish bullshit from genuine statements in the financial domain was positively correlated with age ( $r = 0.29$ ,  $p < 0.01$ ). Females exhibited a lower susceptibility to financial bullshit than males ( $r = 0.06$ ,  $p = 0.04$ ). People with a lower income were better than people with a higher income in distinguishing bullshit from genuine statements in the financial domain ( $r = -0.07$ ,  $p = 0.02$ ). Religiosity and education were not significantly correlated with the ability to detect and distinguish bullshit from genuine financial statements. The fact that education level is uncorrelated with susceptibility to financial bullshit could indicate that it is more important to be street-smart than book-smart when it comes to detecting and distinguishing financial bullshit. Taken together, younger people, males, and those with higher self-reported income were more susceptible to financial bullshit in our sample.

Furthermore, the financial bullshit score did positively and significantly correlate with numeracy ( $r = 0.20$ ,  $p < 0.01$ ), cognitive reflection ( $r = 0.21$ ,  $p < 0.01$ ) and objective financial knowledge ( $r = 0.22$ ,  $p < 0.01$ ), but not subjective (i.e., self-reported) financial knowledge ( $r = 0.03$ ,  $p = 0.32$ ). Thus, participants with higher levels of numeracy, cognitive reflection, and objective financial knowledge were less susceptible to financial bullshit.

Fig. 1 shows the relation between people's financial sophistication and their ability to detect and distinguish bullshit from genuine financial statements. Financial sophistication is the potential (mis)match between people's objective and subjective financial knowledge (see Supplementary Materials, Part A for more

financial bullshit receptivity and the averaged financial profoundness receptivity construct).

<sup>8</sup> A non-parametric Wilcoxon signed-rank test provided qualitatively the same results.

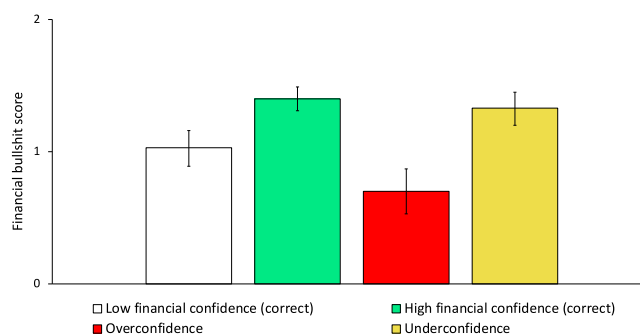


Fig. 1. Susceptibility to financial bullshit across different categories of financial sophistication. Note: The y-axis shows consumers' bullshit score. It can take values between  $-5$  and  $+5$ . Lower values mean more susceptibility to financial bullshit and higher values less susceptibility. The *low financial confidence (correct)* category is low on objective and low on subjective financial knowledge; the *high financial confidence (correct)* category is high on objective and high on subjective financial knowledge; the *overconfidence* category is low on objective but high on subjective financial knowledge; the *underconfidence* category is high on objective but low on subjective financial knowledge. Error bars are 95% confidence intervals.

details). A one-way ANOVA ( $F(3,1054) = 20.28$ ,  $p < 0.01$ ) showed that respondents' financial bullshit score varied across financial sophistication. In particular, post-hoc tests with Bonferroni corrected *p*-values showed that overconfident respondents had the lowest ability to detect and distinguish bullshit from genuine financial statements ( $M = 0.70$ ;  $SD = 0.96$ ), followed by respondents that correctly perceived their financial competence to be low ( $M = 1.03$ ;  $SD = 0.97$ ). Respondents that correctly perceived their financial competence to be high ( $M = 1.40$ ;  $SD = 1.04$ ) and underconfident respondents ( $M = 1.33$ ;  $SD = 0.94$ ) showed similar abilities (all groups are significantly different from each other at least at  $p < 0.05$ , except for *high financial confidence (correct)* and *underconfident*).<sup>9</sup> Taken together, while overconfident consumers (i.e., low objective but high subjective financial knowledge) were most susceptible to financial bullshit, those with high objective knowledge – regardless of their subjective financial knowledge – were the least susceptible.

