


ORIGINAL ARTICLE

The impact of social desirability bias on conspiracy belief measurement across cultures

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Abstract

Polls asking respondents about their beliefs in conspiracy theories have become increasingly commonplace. However, researchers have expressed concern about the willingness of respondents to divulge beliefs in conspiracy theories due to the stigmatization of those ideas. We use an experimental design similar to a list experiment to decipher the effect of social desirability bias on survey responses to eight conspiratorial statements. Our study includes 8290 respondents across seven countries, allowing for the examination of social desirability bias across various political and cultural contexts. While the proportion of individuals expressing belief in each statement varies across countries, we observe identical treatment effects: respondents systematically underreport conspiracy beliefs. These findings suggest that conspiracy beliefs may be more prominent than current estimates suggest.

Keywords: Conspiracy theory; measurement error; misinformation; social desirability bias; trust

As evidence that conspiracy beliefs hinder pro-social behaviors while promoting anti-social ones has stockpiled (van der Linden, 2015; Jolley *et al.*, 2019; Imhoff and Lamberty, 2020), understanding why individuals believe in conspiracy theories has increasingly become a priority for scholars across disciplines (e.g., Butter and Knight, 2020). While many researchers employ surveys to measure beliefs in various conspiracy theories (e.g., Oliver and Wood, 2014; Cassino, 2016; Miller *et al.*, 2016),¹ some are beginning to question the various ways in which surveys may generate biased estimates of such beliefs (Berinsky, 2018; Enders and Smallpage, 2018a; Lopez and Hillygus, 2018). Should systematic measurement error exist, it would distort not only academic attempts at understanding the causes and consequences of conspiracy beliefs, but also disrupt the official communications, informational campaigns, and efforts at belief correction that rely on survey research (Berinsky, 2015; Roozenbeek *et al.*, 2020).

Measurement issues are always complicated when scholars try to understand individuals' beliefs, but they are especially so when trying to measure beliefs in ideas that (1) appear ridiculous to some respondents (Lopez and Hillygus, 2018), (2) allow respondents to express a broader attitude, despite not agreeing with the specific proposition (Schaffner and Luks, 2018), or (3) address ideas or behaviors the respondent may want to conceal (Clifford and Jerit, 2015). This third instance, the primary concern of this study, is often referred to as *social desirability bias*. Social desirability bias is a type of response bias whereby subjects systematically alter their responses to certain stimuli because they do not want to admit to holding a belief (or engaging

¹We refer to beliefs in conspiracy theories—i.e., that a person agrees, endorses, or views a particular conspiracy theory as likely true—as *conspiracy beliefs*.

in conduct) that would clash with social norms or otherwise cause others (e.g., interviewers) to judge them negatively (Holbrook *et al.*, 2003; Gonzalez-Ocantos *et al.*, 2012).

Social desirability bias is a particularly critical concern when it comes to conspiracy theories, which are habitually—even definitionally, in some cases—treated as fringe and oftentimes widely stigmatized (Lantian *et al.*, 2018). This negative view of conspiracy theories is likely reinforced by media coverage, which frequently focuses on both the eccentricity and potential danger of conspiracy theories. Thus, the measurement of conspiracy beliefs is likely quite susceptible to social desirability bias, though only a few studies have examined this proposition, and in fairly limited ways (Wood, 2016; Berinsky, 2018).

We examine the effect of social desirability bias on the measurement of conspiracy beliefs using a survey administered to 8290 respondents across seven countries: Great Britain, Germany, Sweden, Portugal, Italy, Poland, and Argentina. Examining social desirability bias using a cross-comparative design is crucial, as what is socially acceptable is completely contingent on cultural norms. There can be no bias without social pressure, and which beliefs people feel social pressure to suppress is likely to vary across contexts. Thus, a complete examination of the impact of social desirability bias on the measurement of conspiracy beliefs—i.e., one that can generalize beyond the confines of one society—requires testing across different social and political contexts.

We estimate the extent of social desirability bias using an experimental design similar in structure to list experiments. In the control group, respondents were asked to reveal which of eight conspiratorial sentiments they agree with; in the treatment group, they were asked only *how many* of the eight sentiments they agreed with. While many respondents, across contexts, express general conspiratorial sentiments about concentrated power and secret government plots, far fewer respondents openly endorse specific conspiracy theories regarding the intentional spread of the AIDS virus or Holocaust denial, for example. Most importantly, we find—across these political and cultural contexts—that respondents systematically underreport their agreement with our list of specific conspiracy theories and more general conspiratorial propositions.

Our findings have multiple implications, both substantive and empirical. That public opinion polls appear to be systematically undercounting beliefs in conspiracy theories suggests, on the one hand, that the scope of the social problem posed by such beliefs may be greater than previously understood. On the other hand, that social desirability concerns are biasing our estimates also suggests that conspiracy theories are still perceived to be fringe, socially unacceptable beliefs. In other words, even though conspiracy beliefs are being underestimated, they are still far from “mainstream.” Our results also have implications for the measurement of conspiracy beliefs and the development of strategies for correcting such beliefs. Simply put, if surveys are systematically undercounting conspiracy beliefs, the efficacy of strategies to correct beliefs in conspiracy theories and even some misinformation—which rely on exposing people to precisely the kind of conspiratorial information that triggers social desirability bias—may be questionable. We further elaborate on these and additional implications below.

