The antidepressant hoax: Conspiracy theories decrease health-seeking intentions

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Abstract

Health-related conspiracy theories can undermine the trustworthiness of actors and institutions and may impact an individual's intention to seek help. Across 3 experimental studies we investigated the consequences of exposure to an antidepressant conspiracy theory on general intentions to seek medical and psychological help. Study 1 participants (N = 299) were randomly allocated to read one of three articles (pro-conspiracy, anti-conspiracy, control) after which they completed measures of conspiracy endorsement, trust, powerlessness and health-seeking intentions. Results suggested that exposure to antidepressant conspiracy theories significantly reduced individual's intention to seek help indirectly through decreased trust in health authorities, but not health-industry related powerlessness. In two additional pre-registered studies we found some support for these findings. While Study 2 (N = 244) found no support for a direct or indirect relationship between conspiracy exposure and health-seeking intentions, an exploratory analysis highlighted the importance of gender differences when investigating conspiracy exposure on intentions. Study 3 (N = 247) replicated Study 1 findings, highlighting that antidepressant conspiracy theories decrease health-seeking intentions indirectly through decreased trust and increased powerlessness. Mere exposure to antidepressant conspiracy theories had significant indirect consequences on general health-seeking intentions.

Keywords:

Conspiracy Theories; Health-Seeking Intentions; Powerlessness; Trust

Data availability statement:

The data that support the findings of this study are openly available in the Open Science Framework project repository at https://osf.io/qbh6w/

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Conspiracy theories assert there is a powerful network of actors working in secret against the public good. Once thought of as a set of erroneous beliefs confined to those on the margins of society (Hofstadter, 1964), belief in conspiracy theories are now understood to be pervasive and enduring across popular discourse (Brotherton & French, 2014), politics (Oliver & Wood, 2014b), as well as scientific and medical contexts (Goertzel, 2010). For example, 50 years after the JFK assassination, a Gallup poll reported that 61 percent of Americans believed that others aside from Lee Harvey Oswald were involved in a conspiracy (Swift, 2013).

While some conspiracy theories provide explanations for large scale or catastrophic events, they do not necessarily require a single catalyst to light the blue touchpaper. Narratives have emerged during the global COVID-19 pandemic, such as 5G networks are spreading the novel coronavirus, can be understood in part due to existing technological fears and concerns (Meese et al., 2020). Similarly, most health-related conspiracy theories contain generic content suggesting the suppression of information by organisations such as governments, corporations, and scientists (Brotherton et al., 2013). For example, that the US Food and Drug Administration is deliberately preventing the public from getting natural cures for cancer and other diseases because of pressure from drug companies (Oliver & Wood, 2014a), that powerful pharmaceutical companies lobby to advance biological interventions over natural cures (Lamberty & Imhoff, 2018), or of a conspiracy about the effectiveness of antidepressants (Perlis, 2018).

Despite growing research into conspiracy theories (see Douglas et al., 2019, for a review), there are few studies examining health-related conspiracy theories, and fewer still on how exposure impacts attitudes, intentions, or behaviour. Studies investigating the consequences of exposure to conspiracy theories suggest they can influence both congeneric and conspecific outcomes. For example, exposure to narratives involving a government plot

and coverup was found to increase intentions to engage in every day crime (Jolley et al., 2019), whereas exposure to vaccination specific conspiracies led to decreased intentions to vaccinate a hypothetical child (Jolley & Douglas, 2014a).

The current research examined the effect of exposure to a specific health-related conspiracy on general health-seeking intentions. We focused on "the antidepressant hoax" – a conspiracy theory involving the vested interests of drug companies and the health industry more broadly. This narrative suggests that, in league with others such as psychiatrists, the pharmaceutical industry fabricates diseases and advances a chemical solution over natural alternatives for profit (Nutt et al., 2014), and that antidepressants are ineffective and intentionally over-prescribed (Ioannidis, 2008). Understanding the impact of such conspiracy theories on public health intentions related to wellbeing is important, especially in light of recent health focussed mis- and dis-information campaigns during the COVID-19 pandemic that have falsely suggested that any vaccination in will be used to microchip and track individuals (P. Ball & Maxmen, 2020). First, we review the literature on health-related conspiracy theories, followed by an investigation of two potential mechanisms of the link between mere exposure to this antidepressant conspiracy and intentions to seek help – trust and powerlessness in the health industry.

Health-related conspiracy theories

Medical conspiracies assert that information is deliberately concealed from the public by powerful groups or individuals in the government or health industry. Oliver and Wood (2014a) reported that almost half of all Americans endorse at least one medical conspiracy, including narratives that pharmaceutical companies coverup known health effects of vaccinations, suppress known cures, or are knowingly keeping patients unwell for profit. Conspiracy theories focused on pharmaceutical companies, regulators, politicians, and others secretly conspiring against the public interest (Blaskiewicz, 2013) are such a part of common

parlance, that this industry is known as ‘big pharma’. It is these narratives that we refer to as health-related conspiracy theories, distinct from others solely focused on medical or health practitioners to the exclusion of other conspirators.

Understanding the impact of exposure to health-related conspiracies is critical given they are related to various health attitudes, intentions, and behaviours. For example, prominent narratives include that HIV does not lead to AIDS and that the government is in “cahoots with a multibillion dollar pharmaceutical scam” (Kalichman, 2009, p. xiv), and that the HIV/AIDS epidemic was created by the US government to infect African American men in the 1970s (Lewandowsky, Oberauer, et al., 2013). Research has shown these conspiracy beliefs may be a barrier to African Americans’ attitudes towards safe sex practice (Bogart & Thorburn, 2005) and encourage nonadherence to treatment (Bogart et al., 2010). Other research has shown a link between conspiracy theories and medical distrust, but not with attitudes towards HIV testing (K. Ball, 2016). These findings suggest that, at least for HIV/AIDS conspiracies, distrust in the government and health system is an important link between these conspiracy theories and health outcomes.

Other conspiracy theories have been associated with more specific medical attitudes and intentions. Oliver and Wood (2014a) found those who endorsed medical conspiracy theories (e.g., corporate coverups linking mobile phones with cancer) were more likely to report using alternative medicines, avoid traditional medicines, and less likely to have annual check-ups or get influenza vaccinations. Increased conspiracist thinking, a propensity to agree with general conspiracies, has also been linked with negative attitudes towards vaccinations (Lamberty & Imhoff, 2018; Lewandowsky, Gignac, et al., 2013). However, the correlational nature of these studies make it difficult to determine causality. For example, individuals exposed to health-related conspiracy theories may report less positive health

attitudes, or it could be that those with less positive attitudes are more likely to endorse health-related conspiracy theories.

There is evidence for the impact of exposure to specific health-related conspiracy theories on lowered vaccination intentions. In a study by Jolley and Douglas (2014a), participants were presented with information that supported anti-vaccination conspiracy theories, information that refuted these conspiracy theories, or no information serving as a control. Results showed that individuals exposed to information supporting vaccination conspiracy theories were less likely to vaccinate a hypothetical child, as compared to the other conditions, and that this was due to an increase in the perceived dangers of vaccines, disillusionment and distrust in authorities involved in vaccinations, and increased feelings of powerlessness. This suggested that exposure to specific vaccination conspiracy theories led individuals to disengage with public health initiatives, and that specific psychological factors such as powerlessness and distrust in authorities were important in understanding the relationship between exposure and health-related outcomes.

The focus of the present research is on an antidepressant conspiracy theory. It is a narrative suggesting that authorities in the health industry including ‘big pharma’, but also medical doctors, lie about the effectiveness of treatments for depression, suppress alternative natural cures, and over prescribe antidepressants for financial gain. It is consistent with conspiracies suggesting that drug companies lie or suppress information about the effectiveness or harmful side effects of drugs (Goertzel, 2010; Oliver & Wood, 2014a), overlaps with concerns that the industry has a vested financial interest in advancing a chemical solution (Nutt et al., 2014) and that antidepressants are ineffective and over-prescribed (Perlis, 2018). In the following section, we consider the role of powerlessness and trust in the health industry as potential reasons why exposure to this antidepressant conspiracy theory may reduce general intentions to seek help.