### 3.3. Can the financial bullshit scale predict financial well-being?

Next, we investigated the predictive validity of the financial bullshit scale by exploring its relationship with the two dimensions of financial well-being: financial anxiety and financial security. We first provide model-free evidence for these relations and then show with a series of ordinary least squares (OLS) regressions that these relations hold when controlling for consumers' financial knowledge (objective financial knowledge and subjective financial knowledge), numeracy, and demographics. Multicollinearity is not an issue in any of these regression models because the highest variance inflation factor (VIF) was 1.64.

#### 3.3.1. Financial anxiety

The financial bullshit score did not correlate significantly with financial anxiety ( $r = 0.02$ ;  $p = 0.62$ ). We followed up on this null effect with a series of OLS regressions where we control for consumers' financial knowledge, numeracy, cognitive reflection, and demographics. Consistent with the model-free results, Table 6 shows that consumers' ability to detect and distinguish bullshit from genuine financial statements had no direct association with the extent to which they felt anxious about their financial

<sup>9</sup> A non-parametric Kruskal–Wallis ANOVA with corresponding post hoc tests provided qualitatively the same results.

**Table 5**  
Pearson correlations between financial bullshit score and other variables.

Variable(s)	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Financial bullshit score	1.24	1.03														
2. General bullshit score	1.49	1.10	0.66***													
3. Financial Anxiety	2.91	1.01	0.02	0.03												
4. Financial Security	2.76	1.20	-0.13***	-0.14***	-0.53***											
5. Financial behavior (FMBS)	3.48	0.75	0.04	0.03	-0.36***	0.59***										
6. Financial buzzword task	11.14	2.29	0.32***	0.30***	-0.17***	0.04	0.21***									
7. Objective financial knowledge	2.81	1.04	0.22***	0.23***	-0.24***	0.09***	0.24***	0.43***								
8. Subjective financial knowledge	3.82	1.30	0.03	0.00	-0.41***	0.41***	0.42***	0.32***	0.44***							
9. Numeracy	3.75	1.88	0.20***	0.23***	-0.11***	0.00	0.09***	0.36***	0.43***	0.21***						
10. Cognitive reflection	1.79	1.20	0.21***	0.23***	-0.07**	-0.06*	0.02	0.31***	0.34***	0.10***	0.54***					
11. Age	38.07	11.40	0.29***	0.22***	-0.06*	-0.03	0.14**	0.19***	0.24***	0.12***	0.02	0.06*				
12. Gender (0 = male; 1 = female)	0.47	0.50	0.06**	0.09***	0.21***	-0.12***	-0.04	-0.13***	-0.19***	-0.22***	-0.14***	0.12***				
13. Religiosity	3.05	2.25	0.04	0.02	-0.05	0.11***	0.14**	-0.07**	-0.04	0.07**	-0.13***	-0.17***	0.22***			
14. Education (0 = low; 1 = high)	0.84	0.37	0.04	0.04	-0.02	0.09***	0.17**	0.12***	0.22**	0.17***	0.13***	0.10***	-0.01	0.00	0.09***	
15. Income (0 = low; 1 = high)	0.34	0.47	-0.07**	-0.06*	-0.17***	0.33***	0.39***	0.05	0.10**	0.25***	-0.05	-0.04	0.03	-0.05*	0.06**	0.11***

Note: Religiosity measures how often the respondent reads religious texts, goes to church or prays to God (1 = never; 2 = once each year; 3 = a few times each year; 4 = once each month; 5 = a few times a week; 6 = several times a week; 7 = every day). Respondents who have at most finished high school were categorized as low-education group (three categories: not finished junior high school, finished junior high school, and finished high school) and respondents who started or finished university/college as high-education group. Respondents earning up to \$49,999 yearly were categorized as low-income group (four categories: \$0, \$1 to \$9 999, \$10 000 to \$24 999, and \$25 000 to \$49 999) and respondents earning \$50,000 yearly or more as high-income group (four categories: \$50 000 to \$74 999, \$75 000 to \$99 999, \$100 000 to \$149 999, and \$150 000 and greater).

\*p < 0.10.  
\*\*p < 0.05.  
\*\*\*p < 0.01.

**Table 6**  
Financial anxiety as a function of financial bullshit score, financial knowledge, numeracy, and cognitive reflection.