Measuring conspiracy beliefs

Before a researcher can decide *how* to measure something, they are first required to answer a theoretical question about *what*, exactly, they intend to measure. In this vein, measuring conspiracy beliefs requires researchers to determine what *counts* both as a “conspiracy theory” and as “belief” before they can measure such beliefs. In this way, measurement difficulties are not independent from theoretical ones, but intimately related: “measurement is theory-testing” (Jacoby, 1999). If researchers are measuring conspiracy beliefs incorrectly, or if they are not properly accounting for potential biases, then our theoretical understanding will also be skewed.

Many researchers understand conspiracy theories—explanations of past, present, or future events or circumstances that cite as the primary cause a small group of powerful people working in secret, for their own benefit, against the common good, and in a way that undermines societal

norms or laws (Uscinski, 2020)—to be *precisely* the kind of ideas that are prone to “social desirability bias” (Wood, 2016; Lantian *et al.*, 2018; Orr and Husting, 2018; Thalmann, 2019). Early studies conceptualized conspiracy theories as marginalized or stigmatized ideas (e.g., Hofstadter, 1964; Pipes, 1997) and some definitions of the term explicitly incorporate the criterion that very few people believe them (e.g., Freeman and Bentall, 2017). Of course, such understandings have driven the *theoretical* understanding of conspiracy theories to be something concentrated on the fringes, with social scientists therefore focusing on finding them among the marginalized and less powerful (Goertzel, 1994; Waters, 1997; Bird and Bogart, 2003; Simmons and Parsons, 2005; Avery, 2006; Rousseau and Jamil, 2008; Mattocks *et al.*, 2017).

However, as polling data have continually demonstrated, conspiracy beliefs are widely held in numerous countries (Oliver and Wood, 2014; Hogg *et al.*, 2017; Nyhan and Zeitzoff, 2018; Soral *et al.*, 2018), even by majorities in some instances (e.g., Drochon, 2018; Enders and Smallpage, 2018b). This has shifted researchers’ views of conspiracy theories over time, with beliefs in such theories now being recognized as “commonplace” (Miller and Saunders, 2016, see also Barkun, 2016). Furthermore, the conceptualization of conspiracy theories as the province of the marginalized, powerless, and socially excluded has been deeply criticized (e.g., Nyhan and Zeitzoff, 2018). This is not to say, however, that social desirability biases do not play a role in researchers’ measurements of these beliefs in surveys. Indeed, recent research suggests that while “conspiracy theory,” as a general concept, may carry less social stigma than one might expect (Wood, 2016), specific conspiracy theories may carry enough stigma to encourage people to conceal related beliefs (Lantian *et al.*, 2018).

The impact of social desirability

Regardless of a changing scientific consensus on who believes in conspiracy theories and why, popular narratives frequently describe conspiracy theories and theorists as irrational, fringe, and extreme (Thalmann, 2019; Bratich, 2008; Coady, 2018; Orr and Husting, 2018). Studies show that people who believe conspiracy theories “actively resist their stigmatization” by framing their theories in other ways (Harambam and Aupers, 2017), likely because they expect to “be socially excluded when they express endorsement” of specific theories (Lantian *et al.*, 2018). This explains why, when espousing conspiracy theories, many people opt for a “just asking questions” style of argumentation, rather than directly expressing their theories (Wood, 2018, see also Wood and Douglas, 2013). The stigmatization encouraging this behavior may not just be perceived: for example, “conspiracy theorists,” as a group, are rated on surveys more negatively than other groups, such as members of the out-party (Smallpage, 2018). Moreover, there seems to be little public tolerance for the advocacy of certain conspiracy theories, such as those regarding school shootings (Smallpage, 2018).

Outside of the popular usage of the term, conspiracy theories have even been pathologized in the scholarly literature (Butter and Knight, 2018). Social scientists and philosophers have, historically, dismissed conspiracy theories outright (Popper, 1972), treating them as “irrational” (Harambam and Aupers, 2015) or reducing them to “vices” (Cassam, 2016). Some scholars have even proposed that we combat conspiracy beliefs with ridicule (Orosz *et al.*, 2016) or by sending undercover government agents into chat rooms to engage in “cognitive infiltration” (Sunstein and Vermeule, 2009). All this is to further demonstrate the scope of the stigmatization of conspiracy beliefs: even scholars who better understand the rational political, psychological, and social ingredients of conspiracy beliefs now, nevertheless once chalked them up to the bizarre beliefs of an irrational few (and a minority continue to do so).

Despite ample reason to anticipate social desirability bias, there exists limited empirical evidence that conspiracy beliefs are being underestimated on surveys in this way. Survey respondents are more likely than not to register belief in at least one conspiracy theory when queried about several (Goertzel, 1994; Oliver and Wood, 2014), they are no less likely to register belief in a

proposition when it is called a “conspiracy theory” rather than a mere “idea” (Wood, 2016), and when social scientists broaden the *types* of questions asked—seeking to measure general conspiratorial orientations—positive response rates become quite high (Drinkwater *et al.*, 2020; Miller, 2020).