Trust in the health industry

Conspiracy theories involve an element of deception. They present a distrustful representation of others and groups, where trust is the "positive expectations regarding another's conduct" (Lewicki et al., 1998, p. 439). Studies suggest that trust is an important correlate, antecedent, or consequence of conspiracy belief. Lower interpersonal trust (i.e., trust in the police, neighbours, or relatives) has been associated with higher endorsement of conspiracy beliefs (Goertzel, 1994), as has the degree to which people are seen as not trustworthy (e.g., moral, honest, reliable; Abalakina-Paap et al., 1999).

Experimental studies have generally found that exposure to conspiracy theories decreases institutional trust (e.g., the government). Individuals exposed to conspiracy theories about economic and political issues reported lower levels of trust in government institutions, compared with those not exposed to conspiracy theories (Einstein & Glick, 2015). Another study found that following exposure to a government conspiracy video, belief in a government conspiracy and distrust in the government increased immediately, and two weeks later (Kim & Cao, 2016). However, other research found that exposure to specific political conspiracy theories did not alter institutional trust (Jolley & Douglas, 2014b). Less, however, is known about the impact of health-related conspiracy theories on trust in those specific actors and organisations.

In a medical context, trust incorporates judgements of fidelity, competence, honesty, confidentiality and global trust with respect to doctors and institutions (Hall et al., 2002). Access to healthcare often involves an element of vulnerability and risk for the individual, therefore trust in the health industry is integral to this decision. Individuals less trusting of medical and allied health professionals may have lower adherence to medication and willingness to follow recommendations (Hall et al., 2001). While many individual level factors can influence a decision to seek or access health services – females are more likely to

seek help than males, and free health care increases likelihood of access (Doherty & Kartalova-O'Doherty, 2010) – the content of some conspiracy theories (e.g., health industry suppressing cures) may erode trust in the medical establishment and reduce intentions to seek help. It was therefore hypothesised that mere exposure to an antidepressant conspiracy theory would decrease trust in the health industry, which in turn would decrease intentions to seek help.

Powerlessness

Hofstadter (1964) suggested that conspiracy beliefs occur among those who feel powerless. Likewise, Goertzel (1994) argued that individuals who feel powerless may be attracted to conspiracies as a way to regain a sense of control by allowing them to reject official narratives. Accordingly, studies find a positive relationship between powerlessness and endorsement of conspiracy theories (Abalakina-Paap et al., 1999; Goertzel, 1994) or susceptibility to conspiracy thinking (Moulding et al., 2016). Recent experimental evidence found that inducing political powerlessness increased endorsement of conspiracy stereotypes in Jewish, German, and Russian groups (Kofta et al., 2020).

Conspecific forms of powerlessness may also arise as a result of exposure to conspiracy theories. In two separate studies, Jolley and Douglas (2014b) found that exposure to government and climate change conspiracy theories increased feelings of political and climate change powerlessness, respectively. This heightened sense of powerlessness then explained a decrease in intention to engage in political behaviours such as voting and climate change action. Another study, found that increased powerlessness concerning vaccination, following exposure to a vaccination conspiracy, explained a reduction in intentions to vaccinate a hypothetical child (Jolley & Douglas, 2014a).

While some research has argued the benefit of conspiracy theories, such as providing a sense of community (Franks, Bangerter, Bauer, Hall, & Noort, 2017), and exposing

corruption (Clarke, 2002), the majority of findings highlight the negative consequences of conspiracy theories (e.g., Jolley et al., 2019, 2020). More information, however, is needed to clarify the exact role of powerlessness; whether it is a driving force, a result of these beliefs, or a combination of both. Specific to health-related conspiracy theories, to the best of our knowledge the role of powerlessness and trust as related to the health industry, outside of childhood vaccinations, has not yet been examined. In the present research it was hypothesised that mere exposure to an antidepressant conspiracy theory would increase health-related powerlessness, which in turn would lead to lower intentions to seek help.

The Present Research

To date, no study has experimentally manipulated the impact of exposure to a specific health-related conspiracy on broader health-seeking intentions. If exposure to vaccine-related conspiracy theories has significant impacts on intended vaccine uptake (Jolley & Douglas, 2014a), it is plausible that exposure to other health-related conspiracy theories may have similar consequences. Strengthening our understanding of how conspiracy theories may adversely impact an individual's decision to seek health-related help is therefore important. Across three studies, we used an experimental design to investigate the relationship between mere exposure to an antidepressant conspiracy theory and intentions to engage in health-seeking behaviours. We also investigated the role of trust and powerlessness in the health industry as mediators of this relationship.

Study 1

It was hypothesised that individuals exposed to an article promoting health-related conspiracy theories would report lower intentions to engage in health-seeking behaviour compared to those exposed to an article refuting health-related conspiracy theories. We further hypothesised that this relationship would be mediated by decreased trust in the health industry and increased feelings of powerlessness in the health industry.

Method

Participants

A sample of 299 participants (153 males, 146 females)[1] were recruited online via Amazon Mechanical Turk (MTurk)[2] and paid $1USD for their time (~10 minutes). Based on a similar design (Jolley & Douglas, 2014b; η2 = .03), we estimated a small effect size f = .176 (η^2 = .03), requiring a total of 100 participants per condition to reach a power of .80 (α = .05, two-tailed test).

Participants were from the United States and ranged from 19 to 75 years old (M = 37.87, SD = 11.36). Most participants identified as White (73.9%), followed by Black or African American (9.7%), Asian/Pacific Islander (9.4%), Hispanic or Latino (4.7%), Native American or American Indian (0.7%) and other (e.g., multi-racial; 1.7%). The sample was well-educated (91% of participants reported having attended college at varying degree levels) and varied in religiosity, with a mean importance rating of 3.10 (SD = 2.29; 1 = *not at all important*, 7 = *extremely important*). Participants identified being more politically left-wing than right (M = 3.28, SD = 1.68; 1 = *left*, 7 = *right*). All participants were required to be proficient in English.[3]

Materials and procedure

Participants were invited to complete the online Qualtrics questionnaire through Amazon's MTurk platform. After reading the Participant and Information Consent Form and providing consent, participants were randomly allocated to view one of three article

[1] Of 336 total survey responses, four individuals asked to be excluded from analyses and 32 were excluded due to failing multiple attention checks, not following instructions on the written task and/or completing the study multiple times against instruction.
[2] MTurk, is an online crowdsourcing tool acceptable for participant recruitment due to its ability to gather high-quality data in a timely an inexpensive manner (Buhrmester et al., 2016).
[3] In a series of post-hoc analyses, we confirmed there were no systematic differences in demographic variables (i.e., age, race, education, income, importance of religion, or political self-placement) across experimental conditions in Studies 1, 2, and 3. In Study 1, however, there was a gender imbalance across the three conditions. We report these details and a re-analysis of Study 1, which do not change the pattern of results, in the Supplementary Materials.

conditions (pro-conspiracy; anti-conspiracy; control), then answered all scales and items in the order presented below. Participants were then debriefed as to the true nature of the experiment and provided with a unique code to receive payment via MTurk. All studies were completed as per University ethics approval (HEC18498). Study materials are in the online Supplementary Materials.

Conspiracy articles. The pro-conspiracy article described various conspiracy theories within the health industry including questioning the efficacy of pharmaceuticals for depression, that antidepressants were harmful, and that key information was being concealed from the public for financial gain. The article followed a similar structure to Jolley and Douglas (2014b) and included theories found on online forums and websites, as well as phony statistics. An extract is included below:

> *…many people agree that 'depression' is disturbingly over-medicated, with more and more evidence suggesting these antidepressant medications are ineffective and cause more harm than good. Despite being well-aware of increasing evidence and concern, health professionals continue to prescribe ineffective anti-depressants at an alarming rate…*

The anti-conspiracy article was similar in structure, however emphasised the effectiveness of anti-depressants and refuted conspiracy theories regarding pharmaceutical companies and the health industry. An extract is included below:

> *…although some people show concerns over the medication of depression, more and more evidence suggest these antidepressant medications are overwhelmingly more effective than both placebo and non-treatment of depression. Health professionals use this increasing evidence to make decisions about prescribing…*

The control condition article did not refer to any conspiracy theories. Instead it debated the pros and cons of having a cat or a dog as a pet. An extract is included below:

…the answer really depends on your lifestyle and what you're looking for in a pet. A loyal companion you can take for walks and spend loads of active time with? Could be suited for a dog. A small, lovable but independent creature? A cat might be your best bet…

Antidepressant Conspiracy Scale. A 7-item scale was created to assess the effectiveness of the experimental manipulation by asking participants to rate their agreement with a series of conspiracy theories related to antidepressants and the health industry. Participants rated items (e.g., 'Alternative and natural cures for depression are being suppressed for monetary gain') on a Likert-scale (1 = *strongly disagree*, 7 = *strongly agree*). Items were averaged, with higher scores indicating higher agreement with antidepressant conspiracy theories ($\alpha = .92$).

