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Combating Conspiracy Theories: An Attitudes-Based Approach

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Combating Conspiracy Theories: An Attitudes-Based Approach

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Abstract

The prevalence of conspiracy theories is a topic of increasing concern among researchers. Much of the research in this area has been focused on why people endorse conspiracy theories, and relatively little attention has been paid to how they may be mitigated. What research has been done focused primarily on interventions with arguments based in cognitive, fact-based appeals, with mixed success. The present research draws on findings from the attitudes and persuasion literature to test the hypothesis that conspiracy theory endorsement is more effectively reduced by affectively-based arguments than by cognitively-based arguments. Two affectively-based interventions were tested against a cognitively-based intervention and a control. The affective/empathy condition and the cognitive condition were equally effective at reducing anti-vaccine conspiracy beliefs. The affective/threat condition performed similarly to the control. Affectively-based persuasion does not appear more effective than traditional cognitively-based interventions, but may be an equally effective alternate strategy for reducing conspiracy beliefs.

Keywords: conspiracy theories, attitudes, persuasion, affect

Contents

Introduction

Conspiracy theories are generally viewed as outlandish, and conspiracy theorists are popularly perceived as insane, existing on the fringes of society. Consider the prototypical image of the conspiracy theorist: wearing a tinfoil hat, maybe standing on a street corner or building a bunker somewhere remote, spouting off about aliens.

Yet the reality of conspiracy theories and those who endorse them is both more mundane and more dangerous. Endorsement of conspiracy theories is widespread; for example, approximately 60% of Americans believe the CIA was responsible for assassinating President John F. Kennedy (Douglas et al., 2019). While belief in this conspiracy theory does not present immediate and obvious harm, belief in other conspiracy theories does: for example, 2019 saw a total of 1282 cases of measles in the US, up from 375 in 2018 and 120 in 2017, the majority of which were in unvaccinated individuals (Centers for Disease Control and Prevention [CDC], 2020). Outbreaks of measles have been directly linked to parents' concerns that vaccines cause autism and subsequent decisions not to vaccinate their children (Hall et al., 2017). This finding squares with psychological research, which has found that exposure to anti-vaccine conspiracy arguments reduces intentions to vaccinate a hypothetical child (Jolley & Douglas, 2014). Anti-vaccine conspiracy theories, and their widespread circulation, are thus demonstrably harmful to both individuals and to society.

Given that conspiracy theories are both common and harmful, it is important to understand how they are acquired, why they are endorsed, and what can be done to mitigate them. The present research aims to answer the latter question by integrating findings and techniques from the conspiracy theories and attitudes and persuasion literatures.

Conspiracy Theories

Conspiracy theories are generally defined as attempts to explain some event or circumstance in terms of a plot by two or more malevolent, often powerful actors (e.g., Douglas et al., 2019; Flynn et al., 2017). These actors include the government (e.g., "Bush did 9/11") and large corporations (e.g., "Big Pharma doesn't want you to know how harmful vaccines really are"), but can be any actors that are perceived as having great influence.

It can sometimes be difficult to distinguish conspiracy theories from true conspiracies, as in the cases of Watergate and Iran-Contra, and so some scholars argue that conspiracy theories can only be rejected in retrospect (Räikkä, 2009). Others, such as Sunstein and Vermeule (2009), label all allegations of conspiracy as conspiracy theories, but distinguish true or proven conspiracy theories from false. However, this approach is not dominant, and so while it is generally accepted that conspiracy theories *may* be true, additional qualifiers such as "implausible" or "irrational" are often added to the base definition to allow for a sharper distinction between conspiracy theorizing and more rational skepticism of official stories when there is a lack of evidence or certainty (Douglas et al., 2019; Stojanov & Halberstadt, 2019).

Motives for Endorsement and Process of Endorsement

Endorsement of conspiracy theories is most commonly viewed in terms of a motivated cognition framework (Douglas et al., 2017; Miller et al., 2016; van Prooijen, 2020; van Prooijen & Douglas, 2018). From this perspective, motives for endorsement are categorized as epistemic, existential, and social.

Epistemic motives involve the desire for understanding, certainty, and accuracy. As large-scale events occur and rapidly develop, there tends to be a great deal of uncertainty surrounding them, as with the COVID-19 pandemic. Conspiracy theories then arise to satisfy

these needs in ways that official explanations cannot: they provide more certainty than what is currently known, they are internally consistent, and they have a complexity and scale that matches the scale of the event when simpler explanations are unsatisfying (Douglas et al., 2017).

Existential motives are concerned with the desire for safety, security, and control. When people turn to conspiracy theories, they may feel as though they are reasserting control by choosing not to believe the official story, and they may feel safer in the short term because they feel as though they have identified the threat (Douglas et al., 2017).

Social motives encompass belongingness needs and the desire to feel positively about oneself and one's ingroup. In this case, conspiracy theories about how an individual or group is being held down by "the man" may appear to fill that need, or one might find a sense of belonging with a likeminded community who share the same beliefs (Douglas et al., 2017).

These motives have recently been incorporated into the Existential Threat Model of Conspiracy Theories, which outlines a process for conspiracy theory endorsement (van Prooijen, 2020). According to this model, existential threat triggers the start of the process and causes people to first look to satisfy existential motives. van Prooijen defines existential threat as "feelings of anxiety or uncertainty, often because of distressing events that call one's values, one's way of life, or even one's existence into question" (2020, p. 16), and is felt when an individual or those near to an individual are harmed or expect some sort of loss. From there, sense-making processes are triggered, in which people are motivated to understand both their physical and social environments; in other words, people seek to satisfy epistemic motives. Sometimes these motives are satisfied by the official explanation for the existential threat, but this is not always the case.

In some cases, van Prooijen (2020) suggests, the presence of an antagonistic outgroup (which may or may not actually be related to the existential threat) provides a convenient scapegoat, and as such, social motives moderate the result of sense-making processes. Thus, the Chinese government MUST have manufactured SARS-CoV-2 in a lab, since the pandemic started in China, and happenstance is not a satisfying explanation for a massive pandemic; rather, it must have been the result of some deliberate effort. From this model's perspective, conspiracy theories are the result of sense-making processes gone awry. The presence of a salient outgroup, van Prooijen argues, is what makes people turn to conspiracy theories, rather than other epistemically unwarranted beliefs or retreating to status quo preferences.

Conspiracy theories, however, are not effective at satisfying any of the motives outlined here. Rather, they actually *increase* existential threat, and create a feedback loop in which conspiracy theories are mutually reinforcing (Douglas et al., 2017; van Prooijen, 2020). This feedback loop, then, may be a mechanism through which new conspiracy theories are incorporated into one's worldview.

Belief Systems and Predictors of Endorsement

The single best predictor of conspiracy theory endorsement is endorsing other conspiracy theories (Goertzel, 1994; Stojanov & Halberstadt, 2019; Swami et al., 2011; Wood et al., 2012). This finding has led researchers to conclude that a general trait or worldview, variously termed "conspiracy mentality" (Stojanov & Halberstadt, 2019), "conspiracist ideation" (Swami et al., 2011), or "conspiracy worldview" (Douglas et al., 2019), is responsible for conspiracy theorizing. Goertzel (1994) suggested, based on his finding that endorsement of conspiracy theories is correlated with endorsement of other conspiracy theories, that conspiracy theories comprise a monological belief system – they are both self-contained and self-reinforcing. This is

often interpreted to mean that people tend to endorse conspiracy theories almost indiscriminately, regardless of content, as long as they point to a conspiracy (Douglas et al., 2019). However, this conclusion is disputed. In a text analysis of comments from approximately 130,000 authors on reddit's conspiracy subreddit, Klein et al. (2018) found that only a minority of commenters wrote in ways that reflected this interpretation of a monological belief system. The majority, by contrast, had one or two pet conspiracy theories, and preferred to discuss only those topics. Goertzel (1994) also allowed for this conclusion, charging that many who believe conspiracy theories tend to attribute every problem to their favored conspiracy actor in his suggestion of a monological belief system.

Other predictors tend to map on to the motives outlined by Douglas et al. (2017). Related to epistemic motives, when conspiracy explanations for events are made salient, need for cognitive closure predicts endorsement of conspiracy theories (Marchlewska et al., 2018). In addition, uncertainty is associated with beliefs in conspiracy theories (van Prooijen & Jostmann, 2013). People who endorse conspiracy theories also tend to be more susceptible to the conjunction fallacy (Brotherton & French, 2014), suggesting, consistent with van Prooijen's (2020) model, that errors in reasoning are associated with conspiracy beliefs. Other evidence supports this interpretation: conspiracy theory endorsement is associated with susceptibility to fake news (Anthony & Moulding, 2019) and bullshit (Hart & Graether, 2018; Pennycook et al., 2015), as well as preference for intuitive/experiential information processing (Stojanov, 2015). Though Stojanov (2015) found no association between conspiracy beliefs and preferences to think analytically/rationally, Swami et al. (2014) found a negative correlation between analytic/rational thinking and conspiracy beliefs, and also demonstrated experimentally that two separate manipulations designed to induce more analytic thinking reduced conspiracy theory

endorsement. In short, epistemic motives appear to drive conspiracy theory endorsement when errors are made in the application of sense-making processes.

Lacking control, in particular, has been demonstrated to increase conspiracy theory endorsement (Whitson & Galinsky, 2008). Possessing a sense of control is an essential component of existential motives, and conspiracy theories may provide a sense of control by allowing an active rejection of official explanations (Douglas et al., 2017). Other predictors of conspiracy theory endorsement related to existential motives include beliefs in a dangerous world (Hart & Graether, 2018), attachment anxiety (Green & Douglas, 2018), feelings of anomie or political disengagement (Goertzel, 1994), and lack of trust in political institutions (Einstein & Glick, 2015). Thus, those who lack control and feel they either cannot change society or mistrust those who have power and control are more likely to turn to conspiracy theories to understand the world and regain control.

Social motives for conspiracy theory endorsement include the need to feel positively about the self and one's ingroup. In line with these motives, research has demonstrated a correlation between individual narcissism and conspiracy beliefs (Cichocka, Marchlewska, & Golec de Zavala, 2016). Collective narcissism, the group-level analogue to individual narcissism, is also associated with conspiracy theory endorsement (Cichocka, Marchlewska, Golec de Zavala, & Olechowski, 2016). However, while both types of narcissism predict conspiracy theory endorsement, these studies also found that high self-esteem and high collective self-esteem *negatively* predicted conspiracy beliefs (Cichocka, Marchlewska, & Golec de Zavala, 2016; Cichocka, Marchlewska, Golec de Zavala, & Olechowski, 2016). This suggests that conspiracy theory endorsement can be a compensatory process, since it is predicted by unstable rather than stable positive regard for the self and one's ingroup.

In addition to psychological motives, there are some demographic characteristics that predict conspiracy theory endorsement. Members of lower-status social groups, such as members of racial and ethnic minorities in the US, are more likely to endorse conspiracy theories than their higher-status counterparts (Goertzel, 1994). As Douglas et al. (2019) point out, this may be a very rational reaction: members of minority groups have legitimately been historically targeted, and continue to be targeted at the present time, which can make it seem intuitive that others are conspiring in bad faith, and make a range of conspiracy theories appear more plausible.

Lack of education also predicts conspiracy theory endorsement (van Prooijen, 2017). Mediation analyses conducted by van Prooijen (2017) in two different studies suggest that the relationship between lack of education and conspiracy beliefs operates through feelings of control, belief in simple solutions to complex problems, and analytic thinking. van Prooijen (2017) suggests that there may be a causal relationship, such that education increases feelings of control, cognitive complexity (and therefore decreases belief in simple solutions), and trains analytic thinking skills. At this point, however, causality has not been empirically demonstrated. Nonetheless, the link between education and decreased belief in conspiracy theories seems clear, and increased education on a societal level appears to be a possible long-term solution for decreasing conspiracy theory endorsement.

Thus far, the picture that emerges of those who tend to endorse conspiracy theories is as follows: they tend to endorse more than one conspiracy theory (though these may be variations on a core theme); they tend to be less equipped to reason effectively; they tend to be motivated to seek closure; they tend to feel lower levels of control and higher levels of disaffection with society; and they tend to feel less stable socially. This suggests that an effective intervention should meet one or more of these needs by providing clear reasoning, a definitive answer, a

sense of control, and/or should not make the target of the intervention feel like they or their group are being attacked.