Thus, we are left with a conflicted literature. On the one hand, there is evidence showing that people do not want to label their beliefs as conspiracy theories (Wood and Douglas, 2013), do not want to express conspiracy theories publicly (Lantian *et al.*, 2018), and stigmatize conspiracy theorists in society (Smallpage, 2018). On the other hand, people are no less likely to express belief in ideas labeled as conspiracy theories (Wood, 2016) and many respondents—sometimes majorities—express belief in specific conspiracy theories and general conspiratorial views on surveys (Uscinski *et al.*, 2016, Enders and Smallpage, 2018b). It is, therefore, imperative that survey researchers address the question of whether social desirability bias matters in the context of conspiracy beliefs or not. Attempting to integrate the disparate findings, we might surmise from the literature that people may not have an aversion to believing in conspiracy theories in general but may not want to admit to those beliefs in some circumstances, perhaps because they may want to avoid the stigma attached to being labeled a conspiracy theorist for expressing belief in a specific idea. The literature, therefore, leads us to a testable hypothesis:

H₁: People systematically underreport their conspiracy beliefs when they have to explicitly denote which theories they believe in.

Testing social desirability across contexts

The basic nature and scope of social desirability bias are rooted in culture: people are dissuaded from revealing beliefs (or behaviors) because of social norms about what is (not) acceptable (Keillor *et al.*, 2001; Johnson and Van de Vijver, 2003; Bou Malham and Saucier, 2016). For example, in Argentina, there is a prominent OVNI (objeto volador no identificado, or “unidentified flying object”) culture regarding alien sightings that might make UFO conspiracy theories more socially acceptable than other ones (Sheinin, 2018). Moreover, some countries may have histories littered with more instances of actual conspiracies than others—this, too, may result in conspiracy theories being more acceptable explanations for salient phenomena. In this light, we might expect that the impact of social desirability bias on conspiracy belief estimation can vary across cultural contexts based on the acceptance of conspiracy theories in each culture. The level of conspiracy stigmatization in a given culture can find roots in factors such as societal norms regarding interest and involvement in politics, as well as norms concerning political discourse. It may also be influenced by the shape and form of political and economic institutions, the performance of those institutions, and both recent and past events and circumstances.

With an eye toward this potential impact of cultural variability, we test our hypothesis across seven countries: Great Britain, Germany, Sweden, Portugal, Italy, Poland, and Argentina (Drochon, 2018). This sampling of countries provides variation along numerous dimensions. For example, our sample includes European countries that geographically span the continent, as well as a South American state (Argentina). These states also vary considerably in nominal gross domestic product (e.g., Germany at \$3.6 trillion versus Poland at \$0.5 trillion), population size (e.g., Germany at 84 million versus Sweden at 10 million), and income inequality according to the GINI index (e.g., Argentina at 41 versus Sweden at 29). Finally, these countries vary in their political systems, levels of civic engagement, and other cultural norms that may impact how conspiratorial ideas are generally treated in society.

While we do not construct specific hypotheses linking these many factors to the expression of conspiracy beliefs, our intention is to provide for the possibility that political, social, and cultural norms—which vary across countries—may impact the nature and scope of social desirability bias. Moreover, allowing for cross-national variation in the social desirability dynamic will result in our

empirical test, which we describe in the next section, resting on firmer grounds than the majority of conspiracy belief research, most of which is examined in the context of a single or very few countries.

Data and method

In order to test our hypothesis, we use an experimental design similar to a list experiment (e.g., Lax *et al.*, 2016). Within each of the seven country-samples listed above, respondents were randomly assigned to either a control or treatment condition. Those in the control group selected which of eight distinct statements they believed; this was done via radio buttons whereby respondents simply checked a box next to the beliefs they hold. The specific question was, “Which, if any, of the following statements would you say are true? (Please select all that apply).” The treatment group was instructed to read the entire list of eight statements and indicate only *how many* of the statements they believed, but not which ones. If social desirability bias causes people to conceal conspiracy beliefs, we should observe that the number of conspiracy beliefs reported by the treatment group exceeds that reported by the control group. The statements, which appear identically across all seven countries, are as follows (labels in parentheses):

1. Even though we live in what’s called a democracy, a few people will always run things in this country anyway (*Elite Control*).
2. Secret plots that harm the nation are more common in this country than in other countries (*Secret Plots*).
3. Humans have made contact with aliens and this fact has been deliberately hidden from the public (*Alien Contact*).
4. The AIDS virus was created and spread around the world on purpose by a secret group or organization (*AIDS Virus*).
5. Regardless of who is officially in charge of governments and other organizations, there is a single group of people who secretly control events and rule the world together (*Control World*).
6. The official account of the Nazi Holocaust is a lie and the number of Jews killed by the Nazis during World War II has been exaggerated on purpose (*Holocaust Denial*).²
7. The idea of man-made global warming is a hoax that was invented to deceive people (*Global Warming*).
8. The Government is deliberately hiding the truth about how many immigrants really live in this country (*Hide Immigrants*).