Trust in the Health Industry. Trust in authorities and others to tell the truth about the health industry was adapted from Jolley and Douglas (2014a) and included relevant health industry groups (e.g., medical doctors, psychologists, psychiatrists). Participants rated they level of trust using a 7-item Likert-type scale (1 = *strongly distrust*, 7 = *strongly trust*). Items were averaged, with higher scores indicating greater levels of trust ($\alpha = .74$).

Powerlessness. Feelings of powerlessness was measured using a 3-item scale adapted from Jolley and Douglas (2014a). Participants rated their level of agreement (1 = *strongly disagree*, 7 = *strongly agree*) with statements such as, 'I feel that my actions will not stop the negative outcomes of big pharmaceutical companies'. After reverse scoring one item, items were averaged, where higher scores indicated greater feelings of powerlessness ($\alpha = .78$).

Health-seeking intentions scale. A novel scale was generated to measure intention to engage in various health-seeking behaviours within the next 12 months (e.g., 'visit a medical doctor'). Participants rated 5-items using a 7-point scale (1 = *definitely no*, 7 = *definitely yes*).

Items were averaged, with higher scores indicating greater intention to engage in pro-health-seeking behaviours ($\alpha = .66$).

Attention check. A textbox recall item assessed whether participants had paid attention during the experimental manipulation. Participants were asked to describe the article they read, in no fewer than two/three sentences.

Demographics. Questions were included to assess age, gender, race, education level, income, religiosity and political ideology.

Results

Descriptives were calculated using SPSS version 25 and the results for outcome variables across conditions are presented below in Table 1. Overall, the sample was close to the midpoint for Trust across all conditions. Similar results were found for the measures of Powerlessness and Health-seeking intentions, with Powerlessness slightly above the midpoint and Health-seeking intentions slightly below the midpoint of the scale.

[INSERT TABLE 1 APPROX. HERE]

Manipulation check

A one-way Analysis of Variance (ANOVA) was used to determine whether the experimental manipulation had the intended effect across conditions. The ANOVA was significant across conditions, $F(2, 298) = 22.79$, $p < .001$, $\eta p^2 = .13$. As predicted belief in antidepressant conspiracies was significantly higher in the pro-conspiracy condition ($M = 5.32$, $SD = 1.31$) than the anti-conspiracy condition ($M = 3.96$, $SD = 1.69$; $p < .01$, Cohen's $d = .90$) and the control condition ($M = 4.52$, $SD = 1.25$; $p < .01$, Cohen's $d = 0.63$). The experimental manipulation was therefore successful.

Model testing

A multiple mediation analysis was conducted using Mplus 8.0 (Muthén & Muthén, 2017) examining the effect of pro vs. anti-conspiracy condition on health-seeking intentions

(D1), when controlling for pro-conspiracy vs. control (D2). These dummy coded contrasts allowed for the comparison between the pro and anti-conspiracy conditions, accounting for existing levels as assessed by the control condition. Trust and powerlessness were entered as mediators in this model. We used a maximum likelihood estimator with robust standard errors to account for any skewness (Yuan & Bentler, 2000), and estimated frequentist 95% Confidence Intervals (CIs). The model was fully saturated and therefore an excellent fit with the data, $\chi^2(9) = 48.065$, $p < .001$, comparative fit index = 1.00, standardised root mean square residual = .00, root mean square error of approximation = .00.[4]

Presented in Figure 1, it showed that exposure to conspiracy theories significantly influenced health-seeking intentions indirectly through trust, but not powerlessness. Compared with the anti-conspiracy condition and accounting for the control condition, those in the pro-conspiracy condition reported lower levels of trust ($a^1 = .18$, $p = .01$; $CI_{95} = .004,.032$), leading to lower health-seeking intentions ($b^1 = .16$, $p = .02$; $CI_{95} = .03,.29$). Being in the pro-conspiracy condition (compared with the anti-conspiracy condition, accounting for the control condition) resulted in higher levels of powerlessness ($a^3 = -.14$, $p = .04$; $CI_{95} = -.28,-.01$), however, this did not lead to significantly lower health-seeking intentions ($b^2 = -.07$, $p = .33$; $CI_{95} = -.20,.07$). In order to test the indirect effect of conspiracy condition on health-seeking intentions through trust, the confidence interval for the indirect effect following 10,000 Bias Corrected (BC) bootstrap samples (MacKinnon et al., 2004) did not include zero ($a^1b^1 = .029$, $p = .05$; BC $CI_{95} = .006,.073$). No direct effect from conspiracy exposure to health-seeking intentions independent of its effects through trust was found ($a^2 = -.04$, $p = .58$; BC $CI_{95} = -.17,.08$).

[INSERT FIGURE 1 APPROX HERE]

Discussion

[4] Subsequent model fits are not reported as these are fully saturated models.

Study 1 found that exposure to a fictitious conspiracy article regarding antidepressants and the health industry significantly increased reported antidepressant conspiracy beliefs. In partial support of our hypotheses, exposure to conspiracies diminished intentions to seek health-related help, but only indirectly through decreased trust in the health industry, and not directly or through powerlessness. These findings are consistent with previous research which has found trust decreases following exposure to conspiracy theories (Einstein & Glick, 2015; Kim & Cao, 2016), and more broadly with studies finding a relationship between decreased trust and increase conspiracy beliefs (Abalakina-Paap et al., 1999; Goertzel, 1994). While exposure to conspiracy theories led to an increase in health-related powerlessness, we did not find support for our hypothesis that powerlessness would impact health-seeking intentions. This is inconsistent with previous research that found powerlessness explained the relationship between exposure to conspiracy theories and behavioural intentions (Jolley & Douglas, 2014b, 2014a).

This study provides a unique contribution to the literature on the consequences of conspiracy theories. It is, to our knowledge, the first experimental study which provides evidence of a mechanism through which a specific health-related conspiracy theory focussed on depression may influence broader health-seeking through trust in the health industry. While we found no direct effect between mere exposure and intentions to seek help, this may have been due to the specific nature of our conspiracy theory only increasing general distrust in the health industry and in turn lowering general health seeking intentions.

We also found, when compared with a control condition, exposure to this antidepressant conspiracy theory led to an increase in antidepressant conspiracy beliefs as assessed by the manipulation check. Importantly, individuals in the anti-conspiracy condition – where these beliefs were refuted – reported significantly lower antidepressant conspiracy beliefs, as compared to a control condition. This adds to the increasing literature highlighting

the importance of messages that refute conspiracy narratives (Jolley & Douglas, 2017), and more broadly on addressing misinformation (e.g., van der Linden et al., 2017).

Study 2

In Study 2, we aimed to replicate the findings of Study 1 using a different sample. Study 1 established that our experimental manipulation influenced health-seeking intentions indirectly through decreased trust in the health industry, thus allowing us to explore the consequence of mere exposure to antidepressant conspiracy theories. In Study 2, we removed the control condition, enabling a larger sample size within each of the two remaining conditions in order to have sufficient power to detect and replicate the small indirect effect from Study 1. This study was pre-registered prior to the collection of data (http://tiny.cc/healthcons2). It was hypothesised that exposure to a conspiracy article (pro-conspiracy condition) would increase an individual's belief in antidepressant conspiracies and decrease intentions to seek health-related help, and that this relationship would be indirectly mediated through decreased trust and increased powerlessness.

