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Effectiveness of Affective based Intervention depending on Personal Relevance to a Conspiracy Belief

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Table of Contents

Abstract

With the increase in conspiracy theory beliefs, there is a need for intervention techniques. Do some intervention techniques work better when taking into account the personal relevance a person has towards a topic? One hundred and sixty undergraduate students first read an article that introduced the conspiracy theory and established personal relevance. To manipulate personal relevance, participants were told that a new vaccine mandate would be put into place either July 2023 or July 2031. Then, they considered an article that worked to intervene the conspiracy belief. Participants either read an article that was focused on affective or cognitive intervention techniques. To measure the dependent variable, participants reported their support for the conspiracy theory. Results indicated that personal relevance played little role in impacting conspiracy beliefs. However, cognitive intervention tech had a significantly decreased anti-vaccine attitudes when compared to the control condition.

Effectiveness of Affective based Intervention depending on Personal Relevance to a

Conspiracy Belief

Conspiracy theories are shared around a dinner table or discussed on the news. A distinction must be drawn between what is a conspiracy theory and what is factual. Maybe people sitting around that dinner table believe that the conspiracy theory they are sharing is the real account of what happened. Why do these people believe in conspiracy theories? How might they be challenged or correct? In the following research, the possible intervention techniques are explored that work to decrease anti-vaccine conspiracy beliefs depending on how personally relevant the conspiracy theory is to a person.

Defining Conspiracy Theories

Conspiracy theories focus on a hidden mysterious entity that controls the outcomes of different situations and has malevolent intent (Brotherton, 2013). Conspiracy theories are unverified claims about sensational events that are less plausible than the official explanation. Random coincidence cannot simply occur in nature (Hofstadter, 1964; Uscinski, 2020). Conspiracy theorists would rather take the word of an eyewitness than other, more effective methods of investigation (Dunbar & Reagan, 2006; Wells & Olson, 2003). One aspect that makes conspiracy theories dangerous is that people get to pick and choose which "facts" they believe. These "facts" might not be true or accurate to what happened during the event. Conspiracy theorists, also, use the lack of evidence in unofficial stories as evidence that mainstream media is not telling the "actual" event. This absence of evidence is convincing enough that people believe that a possible evildoer is hiding something. The evidence given out by mainstream media is false. This flaw in logic is a reason for the spread of misinformation. Effective intervention methods must be discovered to combat conspiracy beliefs. A difficult

situation is presented: How do you get someone to believe the actual story when they are set on not believing in it?

The lasting impacts of holding conspiracy theory beliefs can have major impacts on society. Minor exposure can have an impact on a person's belief system. Seeing a conspiracy once or twice (Jolley, 2013), might not change much, but it could impact how a person takes in information and what they choose to believe is true or not. The next level would be a shift in attitudes. A conspiracy theory always has an enemy. This will normally show up as "big" pharmaceuticals, government, agriculture, etc. Finally, these attitudes can influence our behaviors. These behaviors include not wearing a mask or getting vaccinated or sharing misinformation on Facebook. It might be the blog a mother's college roommate shared on Facebook that keeps her from giving her baby the MMR vaccine. Perhaps, she does give her child the vaccine and the baby gets MMR. It is easy to read a blog post from another mother and believe them when they claim that right after her child got the MMR vaccine, they also got diagnosed with autism. This answer is much easier to understand than the scientific literature, which does not give a definite explanation for the cause of autism. They examine complex genetic factors that are manipulated by advanced parental age and environmental influences. Simply reading the Facebook blog post and being exposed to the anti-vaccine conspiracy can cause a mother to become hesitant about getting certain vaccines and be the determining factor for the health of the child (Jolley & Douglas, 2014).

The spread of misinformation is a key reason for why conspiracy theories continue to grow and stay around. Effective methods must be created to help stop the spread of misinformation and properly inform the community. To dismantle conspiracy theories, there

must be an understanding as to how and why people fall prey to them. This information will help create effective intervention methods that will be used to break down untrue beliefs.

Personality and Social Influences on Conspiracy Theory Beliefs

Another reason that conspiracy belief intervention is hard is because of the people that believe in them. A conspiracy theorist is likely to have ties to religion or believe in the unknown or unseen (Oliver & Wood, 2014). This can also manifest in beliefs in ghosts or other paranormal activity. These beliefs give people a sense of control over a situation that they could not have changed. Many people use the rhetoric, "It was in God's will," or something similar. Conspiracy theories offer a similar sense of autonomy over an unlikely outcome (Jolley & Douglas, 2014). It was not in the mother's choice that their baby got diagnosed with autism. However, by believing that the MMR vaccine possibly gave it to them, the mother feels a higher level of control over the situation. Their willingness to believe helps support the loose evidence characteristic of conspiracy theories, a key personality trait of a person that believes in conspiracy theories. Another personality trait is the desire to be different from other people (Uscinski, 2020). This manifests in the idea that one's life has meaning while maybe other people's do not. This character trait is closely related to narcissism or thinking that a person is the center of the world. One way this characteristic manifests would be that the mothers buy into the conspiracy theories surrounding the MMR vaccine before giving it to their children. They believe they are better because they did not fall for the mainstream propaganda that told them their babies should have the vaccine.