This is, of course, an inexhaustive list of conspiracy theories—an unavoidable feature of conspiracy belief scholarship given the seemingly infinite number of conspiracy theories (Uscinski, 2020). That said, this list includes a broad range of conspiratorial ideas. Some are specific conspiracy theories (*Alien Contact*, *AIDS Virus*, *Holocaust Denial*, *Global Warming*, *Hide Immigrants*), while others are more general conspiratorial sentiments (*Elite Control*, *Secret Plots*, *Control World*). Furthermore, these statements address a range of topical domains around which conspiracy theories are oftentimes constructed, including the paranormal (*Alien Contact*), immigrants and minority groups (*Hide Immigrants*, *Holocaust Denial*), and scientific and medical issues (*AIDS Virus*, *Global Warming*). As our hypothesis does not specify, and our empirical test does not require, people in each country to report the same number of beliefs about the same

²The *Holocaust Denial* question is absent only from the German sample because asking about Holocaust denial is illegal in Germany. This does not impact any of our analyses or findings, as we show below. We also include a replication of the model on the combined sample presented in Table 1, omitting Germany, in the Appendix.

conspiracy theories and conspiratorial propositions, this variability in the conspiracy theories we employ is a virtue of the study.

All surveys were conducted in March 2016 using an online interview administered to members of panels that YouGov constructed and maintains. Emails were sent to panelists selected at random from the base sample. The responding sample was then weighted on age, gender, and region to reflect the composition of each country's population using available census data.³ Sample sizes and fielding dates for each country are as follows: Great Britain ($n = 1742$; 3/11/2016–3/14/2016), Germany ($n = 2039$; 3/9/2016–3/11/2016), Sweden ($n = 1007$; 3/11/2016–3/14/2016), Portugal ($n = 500$; 3/8/2016–3/29/2016), Italy ($n = 1001$; 3/8/2016–3/21/2016), Poland ($n = 1000$; 3/8/2016–3/21/2016), and Argentina ($n = 1001$; 3/8/2016–3/21/2016). The survey was originally written in English and translated into the other languages by either the YouGov offices in those countries (in the case of Germany, Poland, Italy, Sweden) or certified partners (in the case of Argentina and Portugal). We include a table of substantive and sociodemographic characteristics of each sample in the Appendix.

Results

We begin our analysis by simply examining the distribution of a count of the conspiracy beliefs respondents hold—across experimental conditions—by country. This appears in [Figure 1](#). In each instance, the distribution of conspiracy beliefs is positively skewed such that most respondents express very few, if any, conspiracy beliefs. The median number of conspiracy beliefs is 2 for all countries but Great Britain and Sweden, for which it is 1. Sweden, exhibiting the greatest skew, is the only country with a modal value of 0 conspiracy beliefs. These distributions leave us with a somewhat mixed picture of conspiracy beliefs across countries: on the one hand, there is visible cross-comparative variability in the number of conspiracy beliefs people report; on the other, most people appear to believe in 0–2 of the conspiracy theories we polled, with very few believing more than 3.

In order to better understand how conspiracy beliefs vary across political and cultural contexts, we next plot the proportion of individuals in each country subscribing to each conspiracy theory in [Figure 2](#).⁴ The *Holocaust Denial* belief receives the lowest levels of support across countries (3 percent, on average), followed by *AIDS Virus* (7 percent), *Global Warming* (9 percent), and *Alien Contact* (10 percent). Note, however, that a significantly higher proportion of Argentines believe the *AIDS Virus* (21 percent) and *Alien Contact* (25 percent) conspiracy theories, and a significantly greater number of Poles believe the *Global Warming* theory (17 percent).

There is even greater variability in the more general conspiracy theories, though they tend to find more support, on average: *Elite Control* (53 percent across countries), *Hide Immigrants* (32 percent), *Control World* (24 percent), and *Secret Plots* (14 percent). For example, more Britons and Germans express belief in the *Hide Immigrants* theory (42 and 43 percent, respectively). This is also the only theory for which Sweden does not exhibit the lowest proportion of believers (either statistically lower or tied for lowest). The *Elite Control*, *Control World*, and *Secret Plots* theories all receive the most support among the Portuguese, with high or middling numbers among Poles, Italians, and Argentines.

This analysis establishes that there is considerable variability in which conspiracy theories find support in each of the seven countries we examine. Recall that we welcome this variability. If what is “acceptable” or “unacceptable” in a given culture—which surely plays some important part in causing the observed variability in [Figure 2](#)—determines the nature and magnitude of social

³Although YouGov's sampling process does not yield a truly random sample, we emphasize that the experimental nature of our research design does not require a true random sample.

⁴This analysis is, by nature of the experimental design, restricted to control group respondents who identified particular conspiracy theories that they believe.