Method

Participants

Study 2 included 244 Australian participants, proficient in English and recruited online via Facebook[5]. Inadvertently, there was a large gender imbalance (184 females, 58 males, 1 genderfluid, 1 nonbinary participant)[6]. The sample ranged from 18 to 82 years old (M = 45.57, SD = 15.04). Most of the sample (86.9%) reported having engaged in study beyond high school. Participants varied in religiosity (M = 2.77, SD = 2.12; 1 = not at all important, 7 = extremely important), and identified as being more politically left than right-wing (M = 2.90, SD = 1.52; 1 = *left-wing*, 7 = *right-wing*).

[5] For a discussion on the reliability and validity of Facebook recruiting for social science research see Kosinski et al. (2015).

[6] Of 376 survey responses, 132 participants were excluded due to incomplete responses, requests to be left out of analyses, failing attention checks and/or taking multiple hours (e.g., > 4 hours) to complete the survey.

Materials and Procedure

After completing standard consent procedures, participants were randomly allocated to read one of two articles (pro-conspiracy or anti-conspiracy; identical to Study 1). Next, participants completed the Antidepressant Conspiracy Scale (described in Study 1; α = .92), then measures of Trust (α = .75) and Powerlessness (α = .65), as described in Study 1. The original 5-item Health-seeking Intentions Scale was used (α = .67), with minor modifications to ensure appropriateness for an Australian sample (see Supplementary materials). As in Study 1, participants then completed the attention check and demographic questions, were debriefed and given a final opportunity to withdraw their data, and invited to provide contact details in a separate survey not linked to their responses for a gift-card prize draw.

Results

Descriptives for the outcome variables across conditions are presented in Table 2a. Similar to Study 1, responses across conditions were around the scale midpoint for all measures.

[INSERT TABLE 2A APPROX. HERE]

Manipulation check

As predicted, individuals in the pro-conspiracy condition (M = 3.83, SD = 1.57*)* reported stronger belief in antidepressant conspiracy theories than those in the anti-conspiracy group (M = 3.28, SD = 1.42; $t(242) = -2.89$, $p = .004$, Cohen's $d = -0.37$). While this difference was smaller than that of Study 1, the experimental manipulation was still considered successful.

Model testing

As in Study 1, a multiple mediation analysis was conducted using Mplus examining the effect of condition (pro-conspiracy vs. anti-conspiracy) on health-seeking intentions, with trust and powerlessness as mediators. Presented in Figure 2a, it showed that exposure to the

pro-conspiracy article did not significantly indirectly influence health-seeking intentions through trust (a^1b^1 = -.08, p = .21; CI_{95} = -.20,.04) or powerlessness (a^3b^2 = -.003, p = .88; CI_{95} = -.04,.04). However, individuals with lower levels of trust reported significantly lower health-seeking intentions (b^1 = .40, p < .001; CI_{95} = .28,.53). As in Study 1, there was no direct effect from conspiracy exposure to health-seeking intentions (a^2 = -.02, p = .80; CI_{95} = -.13,.10).

[FIGURE 2a APPROX. HERE]

Exploratory analysis: the role of gender

Following a lack of support for the hypotheses, and a failure to replicate Study 1, exploratory analyses were conducted investigating the role of gender on health-seeking intentions, due to the overrepresentation of females in our sample.[7] Results showed significant gender differences across measures. Females reported significantly higher levels of trust, lower powerlessness and higher health-seeking intentions compared to males. Given these results, an exploratory mediation analysis was conducted, with the inclusion of gender as a covariate on the outcome variables.

[TABLE 2b APPROX. HERE]

Model testing– controlling for gender

Once more, a multiple mediation analysis was conducted examining the effect of condition (pro-conspiracy vs. anti-conspiracy) on health-seeking intentions while controlling for gender effects on all outcomes. Presented in Figure 2b, females reported significantly greater levels of trust (a^1 = .17, p = .01; CI_{95} = .04,.30), powerlessness (a^3 = -.12, p = .01; CI_{95} = -.29,-.05) and health-seeking intentions (a^2 = .12, p = .03; CI_{95} = .01,.24). However, there was still no indirect effect of exposure to health-related conspiracy theories on health-seeking

[7] Two individuals who identified as genderfluid and nonbinary were excluded from these analyses leaving n = 242.

intentions through either powerlessness (b^3c^2 = -.004, p = .63; CI_{95} = .02,.01) or trust (b^1c^1 = -.04, p = .11; CI_{95} = -.092,.009), despite the latter trending in the predicted direction. Individuals with higher levels of distrust reported significantly lower health-seeking intentions (c^1 = .39, p < .001; CI_{95} = .26,.51). Again, there was no support for a direct effect from condition to health-seeking intentions (b^2 = -.02, p = .74; CI_{95} = -.13,.09).

[FIGURE 2B APPROX HERE]

Discussion

The results of Study 2 were not consistent with Study 1. No support was found for the hypotheses that exposure to conspiracy theories would decrease individuals' intentions to seek health-related help either directly, or as a result of a decrease in trust and increase in powerlessness. However, trust and powerlessness were significantly related with health-seeking intentions.

A possible explanation for the inconsistent results may relate to the large gender imbalance in the sample. In this context, it is well-established that gender is an important predictor in an individual's decision to seek help. For example, females are more likely than males to have positive health-seeking attitudes (Fischer & Turner, 1970), more likely to utilise health-care services (Waldron, 1983), and seek professional input more frequently for both general health consultations (Briscoe, 1987) and mental health (Mackenzie et al., 2006). When gender was covaried in the model test, while not reaching statistical significance, results were more consistent with Study 1. Study 3 attempted to address this sampling imbalance, and further examine the role of gender in exposure to health-related conspiracy theories.

Study 3

Study 1 found that exposure to conspiracy theories regarding the health industry reduced intention to seek health-related help, indirectly through decreased trust in the health

industry. Study 2 did not replicate these findings, but highlighted the important role that gender plays in health-seeking – a finding well-documented in literature (Yousaf et al., 2015). In a pre-registered Study 3 (http://tiny.cc/healthconsp3), we built upon our findings by replicating Study 1 findings, while addressing the limitations found in Study 2. Therefore, it was hypothesised that, when accounting for the effects of gender, exposing individuals to health-related conspiracy information would adversely influence their intentions to seek help, indirectly through decreased trust and increased powerlessness.

Method

Participants

Study 3 included 247 participants (152 males, 95 females)[8] from the USA, proficient in English and recruited via MTurk who did not participate in Study 1. Participants were paid $1USD consistent with renumeration for research of this length. The sample ranged from 19 to 70 years old (M = 36.40 years, SD = 11.32). Most participants identified as White (73.3%), followed by Asian/Pacific Islander (9.7%), Hispanic or Latino (8.9%), Black or African American (7.3%) and Native American or American Indian (0.8%). Most of the sample reported having attended some level of college (87%). Participants varied in religiosity, with a mean importance rating of 3.40 (SD = 2.32; where 1 = not at all important, 7 = extremely important). In addition, participants identified as being more politically progressive than conservative (1 = *extremely conservative*, 7 = *extremely progressive*) on social issues (M = 4.62, SD = 1.70) and economic issues (M = 4.25, SD = 1.76).

Materials and procedure

Study 3 was largely identical to Study 1 but did not include a control condition. Following the experimental manipulation, participants completed the Antidepressant

[8] Of the 346 survey responses, 49 were excluded for incomplete data, 9 requested for their data to be excluded from analysis and 38 were excluded due to either failing two or more attentions checks or not following the instructions of the written task. A further 3 participants who identified as a gender other than male or female were not able to be included in analyses.

Conspiracy Scale (α = .94) and a shortened 5-item measure of Trust from Study 1 (α = .84). Two items ("family/friends" "religious organisations") were removed a-priori in the pre-registration from the Trust scale due to low inter-item correlations identified in previous studies. Participants then completed the Powerlessness scale from study 1 (α = .76) and a 4-item Health-Seeking Intentions scale adapted from Study 1 (α = .81; one item, "visit a medical doctor" was omitted a-priori in the pre-registration due to previously identified low inter-item correlations). The remainder of the procedure was identical to Study 1.