Additionally, people want to be in a community. Therefore, they are more likely to believe in a certain conspiracy theory if the group also does. Conspiracy theories offer an opportunity for the in-group to blame the out-group for undesirable events, which leads to an

increased feeling of self-worth (Douglas et al., 2017). They see their group as more positive than the other side. A major consequence of conspiracy beliefs is greater distrust of governmental agencies (Einstein & Glick, 2015). Conspiracy beliefs increase group separation and distrust in authority organizations. By studying conspiracy theories, leaders can decrease the distrust and increase collaboration between in-groups and out-groups. Conspiracy theories do not just create tensions between groups of people, they also are potentially dangerous to the community at large. It is essential to get vaccines to protect from illness and respect the planet to better combat global warming. By studying conspiracy theories, more information becomes available that challenges misinformation or fake news. By studying different intervention methods, more effective ways to combat conspiracy beliefs can be developed.

Cognitive and Emotional Components of Conspiracy Theories

A question that needs to be answered is how to intervene with a conspiracy theory. For example, can we get participants to decrease their belief in an anti-vaccine conspiracy? Finding this solution is a driving force in conspiracy theory research. Current research is studying the effects of one-on-one interventions. Many people try to persuade individuals that conspiracy theories are not true using a counter-attitudinal approach. This approach has a person think of the other side's argument. By doing this, cognitive dissonance, or having thoughts that differ from an action, will be created, allowing this person to be more susceptible to opposing influences. Many people are told different arguments using reasons and evidence as to why their attitudes are not credible. However, this form of persuasion may not work best with conspiracy theories because people can side-step cognitive dissonance by arguing not why their belief was true but, why the popular belief of what happened is wrong (Wood & Douglas, 2013). In addition, many conspiracy theorists know that people disagree with them and begin to build arguments that

prepare them against counter-belief messaging (Bonetto, 2018). An additional explanation for why standard persuasion methods may not work is because conspiracies are more irrational than logical. Many conspiracy beliefs are not built on rational or analytical thought but on emotions. In popular culture, most conspiracy theories are based on highly emotional situations such as terrorist attacks or natural disasters (Swami et al., 2014).

"Cognition is the mental process of acquiring knowledge and understanding. Every day, each of us is bombarded with billions of data points. Our brains are tasked with making sense of all that information and learning from it," (Uscinski, 2020, p. 66). People want to be informed. The world has been in an information arms race since the industrial revolution seeking knowledge to make life easier. This need to gather new information is one motive for people to fall prey to conspiracy theories (Douglas, Sutton, & Cichocka 2017). They are gathering all the information possible including misinformation. When presented with so much information, people need to be able to discern the facts from the made-up ones in conspiracy theories. Building strong arguments with correct facts will help to discredit conspiracy theories.

Presenting facts to a person might get them to change their mind about an established attitude they have. For emotionally based attitudes, affectively based arguments will work more effectively to change opinions. An emotional attitude is more likely to be influenced when paired with an affectively based persuasion technique (Fabrigar & Petty 1999). This pairing of attitude to persuasion technique works with cognitive attitudes as well. Paired persuasion techniques might work with analyzing conspiracy theories. If conspiracy beliefs are more emotionally based than logical, it would follow that conspiracy beliefs might have the best chance to be overturned by using an affective argument.

The Role of Relevance

Whether an argument is based on emotions or facts, if it is strong it will be more persuasive. The factors that go into an argument include the source, contents of the message, and characteristics of the audience (Hovland, Janis, & Kelley, 1953). For the purpose of this study, we keep the source similar to better understand how the individual uses personal relevance when deciding if they want to endorse a conspiracy theory. In addition, cognitive or affective messaging is used to determine which intervention technique would be better in decreasing anti-vaccine attitudes dependent on personal relevance.