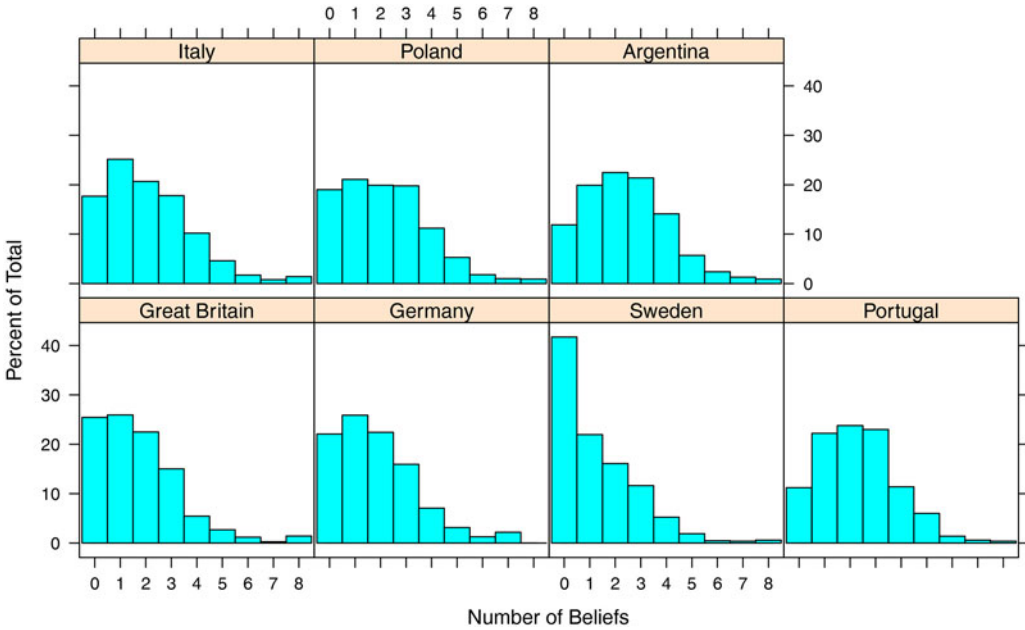


Figure 1. Distribution of conspiracy belief count in each country.

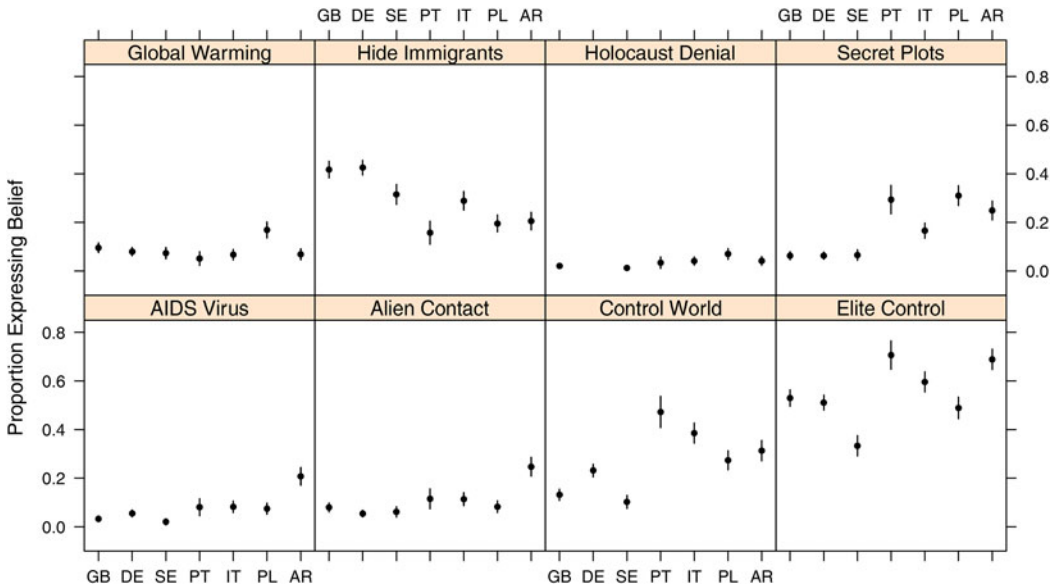


Figure 2. Proportion of individuals who believe each conspiracy theory, by country. Vertical bars represent 95 percent confidence intervals.

desirability bias, it is critical for any complete investigation of the impact of social desirability bias to consider multiple contexts. Even though examination of more South American, African, and Asian cultures—where inadequate census records, hostile political climates, unsuitable communication technology, and other issues frequently prevent high-quality polling—would surely