Conspiracy Theories as Misinformation

Misinformation is any information that is factually incorrect (e.g., Flynn et al., 2017). As such, it is a broad category that includes several more specific types of misinformation. In particular, fake news is a recently coined term that describes misinformation that is presented as though it is factual news (Anthony & Moulding, 2019; Pennycook & Rand, 2020). Rumors, which are relevant but unverified claims that circulate surrounding a certain event or topic, are similarly considered misinformation or misperceptions unless they are proven true (Flynn et al., 2017). In this same vein, some scholars find it useful to classify conspiracy theories as a type of misinformation.

Misinformation and conspiracy theories share several key characteristics. For example, the endorsement of both misinformation and conspiracy theories in political contexts is generally considered to be, in part, a result of motivated cognition (Douglas et al., 2019; Flynn et al, 2017; Miller et al., 2016); people tend to either seek out or selectively attend to information that confirms their preexisting attitudes and beliefs. Those who endorse conspiracy theories are also more susceptible to fake news and pseudo-profound bullshit (Anthony & Moulding, 2019; Hart & Graether, 2018; Pennycook et al., 2015). And perhaps most interestingly, the propensity not to engage in analytic thinking has been linked to fake news, bullshit receptivity, and conspiracy beliefs (Pennycook & Rand, 2019; Pennycook & Rand, 2020; Swami et al., 2014). These findings suggest not only that endorsement of conspiracy theories and susceptibility to misinformation share common psychological roots, but that they are in fact interrelated, possibly to the extent that conspiracy theories can be classified as misinformation.

However, some scholars dispute the classification of conspiracy theories as misinformation. Einstein and Glick (2015), in particular, argue that there are too many differences between the psychology of misinformation and the psychology of conspiracy theories to consider them as semi-interchangeable; they argue that the consequences of conspiracy beliefs are far more sinister than those of simple misinformation, and that conspiracy theories do far more damage to institutional trust. Yet despite these objections, the majority of scholars find it more useful to consider conspiracy theories as similar to misinformation (e.g., Swami et al., 2014), and in fact, Douglas et al. (2019) specifically recommend consulting the misinformation literature for strategies to combat conspiracy beliefs. Many scholars have done just that in an attempt to develop successful interventions, as will be outlined below; however, these approaches have yielded limited success, perhaps due to conspiracy theories' status as a more tenacious and complicated form of misinformation, and suggest the need for incorporating additional perspectives and techniques.

Previous Research on Conspiracy Theory Interventions

There have been a handful of attempts in recent years to combat conspiracy beliefs, including utilizing persuasive techniques, but this area of research is still very much in its infancy. As such, there has been little follow-up to any of these studies, and a coherent picture of effective interventions has yet to emerge. Nonetheless, what follows is an overview of the research that has been published to date on this topic.

One attempt to reduce conspiracy beliefs involved inducing analytic thinking experimentally. Across three studies, with two different manipulations, Swami et al. (2014) demonstrated that increased analytic thinking decreased endorsement of conspiracy theories. Their first manipulation consisted of a task in which participants were instructed to form viable

sentences from a set of scrambled words; in the experimental condition, these words included words related to thinking and reasoning. After participating in this task, participants in the experimental condition, primed with words related to analytic thinking, reported significantly less endorsement of conspiracy theories, compared both to those in the control condition and themselves five weeks prior. In the second manipulation, analytic thinking was induced by making the text more difficult to read. While those in the control condition filled out a survey presented in an easy-to-read font, participants in the experimental condition filled out an identical survey that was printed in a difficult-to-read font, which was intended to require more cognitive resources to complete. Those who completed the more difficult survey again reported significantly lower levels of conspiracy beliefs, compared to the control condition and to themselves four weeks prior. The results of this second study were essentially replicated with a sample from the general population; while there was only one time point of observation, those who were given a survey that was harder to read reported less conspiracy theory endorsement than those who had a survey that was easy to read.

A second attempt to reduce conspiracy beliefs involves interventions that seem relatively straightforward in comparison. In a single online study, using an (unspecified) platform similar to Amazon's Mechanical Turk, Orosz et al. (2016) tested three separate interventions across approximately 700 participants. All participants first listened to a recorded speech detailing a large-scale conspiracy against Hungary (the country in which the study took place), and then were assigned to one of the three interventions or a control condition (in which they listened to a weather forecast). In the first intervention, termed the "rational" condition, participants listened to another prerecorded speech that pointed out logical flaws in the arguments presented in the initial speech and gave in-depth, rational explanations for why the claims in the first speech

could not be true. In the second intervention, termed the "ridiculing" condition, participants again listened to a speech pointing out flaws in the initial recording. However, rather than presenting cogent arguments explaining why the conspiracy theories initially presented could not be true, this second condition's speech focused on those who endorse conspiracy theories, insulting them personally and presenting them as utterly ridiculous. The third intervention was termed the "empathetic" condition, and in this condition, participants listened to a prerecorded speech that attempted to create empathy for the targets of conspiracy theories. This condition paid scant attention to the contents of the arguments presented in the initial recording, but instead essentially attempted to remind the audience that those allegedly conspiring against them are people too.

Participants completed a measure of agreement with the arguments presented in the initial recording twice: first immediately after listening to the recording, and again after the interventions (or weather forecast). Compared to themselves at time 1, those in the "rational" and "ridiculing" conditions reported less belief in the conspiracy theory they had been exposed to at time 2; however, there was no difference between times 1 and 2 for those in the "empathetic" condition. The authors also compared all conditions to the control condition at time 2 only, and found a significant difference between those in the "rational" and control conditions, but not between either of the other conditions and the control condition. This suggests that rationally refuting conspiracy arguments may be effective, though evidence for the efficacy of mocking appears mixed.

A third attempt at reducing conspiracy beliefs, conducted by Jolley and Douglas (2014), concerned increasing intentions to vaccinate a fictional child by providing information that refuted anti-vaccine conspiracy beliefs. In this experiment, they presented participants in the pro-

vaccine condition with an article that provided information indicating that there is no reason to doubt that vaccines are safe and effective. In the anti-vaccine condition, participants were given an article that presented conspiracy arguments against the safety and efficacy of vaccines. There was also a control condition in which participants did not read any article. They found that those in the pro-vaccine condition were significantly less likely to endorse anti-vaccine conspiracy theories than those in either the anti-vaccine or control conditions. However, while they found that those who read anti-vaccine conspiracy arguments were significantly less likely to intend to vaccinate a fictional child, there was no difference in vaccination intentions between the control group and those who read pro-vaccine arguments. These main effects were mediated by the perceived dangers of vaccines. The results from the analysis of vaccination intentions in particular suggest that presenting an argument against conspiracy theories that focuses primarily on statistics and public opinion reports, as the pro-vaccine article did, is at best a partially effective intervention against conspiracy beliefs.

A fourth attempt at reducing conspiracy beliefs, done by Stojanov (2015), involved two manipulations intended to reduce conspiracy beliefs and increase the likelihood of vaccinating a fictional child. This work attempted to build on previous research in Jolley and Douglas (2014). In this study, Stojanov tested a manipulation similar to that of Jolley and Douglas (2014), which she termed the "debunking" condition, in which a straightforward, fact-based refutation of vaccine-related conspiracy beliefs was presented. In addition, she included a condition in which participants were presented with the same information as in the "debunking" condition, but were also given additional information about the motives of those spreading conspiracy theories and the fallacies in their reasoning. These two manipulations were tested against a control group that received no information. She found that those in the condition that also addressed motives and

reasoning fallacies endorsed medical conspiracy theories to a significantly lesser extent than those in the "debunking" and control conditions, but that there was no difference between conditions for conspiracy beliefs in general. In addition, there was no difference between conditions in intentions to vaccinate a fictional child. Thus far, then, we have what could be optimistically termed mixed evidence for the generality of conspiracy belief reductions across studies. However, there is some evidence that sometimes some approaches work to reduce beliefs in specific conspiracy theories or categories of conspiracy theories.

Jolley and Douglas (2017) executed a study to follow up on their 2014 study concerning anti-vaccine conspiracy beliefs and intentions to vaccinate a fictional child. In this follow-up, Jolley and Douglas (2017) reasoned that since participants are more likely to be most interested in and pay the most attention to information that is presented first, they could use that to their advantage and present anti-conspiracy arguments first; in other words, they could test an information inoculation strategy. Information inoculation involves presenting a "weakened" version of an undesired position, and refuting the arguments presented in that version (McGuire, 1961). To test this idea, they created an experiment that included five conditions: a control condition, in which participants were given no information; a condition in which participants only saw arguments in favor of anti-vaccine conspiracy theories (anti-vaxx); a condition in which participants only saw arguments against anti-vaccine conspiracy theories (pro-vaxx); a condition in which participants first saw arguments for conspiracy theories, followed by arguments against conspiracy theories (anti-vaxx/refutation); and a condition in which participants first saw arguments against conspiracy theories, followed by arguments for conspiracy theories (inoculation). Similar to the 2014 study, they then asked participants about their beliefs in vaccine-related conspiracy theories and their intentions to vaccinate a fictional

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child. They found that compared to the anti-vaxx condition, those in the anti-vaxx/refutation condition did not demonstrate increased intentions to vaccinate; however, those in the inoculation condition did show greater vaccination intentions than those in the anti-vaxx and anti-vaxx/refutation conditions. They replicated these results in a second study. These findings suggest that inoculation may be a viable strategy for reducing conspiracy beliefs.

There is some work in the communications literature on conspiracy belief interventions that may also be instructive. Warner and Neville-Shepard (2014) tested the effects of a refutation-style intervention on two separate conspiracy theories: 9/11 conspiracy theories and the theory that Obama was not actually born in the US (birtherism). For each conspiracy theory, participants were shown actual media from various sources that either supported, refuted, or showed both sides of the issue. They were shown a newspaper or magazine article, a video, and a selection of comments from a blog post. In the first condition, participants were shown only pro-conspiracy information: the article, video, and blog comments unilaterally supported the 9/11 conspiracy theories or birtherism. In the second condition, participants were first presented with the conspiracy theory using the same pro-conspiracy article, but then shown a video that refuted the conspiracy theory; the blog comments they viewed contained arguments for and against the conspiracy theory. In the control condition, participants still viewed media in the same formats, but the media concerned issues unrelated to the conspiracy theories or to each other. Unsurprisingly, they found that those in the pro-conspiracy condition in each study showed significantly increased endorsement of the conspiracy theory as compared to the beginning of the experiment. Additionally, for the 9/11 conspiracy theory, they found (unexpectedly) increased endorsement from the beginning to the end of the study in all conditions, including the control condition. However, the birtherism conspiracy theory yielded the expected pattern of results, in

which endorsement decreased in the refutation condition and did not change in the control condition. They also found, interestingly, that political affiliation was not a moderator: self-identified Democrats and Republicans were equally likely to endorse the conspiracy theories in the pro-conspiracy condition, and equally likely to dismiss them in the refutation condition. The authors noted that the refutation they presented in the 9/11 conspiracy study may have been too technical for the audience, and suggest this may be one reason the refutation was unsuccessful. While their results cannot clarify that this may have been the case, this reasoning aligns with other research that demonstrates that endorsement of conspiracy theories is related to less analytic thinking (e.g. Swami et al., 2014); if the intervention requires a high level of analytic thinking to understand, it is less likely that the intended audience will put forth the effort necessary to understand, process, and incorporate the information into their own worldviews.

Banas and Miller (2013) tested both inoculation and "metainoculation" strategies against conspiracy beliefs. This study contained five conditions: two which were inoculation-based, two which contained metainoculation, and a control condition. The authors described metainoculation as, in essence, inoculation against inoculation: participants were warned that they would be presented with the inoculation materials, and they were given a description of what inoculation is and what it is meant to achieve. Both the inoculation and metainoculation messages (which followed the metainoculation warning in those conditions) were presented in either a fact-based or logic-based manner. They contained the same essential facts, but refuted the arguments participants would be presented with by emphasizing either the incorrectness of the facts or the errors in reasoning. After reading these messages, participants viewed a portion of a film that advanced 9/11-related conspiracy theories. As compared to the control condition, participants in the inoculation conditions were less likely to support the notion that there was a

conspiracy involving the US government surrounding 9/11. The authors also found that those in the metainoculation conditions were more likely to endorse 9/11 conspiracy theories than those in the inoculation conditions. In addition, the fact-based inoculation condition was significantly more effective at inoculating participants against the conspiracy arguments than the logic-based condition, while there was no difference in efficacy in the metainoculation conditions. This suggests, first, that metainoculation directly before inoculation is generally effective. However, it also suggests that while inoculation is effective against conspiracy beliefs, this effect is differential: since the fact-based condition was more effective with a sample of college students, who are more likely to engage in reasoning processes within an academic context, it is more likely that a logic-based intervention will be even less effective in a more representative sample, in which fewer participants will prefer to engage in this sort of logic-based reasoning. An effective intervention would take these tendencies into account, and not rely on technical or difficult-to-follow language and reasoning.