	Dependent variable: financial anxiety					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>Predictors</b>						
Financial bullshit score	0.02 (.03)					0.04 (.03)
Objective financial knowledge		-0.20 (.03)***				-0.08 (.04)**
Subjective financial knowledge			-0.28 (.03)***			-0.26 (.03)***
Numeracy				-0.04 (.02)***		0.01 (.02)
Cognitive reflection					-0.05 (.03)*	-0.02 (.03)
<b>Controls</b>						
Age	-0.01 (.00)**	-0.00 (.00)	-0.00 (.00)	-0.01 (.00)**	-0.01 (.00)**	-0.00 (.00)
Gender (0 = male; 1 = female)	0.45 (.06)***	0.37 (.06)***	0.28 (.06)***	0.41 (.06)***	0.44 (.06)***	0.25 (.06)***
Religiosity	-0.03 (.01)*	-0.03 (.01)**	-0.02 (.01)	-0.03 (.01)**	-0.03 (.01)**	-0.02 (.01)*
Education (0 = low; 1 = high)	0.00 (.08)	0.13 (.08)	0.14 (.08)*	0.04 (.09)	0.03 (.09)	0.18 (.08)**
Income (0 = low; 1 = high)	-0.32 (.06)***	-0.29 (.06)***	-0.15 (.06)**	-0.33 (.06)***	-0.33 (.06)***	-0.14 (.06)**
Intercept	3.13 (.14)***	3.45 (.15)***	3.94 (.14)***	3.28 (.15)***	3.21 (.14)***	4.00 (.15)***
Observations	1,058	1,058	1,058	1,058	1,058	1,058
R <sup>2</sup>	0.08	0.11	0.19	0.08	0.08	0.20

Note: The dependent variable is the arithmetic mean of the financial anxiety items and can take values between 1 and 5. Predictors and controls are discrete or continuous variables except gender, education, and income which are binary variables. The Financial bullshit score takes a value between +5 (max ability to detect and distinguish financial bullshit) and -5 (max susceptible to financial bullshit), Objective financial knowledge takes a value between 0 and 4, Subjective financial knowledge takes a value between 1 and 7, Numeracy takes a value between 0 and 7, Cognitive reflection takes a value between 0 and 3. Results are ordinary least square (OLS) regressions. Robust standard errors are shown in parentheses.

\*p < 0.10.  
\*\*p < 0.05.  
\*\*\*p < 0.01.

situation (Model 1). Looking at the other variables and their association with financial anxiety we see that objective and subjective financial knowledge both were negatively associated with anxiety (Model 2 and Model 3, respectively) as was numeracy (Model 4). When entering all predictors into the model simultaneously objective and subjective financial knowledge remained the only significant predictors (Model 6).

### 3.3.2. Financial security

The financial bullshit score and financial security were significantly correlated ( $r = -0.13$ ;  $p < 0.01$ ). This means that consumer's ability to detect and distinguish bullshit from genuine financial statements was negatively related to consumers' feelings about their financial security. Table 7 further shows that the financial bullshit score was negatively and significantly related to financial security when controlling for demographics (Model 1). Objective financial knowledge was not associated with financial security (Model 2), while subjective financial knowledge had a significant positive association with financial security (Model 3). Both numeracy (Model 4) and cognitive reflection were not

significantly associated with financial security (Model 5).<sup>10</sup> When entering all predictors simultaneously the financial bullshit score remained a significant predictor (Model 6). Among the other variables, both objective and subjective financial knowledge were significant predictors; objective financial knowledge had a negative and subjective financial knowledge a positive association with financial security (Model 6).

### 3.4. Can the financial bullshit scale predict financial behavior?

There was no significant correlation between the financial bullshit score and financial behavior ( $r = 0.04$ ;  $p = 0.15$ ), showing that consumers' ability to detect and distinguish bullshit from genuine financial statements was not associated with self-reported financial behavior. There were however significant correlations between susceptibility to financial bullshit and single items included in the general measure of financial management

<sup>10</sup> It should be noted the cognitive reflection task has been extensively used among online subject pools. Thus, it is possible that the lack of effect related to it is due to a familiarity effect (Stieger and Reips, 2016).

**Table 7**  
Financial security as a function of financial bullshit score, financial knowledge, numeracy, and cognitive reflection.