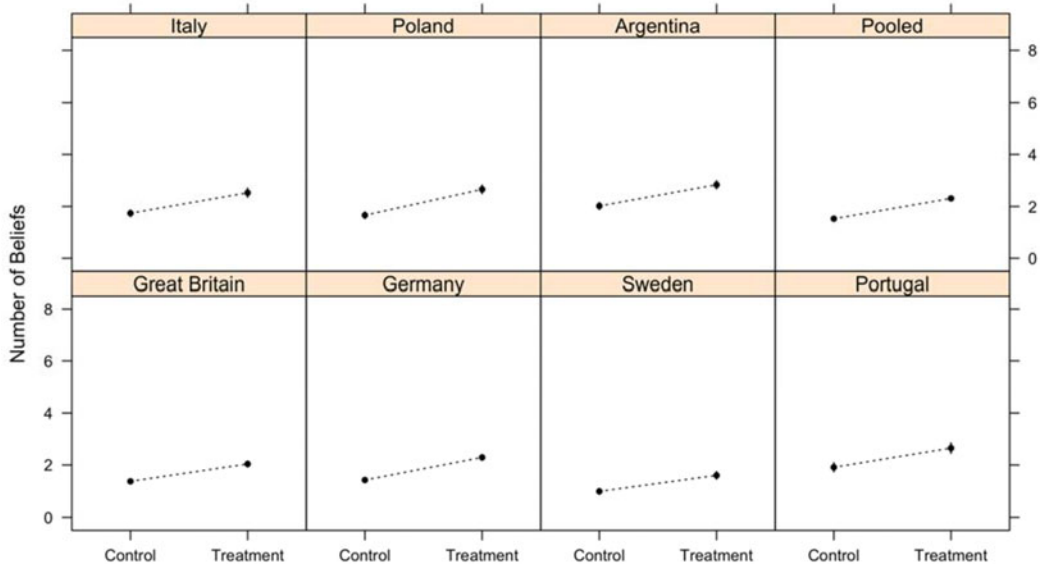


Figure 3. Average count of conspiracy beliefs, by experimental condition and country. Vertical bars represent 95 percent confidence intervals. The “Pooled” panel contains the average across all countries. Treatment effect is significant at $p < 0.001$ in each case (Bonferroni-corrected).

strengthen our analysis, we are nevertheless capturing considerable cross-national variability in both socio-political characteristics and specific observed conspiracy beliefs.

Turning to our examination of experimental results, we first plot the average count of conspiracy beliefs, by experimental condition and country, in [Figure 3](#); we also include an eighth panel with the control and treatment group means pooled across all countries. The pattern is remarkably consistent across countries: in every case, the treatment group—in which respondents only listed the number of conspiracy theories they believe—exhibits a statistically greater number of conspiracy beliefs ($p < 0.001$ in each case, Bonferroni-corrected).⁵ This difference is 0.78 beliefs on average, ranging from a low of 0.61 in Sweden to a high of 1.00 in Poland. Cohen’s d , a standardized measure of effect size, are as follows for each country: Great Britain ($d = 0.42$, 95 percent CI 0.33–0.51), Germany ($d = 0.56$, 95 percent CI 0.48–0.64), Sweden ($d = 0.41$, 95 percent CI 0.29–0.54), Portugal ($d = 0.50$, 95 percent CI 0.32–0.68), Italy ($d = 0.48$, 95 percent CI 0.35–0.60), Poland ($d = 0.61$, 95 percent CI 0.50–0.72), and Argentina ($d = 0.50$, 95 percent CI 0.38–0.63). In other words, the count of conspiracy beliefs in the treatment group is, on average, 0.50 standard deviations higher than the count in the control group. According to conventional rules of thumb, these represent medium–large effect sizes.

Even though random assignment to the two experimental conditions appears to be balanced (see the Appendix for a randomization check), we opted to provide a conservative assessment of the treatment effects in the context of regression models. This allows us to control for a profile of covariates that might impact our estimate of the treatment effect and to check for potential heterogeneous treatment effects. In [Table 1](#) we present the results from OLS regressions for each country, including controls for trust in the media, trust in government, trust in family and friends, political ideology, religious thinking, educational attainment, employment status, age, gender, and one’s perception of how democratic their country is. Details about the measurement

⁵Also see the Supplemental Appendix for the results of a balance test and a post-hoc sensitivity analysis. The former shows balance between control and treatment groups across a variety of covariates. The latter reveals that our design is adequately powered to detect effects much smaller than those we observe.

Table 1. Regressions of count of conspiracy beliefs on treatment indicator and controls, by country

	GB	DE	SE	PT	IT	PL	AR	Pooled
Treatment group	0.546*** (0.087)	0.854*** (0.075)	0.627*** (0.098)	0.631*** (0.159)	0.662*** (0.116)	0.965*** (0.136)	0.888*** (0.128)	0.737*** (0.040)
Trust in media	0.035 (0.064)	-0.157** (0.052)	-0.036 (0.068)	-0.057 (0.122)	-0.147 (0.084)	-0.049 (0.097)	0.073 (0.098)	-0.086** (0.028)
Trust government	-0.431*** (0.069)	-0.330*** (0.053)	-0.129 (0.072)	-0.074 (0.132)	-0.063 (0.090)	-0.010 (0.110)	-0.201* (0.088)	-0.226*** (0.030)
Trust family/friends	0.016 (0.084)	0.138 (0.072)	-0.011 (0.105)	0.030 (0.173)	-0.141 (0.109)	0.162 (0.131)	-0.057 (0.105)	0.030 (0.038)
Ideology (right)	0.210*** (0.039)	0.127** (0.038)	0.037 (0.041)	0.019 (0.058)	0.155*** (0.048)	-0.019 (0.061)	0.040 (0.056)	0.125*** (0.017)
Religious thinking	0.245*** (0.051)	0.197*** (0.039)	0.188** (0.063)	0.194* (0.082)	0.152* (0.060)	0.238*** (0.065)	0.158* (0.065)	0.203*** (0.021)
Education	-0.232*** (0.039)	-0.111** (0.035)	-0.086* (0.043)	0.002 (0.074)	0.026 (0.042)	-0.017 (0.052)	-0.116 (0.063)	-0.093*** (0.017)
Unemployed	-0.180 (0.205)	0.096 (0.210)	0.809** (0.298)	-0.052 (0.266)	0.190 (0.195)	0.858** (0.326)	0.160 (0.241)	0.161 (0.089)
Age	0.009** (0.003)	0.004 (0.003)	0.002 (0.003)	0.010 (0.006)	-0.002 (0.004)	0.004 (0.005)	-0.001 (0.004)	0.004** (0.001)
Female	0.013 (0.088)	-0.134 (0.076)	-0.197 (0.102)	-0.131 (0.162)	-0.019 (0.118)	-0.239 (0.136)	-0.220 (0.130)	-0.125*** (0.041)
Democracy score	-0.115*** (0.021)	-0.145*** (0.017)	-0.235*** (0.023)	-0.152*** (0.040)	-0.137*** (0.027)	-0.064* (0.030)	-0.044 (0.031)	-0.129*** (0.009)
Constant	1.887*** (0.310)	2.252*** (0.297)	2.627*** (0.361)	2.349*** (0.626)	2.292*** (0.465)	1.511** (0.465)	2.686*** (0.399)	2.145*** (0.140)
R^2	0.232	0.241	0.332	0.131	0.172	0.127	0.108	0.176
n	917	1401	644	316	632	551	628	5089