While the above interventions are encouraging, as they present some evidence that conspiracy theory endorsement can be reduced, they were by no means universally successful. They do suggest some direction for future research; for example, interventions that relied on logic or contained very technical explanations were less successful, which is in line with findings from multiple studies that demonstrate that those who endorse conspiracy theories tend to think less analytically (e.g., Stojanov, 2015; Swami et al., 2014). However, these interventions share a commonality: they focus almost exclusively on cognitive arguments. Given the assumed nature of conspiracy theories and their associated predictors, this seems a major oversight, as affect and emotion appear to feature heavily among reasons for endorsing conspiracy theories. In the next

sections, I will outline additional research in the attitudes and persuasion literature that may be useful in advancing interventions in a way that does not rely on purely cognitive arguments.

Attitudes and Persuasion

Attitudes are not a well-defined construct, but it is generally agreed that they center around evaluations (Petty et al., 1997). These evaluations take place across a wide variety of attitude objects, including people, places, and policy positions, for example. Because of the broad nature of attitudes and what comprises them, it is possible to conceptualize the endorsement of conspiracy theories as attitudes: the endorsement involves an evaluation of the attitude object, i.e., the conspiracy theory. Conceptualizing conspiracy beliefs as attitudes then allows us to consult the literature on attitudes and attitude change to improve interventions in conspiracy theory endorsement.

Cognitive and Affective Attitude Components

Attitudes are generally considered to have both cognitive components and affective components (e.g., Edwards, 1990). Cognitive components are acquired by consciously thinking and reasoning about the attitude object, while affective components are thought to be acquired with little initial thought, and are instead based in how someone feels about the attitude object (Edwards, 1990). Previously, psychologists believed that cognitive processes preceded affective evaluations of attitude objects, but this perspective is no longer supported (Zajonc, 1980). Instead, affective evaluations can be the first or even primary method of evaluating an attitude object.

While most attitudes have both cognitive and affective components, attitudes can be based primarily in affect or primarily in cognition (e.g., Edwards, 1990; Petty et al., 1997). Attitudes can be experimentally induced; priming (Edwards, 1990), persuasive messages

(Fabrigar & Petty, 1999), and varying the presentation order of cognitive versus affective stimuli (Edwards & von Hippel, 1995) have been used to effectively create attitudes based primarily in affect or cognition about novel attitude objects. Attitudes can also be preexisting, such that participants have previously formed attitudes which are cognitive or affective to varying degrees (e.g., van Giesen et al., 2015). These attitudes can then be measured to determine the strength of their cognitive and affective components, such as with Crites et al.'s (1994) commonly used attitudes measure, which includes measures of affective evaluation, cognitive evaluation, and general evaluation, and can be applied to a variety of attitude objects.

Attitude Bases and Persuasion

While the cognitive and affective bases of attitudes can be measured, and their relative strength can be compared, they can also be harnessed in the context of persuasion. After experimentally inducing attitudes that were either primarily affective or primarily cognitive, Edwards (1990) found that affective attitudes were more susceptible to persuasion via affective means, while cognitive attitudes were equally susceptible to affective or cognitive persuasion. Edwards and von Hippel (1995) replicated these results in two experiments that manipulated the order of presentation of cognitive and affective information. Across two experiments, Fabrigar and Petty (1999) also induced primarily cognitive or primarily affective attitudes, which they verified using Crites et al.'s (1994) attitudes measure. They found that affective attitudes were more susceptible to affective persuasion, and that cognitive attitudes were slightly, nonsignificantly more susceptible to cognitive persuasion. These and other findings suggest the presence of "matching" effects, particularly for affective attitudes, such that affective persuasive messages seem important to consider as an intervention for conspiracy beliefs, which are thought to be based in emotion.

In contrast to the above findings, there is a small number of studies that found evidence for "mismatching" effects, such that affective attitudes were more effectively changed by cognitive arguments, and vice versa. Millar and Millar (1990), for example, found that rational arguments were more effective at changing affective attitudes, and inconsistently found that emotional arguments were more effective at changing cognitive attitudes. They suggested that their findings conflicted with Edwards's (1990) because Edwards used novel stimuli, while Millar and Millar (1990) used attitude objects about which participants had preexisting attitudes.

More recently, an additional factor beyond attitude strength was suggested as important to the persuasive process: attitude certainty. According to the amplification hypothesis, attitude strength and attitude certainty can be conceptualized as independent dimensions (Clarkson et al., 2008). Thus, one can hold attitudes that are evaluatively inconsistent (i.e., both positive and negative), but be certain about this evaluation. The amplification hypothesis suggests that high attitude certainty decreases susceptibility to persuasion when attitudes are consistent (either positive or negative), but increases susceptibility to persuasion when attitudes are inconsistent. Applying this hypothesis to persuasion, Clarkson et al. (2011) found matching effects when attitude certainty was experimentally increased, but found mismatching effects when certainty was decreased. This suggests that the certainty with which individuals hold conspiracy beliefs should be considered when developing interventions, as attitude certainty may influence which strategy (matching vs mismatching) is more effective.

See et al. (2013) examined the role of initial attitudes in matching and mismatching effects. Rather than inducing attitudes about novel stimuli, as has been done in previous research (Clarkson et al., 2011; Edwards, 1990; Fabrigar & Petty, 1999), they measured preexisting attitudes about several topics to determine whether those topics tended to elicit cognitive or

affective attitudes. They then presented either cognitive or affective persuasive messages and measured their effects. They found that for those whose initial attitudes were congruent with the persuasive message, there was either a matching effect or no difference between cognitive and affective messages. However, for those who were initially opposed, a mismatching effect occurred. They also found that for those who were initially opposed, high attitude certainty predicted matching effects, while low certainty predicted mismatching effects; they did not find that certainty influenced which message was more persuasive for those initially in favor of the message position. Including attitude certainty, then, appears to replicate results of prior research, but only when the targets of persuasive messages are opposed to those messages.

A final factor that seems especially relevant in this case is people's perceptions about their attitudes. See et al. (2008) distinguish between "structural bases" (how they refer to the attitude bases discussed above) and "meta-bases": whether people believe that their attitudes are primarily cognitive or primarily affective, as measured via self-report. These meta-bases tend to be uncorrelated with structural bases, and also predict the amount of attention participants pay to affective messaging. In addition, meta-bases produce similar matching effects to structural bases in a persuasive context; those with affective meta-bases are more persuaded by affective messages, and those with cognitive meta-bases are more persuaded by cognitive messages – despite the apparent independence of structural and meta-bases (See et al., 2008). An evident moderator of this effect is how deliberate participants are when considering their responses. When going quickly and not considering their responses very much, structural bases are a stronger predictor of later evaluations, but when thinking more carefully and considering each response, meta-bases are a stronger predictor (See et al., 2008). In the case of conspiracy theories, it would be possible for participants to hold attitudes that are primarily affective on a

structural level, but *believe* that they formed these attitudes cognitively, after careful consideration, and therefore the meta-basis is cognitive. Opposition to a persuasive message has been shown to increase the amount of time a person spends reading the message, possibly due to counterarguing, and therefore increase the attention paid to the message (Petty & Cacioppo, 1986; Taber & Lodge, 2006). This may introduce problems when attempting to tailor a persuasive message to structural bases. However, this line of thought introduces multiple untested assumptions about cognitive processes involved in the formation and maintenance of conspiracy beliefs; as of yet, it remains simply a possible explanation for the success or lack thereof of any given intervention, and requires empirical support that does not yet exist.

Individual Differences

There are some individual differences that predict in what ways people tend to form and change attitudes. One such individual difference is the meta-bases of attitudes discussed above. Other important individual differences include need for affect and need for cognition.

Need for affect involves the motivation to either approach or avoid situations that create emotion (Haddock et al., 2008). Need for cognition involves the tendency to engage in and enjoy effortful thinking (Cacioppo & Petty, 1982). These two constructs are relatively independent, such that it is possible to be high in both need for affect and high in need for cognition. They also both appear to be important in the context of persuasion: Haddock et al. (2008) found across multiple studies that those high in need for affect tend to be more persuaded by affective messages, and those high in need for cognition tend to be more persuaded by cognitive messages. This is analogous to the matching effects between structural bases and message type that are predominantly found in the persuasion literature.

Need for affect and need for cognition also appear to be important in attitude formation. Some research shows that when both affective and cognitive information is available, those high in need for cognition prefer to rely on cognition and cognitive information when making evaluations (van Giesen et al., 2015). The same appears to be true for those high in need for affect and reliance on affective information. However, the operationalization of "need for affect" is not yet as standardized as need for cognition; the "need for affect" in van Giesen et al. (2015) was measured with faith in intuition, which involves judgments of participants' own reliance on intuition and intuitiveness, rather than a motivation for affective stimulation per se. This precludes a firm conclusion about the role of need for affect in attitude formation, but given its importance in persuasion, and its similarity to need for cognition on that count, it seems plausible that need for affect as measured by the scale of the same name is important not only for attitude change, but also initial attitude formation.

Need for cognition and faith in intuition are two of the most common individual difference measures used in literatures related to attitudes, persuasion, and thinking styles more generally. However, these measures are not necessarily the only standard. Aside from need for affect, some researchers favor other, alternative measures for some form of distinction between automatic and deliberate cognitive processes. Versions of the Rational-Experiential Inventory (REI; Epstein et al., 1996) tend to be favored in conspiracy theory research; depending on the version used, the REI is essentially a combination of need for cognition and faith in intuition, but this is not always the case. There does appear to be both conceptual and practical overlap between these constructs; Swami et al. (2014) found a correlation between need for cognition and the rationality subscale of one version of the REI, for example, and van Giesen et al. (2015) considered faith in intuition a reasonable measure of need for affect. But it is not necessarily

clear just how closely all of these rational/cognitive and intuitive/affective constructs are related. This presents a potential conceptual problem: while it is clear that an experiential/intuitive thinking style, as measured with the REI, is associated with conspiracy beliefs (Stojanov, 2015), it is less clear whether this translates directly to need for affect, which has been specifically implicated as an individual difference moderator in persuasion. Thus, it seems likely, but uncertain, that the tendency for those who endorse conspiracy theories to also favor an experiential/intuitive thinking style will enhance the matching effects that I hypothesize are present between the attitude bases of conspiracy theories and affective persuasive messaging.

The Present Research

In this research, I conceptualized conspiracy beliefs as attitudes, and the individual conspiracy theories as attitude objects. This is a departure from prior conspiracy theory research, which has favored conceptualizing conspiracy theories as misinformation, and designed interventions accordingly.

Previous research in this area, favoring a misinformation approach to interventions, has yielded mixed success. This is due, at least in part, to ignoring key components of conspiracy beliefs. Most interventions attempted to this point have relied on primarily factual information and logical reasoning, which ignores the relative lack of analytic thinking skills associated with endorsing conspiracy theories. Crucially, this logical or factual approach also ignores researchers' agreed-upon conceptualization of conspiracy theories as based in emotion. Ignoring this characteristic seems a major oversight, since, according to the attitudes and persuasion literature, affectively-based attitudes are more easily changeable with affectively-based persuasive messaging. I have corrected this oversight in my research by targeting these affective bases.

Conspiracy beliefs are thought to originate due to existential threat, and are adopted to mitigate this threat by attempting to satisfy existential, epistemic, and social needs (needs for security, understanding, and belongingness). Conspiracy theories seem to be ineffective in meeting these needs, which can drive those who endorse them to incorporate more conspiracy theories into their worldview. However, knowing that these needs have not been satisfied may be advantageous in developing interventions – a successful intervention would likely need to address at least one effectively.

In addition to the characteristics of conspiracy beliefs noted above, I have considered a few potentially important individual differences, particularly tendencies toward intuition and affect. The conspiracy theory literature strongly suggests that those who endorse conspiracy theories favor an experiential/intuitive thinking style over a rational/analytic thinking style. The persuasion literature shows that those high in need for affect tend to be more persuaded by affective messaging, and an experiential thinking style seems conceptually similar to this need for affect. Admittedly, these constructs are not necessarily interchangeable, but it seems reasonable to posit that there is some overlap. Given the apparently likely similarity, appealing to affective attitude bases seems more likely to be effective specifically for those who endorse conspiracy theories, due to their reliance on an experiential thinking style.