Results

Descriptives were calculated and the results for the outcome variables items across conditions are presented below in Table 3. Overall participants reported Trust, Powerlessness and Health-seeking intentions at or around the midpoint of the scale.

[INSERT TABLE 3 APPROX. HERE]

Manipulation check

An independent samples t-test was conducted to determine whether exposure to the pro-conspiracy condition (as compared to the anti-conspiracy condition) increased belief in antidepressant conspiracies. As predicted, individuals in the pro-conspiracy condition (M = 5.10, SD = 1.44) reported stronger belief in health-related conspiracy theories than those in the anti-conspiracy group (M = 3.84, SD = 1.68; $t(238.85) = -6.29$, $p < .01$, Cohen's d = -0.81). The experimental manipulation was considered successful, and this mean difference was consistent with Study 1 and larger than Study 2.

Model testing

Identical to Study 2, a multiple mediation analysis was conducted examining the effect of condition (pro-conspiracy vs. anti-conspiracy) on health-seeking intentions while accounting for gender as a covariate. Presented in Figure 3a, when controlling for gender, exposure to the pro-conspiracy condition, as compared to the anti-conspiracy condition,

significantly indirectly influenced health-seeking intentions through both decreased trust (b^1c^1 = -.07, p = .005; CI_{95} = -.13,-.03) and increased powerlessness (b^3c^2 = -.05, p = .015; CI_{95} = -.09,-.01). Consistent with Study 1 and 2, there was no direct effect from condition to health-seeking intentions (b^2 = -.04, p = .52; CI_{95} = -.08,.15). There was, however, a direct effect from gender to health-seeking intentions (a^2 = .12, p = .04; CI_{95} = .01,.23), with females reporting greater health-seeking intentions as compared with males.

[INSERT FIGURE 3A APPROX. HERE]

When the model was run without gender (see Figure 3b), the indirect effects were still present, following 10,000 BC bootstrap samples, through both trust (β = -.07, p < .01; BC CI_{95} = -.13,-.03) and powerlessness (β = -.04, p = .02; BC CI_{95} = -.09,-.01).

[INSERT FIGURE 3B APPROX. HERE]

Discussion

There was support for the link between exposure to health-related conspiracies and decreased health-seeking intentions indirectly through decreased trust and increased powerlessness in the health industry from Study 3. These indirect effects were present, with and without gender included in the model. Our refined measure of trust in Study 3, omitted interpersonal indicators of trust (i.e., “family/friends”, “religious organisations”) which we argue are less central to trust judgements surrounding the health industry. Consistent with Study 1, trust in the health industry was a significant mediator of the relationship between conspiracy exposure and help-seeking, but Study 3 also found powerlessness as a mediator of this relationship. Together, these findings suggest that specific exposure to antidepressant conspiracy theories lead to lower levels of trust in organisations and individuals related to the health industry and higher feelings of powerlessness around personal control over the health industry. This in turn adversely impacts broader intentions to seek health-related help. Discussion and implications are outlined below.

General Discussion

Research has shown that conspiracy theories cannot be dismissed as inconsequential. The present set of studies shed light on the potentially serious consequences of mere exposure to a health-related conspiracy theory concerning antidepressants on health-seeking intentions. Study 1 found that exposure to this specific antidepressant conspiracy theory, as compared to a narrative refuting it, reduced general intentions to engage in help-seeking indirectly through a decrease in trust toward key health industry actors and institutions. While Study 2 did not replicate these findings, it highlighted the importance of considering gender differences in trust, powerlessness and health-seeking intentions. A successful pre-registered replication in Study 3 confirmed and extended the initial findings that exposure to antidepressant conspiracies decreased intention to seek help indirectly by reducing trust in, and increasing powerlessness of, individuals and organisations associated with the health industry. Study 3 findings were robust, with gender included or omitted as a covariate. Overall, these results provide an important and novel contribution to the literature by highlighting the consequences that this specific health-related conspiracy centering on antidepressants has on general health-seeking intentions.

Two of three studies suggested that exposure to health-related conspiracy theories increased distrust in key health industry actors and groups. This is particularly concerning given that in health and medical contexts, institutional trust is an important factor in help-seeking. Individuals who perceive their service provider as untrustworthy, are more hesitant to engage in pro-health behaviours (e.g., following doctors' recommendations; Hall et al., 2002). Trust in specific others involved in the health industry may be an important psychological factor impacted on by specific narratives such as those suggesting a conspiracy to suppress or cover up evidence about the efficacy of, and motivations behind the prescription of antidepressants by authorities such as doctors and pharmaceutical companies.

Research has found exposure to government or climate change conspiracy theories led to decreased intentions to engage in democratic or pro-environmental behaviour, respectively, but institutional trust did not explain this relationship (Jolley & Douglas, 2014b). Studies in other contexts, however, have shown that exposure to political/governmental conspiracy theories resulted in decreased trust in those institutions (Einstein & Glick, 2015; Kim & Cao, 2016), but did not examine impact on future intentions. In Study 3 we removed groups not directly associated with the health-industry (i.e., family/friends, religious organisations), finding results consistent with Study 1 of a small, but important effect that trust in institutional actors and groups to tell the truth about the health industry has on general health-seeking intentions. This suggests the importance of distinguishing between interpersonal and institutional trust, and is consistent with previous research trust in medical authorities on more specific vaccination intentions (Jolley & Douglas, 2014a).

Our studies, however, found less consistent support for the role of powerlessness as a reason why exposure to an antidepressant conspiracy theory may decrease general health-seeking intentions. Study 1 found a link between exposure to conspiracy theories and powerlessness (but not to intentions), however, Study 3 found powerlessness to be a mediator of this relationship. In general, increased powerlessness has been found to be related to increased belief in conspiracy theories (Abalakina-Paap et al., 1999; Goertzel, 1994), but also to mediate the relationship between exposure to conspiracy theories and decreased intention to engage in some behaviours (Jolley & Douglas, 2014b, 2014a). Our findings suggest that in the context of this specific health-related conspiracy theory focussed on the antidepressant hoax, as compared with trust in the health industry, powerlessness may be less central in reducing general health-seeking intentions.

Consistent with hypotheses, all three studies found that participants who were exposed to a pro-conspiracy article on the antidepressant hoax were significantly more likely

to endorse antidepressant conspiracy theories than participants who read an article refuting conspiracy narratives. Study 1 findings also highlighted that while the pro-conspiracy narrative increased antidepressant conspiracy beliefs, exposure to a narrative refuting antidepressant conspiracies decreased antidepressant conspiracy beliefs, relative to the control group. These findings are consistent with research finding that exposing individuals to material refuting conspiracy theories prior to exposure can reduce the negative impact of these beliefs (Jolley & Douglas, 2017).

Exposure to conspiracy theories not only have the potential to increase conspiracy beliefs, but can have further harmful consequences such as an erosion of pro-social behaviour (Jolley et al., 2019), heightened prejudice (Jolley et al., 2020), and lower vaccination uptake (Jolley & Douglas, 2014a). The present research suggests similar small detrimental effects related to more generalised medical and psychological help-seeking intentions may occur due to exposure to antidepressant conspiracy narratives indirectly through decreased trust in the health industry.

This research had some limitations that should be addressed in future research. Exposure to pro-conspiracy narratives across all three studies highlighted the importance of authorities central to health telling the truth, but also showed that gender effects may be present when examining exposure to health-related conspiracies and health-seeking intentions. The present set of studies did not set out to examine gender effects, however, future studies may seek to further examine the role of gender as a potential moderator of exposure to conspiracy theories where gender-bias may be relevant (e.g., health or medical conspiracies involving gender). While this set of studies provided good internal validity given its focus on experimental methods in examining how exposure to conspiracy theories may lead to a decrease in health-seeking intentions, it sampled a population that may be restricted on health-seeking. These participants were presumed to include, but not limited to those who

may be currently seeking help. Future research may examine how individuals who are either unwell or actively seeking help (e.g., visiting a psychiatrist, taking an anti-depressant prescription) are impacted by conspiracy theories. Finally, we cannot rule out that there may have been some cultural and general demographic differences across our samples that influenced our findings, particularly for Study 2. For instance, in addition to a gender imbalance in our sampling, the effect of exposure to conspiracy theories on the antidepressant manipulation check was not as large as both Study 1 and 3. Future studies may wish to consider potential cultural differences following exposure to conspiracy theories.