	Dependent variable: financial security					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>Predictors</b>						
Financial bullshit score	−0.12 (.04) <sup>***</sup>					−0.10 (.03) <sup>***</sup>
Objective financial knowledge		0.05 (.04)				−0.08 (.04) <sup>**</sup>
Subjective financial knowledge			0.32 (.03) <sup>***</sup>			0.35 (.03) <sup>***</sup>
Numeracy				0.00 (.02)		−0.00 (.02)
Cognitive reflection					−0.05 (.03)	−0.03 (.03)
<b>Controls</b>						
Age	−0.00 (.00)	−0.01 (.00) <sup>*</sup>	−0.01 (.00) <sup>***</sup>	−0.01 (.00)	−0.00 (.00)	−0.01 (.00)
Gender (0 = male; 1 = female)	−0.28 (.07) <sup>***</sup>	−0.26 (.07) <sup>***</sup>	−0.09 (.07)	−0.28 (.07) <sup>***</sup>	−0.29 (.07) <sup>***</sup>	−0.11 (.07)
Religiosity	0.06 (.02) <sup>***</sup>	0.07 (.02) <sup>***</sup>	0.05 (.02) <sup>***</sup>	0.06 (.02) <sup>***</sup>	0.06 (.02) <sup>***</sup>	0.05 (.02) <sup>***</sup>
Education (0 = low; 1 = high)	0.16 (.09) <sup>*</sup>	0.11 (.10)	−0.02 (.09)	0.14 (.10)	0.16 (.09) <sup>*</sup>	0.05 (.09)
Income (0 = low; 1 = high)	0.77 (.07) <sup>***</sup>	0.79 (.07) <sup>***</sup>	0.60 (.07) <sup>***</sup>	0.79 (.07) <sup>***</sup>	0.79 (.07) <sup>***</sup>	0.57 (.07) <sup>***</sup>
Intercept	2.51 (.15) <sup>***</sup>	2.41 (.16) <sup>***</sup>	1.59 (.16) <sup>***</sup>	2.49 (.17) <sup>***</sup>	2.56 (.16) <sup>***</sup>	1.70 (.16) <sup>***</sup>
Observations	1,058	1,058	1,058	1,058	1,058	1,058
R <sup>2</sup>	0.14	0.14	0.24	0.14	0.14	0.25

Note: The dependent variable is the arithmetic mean of the financial security items and can take values between 1 and 5. Predictors and controls are discrete or continuous variables except gender, education, and income which are binary variables. The Financial bullshit score takes a value between +5 (max ability to detect and distinguish financial bullshit) and −5 (max susceptible to financial bullshit), Objective financial knowledge takes a value between 0 and 4, Subjective financial knowledge takes a value between 1 and 7, Numeracy takes a value between 0 and 7, Cognitive reflection takes a value between 0 and 3. Results are ordinary least square (OLS) regressions. Robust standard errors are shown in parentheses.

<sup>\*</sup> $p < 0.10$ .

<sup>\*\*</sup> $p < 0.05$ .

<sup>\*\*\*</sup> $p < 0.01$ .

behavior (see Table C1 in the Supplementary Materials). Table 8 shows that the general null effect related to financial behavior from the correlational analysis remained when controlling for consumers' financial knowledge, numeracy, cognitive reflection, and demographics in a series of OLS regressions. Multicollinearity is not an issue in any of these regression models because the highest VIF was 1.64. Among the other variables, objective and subjective financial knowledge were both positive and significantly related to financial behavior (Model 2 and Model 3, respectively) as was numeracy (Model 4). Cognitive reflection was not significantly associated with financial behavior (Model 5). When entering all predictors simultaneously only subjective financial knowledge remained a significant predictor (Model 6). These results mirror the descriptive results in that consumers' ability to detect and distinguish bullshit from genuine financial statements was not associated with how consumers manage their personal finances.

Susceptibility to financial bullshit was however associated with the ability to correctly assess claims about financial products and services that were described using opaque language and financial buzzwords ( $r = 0.32$ ;  $p < 0.01$ ). Table 9 shows that this effect remained when controlling for consumers' financial knowledge, numeracy, cognitive reflection, and demographics in a series of OLS regressions. The financial bullshit score, objective and subjective financial knowledge, numeracy, and cognitive reflection showed a positive association with scores on the financial buzzword task as single predictors (Model 1 to Model 5) and when entering all predictors simultaneously (Model 6). Multicollinearity is not an issue in any of these regression models because the highest VIF was 1.64. The financial bullshit scale was also able to predict ability on the financial buzzword task beyond what could be done using the general bullshit scale, further strengthening the incremental validity of the scale (see Table C2 in the Supplementary Materials).