In the current research, I used an attitudes-based approach to test interventions for conspiracy beliefs. To do this, I tested a cognitive persuasive message, utilized in prior research and designed to refute anti-vaccine conspiracy theories, against two novel affective messages. These messages were designed in line with findings from prior research in conspiracy theories and persuasion. I chose to investigate anti-vaccine conspiracy theories because there is a high

level of interest in anti-vaccine attitudes among both researchers and the general public, and because these conspiracy theories pose a specific threat to public health.

The first affective message was a condition that was meant to elicit feelings of social threat. Conspiracy theory research suggests that social motives are one reason for conspiracy theory endorsement; threatening current (or future) social bonds may motivate attitude and behavior change to maintain those bonds (Baumeister & Leary, 1995). Research in health psychology has also utilized social threat messages (Takahashi & Earl, 2020), and I used these messages as a starting point for developing the current social threat message.

The second affective message was developed in line with prior attitudes and persuasion research. Previous experiments have structured affective messages such that a fact is presented, and then an emotional reaction is described (See et al., 2013). I structured the second affective message the same way, and the message was designed to elicit empathy for those who believe the conspiracy theory. Empathizing has been explored as a possible avenue to reduce conspiracy beliefs in prior research (Orosz et al., 2016), though this research attempted to induce empathy for the target of the conspiracy theory, rather than those who hold those beliefs. Changing the recipient of empathy, while simultaneously suggesting their beliefs were undesirable, thus seemed an appropriate extension of this research.

These three messages were tested against one another and a neutral control message in a between-subjects design. I predicted that in the primary analysis, the affective messages would be a more effective intervention than the cognitive message or a neutral control. Given the lack of research to date on affective interventions in conspiracy beliefs, I had no specific predictions on which affective message might be more effective. This study and the hypotheses were

preregistered on Open Science Framework (OSF). Analyses involving potential moderators were listed as exploratory.

Method

Participants

Participants were 413 undergraduate students from the psychology department participant pool. An a priori power analysis done in G*Power (Faul et al., 2007) for a one-way ANOVA with four conditions ($\alpha = .05$, $\beta = .80$, and $f = .176$; equivalent to $R^2 = .15$) suggested a minimum sample size of 356. Data was collected beyond this point to allow for exclusions and additional, exploratory analyses. All participants were required to be at least 18 years old, and they were compensated with partial credit toward a course requirement. Participants were also required to have completed the anti-vaccine conspiracy theory endorsement items and the 9/11 conspiracy theory endorsement items during prescreening.

Of the initial 413 participants, 7 were excluded because they failed to complete the study. Of the remaining 406 participants, 240 (59%) identified as female, 165 (41%) identified as male, and 1 identified as some other gender. Twenty-six participants (6%) identified as Black/African-American, 326 (80%) identified as White, 29 (7%) identified as Hispanic/Latino, 5 (1%) identified as Asian, 3 (.01%) identified as Native American, 15 (4%) identified as biracial, mixed race, or some other ethnicity, and the remaining 2 chose not to specify. Participants ranged in age from 18 to 48, $M = 19.41$, $SD = 2.08$.

Materials

Persuasive Messages

The manipulation consisted of a set of persuasive messages designed to dissuade participants from endorsing anti-vaccine conspiracy theories. One persuasive message was based

in cognitive attitudes, in which concerns related to vaccines were factually refuted, and was adapted from Jolley and Douglas (2014; see Appendix for all manipulations and measures). Two persuasive messages were affectively based. The first was a social threat message, in which it was suggested that there would be social consequences for choosing not to vaccinate. The second was meant to elicit empathy for those who endorse anti-vaccine conspiracy theories, while portraying those beliefs as undesirable. There was also a neutral control condition, which discussed meteors and was entirely irrelevant to the topic of interest.

Manipulation Check

The manipulation check consisted of 8 items asking participants to rate to what extent they felt a set of emotions. Some items were selected from the Brief Mood Introspection Scale (BMIS; Mayer & Gaschke, 1988), while others were chosen specific to this study (e.g., "empathetic"). All items were rated on a scale of 1 (*not at all*) to 7 (*a great deal*). I expected that the threat condition would yield higher scores on the "shame," "fear," and "anger" items, and that the empathy condition would yield higher scores on the "empathetic" item, as compared to the other conditions. These results would suggest the affective manipulations were successful.

Anti-Vaccine Conspiracy Theory Endorsement

A set of 5 items developed for this study measured endorsement of anti-vaccine conspiracy theories. All items were rated on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*) and included statements such as "The safety of vaccines is being compromised so the medical industry can profit financially." This measure was the primary dependent variable within the study, and was measured in prescreening to allow for comparisons before and after exposure to the experimental manipulation. Reliability for this measure was acceptable, $\alpha = .88$, so the items were indexed as a mean score for each participant.

9/11 Conspiracy Theory Endorsement

As an additional control, a set of 4 items developed for this study was included that measured endorsement of 9/11-related conspiracy theories. All items were rated on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale, and included statements such as "The US government knew in advance of the 9/11 attacks, but allowed them to occur anyway." This measure was also included in prescreening to allow for comparisons before and after exposure to the experimental manipulation. Reliability for this measure was good, $\alpha = .95$, so the items were indexed as a mean score for each participant.

Attitude Certainty

At the end of both the anti-vaccine and 9/11 measures, attitude certainty was assessed with the following item: "How certain do you feel about your answers to the above statements?" Responses to this item were on a scale of 1 (*not at all certain*) to 7 (*very certain*). This measure was included as a potential moderator of persuasion for exploratory analyses. Prior research suggests that for those initially opposed to a persuasive message, matching effects occur when they are highly certain (See et al., 2013). Based on this research, I would expect that those higher in both anti-vaccine attitudes and certainty would be more persuaded by the affective messages, but the effectiveness of affective persuasion may be attenuated at lower levels of certainty.

Conspiracy Mentality Scale

General tendencies toward conspiratorial thinking were assessed with the Conspiracy Mentality Scale (CMS; Stojanov & Halberstadt, 2018). This scale includes 11 items and 2 subscales – one subscale measures conspiracist ideation and contains 7 items (e.g., "Events on the news may not have actually happened"), and the other measures the tendency to think skeptically, but in a more rational manner (e.g., "Some things are not as they seem"), and

contains 4 items. All items were rated on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*).

This measure was included as a potential moderator for exploratory analyses, to investigate the

possibility that those higher in conspiratorial thinking might be less persuaded by the messages,

or alternately prefer the affective messages more strongly. Reliability for the full scale was

acceptable, $\alpha = .84$, as was reliability for the conspiracist ideation subscale ($\alpha = .81$) and for the

rational skepticism subscale ($\alpha = .82$).

Need for Cognition

The Need for Cognition scale (Cacioppo et al., 1984) contains 18 items measuring the

tendency to engage in and enjoy effortful thinking (e.g., "I find satisfaction in deliberating hard

and for long hours"). Participants were asked to rate how characteristic each statement was of

themselves, with 1 being *extremely uncharacteristic*, 4 being *neither characteristic nor*

uncharacteristic, and 7 being *extremely characteristic*. This measure was included as a potential

moderator for exploratory analyses, since previous research suggests a link between need for

cognition and susceptibility to cognitive persuasive messages (Haddock et al., 2008). This

research suggests those higher in need for cognition might be more persuaded by cognitive

messages. Reliability for this measure was acceptable, $\alpha = .84$, so the items were indexed as a

mean score for each participant.

Need for Affect

The Need for Affect scale (Maio & Esses, 2001) contains 26 items measuring the

tendency to approach or avoid situations that elicit emotion (e.g., "Strong emotions are generally

beneficial"). Responses were given on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale. This

measure was included as a potential moderator for exploratory analyses, since previous research

suggests a link between need for affect and susceptibility to affective persuasive messages

(Haddock et al., 2008). Based on that research, I suspected those higher in need for affect might be more persuaded by the affective messages. Reliability for this measure was good, $\alpha = .82$, so the items were indexed as a mean score for each participant.

Demographics

Additional demographic items were included asking participants to provide their age, gender, race/ethnicity, major, as well as to self-report ideology in general, socially, and economically, and whether English was participants' native language.

Procedure

Participants signed up to participate in the study through SONA, after which they followed a link to the survey in Qualtrics. After providing informed consent, participants were given orienting instructions. They were then randomly assigned to one of the four conditions (cognitive, social threat, empathy, or control). Participants read the persuasive (or control) message, and then completed the manipulation check. Items on the manipulation check were presented in random order. They then completed the anti-vaccine and 9/11 conspiracy theory endorsement measures.

Next, participants completed the CMS, Need for Cognition, and Need for Affect scales. These measures were presented in random order, and all items were randomized within each measure. Participants then provided demographic information, were debriefed, and compensated.

Results

Preliminary Analyses: Manipulation Checks

I included eight manipulation check items to verify the success of the manipulations in eliciting various emotions. I asked to what extent participants felt shame, empathetic, fear, anger, happy, calm, peppy, and tired. I tested each of these items in one-way ANOVAs, and conducted

follow-up pairwise comparisons where appropriate with independent samples t-tests. The results of these tests are reported with p-values corrected via the Holm procedure for multiple comparisons.

I anticipated that participants in the threat condition would feel more shame, fear, and anger than in the other three conditions. A one-way ANOVA confirmed that there were significant differences between conditions in feelings of shame, $F(3,404) = 14.17$, $p < .001$, $R^2 = .09$. Follow-up pairwise comparisons are summarized in Table 1, with the most pertinent results described in text. There was a significant difference in feelings of shame between the control ($M = 1.41$, $SD = .93$) and social threat ($M = 2.51$, $SD = 1.58$) conditions, such that participants reported greater shame in the threat condition. There was no significant difference in feelings of shame between the cognitive ($M = 2.26$, $SD = 1.61$) and social threat conditions. There was no significant difference in feelings of shame between the empathy ($M = 2.56$, $SD = 1.54$) and social threat conditions. This suggests that interventions all increased feelings of shame compared to the control, but shame was not especially higher in the threat condition as compared to the other two experimental conditions. These findings indicate that the threat manipulation was partially successful.

Table 1

Pairwise Comparisons Between Conditions for Feelings of Shame

Pairwise Comparison	t	df	p	Cohen's d
Control vs cognitive	-4.59	158	< .001***	.64
Control vs empathy	-6.52	168	< .001***	.91
Control vs threat	-6.08	164	< .001***	.85
Cognitive vs empathy	-1.37	200	.40	N/A
Cognitive vs threat	-1.11	200	.44	N/A
Empathy vs threat	.24	203	.79	N/A

Note: p-values are adjusted with the Holm procedure for multiple comparisons; * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

A one-way ANOVA confirmed that there were significant differences between conditions in feelings of fear, $F(3,402) = 12.13$, $p < .001$, $R^2 = .08$. Pairwise comparisons are summarized in Table 2. These comparisons revealed that there was a significant difference in feelings of fear between the control ($M = 1.88$, $SD = 1.34$) and threat ($M = 2.63$, $SD = 1.50$) conditions, such that those in the threat condition felt more fearful. There was also a significant difference in feelings of fear between the cognitive ($M = 1.89$, $SD = 1.24$) and threat conditions, such that those in the threat condition felt more fearful. However, there was no significant difference in feelings of fear between the empathy ($M = 2.77$, $SD = 1.37$) and threat conditions. This suggests that the affective conditions elicited more fear than the other two conditions. It is possible that this is due in part to the negative valence of the empathy condition, though the data cannot provide direct evidence for this conclusion.

Table 2

Pairwise Comparisons Between Conditions for Feelings of Fear

Pairwise Comparison	t	df	p	Cohen's d
Control vs cognitive	-.03	200	.98	N/A
Control vs empathy	-4.66	204	< .001***	.65
Control vs threat	-3.76	199	< .001***	.52
Cognitive vs empathy	-4.77	199	< .001***	.67
Cognitive vs threat	-3.82	193	< .001***	.54
Empathy vs threat	.66	200	.97	N/A

Note: p-values are adjusted with the Holm procedure for multiple comparisons; * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

A one-way ANOVA showed that there were significant differences between conditions in feelings of anger, $F(3,403) = 48.93$, $p < .001$, $R^2 = .27$. Pairwise comparisons are summarized in Table 3. There was a significant difference in feelings of anger between the control ($M = 1.34$, $SD = .83$) and threat ($M = 3.36$, $SD = 1.57$) conditions, such that those in the threat condition felt more anger. There was a significant difference between the cognitive ($M = 2.29$, $SD = 1.44$) and threat conditions in feelings of anger, such that those in the threat condition felt more anger. There was no difference in feelings of anger between the empathy ($M = 3.36$, $SD = 1.62$) and threat conditions. These findings show that all interventions elicited more anger than the control condition, and the affective conditions elicited more anger than the cognitive condition.