Pooled model uses fixed effects.

Regression coefficients with standard errors in parentheses. Country codes are as follows: Great Britain (GB), Germany (DE), Sweden (SE), Portugal (PT), Italy (IT), Poland (PT), Argentina (AR). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

of these variables appear in the Appendix. The final column includes the estimates from a fixed-effects regression of the pooled dataset, which includes all countries.

Despite statistically significant associations between some control variables and the count of conspiracy beliefs, the treatment effect is statistically significant across all models. Indeed, the treatment group variable is the only statistically significant one across all countries besides religious thinking. This makes good sense as previous studies conducted in different socio-political contexts have revealed that various operationalizations of religious thinking are consistently related to conspiracy beliefs (Drinkwater *et al.*, 2012, Oliver and Wood, 2014). We also observe a significant negative relationship between democracy scores and conspiracy beliefs in six out of seven countries, signaling that the more democratic one perceives their country to be, the fewer conspiracy beliefs they harbor. The remaining controls are only idiosyncratically related conspiracy beliefs across countries.

We also re-estimated the pooled model with interactions between the treatment and each control variable, the full results of which appear in the Appendix.⁶ We observed only one significant interaction, with the religious thinking variable. The treatment effect increases from 0.63 (95 percent CI: 0.52, 0.73) among those who say “*none* of what happens in my life is caused by a ‘higher force’, such as God, fate or destiny” to 0.98 (95 percent CI: 0.80, 1.16) among those who say “*everything* that happens in my life is caused by a ‘higher force’, such as God, fate or destiny.” This makes substantive sense in the context of the social desirability bias framework: those who believe that *everything* is caused by a higher force are likely to be more attuned and sensitive to social pressure regarding their beliefs, especially in Western European countries that exhibit very low levels of religiosity (Pew, 2020). In other words, people with high levels of religious thinking may be more likely to conceal additional beliefs that are stigmatized in their society.

Discussion

Our analysis shows that social desirability bias significantly impacts the reporting of conspiracy beliefs on surveys and does so systematically across political and cultural contexts where beliefs in conspiracy theories vary in content and number. Specifically, people underreport conspiracy beliefs by an average of between 0.61 and 1.00 beliefs across the seven countries we studied. This finding has several substantive and methodological implications.

First, it appears that peoples’ conceptualization and psychological interaction with conspiracy theories is consistent across political and cultural contexts, regardless of their specific conspiracy beliefs. This finding comports with many of the findings generated by a slowly expanding strain of literature that looks cross-culturally at conspiracy beliefs (Bruder *et al.*, 2013; van Prooijen *et al.*, 2015, Lantian *et al.*, 2016, Drochon, 2018, Smallpage *et al.*, 2020). For example, Walter and Drochon (2020) find that the basic structure of conspiracy beliefs is fairly consistent across nine European and North American countries, as are many of the substantive correlates of conspiracy beliefs. While previous work such as this showcases that the basic psychology of conspiracy thinking is similar cross-culturally, our study clarifies one potential mechanism by which this is true: democratic societies may stigmatize conspiracy beliefs in similar ways.

Second, our findings show that people believe more conspiracy theories than survey results currently suggest. Even though previous research reports that many people believe in various conspiracy theories and endorse conspiratorial ideas of various sorts, the true number of believers may be significantly higher. This only underscores that conspiracy theories are hardly marginal ideas; rather, they are important and potentially consequential fixtures of politics and culture that must be taken seriously.

Still, one may wonder whether a biased estimate of approximately one belief is substantively meaningful. We believe it is. In Figure 1, we can see that the distribution of conspiracy beliefs

⁶We only do this for the pooled model so as to ensure a properly powered analysis.

in each country is noticeably positively skewed. Not many people believe *most* of the theories we polled on, which is congruent with the majority of previous work across contexts (Oliver and Wood, 2014, Miller *et al.*, 2016, Adam-Troian *et al.*, 2020). That said, about half of respondents still believe 1–3 conspiracy theories. If this is the effective range of conspiracy theories that most people believe in and people are consistently underreporting by approximately one belief, the extent of bias strikes us as substantively quite large.