#### 4. Discussion and conclusion

The ability to detect and distinguish profound statements (and information) from plain gibberish is crucial for individual's to effectively navigate any social system and make well informed

decisions. Finance is often portrayed as a complex and difficult area of decision making, where interactions commonly are characterized by jargon, acronyms, and slogans. This provides a hotbed for bullshitting to thrive and obscure the view of consumers. We developed and validated a novel measurement scale that allows us to measure individual differences in susceptibility to financial bullshit – the financial bullshit scale. We show that this scale captures a unique construct that is only moderately correlated with related constructs such as financial literacy and numeric ability. Moreover, we show that the ability to detect financial bullshit is distinctively separate from the ability to detect general bullshit and predict ability on the financial buzzword task beyond the original general bullshit scale.

Our results also provide insights into 'who is more susceptible for financial bullshit?'. Consumers particular vulnerable to financial bullshit were more likely to be young, male, have a higher income, and be overconfident with regards to their own financial knowledge. This finding is in line with prior research that found age to be positively related to people's ability to distinguish profound and pseudo-profound communication in general (Erlandsson et al., 2018). The finding that women showed a greater ability to detect and distinguish bullshit from genuine financial statements is a little surprising given that prior research has documented a persistent gender gap in financial literacy which partly can be attributed to stereotype threat, which posits that inbuilt prejudices about gender and finance undermine performance among women in tasks involving finance (Tinghög et al., 2021). The finding that higher income was positively related to being susceptible to financial bullshit might also be surprising. However, it seems reasonable to believe that as income rise consumers become less vigilant when it comes to financial matters and therefore less alert when it comes to detecting to be affected by impressive financial language. Much in the same way that scarcity requires trade-off thinking and makes people more efficient (Mullainathan and Shafir, 2013).

We also investigated the consequences susceptibility to financial bullshit has for financial well-being and financial behavior. Our results show that the financial bullshit scale predicted subjective financial well-being. In particular, consumers with an increasing ability to detect bullshit felt more insecure

**Table 8**  
Financial behavior as a function of financial bullshit score, financial knowledge, numeracy, and cognitive reflection.

	Dependent variable: financial behavior					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>Predictors</b>						
Financial bullshit score	0.02 (.02)					0.01 (.02)
Objective financial knowledge		0.12 (.02)***				0.03 (.02)
Subjective financial knowledge			0.19 (.02)***			0.18 (.02)***
Numeracy				0.04 (.01)***		0.02 (.01)
Cognitive reflection					0.02 (.02)	-0.02 (.02)
<b>Controls</b>						
Age	0.01 (.00)***	0.00 (.00)***	0.01 (.00)***	0.01 (.00)***	0.01 (.00)***	0.00 (.00)**
Gender (0 = male; 1 = female)	-0.07 (.04)*	-0.02 (.04)	0.05 (.04)	-0.04 (.04)	-0.07 (.04)	0.06 (.04)
Religiosity	0.03 (.01)***	0.03 (.01)***	0.02 (.01)***	0.03 (.01)***	0.03 (.01)***	0.03 (.01)***
Education (0 = low; 1 = high)	0.24 (.06)***	0.16 (.06)***	0.15 (.05)***	0.21 (.06)***	0.23 (.06)***	0.13 (.06)**
Income (0 = low; 1 = high)	0.59 (.04)***	0.56 (.04)***	0.47 (.04)***	0.59 (.04)***	0.58 (.04)***	0.47 (.04)***
Intercept	2.72 (.09)***	2.53 (.09)***	2.18 (.10)***	2.58 (.09)***	2.70 (.09)***	2.13 (.10)***
Observations	1,058	1,058	1,058	1,058	1,058	1,058
R <sup>2</sup>	0.20	0.22	0.29	0.20	0.19	0.29

Note: The dependent variable is the arithmetic mean of the FMBS items and can take values between 1 and 5. Predictors and controls are discrete or continuous variables except gender, education, and income which are binary variables. The Financial bullshit score takes a value between +5 (max ability to detect and distinguish financial bullshit) and -5 (max susceptible to financial bullshit), Objective financial knowledge takes a value between 0 and 4, Subjective financial knowledge takes a value between 1 and 7, Numeracy takes a value between 0 and 7, Cognitive reflection takes a value between 0 and 3. Results are ordinary least square (OLS) regressions. Robust standard errors are shown in parentheses.