Table 3

Pairwise Comparisons Between Conditions for Feelings of Anger

Pairwise Comparison	t	df	p	Cohen's d
Control vs cognitive	-5.61	157	< .001***	.79
Control vs empathy	-11.16	150	< .001***	1.56
Control vs threat	-11.44	153	< .001***	1.60
Cognitive vs empathy	-4.98	198	< .001***	.70
Cognitive vs threat	-5.06	199	< .001***	.71
Empathy vs threat	0.00	202	1.00	N/A

Note: *p*-values are adjusted with the Holm procedure for multiple comparisons; * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

I expected that the empathy condition would elicit stronger feelings of empathy than the other conditions. A one-way ANOVA showed that there were significant differences between conditions in feeling empathetic, $F(3,403) = 40.63$, $p < .001$, $R^2 = .23$. Pairwise comparisons are summarized in Table 4. In particular, there was a significant difference in feeling empathetic between the control ($M = 1.90$, $SD = 1.38$) and empathy ($M = 4.23$, $SD = 1.58$) conditions, such that participants in the empathy condition felt more empathetic. There was also a significant difference in feeling empathetic between the cognitive ($M = 3.04$, $SD = 1.55$) and empathy conditions, such that those in the empathy condition felt more empathetic. There was a significant difference in feeling empathetic between the empathy and threat ($M = 3.50$, $SD = 1.70$) conditions, such that those in the empathy condition felt more empathetic. These results suggest that the empathy manipulation was successful, and that empathy was highest in the empathy message condition.

Table 4

Pairwise Comparisons Between Conditions for Feeling Empathetic

Pairwise Comparison	*t*	*df*	*p*	Cohen's *d*
Control vs cognitive	-5.52	197	< .001***	.78
Control vs empathy	-11.29	200	< .001***	1.57
Control vs threat	-7.39	192	< .001***	1.03
Cognitive vs empathy	-5.43	201	< .001***	.76
Cognitive vs threat	-2.03	198	.03*	.29
Empathy vs threat	3.17	200	.002**	.44

Note: *p*-values are adjusted with the Holm procedure for multiple comparisons; * = *p* < .05, ** = *p* < .01, *** = *p* < .001.

I expected that those in the cognitive and control conditions might feel happier and calmer than in the affective conditions. A one-way ANOVA showed that there were significant differences between conditions in feeling happy, $F(3,403) = 13.74$, $p < .001$, $R^2 = .09$. Pairwise comparisons between conditions are summarized in Table 5. There was a significant difference in feeling happy between the control ($M = 3.02$, $SD = 1.53$) and empathy ($M = 2.11$, $SD = 1.41$) conditions, such that those in the control condition felt happier. There was a significant difference in feeling happy between the control and threat ($M = 2.33$, $SD = 1.45$) conditions, such that those in the control condition felt happier. Additionally, there was a significant difference in feeling happy between the cognitive ($M = 3.27$, $SD = 1.59$) and empathy conditions, such that those in the cognitive condition felt happier. There was a significant difference in feeling happy between the cognitive and threat conditions, such that those in the cognitive condition felt happier. There was no significant difference in feeling happy between the empathy

and threat conditions. This and prior manipulation check items suggest that the affective conditions elicited more negative affect than the cognitive and control conditions.

Table 5
Pairwise Comparisons Between Conditions for Feeling Happy

Pairwise Comparison	t	df	p	Cohen's d
Control vs cognitive	-1.14	199	.47	N/A
Control vs empathy	4.43	201	< .001***	.62
Control vs threat	3.28	201	.004**	.46
Cognitive vs empathy	5.49	197	< .001***	.77
Cognitive vs threat	4.36	197	< .001***	.61
Empathy vs threat	-1.13	203	.47	N/A

Note: p-values are adjusted with the Holm procedure for multiple comparisons; * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

A one-way ANOVA showed that there were significant differences between conditions in feeling calm, $F(3,403) = 7.06$, $p < .001$, $R^2 = .05$. Pairwise comparisons are summarized in Table 6. There was no difference in feeling calm between the control ($M = 3.72$, $SD = 1.66$) and empathy ($M = 3.27$, $SD = 1.59$) conditions. There was also no difference in feeling calm between the control and threat ($M = 3.35$, $SD = 1.67$) conditions. There was a significant difference in feeling calm between the cognitive ($M = 4.21$, $SD = 1.57$) and empathy conditions, such that those in the cognitive condition felt calmer. There was also a significant difference in feeling calm between the cognitive and threat conditions, such that those in the cognitive condition felt calmer. This suggests that those in the affective conditions felt less calm than in the cognitive condition, but not less calm than in the control condition.

Table 6

Pairwise Comparisons Between Conditions for Feeling Calm

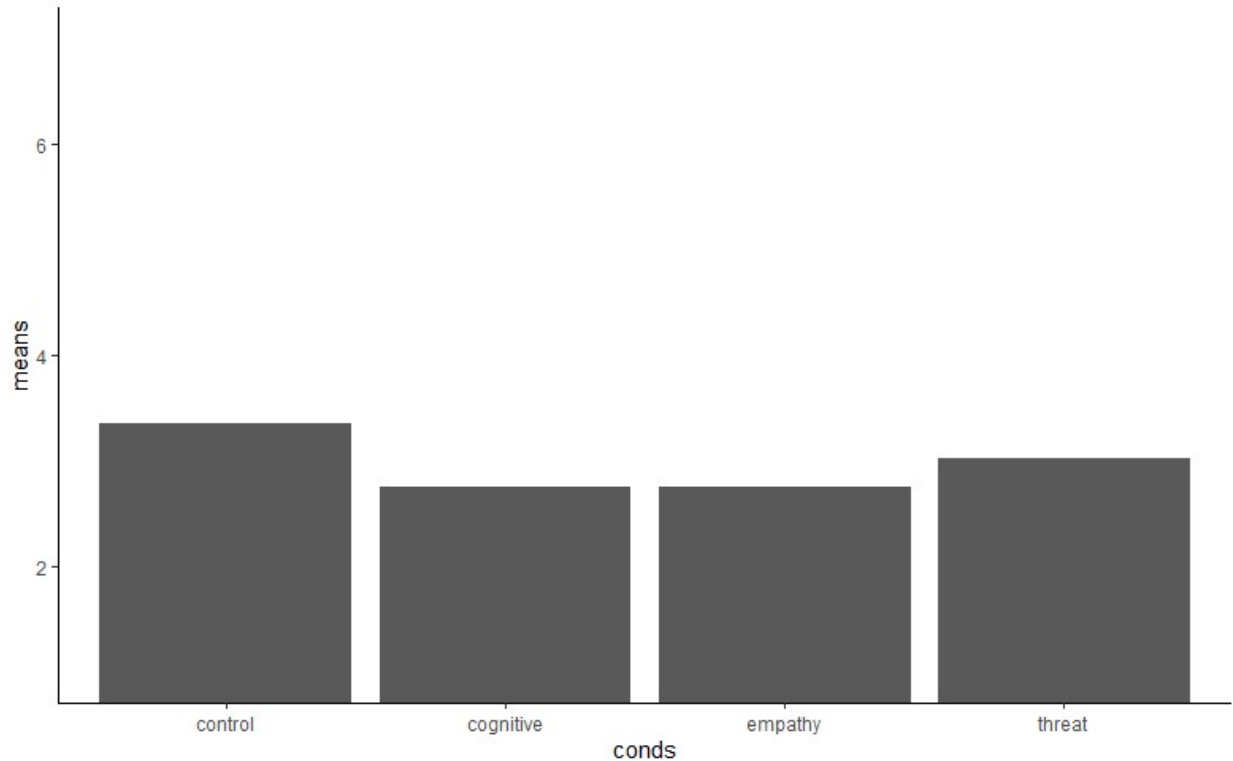| Pairwise Comparison	t	df	p	Cohen's d
Control vs cognitive	-2.17	201	.13	N/A
Control vs empathy	1.99	204	.15	N/A
Control vs threat	1.60	202	.20	N/A
Cognitive vs empathy	4.23	201	< .001***	.59
Cognitive vs threat	3.78	198	< .001***	.53
Empathy vs threat	-.33	201	.74	N/A

Note: p-values are adjusted with the Holm procedure for multiple comparisons; $* = p < .05$, $** = p < .01$, $*** = p < .001$.

I did not anticipate differences between conditions in feeling peppy or feeling tired, and this expectation was borne out. A one-way ANOVA showed no significant differences between conditions in feeling peppy, $F(3,404) = .52$, $p = .67$. There were also no significant differences between conditions in feeling tired in a one-way ANOVA, $F(3,403) = .75$, $p = .52$. These findings were both expected.

Primary Analysis

In the primary analysis, I tested the success of each of the interventions, as measured by endorsement of anti-vaccine conspiracy theories after the manipulation. I conducted a one-way ANOVA with condition as the independent variable and anti-vaccine conspiracy theory endorsement as the dependent variable. The omnibus test revealed that there were significant differences between conditions, $F(3,404) = 4.71$, $p = .003$, $R^2 = .03$. To probe these effects, I computed independent samples *t*-tests for pairwise comparisons between conditions, again using the Holm procedure to correct for multiple comparisons. A visual of the data is presented in

Figure 1, and the results are summarized in Table 7. These tests revealed a significant difference between the control ($M = 3.35$, $SD = 1.36$; higher scores indicate more conspiracy theory endorsement) and cognitive ($M = 2.75$, $SD = 1.31$) conditions, such that those in the cognitive condition endorsed anti-vaccine conspiracy theories less than those in the control condition. There was also a significant difference in conspiracy theory endorsement between the control and empathy ($M = 2.75$, $SD = 1.35$) conditions, such that those in the empathy condition endorsed anti-vaccine conspiracy theories to a lesser extent than those in the control condition. However, there was no significant difference in conspiracy theory endorsement between the control and threat ($M = 3.02$, $SD = 1.35$) conditions. There was also no difference in conspiracy theory endorsement between the cognitive and empathy conditions, suggesting that these interventions were equally effective. There was no difference in conspiracy theory endorsement between the cognitive and threat conditions. Finally, there was no difference in conspiracy theory endorsement between the empathy and threat conditions. These findings suggest that overall, the cognitive and empathy conditions successfully decreased conspiracy theory endorsement as compared to the control condition; inspection of means places the threat condition midway between the control and the other interventions, but the threat condition did not perform better than the control.

Figure 1. Means for anti-vaccine conspiracy theory endorsement by condition.

Table 7

Pairwise Comparisons Between Conditions for Anti-Vaccine Conspiracy Theory Endorsement

Pairwise Comparison	t	df	p	Cohen's d
Control vs cognitive	3.21	201	.008**	.45
Control vs empathy	3.24	203	.008**	.45
Control vs threat	1.72	203	.32	N/A
Cognitive vs empathy	-.04	200	.97	N/A
Cognitive vs threat	-1.47	200	.42	N/A
Empathy vs threat	-1.47	202	.42	N/A

Note: p-values are adjusted with the Holm procedure for multiple comparisons; * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

I also compared anti-vaccine conspiracy theory endorsement measured prior to exposure

to the manipulation with conspiracy theory endorsement post-manipulation in a regression with

endorsement pre-manipulation, condition, and their interaction as predictors and conspiracy theory endorsement post-manipulation as the outcome. The full model was significant, $F(7,323) = 61.75$, $p < .001$, $R^2 = .57$. Anti-vaccine conspiracy theory endorsement pre-manipulation was a significant predictor of endorsement post-manipulation, b (unstandardized) $= .76$, $SE = .07$ $t = 10.36$, $p < .001$, such that those high in endorsement pre-manipulation were also higher in endorsement post-manipulation. The cognitive condition still predicted a significant reduction in conspiracy theory endorsement compared to the control condition, $b = .76$, $SE = .37$, $t = -2.03$, $p = .04$. The empathy condition also predicted a significant reduction in endorsement compared to the control, $b = -.76$, $SE = .35$, $t = -2.16$, $p = .03$. The threat condition did not perform better than the control condition when accounting for initial endorsement, $b = -.21$, $SE = .35$, $t = -.60$, $p = .55$. There were also no significant interactions between pre-manipulation endorsement and condition. In addition, a one-way ANOVA comparing only rates of pre-manipulation anti-vaccine conspiracy theory endorsement by condition revealed no significant differences, $F(3,327) = .10$, $p = .96$, suggesting base rates of endorsement did not differ by condition. These data suggest that even when accounting for initial attitude, a cognitively-based intervention and an empathy-based affective intervention can successfully reduce conspiracy theory endorsement.