Conclusion

Exposure to health-related conspiracy theories is not without consequences. Mere exposure to a pernicious narrative was found to significantly increase antidepressant conspiracy beliefs, and reduce intention to seek health-related help indirectly through decreased trust in the health industry, albeit with small but potentially important effects. These results contribute to a growing body of research on the consequences of conspiracy theories and provide important considerations for public health, given existing relationships between belief in conspiracy theories and poor mental wellbeing (Freeman & Bentall, 2017). They also speak to the importance of understanding the effects of health-related conspiracy theories on public health behaviours during the pandemic, with recent findings of the impact of COVID-19 conspiracy theories on reported social distancing (Bierwiaczonek et al., 2020), and associations with future vaccination intentions (Romer & Jamieson, 2020). Developing a more thorough understanding of how conspiracies theories influence attitudes and intentions is an important step in understanding how best to manage and combat these beliefs.

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Tables

Table 1. *Study 1 Means and Standard Deviations for Outcome Variables Across Conditions.*

	Control (n = 96)		Anti-Conspiracy (n = 106)		Pro-Conspiracy (n = 97)	
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*
Trust	4.17	0.78	4.35	1.07	3.98	0.93
Powerlessness	4.89	1.26	4.35	1.61	4.73	1.41
Health-Seeking Intentions	3.79	1.10	3.87	1.34	3.95	1.21

Note. Theoretical range for all scales=1-7, where higher scores indicate greater level of that construct.

Table 2a. *Study 2 Means and Standard Deviations for the Outcome Variables Across Conditions.*

	Anti-Conspiracy (n = 123)		Pro-Conspiracy (n = 121)	
Variable	*M*	*SD*	*M*	*SD*
Trust	4.21	0.88	4.07	0.89
Powerlessness	3.87	1.31	3.89	1.12
Health-Seeking Intentions	4.65	1.17	4.53	1.12

Note. Theoretical range for all scales=1-7, where higher scores indicate greater level of that construct.

Table 2b. *Study 2 T-Test Examining the Impact of Gender on Trust, Powerlessness and Health-Seeking Intention.*

	Male (n = 58)		Female (n = 184)		t	Cohen's d
	M	*SD*	*M*	*SD*		
Trust	3.89	0.95	4.23	0.83	-2.63*	0.40
Powerlessness	4.22	1.20	3.76	1.19	2.59*	-0.39
Health-Seeking Intentions	4.18	1.14	4.73	1.12	-3.27*	0.49

Note. $p < .01$.

Table 3. *Study 3 Means and Standard Deviations for the Outcome Variables Across Conditions.*

	Anti-Conspiracy (n = 123)		Pro-Conspiracy (n = 124)	
Variable	*M*	*SD*	*M*	*SD*
Trust	4.48	1.22	3.92	1.23
Powerlessness	4.42	1.69	5.06	1.29
Health-Seeking Intentions	3.89	1.63	3.63	1.54

Note. Theoretical range for all scales=1-7, where higher scores indicate greater level of that construct.

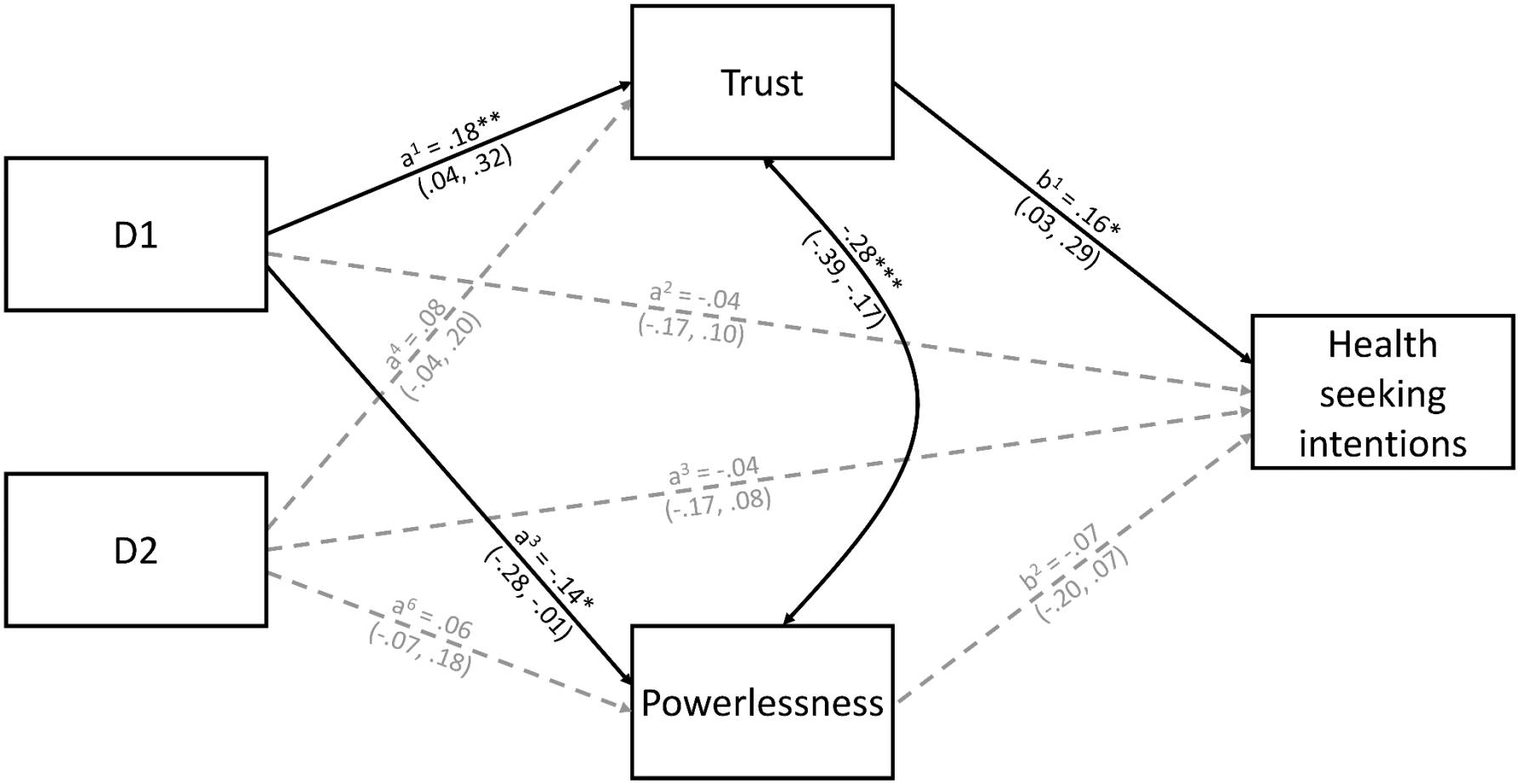

Figure 1. Study 1: Conspiracy Exposure on Health-Seeking Intentions Including Mediators

Notes. D1 = Pro vs. anti-conspiracy condition on health-seeking intentions, when controlling for pro conspiracy vs. control (D2). Coding for D1: Pro-conspiracy (0), Anti-conspiracy (1), Control (0). Coding for D2: Pro-conspiracy (0), Anti-conspiracy (0), Control (1).
Coefficients are standardised (with frequentist 95% confidence intervals). Grey dashed lines reflect non-significant paths. *** $p < .001$, ** $p < .01$, *$p < .05$.