\*p < 0.10.  
\*\*p < 0.05.  
\*\*\*p < 0.01.

**Table 9**  
The ability to judge claims about financial products as a function of financial bullshit score, financial knowledge, numeracy, and cognitive reflection.

	Dependent variable: financial buzzword task					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>Predictors</b>						
Financial bullshit score	.64 (.07)***					.47 (.06)***
Objective financial knowledge		.82 (.07)***				.41 (.08)***
Subjective financial knowledge			.50 (.06)***			.33 (.05)***
Numeracy				.39 (.04)***		.15 (.04)***
Cognitive reflection					.51 (.06)***	.19 (.06)***
<b>Controls</b>						
Age	.03 (.01)***	.02 (.01)***	.04 (.01)***	.04 (.01)***	.04 (.01)***	.01 (.01)**
Gender (0 = male; 1 = female)	-.69 (.13)***	-.31 (.13)**	-.35 (.14)**	-.34 (.14)**	-.51 (.13)***	-.13 (.13)
Religiosity	-.11 (.03)***	-.08 (.03)***	-.13 (.03)***	-.08 (.03)**	-.06 (.03)*	-.07 (.03)**
Education (0 = low; 1 = high)	.72 (.18)***	.29 (.17)*	.57 (.18)***	.52 (.18)***	.60 (.19)***	.13 (.17)
Income (0 = low; 1 = high)	.24 (.14)*	.00 (.14)	-.18 (.15)	.23 (.14)	.19 (.14)	.01 (.13)
Intercept	9.21 (.27)***	8.03 (.29)***	7.90 (.32)***	8.00 (.30)***	8.57 (.30)***	6.89 (.32)***
Observations	1,058	1,058	1,058	1,058	1,058	1,058
R <sup>2</sup>	0.16	0.20	0.16	0.18	0.15	0.30

Note: The dependent variable is the sum of correct answers and can take values between 0 and 16. Predictors and controls are discrete or continuous variables except gender, education, and income which are binary variables. Financial bullshit score takes a value between +5 (max ability to detect and distinguish financial bullshit) and -5 (max susceptible to financial bullshit), Objective financial knowledge takes a value between 0 and 4, Subjective financial knowledge takes a value between 1 and 7, Numeracy takes a value between 0 and 7, Cognitive reflection takes a value between 0 and 3. Results are ordinary least square (OLS) regressions. Robust standard errors are shown in parentheses.

\*p < 0.10.  
\*\*p < 0.05.  
\*\*\*p < 0.01.

about their finances. Put differently, consumers worse at distinguishing between bullshit and genuine communication exhibited an *ignorance-is-bliss effect* when it came to subjective financial well-being. This *ignorance-is-bliss effect* did however not extend to self-reported financial behavior in our study. Considering these results, being able to detect and distinguish bullshit from genuine financial statements is neither unequivocally a good nor a bad thing. On the good side, people who were less susceptible to financial bullshit displayed a greater ability on a number of financially relevant competencies (e.g., greater objective financial knowledge). On the bad side, susceptible to bullshit was also related to a decrease in perceived financial security about their own future financial situation.

Even if the financial bullshit scale was related to financial well-being, we did not find a systematic relationship to self-reported financial behaviors. The financial management behavior scale

taps into everyday household finance behaviors and management strategies (e.g., keep a budget, pay bills on time). Prior research demonstrated that this scale is related to both self-control and financial well-being (Strömbäck et al., 2017; Strömbäck et al., 2020). In hindsight these general behaviors are likely less strongly related to individual differences in susceptibility to financial bullshit, than behaviors containing financial bullshit (e.g., purchase of questionable financial products or evaluating misleading claims about the financial performance of products). Our results, showing that susceptibility to financial bullshit was related to financial buzzword comprehension but not general financial behavior supports this notion. We also note that, the present research relates to research on overclaiming in the financial domain. For instance, previous research on overclaiming (e.g., Atir et al., 2015) used people's self-assessed financial knowledge and compared it to their knowledge claims of fictional finance terms. We, on the



other hand, used people's self-assessed financial knowledge and compared it with their actual knowledge. We also showed that people's financial sophistication can be related to their financial bullshit score.