Exploratory Analyses

9/11 Conspiracy Theory Endorsement

I conducted several exploratory analyses in addition to my primary analyses. First, I performed a one-way ANOVA on endorsement of an unrelated conspiracy theory, 9/11 conspiracy beliefs, with condition as the predictor. I found no effect of condition on 9/11 conspiracy theory endorsement, $F(3,404) = 1.04$, $p = .38$. A regression of condition, 9/11 conspiracy theory endorsement pre-manipulation, and their interaction on post-manipulation

endorsement yielded a significant full model, $F(7,323) = 95.17$, $p < .001$, $R^2 = .67$, but further inspection revealed that the only significant predictor was endorsement pre-manipulation ($b = .90$, $SE = .08$, $t = 12.03$, $p < .001$). These results suggest that targeted conspiracy theory interventions do not generalize beyond the conspiracy theory they are meant to combat.

Attitude Certainty

Next I investigated whether attitude certainty moderated the effect of the interventions. Before testing for moderation, I conducted a one-way ANOVA on attitude certainty with condition as the predictor. There were no differences in certainty between conditions, $F(3,404) = .35$, $p = .79$. I dummy-coded condition so that the control condition was set to 0 as the reference group, and 3 dummy-coded variables represented each of the manipulations as 1. These dummy codes were used for this analysis and the subsequent moderation analyses. I conducted a regression with dummy-coded condition, mean-centered attitude certainty, and their interactions as predictors, and anti-vaccine conspiracy beliefs as the dependent variable. The full model was significant, $F(7,400) = 9.48$, $p < .001$, $R^2 = .14$. The cognitive condition remained a significant predictor, $b = -.60$, $SE = .18$, $t = -3.42$, $p < .001$. The empathy condition also remained a significant predictor, $b = -.60$, $SE = .17$, $t = -3.43$, $p < .001$. Attitude certainty was not a significant predictor of anti-vaccine conspiracy beliefs, $b = -.16$, $SE = .10$, $t = -1.59$, $p = .11$. There was, however, a significant interaction between the cognitive condition and attitude certainty, $b = -.33$, $SE = .15$, $t = -2.20$, $p = .03$. There was also a significant interaction between the empathy condition and attitude certainty, $b = -.33$, $SE = .15$, $t = -2.21$, $p = .03$. To probe these interactions, I tested simple effects at 1 standard deviation above and 1 standard deviation below the mean of attitude certainty. At 1 standard deviation below the mean, there were no significant differences between the means of anti-vaccine conspiracy beliefs among any of the conditions.

At 1 standard deviation above the mean, there was a significant difference between the means of the cognitive and control conditions, $b = -.98$, $SE = .25$, $t = -3.94$, $p < .001$, such that there was lower conspiracy theory endorsement in the cognitive condition. There was also a significant difference between the means of the empathy and control conditions, $b = -.98$, $SE = .25$, $t = -3.93$, $p < .001$, such that there was lower conspiracy theory endorsement in the empathy condition. There were no other significant differences between conditions. This suggests that the cognitive and empathy interventions became more effective at higher levels of certainty.

Conspiracy Mentality

I then tested the CMS as a moderator of anti-vaccine conspiracy beliefs in a regression with condition, mean-centered CMS scores, and their interactions as predictors, and anti-vaccine conspiracy beliefs as the dependent variable. The full model was significant, $F(7,400) = 12.13$, $p < .001$, $R^2 = .18$. The cognitive condition was a significant predictor, $b = -.50$, $SE = .17$, $t = -2.89$, $p = .004$. The empathy condition was a significant predictor, $b = -.52$, $SE = .17$, $t = -3.06$, $p = .002$. The effect of the threat condition also became significant, $b = -.35$, $SE = .17$, $t = -2.05$, $p = .04$, such that the threat condition was more effective than the control condition at the mean of CMS. The CMS was also a significant predictor of anti-vaccine conspiracy beliefs, $b = .64$, $SE = .16$, $t = 4.06$, $p < .001$. There was no interaction between the CMS and any of the interventions. This suggests that those higher in conspiracy mentality tend to remain higher in anti-vaccine conspiracy beliefs, and also that the threat intervention may be more successful when accounting for general conspiracy beliefs. These findings also suggest that there were similar reductions in anti-vaccine conspiracy beliefs across levels of conspiracy mentality. The pattern of results was similar for the conspiracist ideation subscale of the CMS (see Table 8).

Table 8

Regression of Anti-Vaccine Conspiracy Theory Endorsement on Condition, CMS-Conspiracist Ideation, and Interactions

Predictor	*b* (unstandardized)	*SE*	*t*	*p*
Intercept	3.32	.12	28.41	< .001***
Cognitive	-.51	.17	-3.07	.002**
Empathy	-.53	.17	-3.22	.001**
Threat	-.35	.17	-2.14	.03*
CMS-CI	.68	.13	5.42	< .001***
Cognitive*CMS-CI	-.09	.18	-.49	.62
Empathy*CMS-CI	-.06	.17	-.33	.74
Threat*CMS-CI	-.12	.17	-.68	.50

Note: negative *b* indicates decreased conspiracy theory endorsement; * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Need for Cognition

I also tested need for cognition as a potential moderator in a regression with dummy-coded condition, mean-centered need for cognition, and their interactions as predictors. There was a significant effect of the cognitive condition, $b = -.55$, $SE = .18$, $t = -3.06$, $p = .002$. There was also a significant effect of the empathy condition, $b = -.50$, $SE = .18$, $t = -2.77$, $p = .006$. Need for cognition was a significant predictor of anti-vaccine conspiracy beliefs, $b = -.47$, $SE = .15$, $t = -3.04$, $p = .003$. There were no significant interactions. This suggests that need for cognition attenuates conspiracy beliefs, such that those higher in need for cognition tended to be lower in anti-vaccine conspiracy theory endorsement. Need for cognition does not appear to moderate conspiracy theory endorsement, but rather those high in need for cognition do not prefer cognitive arguments over affective arguments as compared to those lower in need for cognition.

Need for Affect

Finally, I tested need for affect as a potential moderator in a regression with dummy-coded condition, mean-centered need for affect, and their interactions as predictors, and anti-vaccine conspiracy beliefs as the dependent variable. The full model was significant, $F(7,400) = 3.12$, $p = .003$, $R^2 = .05$. However, there was no effect of need for affect, $b = -.13$, $SE = .21$, $t = -.63$, $p = .53$, and there were no interactions. There were again significant effects of the cognitive and empathy conditions ($b = -.61$, $SE = .19$, $t = -3.31$, $p = .001$, and $b = -.59$, $SE = .18$, $t = -3.22$, $p = .001$, respectively). This suggests that need for affect does not moderate persuasion on anti-vaccine conspiracy theories.

Discussion

My primary hypothesis was that affectively-based interventions would be more effective at reducing conspiracy theory endorsement than cognitively-based interventions or a neutral control. This hypothesis received partial support; the empathy condition was more effective than the control condition. However, the empathy condition was not more effective than the cognitive condition, and the threat condition performed no better than the control. Nonetheless, the results of this study suggest that conspiracy beliefs *can* be reduced, and add to a growing body of literature exploring how best to achieve that.

It is possible that the lack of success of the threat condition may be due to reactance – those in the threat condition may have felt that they themselves were being attacked, and were thus less willing to be persuaded by the arguments presented. However, there were no differences between the threat condition and the more successful empathy condition in participants' experience of negative affect, as measured by the manipulation check items, including anger. Those in the threat condition did feel more anger than in the cognitive

condition, which was also addressed more directly to the reader, as opposed to the empathy condition that described others. But the cognitive condition was also more successful than the threat condition, suggesting anger, which should be most closely related to reactance, was not the primary source of differences between interventions. While this is far from definitive evidence that reactance did not occur, it is also not obvious that reactance is the likely explanation. It may simply be that the framing of the arguments in the threat condition was unconvincing or irrelevant to the average college student.

It is also encouraging that the findings from the primary analysis were supported by an additional comparison with baseline anti-vaccine conspiracy beliefs. Comparing scores of participants on this measure pre- and post-manipulation suggests that anti-vaccine conspiracy beliefs were reduced by the manipulation specifically in the cognitive and empathy conditions.

The exploratory analyses suggest that interventions in one conspiracy belief, even when successful, do not generalize to other conspiracy theories. This may make creating larger-scale, widely applicable interventions more difficult, since these results suggest that each conspiracy theory should be targeted individually. However, this finding is not necessarily surprising; rather, it replicates Stojanov's (2015) results, in which she found that reductions in vaccine-related conspiracy beliefs did not extend to more general conspiracy beliefs. The effect of conspiracy mentality was also not unexpected – those more opposed to a persuasive message, even if they shift their attitudes an equivalent amount to those less opposed, will still be more opposed post-intervention. Nonetheless, the data suggest that even those higher in conspiracy mentality shifted their attitudes based on the manipulation.

Of particular interest is the finding that the threat manipulation decreased anti-vaccine conspiracy theory endorsement when accounting for general conspiracy mentality. This suggests

the possibility that overall tendencies toward conspiracy beliefs may influence the effectiveness of interventions. The mean endorsement of anti-vaccine conspiracy beliefs was relatively low, even pre-manipulation (M_{pre} = 3.09, M_{post} = 2.97, collapsed across conditions). However, the mean of the CMS was higher, 4.80, which was slightly above the midpoint of the 1-7 scale. This suggests that measuring endorsement of a single conspiracy theory may not be an effective proxy for tendencies toward general conspiracy theory endorsement, and therefore may not explain the entirety of what interventions might be effective and why. Accounting for the variance explained by conspiracy mentality allows a clearer picture of these effects, suggesting that tendencies toward conspiracy beliefs may increase susceptibility to social threat and rejection as an intervention, at least relative to no intervention.

Attitude certainty appeared to moderate the effects of the interventions, such that the cognitive and empathy interventions became more effective as certainty increased. However, the cognitive and empathy conditions had identical rates of success (or lack thereof) across different levels of certainty. Prior attitudes research suggests that there are matching effects between attitude base and message type when certainty is high and participants are opposed to the message, and mismatching effects when certainty is low and participants are opposed (See et al., 2013). But the current research can provide no evidence for either effect, due to how closely the cognitive and empathy conditions varied together. This suggests a few possibilities.

First, it is possible that matching effects are not as settled as the persuasion literature suggests. Perhaps the matching effects that have been observed in prior research are due to some unobserved third variable. This possibility seems unlikely, given the number of researchers that have found matching effects across multiple contexts (e.g., Clarkson et al., 2011).

The second possibility is that matching effects do not function the same way in the context of conspiracy theories as in the context of more general attitudes. It could be that matching attitude bases and message type has some influence, but that there are more central factors, such as success at meeting epistemic, existential, and social needs.

Finally, it is possible that attitude bases of conspiracy beliefs are not as definitively affective as I suspected. Previous research asserts that conspiracy beliefs are based in emotion, and this assertion is based primarily on predictors related to existential motives (van Prooijen & Douglas, 2018). However, no research has directly assessed the role of emotion in conspiracy beliefs, so open questions remain on this subject.

Need for cognition has also been implicated as a moderator of persuasion via cognitive or affective means (Haddock et al., 2008), but there was no support for this relationship in the current research. Rather, need for cognition predicted lower anti-vaccine conspiracy beliefs overall. This replicates a somewhat inconsistent finding in the conspiracy theory literature, which suggests that analytic/rational thinking and sometimes need for cognition predicts lower conspiracy theory endorsement (Stojanov, 2015; Swami et al., 2014). Similarly, prior research has found that need for affect moderates persuasion via cognitive or affective means (Haddock et al., 2008), but there was no evidence that need for affect plays a role in persuasion related to conspiracy theories, or any role in conspiracy beliefs whatsoever.

Limitations

One limitation of the present research was the relatively low base rates of anti-vaccine conspiracy theory endorsement. Means on this measure prior to the experiment ranged from 3.02 to 3.12 on a 7-point scale, and post-manipulation ranged from 2.75 to 3.35. This is likely due in part to the sample in question, which was composed of college students rather than dedicated

conspiracy theorists, and may also have been influenced by the increasing focus on vaccines and vaccine safety during the spring of 2021, when these data were collected.