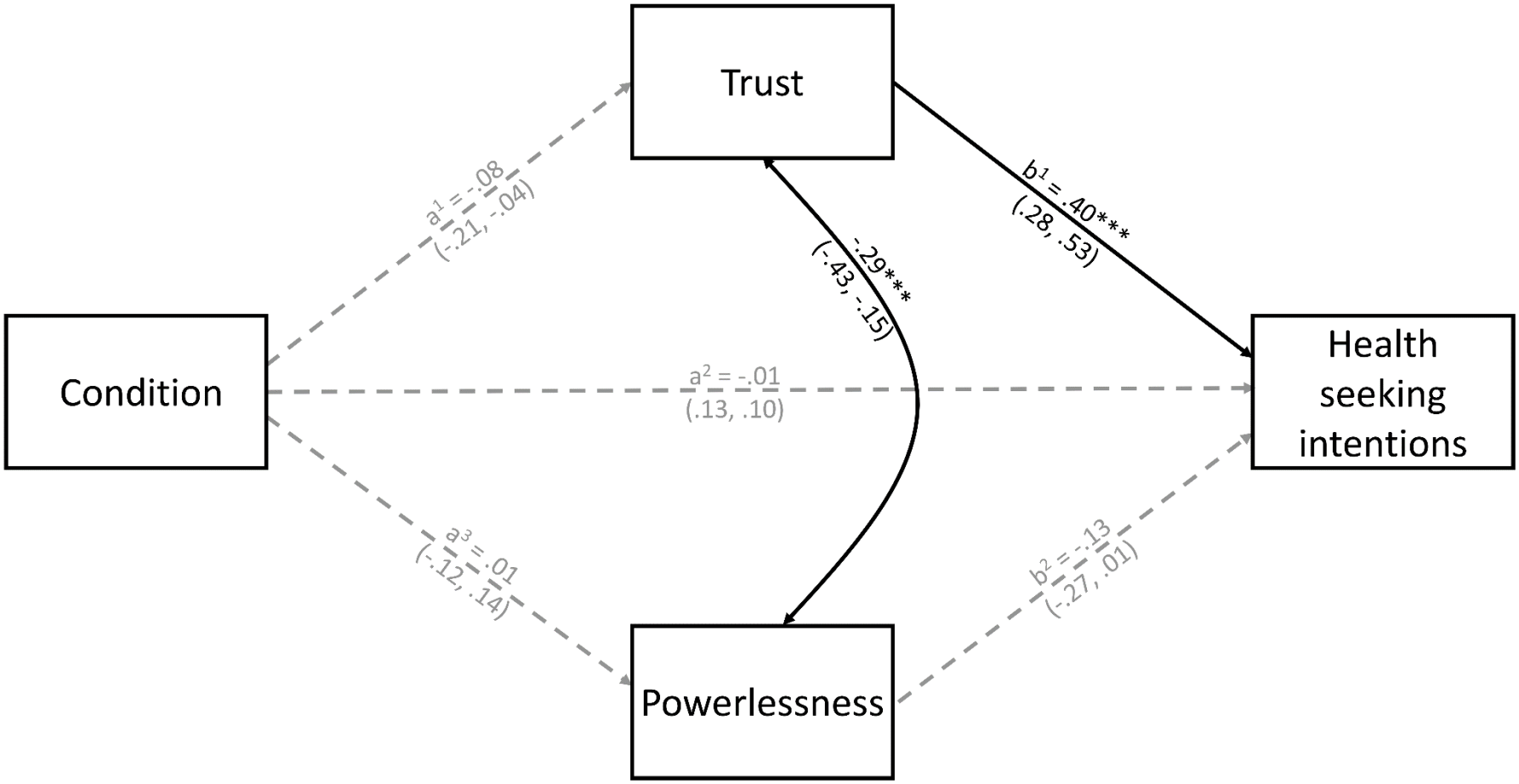

Figure 2a. Study 2: Conspiracy Exposure on Health-Seeking Intentions Including Mediators.

Notes. Condition was coded anti-conspiracy (0), pro-conspiracy (1).
Coefficients are standardised (with frequentist 95% confidence intervals). Grey dashed lines reflect non-significant paths. *** $p < .001$, ** $p < .01$, *$p < .05$.

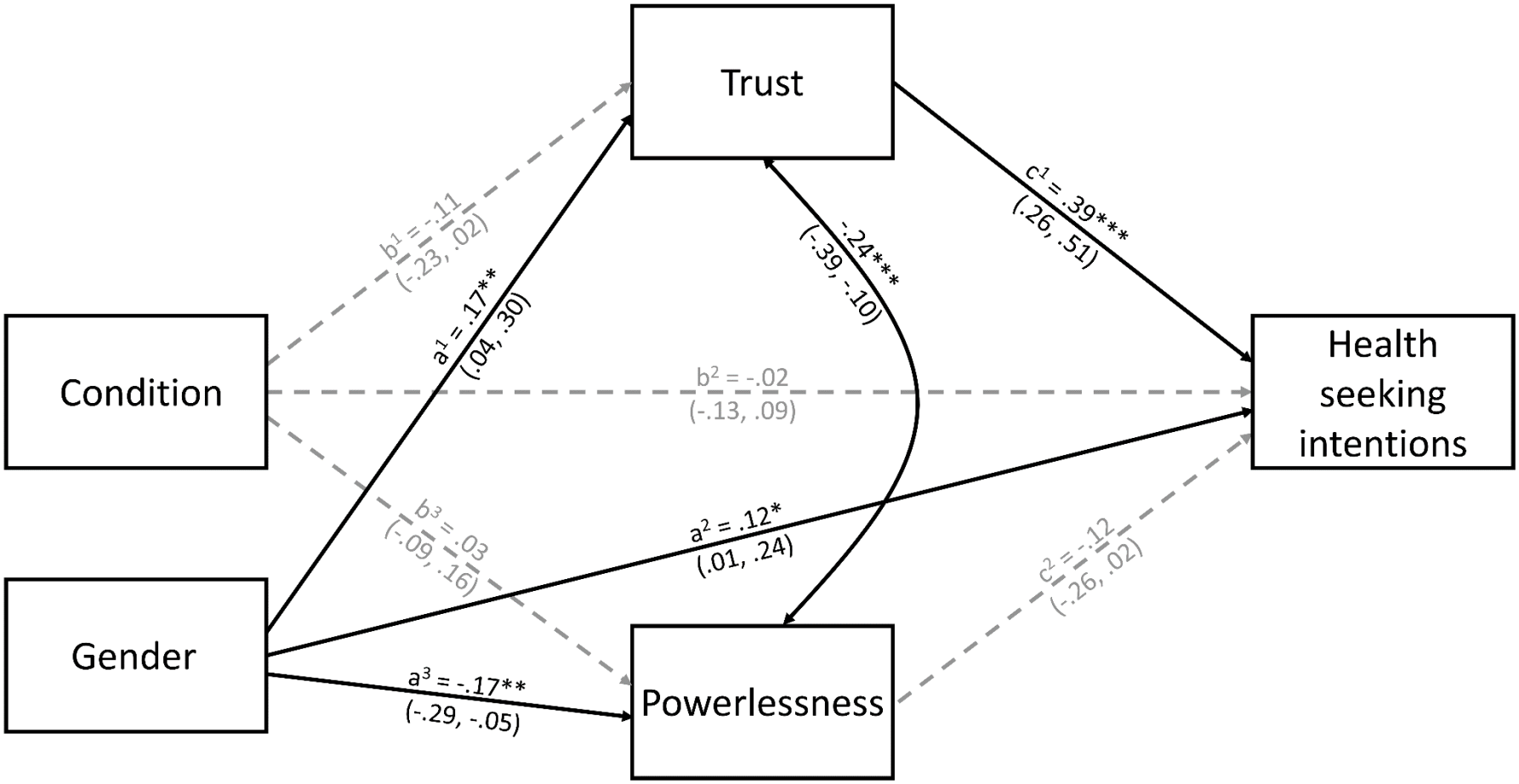

Figure 2b. Study 2: Conspiracy Exposure on Health-Seeking Intentions Including Mediators, Controlling for Gender.

Notes. Condition was coded anti-conspiracy (0), pro-conspiracy (1). Gender was coded as Female (1), Male (0).
Coefficients are standardised (with frequentist 95% confidence intervals. Grey dashed lines reflect non-significant paths. *** $p < .001$, ** $p < .01$, *$p < .05$.