Ideally the financial bullshit scale can be used in future research to advance understanding on how to make individuals better equipped to distill financial communication and navigate the financial landscape. As done here, the scale can be used to identify customers that are vulnerable to fall prey to seemingly impressive statements that could be misleading in negotiations and other financial situations involving human interactions (for more research on financial vulnerability, see O'Connor et al., 2019). By extending research on the psychology of bullshit into the domain of financial decision making we hope to spur future research on what we think is an overlooked topic in consumer research; the impact (bad) financial communication has on consumer financial decision making.

Finally, the present study has practical implications for financial institutions and policy makers. First, our results show that consumers vary in their susceptibility to financial bullshit and certain groups of consumers are more vulnerable to it than others. This information can be an important steppingstone for designing tailored interventions. For example, interventions aimed at helping consumers to make better decisions about their personal finances. Second, financial institutions need to consider that consumers with an increasing ability to detect bullshit felt more insecure about their finances. This suggests that financial institutions need to apply nuanced strategies to serve their customer base. For instance, help customers who can distinguish genuine and bullshit financial communication to feel more secure in their money matters rather than to merely provide them with sound financial advice. This should lead to positive consequences for actual and perceived financial well-being.

### CRedit authorship contribution statement

**Mario Kienzler:** Conceptualization, Methodology, Formal analysis, Writing – original draft, Writing – review & editing. **Daniel Västfjäll:** Conceptualization, Methodology, Writing – review & editing. **Gustav Tinghög:** Conceptualization, Methodology, Writing – original draft, Writing – review & editing.

### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Acknowledgments

The authors thank all members of JEDILab who provided helpful comments and suggestions on the research reported herein. We also thank Simon Daveby och Jesper Ekvall for help with collecting the data.

### Funding

Mario Kienzler gratefully acknowledges financial support from the Jan Wallander and Tom Hedelius Foundation, Sweden (grant number W19-0018). The funding source had no involvement in conducting, preparing, or publishing the research reported herein.

### Appendix A. Supplementary data

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.jbef.2022.100655>.