I was also unable to directly measure attitude bases of the conspiracy theory in this study due to concerns about participant fatigue, and therefore unable to confirm that anti-vaccine conspiracy theory endorsement is affectively based. I could not examine meta-bases of attitudes for similar reasons, and thus cannot speak to their role in conspiracy theory interventions either. It is possible that meta-bases of attitudes are as important as or more important than attitude bases for interventions, since prior research suggests that meta-bases may have a stronger influence when the persuasive message is more closely scrutinized (See et al., 2008). Further research is needed to investigate this possibility.

Despite these limitations, this study provides evidence that effective interventions in conspiracy beliefs can be developed. It will also be possible to address these limitations in future research.

Future Directions

In later research, I intend to explore the attitude bases and meta-bases of conspiracy beliefs. I will then be able to investigate their role in possible interventions more fully. In addition, I plan to investigate the role of different emotions in persuasion more specifically, and how those can be applied to conspiracy theory interventions. I also intend to investigate multiple messaging formats, as strategies such as inoculation appear relatively more successful than simple refutation (Jolley & Douglas, 2017). And finally, I will attempt to generalize these and future findings to interventions in other conspiracy beliefs.

Conclusions

While I did not find evidence to suggest that affectively-based interventions in conspiracy beliefs are more effective than cognitively-based interventions, I did find that affectively-based interventions can be equally successful. This suggests promising avenues for future research into conspiracy theory interventions. New findings in this area are also particularly important on a practical level – the consequences of conspiracy theories can range from measles outbreaks to attempts to overturn elections, and thus it is important to be able to correct such beliefs. The current research provides evidence that there are multiple ways to do so.

References

Anthony, A., & Moulding, R. (2019). Breaking the news: Belief in fake news and conspiracist beliefs. *Australian Journal of Psychology, 71,* 154-162. https://doi.org/10.1111/ajpy.12233

Banas, J. A., & Miller, G. (2013). Inducing resistance to conspiracy theory propaganda: Testing inoculation and metainoculation strategies. *Human Communication Research, 39,* 184-207. https://doi.org/10.1111/hcre.12000

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*(3), 497-529.

Brotherton, R., & French, C. C. (2014). Belief in conspiracy theories and susceptibility to the conjunction fallacy. *Applied Cognitive Psychology, 28,* 238-248. https://doi.org/10.1002/acp.2995

Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology, 42*(1), 116-131.

Cacioppo, J. T., Petty, R. E., & Kao, C. F. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment, 48*(3), 306-307.

Centers for Disease Control and Prevention. (2020). Measles cases and outbreaks.

Cichocka, A., Marchlewska, M., & Golec de Zavala, A. (2016). Does self-love or self-hate predict conspiracy beliefs? Narcissism, self-esteem, and the endorsement of conspiracy theories. *Social Psychological and Personality Science, 7*(2), 157-166. https://doi.org/10.1177/1948550615616170

Cichocka, A., Marchlewska, M., Golec de Zavala, A., & Olechowski, M. (2016). 'They will not control us': Ingroup positivity and belief in intergroup conspiracies. *British Journal of Psychology, 107,* 556-576. https://doi.org/10.1111/bjop.12158

Clarkson, J. J., Tormala, Z. L., & Rucker, D. D. (2008). A new look at the consequences of attitude certainty: The amplification hypothesis. *Journal of Personality and Social Psychology, 95*(4), 810-825. https://doi.org/10.1037/a0013192

Clarkson, J. J., Tormala, Z. L., & Rucker, D. D. (2011). Cognitive and affective matching effects in persuasion: An amplification perspective. *Personality and Social Psychology Bulletin, 37*(11), 1415-1427. https://doi.org/10.1177/0146167211413394

Crites Jr., S. L., Fabrigar, L. R., & Petty, R. E. (1994). Measuring the affective and cognitive properties of attitudes: Conceptual and methodological issues. *Personality and Social Psychology Bulletin, 20*(6), 619-634.

Douglas, K. M., Sutton, R. M., & Cichocka, A. (2017). The psychology of conspiracy theories. *Current Directions in Psychological Science, 26*(6), 538-542. https://doi.org/10.1177/0963721417718261

Douglas, K. M., Uscinski, J. E., Sutton, R. M., Cichocka, A., Nefes, T., Ang, C. S., & Deravi, F. (2019). Understanding conspiracy theories. *Advances in Political Psychology, 40,* 3-35. https://doi.org/10.1111/pops.12568

Edwards, K. (1990). The interplay of affect and cognition in attitude formation and change. *Journal of Personality and Social Psychology, 59*(2), 202-216.

Edwards, K., & von Hippel, W. (1995). Hearts and minds: The priority of affective versus cognitive factors in person perception. *Personality and Social Psychology Bulletin, 21*(10), 996-1011.

Einstein, K. L., & Glick, D. M. (2015). Do I think BLS data are BS? The consequences of conspiracy theories. *Political Behavior, 37,* 679-701. https://doi.org/10.1007/s11109-014-9287-z

Epstein, S., Pacini, R., Denes-Raj, V., & Heier, H. (1996). Individual differences in intuitive-experiential and analytical-rational thinking styles. *Journal of Personality and Social Psychology, 71*(2), 390-405.

Fabrigar, L. R., & Petty, R. E. (1999). The role of the affective and cognitive bases of attitudes in susceptibility to affectively and cognitively based persuasion. *Personality and Social Psychology Bulletin, 25*(3), 363-381.

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39,* 175-191.

Flynn, D. J., Nyhan, B., & Reifler, J. (2017). The nature and origins of misperceptions: Understanding false and unsupported beliefs about politics. *Advances in Political Psychology, 38,* 127-150. https://doi.org/10.1111/pops.12394

van Giesen, R. I., Fischer, A. R. H., van Dijk, H., & van Trijp, H. C. M. (2015). Affect in cognition in attitude formation toward familiar and unfamiliar attitude objects. *PloS One, 10*(10), e0141790. https://doi.org/10.1371/journal.pone.0141790

Goertzel, T. (1994). Belief in conspiracy theories. *Political Psychology, 15,* 733-744.

Green, R., & Douglas, K. M. (2018). Anxious attachment and belief in conspiracy theories. *Personality and Individual Differences, 125,* 30-37. https://doi.org/10.1016/j.paid.2017/12.023

Haddock, G., Maio, G. R., Arnold, K., & Huskinson. T. (2008). Should persuasion be affective or cognitive? The moderating effects of need for affect and need for cognition. *Personality and Social Psychology Bulletin, 34*(6), 769-778. https://doi.org/10.1177/0146167208314871

Hall, V., Banerjee, E., Kenyon, C., Strain, A., Griffith, J., Como-Sabetti, K., Heath, J., Bahta, L., Martin, K., McMahon, M., Johnson, D., Roddy, M., Dunn, D., & Ehresmann, K. (2017). Measles outbreak – Minnesota April-May 2017. *Morbidity and Mortality Weekly Report, 66*(27), 713-717.

Hart, J., & Graether, M. (2018). Something's going on here: Psychological predictors of belief in conspiracy theories. *Journal of Individual Differences, 39*(4), 229-237. https://doi.org/10.1027/1614-0001/a000268

Jolley, D., & Douglas, K. M. (2014). The effects of anti-vaccine conspiracy theories on vaccination intentions. *PLoS One, 9*(2), e89177. https://doi.org/10.1371/journal.pone.0089177

Jolley, D., & Douglas, K. M. (2017). Prevention is better than cure: Addressing anti-vaccine conspiracy theories. *Journal of Applied Social Psychology, 47*(8), 459-469. https://doi.org/10.1111/jasp.12453

Klein, C., Clutton, P., & Polito, V. (2018). Topic modeling reveals distinct interests within an online conspiracy forum. *Frontiers in Psychology, 9,* 189. https://doi.org/10.3389/fpsyg.2018.00189

Maio, G. R., & Esses, V. M. (2001). The need for affect: Individual differences in the motivation to approach or avoid emotions. *Journal of Personality, 69*(4), 583-615. https://doi.org/10.1111/1467-6494.694156

Marchlewska, M., Cichocka, A., & Kossowska, M. (2018). Addicted to answers: Need for cognitive closure and the endorsement of conspiracy beliefs. *European Journal of Social Psychology, 48,* 109-117. https://doi.org/10.1002/ejsp.2308

Mayer, J. D., & Gaschke, Y. N. (1988). The experience and meta-experience of mood. *Journal of Personality and Social Psychology, 55,* 102-111.

Millar, M. G., & Millar, K. U. (1990). Attitude change as a function of attitude type and argument type. *Journal of Personality and Social Psychology, 59*(2), 217-228.

Miller, J. M., Saunders, K. L., & Farhart, C. E. (2016). Conspiracy endorsement as motivated reasoning: The moderating roles of political knowledge and trust. *American Journal of Political Science, 60*(4), 824-844. https://doi.org/10.1111/ajps.12234

Orosz, G., Kreko, P., Paskuj, B., Toth-Kiraly, I., Böthe, B., & Roland-Levy, C. (2016). Changing conspiracy beliefs through rationality and ridiculing. *Frontiers in Psychology, 7,* 1525. https://doi.org/10.3389/fpsyg.2016.01525

Pennycook, G., Cheyne, J. A., Barr, N., Koehler, D. J., & Fugelsang, J. A. (2015). On the reception and detection of pseudo-profound bullshit. *Judgment and Decision Making, 10*(6), 549-563.

Pennycook, G., & Rand, D. G. (2019). Lazy, not biased: Susceptibility to fake news is better explained by lack of reasoning than by motivated reasoning. *Cognition, 188,* 39-50. https://doi.org/10.1016/j.cognition.2018.06.011

Pennycook, G., & Rand, D. G. (2020). Who falls for fake news? The roles of bullshit receptivity, overclaiming, familiarity, and analytic thinking. *Journal of Personality, 88,* 185-200. https://doi.org/10.1111/jopy.12476

Petty, R. E., & Cacioppo, J. T. (1986). The Elaboration Likelihood Model of persuasion. *Advances in Experimental Social Psychology, 19,* 123-205. https://doi.org/10.1016/S0065-2601(08)60214-2

Petty, R. E., Wegener, D. T., & Fabrigar, L. R. (1997). Attitudes and attitude change. *Annual Review of Psychology, 48,* 609-647.

van Prooijen, J.-W. (2017). Why education predicts decreased belief in conspiracy theories. *Applied Cognitive Psychology, 31,* 50-58. https://doi.org/10.1002/acp.3301

van Prooijen, J.-W. (2020). An Existential Threat Model of Conspiracy Theories. *European Psychologist, 25*(1), 16-25. https://doi.org/10.1027/1016-9040/a000381

van Prooijen, J.-W., & Douglas, K. M. (2018). Belief in conspiracy theories: Basic principles of an emerging research domain. *European Journal of Social Psychology, 48,* 897-908. https://doi.org/10.1002/ejsp.2530

van Prooijen, J.-W., & Jostmann, N. B. (2013). Belief in conspiracy theories: The influence of uncertainty and perceived morality. *European Journal of Social Psychology, 43,* 109-115. https://doi.org/10.1002/ejsp.1922

Räikkä, J. (2009). On political conspiracy theories. *The Journal of Political Philosophy, 17*(2), 185-201. https://doi.org/10.1111/j.1467-9760.2007.00300.x

See, Y. H. M., Petty, R. E., & Fabrigar, L. R. (2008). Affective and cognitive meta-bases of attitudes: Unique effects on information interest and persuasion. *Journal of Personality and Social Psychology, 94*(6), 938-955. https://doi.org/10.1037/0022-3514.94.6.938

See, Y. H. M., Valenti, G., Ho, A. Y. Y., & Tan, M. S. Q. (2013). When message tailoring backfires: The role of initial attitudes in affect-cognition matching. *European Journal of Social Psychology, 43,* 570-584. https://doi.org/10.1002/ejsp.1967

Stojanov, A. (2015). Reducing conspiracy theory beliefs. *Psihologija, 48*(3), 251-266. https://doi.org/10.2298/PSI1503251S

Stojanov, A., & Halberstadt, J. (2019). The Conspiracy Mentality Scale: Distinguishing between irrational and rational suspicion. *Social Psychology, 50*(4), 215-232. https://doi.org/10.1027/1864-9335/a000381

Sunstein, C. R., & Vermeule, A. (2009). Conspiracy theories: Causes and cures. *The Journal of Political Philosophy, 17*(2), 202-227. https://doi.org/10.1111/j.1467-9760.2008.00325.x

Swami, V., Coles, R., Stieger, S., Pietschnig, J., Furnham, A., Rehim, S., & Voracek, M. (2011). Conspiracist ideation in Britain and Australia: Evidence of a monological belief system and associations between individual psychological differences and real-world and fictitious conspiracy theories. *British Journal of Psychology, 102,* 443-463. https://doi.org/10.1111/j.2044-8295.2010.02004.x

Swami, V., Voracek, M., Stieger, S., Tran, U. S., & Furnham, A. (2014). Analytic thinking reduces belief in conspiracy theories. *Cognition, 133,* 572-585. https://doi.org/10.1016/j.cognition.2014.08.006

Taber, C. S., & Lodge, M. (2006). Motivated skepticism in the evaluation of political beliefs. *American Journal of Political Science, 50*(3), 755-769. https://doi.org/10.1111/j.1540-5907.2006.00214.x

Takahashi, K. J., & Earl, A. (2020). Effect of extraneous affect on health message reception. *Personality and Social Psychology Bulletin, 46*(2), 270-284. https://doi.org/10.1177/0146167219855042

Warner, B. R., & Neville-Shepard, R. (2014). Echoes of a conspiracy: Birthers, truthers, and the cultivation of extremism. *Communication Quarterly, 62*(1), 1-17. https://doi.org/10.1080/01463373.2013.822407

Whitson, J. A., & Galinsky, A. D. (2008). Lacking control increases illusory pattern perception. *Science, 322,* 115-117. https://doi.org/10.1126/science.1159845

Wood, M. J., Douglas, K. M., & Sutton, R. M. (2012). Dead and alive: Beliefs in contradictory conspiracy theories. *Social Psychological and Personality Science, 3,* 767-773. https://doi.org/10.1177/1948550611434786

Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist, 35*(2), 151-175.