This bias may be additionally underscored if there are differences in the implications of conspiracy beliefs being underreported. Take, for example, a scenario where one divulges that they believe in a conspiracy theory about UFOs but conceals a true belief that COVID-19 is a hoax. The UFO conspiracy theory is fairly innocuous in terms of societal implications. The COVID-19 conspiracy belief, however, might lead one to hoard goods or ignore public health practices, like social distancing (Imhoff and Lamberty, 2020)—behaviors that can impact everyone. If beliefs in “dangerous” conspiracy theories are more likely to be concealed than relatively innocuous ones, the implications of our findings could be quite dire. Even though we cannot answer all of these questions yet, knowing that social desirability bias does appear to afflict the estimation of conspiracy beliefs across socio-political contexts in a similar way is an important first step in assessing the scope and nature of the problem.

Third, that people believe in more conspiracy theories than they indicate on surveys has methodological implications for research into conspiracy beliefs. While some previous studies have shown that conspiracy beliefs are being accurately estimated using surveys (Berinsky, 2018), others argue that conspiracy beliefs are actually being overestimated (Lopez and Hillygus, 2018; Clifford *et al.*, 2020, Sutton and Douglas, 2020). We find that conspiracy beliefs may be underestimated. Biased estimation is never a welcome problem, though it may be an insurmountable one all the same. Considering our findings, researchers may attempt several steps to mitigate the impact of social desirability bias. For instance, they might emphasize, before respondents are exposed to conspiracy-related content, that all responses are anonymous, perhaps even highlighting how the anonymization process unfolds. They should certainly avoid leading content that cues respondents to the goal of measuring conspiracy beliefs, perhaps in the form of question introductions or other frames, as previous work demonstrates the measurable impact of such cues (Krosnick *et al.*, 2014; Lyons *et al.*, 2018). Researchers might also consider allowing gradations of response—in the form of agreement or expressed likelihood—to conspiratorial propositions. That said, previous work finds that explicit choice formats that allow respondents to opt out, exactly as the items in the control group of our study operated, provide the most accurate estimates of conspiracy beliefs (Clifford *et al.*, 2020).

Whereas the aforementioned strategies are aimed at preventing or reducing social desirability bias, perhaps researchers should also consider correcting estimates for social desirability bias after the fact. Our findings reveal a very stable effect of social desirability bias across socio-political contexts. If more testing reveals similarly stable effects, we may be able to devise formal or informal post hoc adjustments to our measurements of the level of conspiracy beliefs. One way to estimate the impact of social desirability bias on specific individual conspiracy beliefs is to undertake more traditional list experiments. These would allow us to determine the level of belief *in a given conspiracy theory* under a condition of strict anonymity. This level can be compared to the results of a more traditional question format where we explicitly ask respondents about their belief in the theory. The difference between the two strategies can serve as an estimate of the magnitude of bias introduced by social desirability concerns. This is but one example of a methodological strategy we can use to overcome social desirability bias once it is properly understood. We strongly encourage future work to pursue these and related avenues.

Finally, our results have implications for the expanding literature on the correction of beliefs in conspiracy theories and misinformation. The typical correction study randomly exposes some subjects to information designed to correct—reduce, weaken, or altogether eliminate—beliefs in ideas deemed to be factually incorrect, and perhaps even harmful. If subjects in the treatment

group exhibit weaker or less beliefs in dubious ideas than those in the control group, the correction strategy is typically successful. Our findings pose a potential problem for this type of inference: Are corrective frames merely inducing social desirability bias, rather than truly reducing “problematic” beliefs? Such a scenario would result in the desirable treatment effect, but perhaps not a substantive, permanent change in beliefs—precisely the outcome we are interested in. Minimally, it seems reasonable to wonder whether treatment effects from dubious belief-correcting experiments are smaller than they appear to be (i.e., the correction strategies are less efficacious than we currently believe them to be). These possibilities must be explored more if we are to successfully limit the pernicious effects of beliefs in conspiracy theories and misinformation.

Even though much more investigation into the impact of social desirability bias is needed, we see reason for optimism. That the nature of the problem (i.e., underestimating conspiracy beliefs) is consistent across the contexts we studied simplifies the challenge posed. As long as conspiracy beliefs and their effects are being taken seriously by practitioners, as they appear to be, the impact of naturally occurring underestimates can be minimized by recognizing the bias and continuing to understand its shape and scope across contexts and particular conspiracy theories.

Of course, our study is not without limitations. While the seven countries we studied vary considerably along many political and cultural dimensions, more tests of our hypothesis in additional contexts will only sharpen our understanding of the structure of conspiracy belief. In particular, it would be illuminating to test for social desirability bias in countries under autocratic rule, where people are more likely to be regularly lied to by a government that actually conspires against its own people. Perhaps in these settings, conspiracy beliefs are more justified and, therefore, more commonplace. We also encourage future work to replicate our analysis with different conspiracy theories. As with the countries/samples, more is always better. Finally, we believe it is important to test for social desirability bias across different survey response formats, as alluded to above. Though previous work has conceptualized graded response formats (e.g., Likert-type response options) as overestimating conspiracy beliefs (Clifford *et al.*, 2020), our results prompt some question as to whether that is the correct interpretation—perhaps those formats are accurately capturing conspiracy beliefs that would not be properly expressed under a forced choice format. How to measure conspiracy beliefs using surveys is a crucially important line of inquiry that needs to be further investigated.

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Data. All data and files will be posted publicly prior to publication.

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