### References

- Atir, Stav, Emily, Rosenzweig, David, Dunning, 2015. When knowledge knows no bounds: Self-perceived expertise predicts claims of impossible knowledge. *Psychol. Sci.* 26 (8), 1295–1303.
- Brüggen, Elisabeth C., Hogreve, Jens, Holmlund, Maria, Kabadayi, Sertan, Löfgren, Martin, 2017. Financial well-being: A conceptualization and research agenda. *J. Bus. Res.* 79, 228–237.
- Churchill, Gilbert A., 1979. A paradigm for developing better measures of marketing constructs. *J. Mar. Res.* 16 (1), 64–73.
- Dew, Jeffery, Xiao, Jing Jian, 2011. The financial management behavior scale: Development and validation. *J. Financial Couns. Plan.* 22 (1), 43–59.
- Erlansson, Arvid, Nilsson, Artur, Tinghög, Gustav, Västfjäll, Daniel, 2018. Bullshit-sensitivity predicts prosocial behavior. *PLoS One* 13 (7), 1–12.
- Frankfurt, Harry G., 2005. *On Bullshit*. Princeton University Press, Princeton, NJ.
- Fünfgeld, Brigitte, Wang, Mei, 2009. Attitudes and behaviour in everyday finance: Evidence from Switzerland. *Int. J. Bank Mark.* 27 (2), 108–128.
- Hair, Joseph F., Black, William C., Babin, Barry J., Anderson, Rolph E., 2014. *Multivariate Data Analysis*. Prentice Hall, Upper Saddle River, NJ.
- Littrell, Shane, Risko, Evan F., Fugelsang, Jonathan A., 2021. The bullshitting frequency scale: Development and psychometric properties. *Br. J. Soc. Psychol.* 60 (1), 248–270.
- McCarthy, Ian P., David Hannah, Leyl, Pitt, F., McCarthy, Jane M., 2020. Confronting indifference toward truth: Dealing with workplace bullshit. *Bus. Horizons* 63 (3), 253–263.
- Mullainathan, Sendhil, Shafir, Eldar, 2013. *Scarcity: Why Having Too Little Means So Much*. Picador, New York, NY.
- Netemeyer, Richard G., Warmath, Dee, Fernandes, Daniel, Lynch, Jr., John G., 2017. How am I doing? Perceived financial well-being, its potential antecedents, and its relation to overall well-being. *J. Consum. Res.* 45 (1), 68–89.
- O'Connor, Genevieve E., Newmeyer, Casey E., Wong, Nancy Yee Ching, Bayuk, Julia B., Cook, Laurel A., Komarova, Yuliya, Loibl, Cazilla, Ong, L. Lin, Warmath, Dee, 2019. Conceptualizing the multiple dimensions of consumer financial vulnerability. *J. Bus. Res.* 100, 421–430.
- Patel, Alice, 2019. A snapshot: Today's car insurance customer. <https://blog.clearcover.com/posts/car-insurance-customer-research>.
- Pennycook, Gordon, Cheyne, James Allan, Barr, Nathaniel, Koehler, Derek J., Fugelsang, Jonathan A., 2015. On the reception and detection of pseudo-profound bullshit. *Judgm. Decis. Mak.* 10 (6), 549–563.
- Pennycook, Gordon, Rand, David G., 2020. Who falls for fake news? The roles of bullshit receptivity, overclaiming, familiarity, and analytic thinking. *J. Pers.* 88 (2), 185–200.
- Petrocelli, John V., 2018. Antecedents of bullshitting. *J. Exp. Soc. Psychol.* 76, 249–258.
- Rowe, Becky, De Ionno, Damon, Peters, Dominique, Wright, Hannah, 2015. Mind the gap – Consumer research exploring experiences of financial exclusion across the UK. <https://www.fca.org.uk/publication/research/mind-the-gap.pdf>.
- Spicer, André, 2018. *Business Bullshit*. Routledge, New York, NY.
- Stieger, Stefan, Reips, Ulf-Dietrich, 2016. A limitation of the cognitive reflection test: Familiarity. *PeerJ* 4, e2395. <http://dx.doi.org/10.7717/peerj.2395>.
- Strömbäck, Camilla, Lind, Thérèse, Skagerlund, Kenny, Västfjäll, Daniel, Tinghög, Gustav, 2017. Does self-control predict financial behavior and financial well-being? *J. Behav. Exper. Finance* 14, 30–38.
- Strömbäck, Camilla, Skagerlund, Kenny, Västfjäll, Daniel, Tinghög, Gustav, 2020. Subjective self-control but not objective measures of executive functions predicts financial behavior and well-being. *J. Behav. Exper. Finance* 27, 100339.
- The Jamovi Project, 2020. Jamovi (Version 1.2). <https://www.jamovi.org>.
- Tinghög, Gustav, Ahmed, Ali, Lind, Therese, Skagerlund, Kenny, Västfjäll, Daniel, 2021. Gender differences in financial literacy: The role of stereotype threat. *J. Econ. Behav. Organ.* 192, 405–416.
- Turpin, Martin Harry, Kara-Yakoubian, Mane, Walker, Alexander C., Walker, Heather E.K., Fugelsang, Jonathan A., Stolz, Jennifer A., 2020. Bullshit ability as an honest signal of intelligence. <http://dx.doi.org/10.31234/osf.io/aru3f>.
- Turpin, Martin Harry, Walker, Alexander C., Kara-Yakoubian, Mane, Gabert, Nina N., Fugelsang, Jonathan A., Stolz, Jennifer A., 2019. Bullshit makes the art grow profounder. *Judgm. Decis. Mak.* 14 (6), 658–670.
- VisibleThread, 2019. 58% Of bank content inaccessible to the average American: An investigation into the communication of 50 of the U.S.' largest banks. <https://www.experienthisshow.com/wp-content/uploads/2019/04/Visible-Thread-US-Banks-Report.pdf>.
- Walker, Alexander C., Turpin, Martin Harry, Stolz, Jennifer A., Fugelsang, Jonathan A., Koehler, Derek J., 2019. Finding meaning in the clouds: Illusory pattern perception predicts receptivity to pseudo-profound bullshit. *Judgm. Decis. Mak.* 14 (2), 109–119.