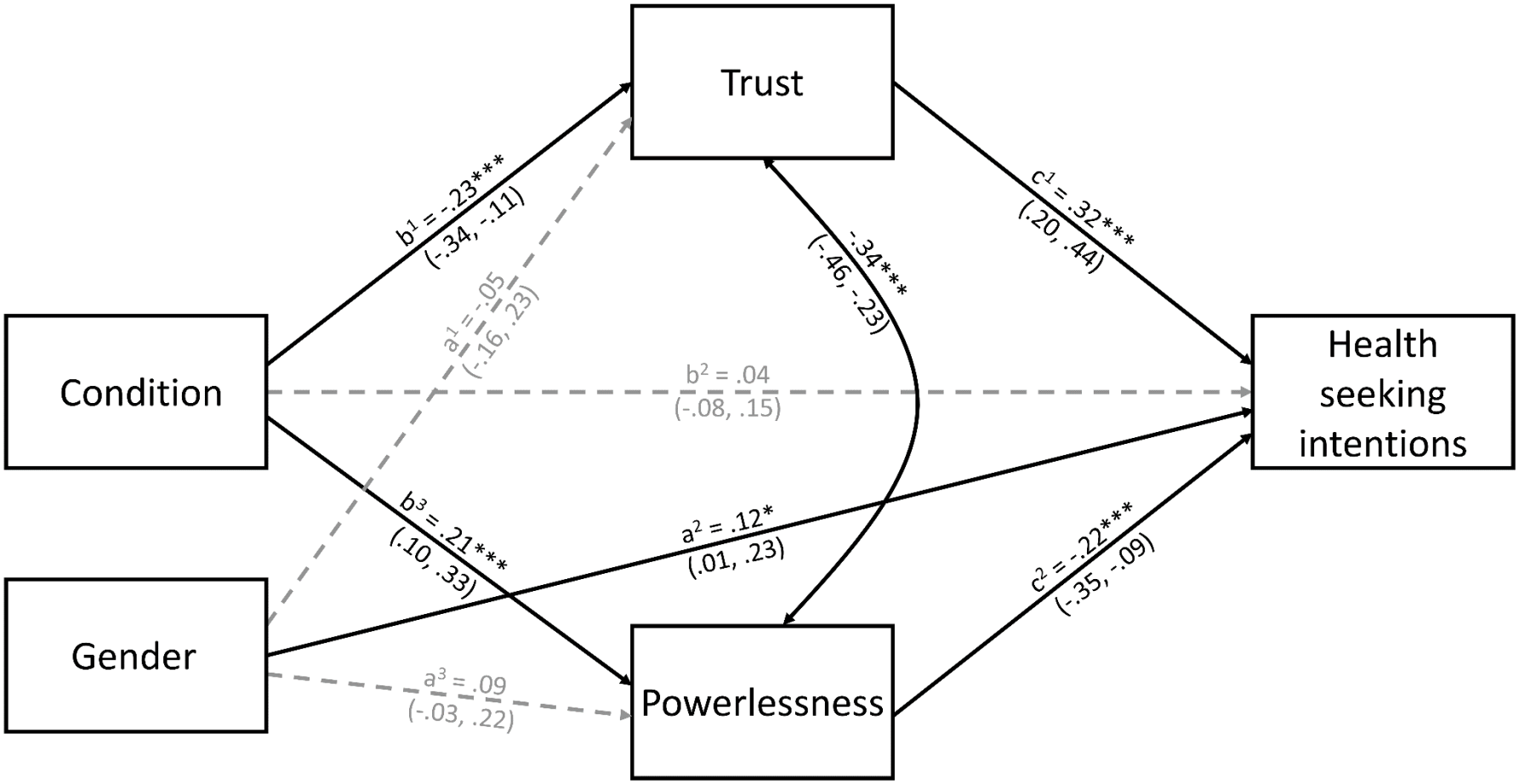

Figure 3a. Study 3: Conspiracy Exposure on Health-Seeking Intentions Including Mediators, Controlling for Gender.

Notes. Condition was coded anti-conspiracy (0), pro-conspiracy (1). Gender was coded as Female (1), Male (0). Coefficients are standardised (with frequentist 95% confidence intervals. Grey dashed lines reflect non-significant paths. *** $p < .001$, ** $p < .01$, *$p < .05$.

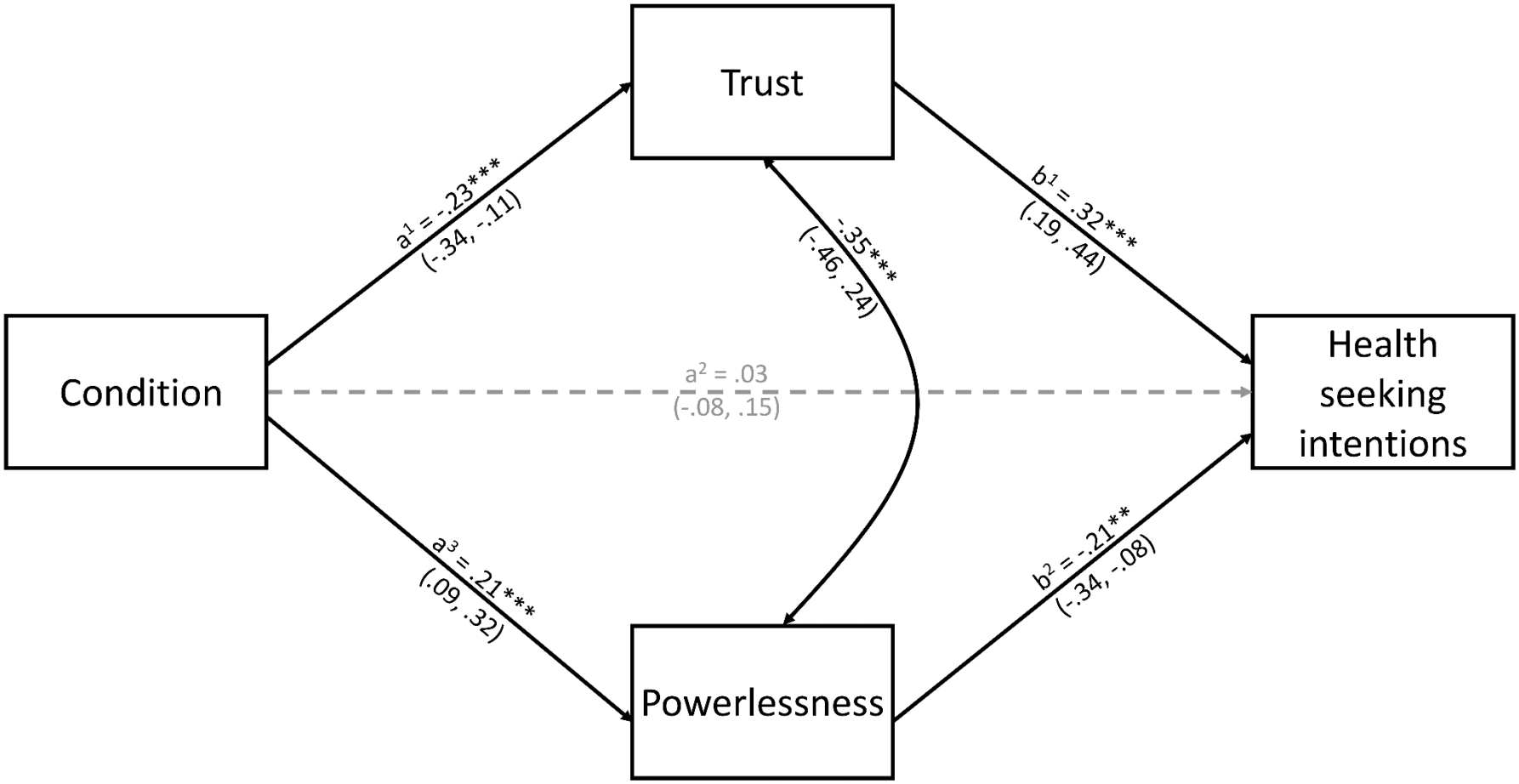

Figure 3b. Study 3: Conspiracy Exposure on Health-Seeking Intentions Including Mediators, Excluding Gender.

Notes. Condition was coded anti-conspiracy (0), pro-conspiracy (1).
Coefficients are standardised (with frequentist 95% confidence intervals. Grey dashed lines reflect non-significant paths. *** $p < .001$, ** $p < .01$, *$p < .05$.