Persuasive Messages

Cognitive Condition

Adapted from Jolley and Douglas, 2014

Should we be suspicious of vaccines? Should we consider the proposal that those in power, whether governments or pharmaceutical companies, hide crucial information about vaccines from the public?

Several specific questions have been raised about vaccines. For example, are people within the industry faking data on vaccine efficacy? Do vaccines hurt more than they help? Is the industry deceiving people purely to make a profit?

Questions such as these are widespread in the media and on the Internet, but should we pay attention to any of them?

The answer is NO. There is no reason to think twice about vaccines.

For example, there is convincing and accurate evidence for the success of vaccines. Diseases such as smallpox and paralytic polio have been completely eradicated by vaccines. These once fatal diseases no longer exist among the population.

Further, there is little evidence to suggest that vaccines are harmful. The side effects are minimal and whilst millions of people have been immunized over the years, less than .005% have ever had an adverse reaction to a vaccine.

Perhaps unsurprisingly, therefore, a recent news poll of 1024 adults showed that an overwhelming majority of 61% believed that vaccines are safe and only a further 17% were unsure. Only 22% of respondents believed that vaccines were harmful and unsafe.

The financial benefits of preventing illnesses far outweigh the profits made from vaccines by pharmaceutical companies. For example, in 2001, routine childhood immunization in the US was estimated to save over $40 per birth-year cohort in overall social costs including $10 billion in direct health costs. The government recommends vaccines for children to improve public health and save money, not to make a profit.

Affective Condition – Empathy

Many people believe that vaccines are ineffective or even harmful. They are afraid that the government, doctors, or pharmaceutical companies are taking advantage of them, and more motivated by profit than a desire to keep people safe. They are afraid vaccines will make themselves or their children sick, and some people are so concerned they choose not to vaccinate.

These fears are understandable. There have been cases where corporations have taken advantage of people for profit. So why wouldn't people be concerned, if they feel the health and safety of their children is in danger?

Unfortunately, these people are confused, or have even been lied to. Of course they are afraid, since they've been told vaccines will harm their children. But they don't realize they've been given incorrect information, and their fears often keep them from understanding how helpful vaccines really are.

Sometimes, the results of this fear are tragic. Parents have to watch their children get sick from preventable diseases. In some cases, the diseases are so severe that their children even die. Then the parents are left lost, confused, and even more afraid. They feel alone, and unable to understand what happened. They believe they did everything right to try to keep their children safe, and were rewarded with the worst possible outcome.

What happens in these cases is extremely sad. These parents had to watch their children suffer and had no way to stop it. They don't understand what went wrong, because they were given the wrong information. They don't understand that all their pain was avoidable. And they are ultimately left alone and in pain because they listened to the wrong people.

Affective Condition – Social Threat

Many people question the safety and efficacy of vaccines. They are afraid that the government, doctors, or pharmaceutical companies are taking advantage of them, and more motivated by profit than a desire to keep people safe. They are afraid vaccines will make themselves or their children sick, and some are so concerned they choose not to vaccinate.

But the costs of these fear-motivated decisions can be high. The vast majority of people understand that vaccines are safe, effective, and beneficial, and they have no problems with vaccinating themselves and their children. They have little tolerance for those they perceive as putting their health in danger.

Imagine that you have a child you choose not to vaccinate. You might believe that you're acting in your child's best interest, but others will disagree. When they learn that your child isn't vaccinated, they will disapprove. They will tell you that you're endangering your child and everyone around them.

Other people, when learning about your decision, may choose to stop associating with you. They don't want to be around someone who can't understand how dangerous that choice is. They won't allow their children around yours, because they don't want to risk you causing their children to be horribly sick. You and your child will both lose friends because of your decision. Your child also won't even be allowed in school. They will lose out on the opportunity for both friendship and education because they weren't vaccinated. This will cause them disadvantages

throughout life. And once they grow up and learn the consequences of your decision, they will blame you. You may even lose your relationship with them – all because you chose not to vaccinate.

Control Condition

Adapted from The Old Farmer's Almanac

What are the differences between an asteroid, meteoroid, meteor, and meteorite? And how do you find a meteorite? Meteorites that fall to earth are the next best thing to space missions. Extraterrestrial material comes to us, instead of the other way around!

To put it simply, they're all space rocks!

The largest rocks are called asteroids. Think of asteroids like minor planets which orbit around the Sun just like Earth.

Over time, these asteroids break down into smaller particles of rock called meteoroids. Meteoroids orbit our Sun, too.

When one of those meteoroids enters the Earth's atmosphere and vaporizes, it is called a meteor – or, shooting star. The meteor heats up and makes the air around it glow. We see a streak of light. Most meteors burn up. Scientists think up to 10,000 tons of meteors fall on the Earth each day, but most are no bigger than a speck of dust.

If a meteor survives its passage through the Earth's atmosphere without burning up and lands upon the Earth's surface, it's called a meteorite. Meteorites range in size from tiny pebbles to boulders.

Some planets and moons don't have enough atmosphere to protect them against meteor and asteroid impacts. Earth's moon, Mercury, and even Mars are covered with round impact craters from these collisions.

Every day, dozens of small meteorites fall to the Earth. Those that are seen coming down are called "falls." Those that are recovered on the ground are called "finds."

Meteorites are often of great interest to researchers as studying them helps us to understand the formation and evolution of the solar system.

Meteorites can be recognized by their dark, often scalloped exterior. Usually they will be denser than a "normal" rock and will often be attracted to a magnet. If recovered, it is best to place them in a clean plastic bag or wrap them in aluminum foil. Meteorites should also be handled as little as possible to preserve their scientific value.

Manipulation Check

How much did the passage you just read make you feel the following emotions? (1 = *not at all*, 7 = *a great deal*)

Ashamed

Empathetic

Afraid

Angry

Happy

Peppy

Calm

Tired

Anti-Vaccine Conspiracy Theory Endorsement Measure

Instructions: Please indicate how much you agree or disagree with the following statements, using the following scale. (1 = strongly disagree, 7 = strongly agree)

Pharmaceutical companies are concealing information about the risks associated with vaccines.

Doctors are concealing information about the risks associated with vaccines.

The government is concealing information about the risks associated with vaccines.

Vaccines are generally safe.

I would vaccinate my child.

Attitude Certainty

How certain do you feel about your answers to the above statements? (1 = *not at all certain*, 7 = *very certain*)

9/11 Conspiracy Items

Instructions: Please indicate how much you agree or disagree with the following statements, using the following scale. (1 = *strongly disagree*, 7 = *strongly agree*)

The US government knew in advance of the 9/11 attacks, but allowed them to occur anyway.

The US government could have prevented 9/11, but chose not to.

The US government let 9/11 happen so they would have an excuse to start a war in the Middle East.

The US government was behind the 9/11 attacks.

Conspiracy Mentality Scale (Stojanov & Halberstadt, 2019)

Instructions: Next you will see a set of beliefs about the state of affairs of the world. People agree or disagree to various extents with these beliefs. Indicate your agreement or disagreement with each statement using the scale provided. Do not overthink your answers; go with your initial hunches. (1 = *strongly disagree*, 7 = *strongly agree*)

The alternative explanations for important societal events are closer to the truth than the official story.

The government or covert organizations are responsible for events that are unusual or unexplained.

Many situations or events can be explained by illegal or harmful acts by the government or other powerful people.

Some things that everyone accepts as true are in fact hoaxes created by people in power.

Events on the news may not have actually happened.

Many so-called "coincidences" are in fact clues as to how things really happened.

Events throughout history are carefully planned and orchestrated by individuals for their own betterment.

Many things happen without the public's knowledge.

There are people who don't want the truth to come out.

Some things are not as they seem.

People will do crazy things to cover up the truth.

Need for Cognition (Cacioppo et al., 1984)

Instructions: For each of the statements below, please indicate to what extent the statement is characteristic of you. (1 = *extremely uncharacteristic*, 7 = *extremely characteristic*)

I would prefer complex to simple problems.

I like to have the responsibility of handling a situation that requires a lot of thinking.

Thinking is not my idea of fun.

I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.

I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.

I find satisfaction in deliberating hard and for long hours.

I only think as hard as I have to.

I prefer to think about small, daily projects to long-term ones.

I like tasks that require little thought once I've learned them.

The idea of relying on thought to make my way to the top appeals to me.

I really enjoy a task that involves coming up with new solutions to problems.

Learning new ways to think doesn't excite me very much.

I prefer my life to be filled with puzzles that I must solve.

The notion of thinking abstractly is appealing to me.

I would prefer a task that is intellectual, difficult, and important to one that is somewhat

important but does not require much thought.

I feel relief rather than satisfaction after completing a task that required a lot of mental effort.

It's enough for me that something gets the job done; I don't care how or why it works.

I usually end up deliberating about issues even when they do not affect me personally.

Need for Affect (Maio & Esses, 2001)

Instructions: Please indicate how much you agree or disagree with each of the following

statements, using the scale provided. (1 = *strongly disagree*, 7 = *strongly agree*)

If I reflect on my past, I see that I tend to be afraid of feeling emotions.

I have trouble telling the people close to me that I love them.

I feel that I need to experience strong emotions regularly.

Emotions help people get along in life.

I am a very emotional person.

I think that it is important to explore my feelings.

I approach situations in which I expect to experience strong emotions.

I find strong emotions overwhelming and therefore try to avoid them.

I would prefer not to experience either the lows or highs of emotion.

I do not know how to handle my emotions, so I avoid them.

Emotions are dangerous – they tend to get me into situations that I would rather avoid.

Acting on one's emotions is always a mistake.

We should indulge our emotions.

Displays of emotions are embarrassing.

Strong emotions are generally beneficial.

People can function most effectively when they are not experiencing strong emotions.

The experience of emotions promotes human survival.

It is important for me to be in touch with my feelings.

It is important for me to know how others are feeling.

I like to dwell on my emotions.

I wish I could feel less emotion.

Avoiding emotional events helps me sleep better at night.

I am sometimes afraid of how I might act if I become too emotional.

I feel like I need a good cry every now and then.

I would love to be like "Mr. Spock," who is totally logical and experiences little emotion.

I like decorating my bedroom with a lot of pictures and posters of things emotionally significant to me.

UNIVERSITY OF ARKANSAS

To:	Marie L Altgilbers BELL 4188
From:	Douglas J Adams, Chair IRB Expedited Review
Date:	01/20/2021
Action:	**Exemption Granted**
Action Date:	01/20/2021
Protocol #:	2012302529
Study Title:	Conspiracy Theories and Persuasion

The above-referenced protocol has been determined to be exempt.

If you wish to make any modifications in the approved protocol that may affect the level of risk to your participants, you must seek approval prior to implementing those changes. All modifications must provide sufficient detail to assess the impact of the change.

If you have any questions or need any assistance from the IRB, please contact the IRB Coordinator at 109 MLKG Building, 5-2208, or irb@uark.edu.

cc: Scott H Eidelman, Investigator