There are two routes to persuasion that the audience can choose to take when being subject to persuasive messaging: the central and the peripheral (Petty & Cacioppo, 1986). While many factors enhance an individual's ability to pay attention to a certain argument presented to them, personal relevance is a significant variable. If a topic is relevant to a person, they are more likely to use the central route to persuasion and use the strength of the argument to determine if they will be persuaded. If relevance is low, people are more likely to use peripheral cues, such as the creditability of the speaker, to determine whether they are persuaded. Higher personal relevance leads participants to have increased attention and arousal (Bayer, Ruthmann & Schacht, 2017). This research suggests that higher emotion is linked with greater personal relevance and attention. It follows that conspiracy theories that are about highly emotional events and are highly relevant, a person would be more likely to use cognitive messaging to determine what they chose to believe. However, social influences are also highly relevant to a person. A person's need to be a part of a group might be great enough that they use peripheral cues to buy into a conspiracy theory. For example, a person will support new QAnon ideas because they need to be accepted by the community. Their beliefs, created by misinformation, influence their

actions. Therefore, the messaging would need to be more affective because the person is already using peripheral cues.

Personal relevance is an interesting factor to manipulate when dealing with conspiracy theories. As discussed, people determine their attitudes based on the source, messaging, and characteristics. Often with conspiracy beliefs, people are choosing to believe in messages from sources that do not have the proper information or credibility. These sources are spreading misinformation. So, people that believe in conspiracy theories are using a peripheral route to persuasion. Yet, people believe in conspiracies surrounding an event that has impacted them in a major way. The older generations were alive during 9/11 and have experienced how the airports changed their security protocols. Conspiracy theories still surround how 9/11 was an inside job committed by the United States. This same principle can be used when looking at vaccine-related conspiracy theories. The older generation saw the major impacts that the smallpox vaccine and the polio vaccine had on the protection of their community. There are moms whose child is diagnosed with autism writing blogs about how their baby got the disease from a vaccine. This is a highly personal relevance topic to the mom whose child is impacted by autism, yet we see them believe in the conspiracy theory and spread the idea. This tendency of conspiracy theorists is different than what is expected. With high personal relevant topics, it becomes imperative that a person uses the central and systematic thought process to sort through the information (Petty, Cacioppo, & Goldman, 1981). However, conspiracy theories show a different pattern. Therefore, perhaps an affective intervention method would work better than one that is cognitive.

The Present Study

The current research targeted the anti-vaccine conspiracy theory community. In the current research, a story is developed that led people who have conspiratorial mindsets to have

concerns that revolved around the Arkansas Health Department wanting to administer the smallpox vaccine to students again after discontinuing the requirement in the 1970s (Welch, 2020). To manipulate relevance, the first independent variable, participants were told this vaccine mandate would either go into effect in 2023 (strong personal relevance) or 2031 (weak personal relevance). By manipulating the personal relevance of a conspiracy theory, we can better discern what role personal relevance has on people who choose to believe in conspiracy theories. After being exposed to this manipulation, participants, undergraduates at the U of A, underwent an intervention, the second independent variable, to decrease anti-conspiracy beliefs. Participants read a counterargument that was either affective or cognitive. The affective manipulation was intended to create emotions that counter the emotion caused by the emotional conspiracy belief. The cognitive condition gave participants the information they need to discredit the false information. We measured participants conspiracy ideation after being exposed to the cognitive intervention method, affective intervention method, or the control condition. The control condition was an article about meteorites. The dependent variable was how much the participant endorsed the conspiracy theory. We predicted an interaction between relevance and intervention type so that affective intervention will be more effective in decreasing anti-vaccine conspiracy beliefs when relevance is high, but cognitive interventions will be more effective when relevance is low.

Method

Participants

Participants were 160 undergraduates recruited from introductory psychology classes at the University of Arkansas. Their ages ranged from 18 years to 30 years old, ($M = 19.08, SD = 1.76$). Of the 160 participants, 39 participants (24%) identified as male, 120 participants (75%)

identified as female, and 1 person (0.63%) identified as other. Eight (5%) participants identified as Black/African American, 4 (2.5%) identified as Asian, 9 (5.6%) identified as Hispanic/Latino, 4 (2.5%) identified as Native American, 129 (80%) identified as White, and 5 (3.1%) identified as biracial, mixed race, or some other ethnicity. One participant chose not to answer. On a scale from 1 (very liberal) to 7 (very conservative), the participants averaged a 4.04 in general, 3.57 socially, and 4.53 economically.

Procedure and Materials

Participants chose to be part of this study by signing up on Sona, a research and participant managing software. One at a time, participants were led into a room with limited distractions where they completed a study on Qualtrics via computer. Once consent was given, participants were randomly assigned to one of two messages about the smallpox vaccine. Participants read an article about how the smallpox disease might return in the near future and to prepare, the Arkansas Department of Health recommended that the University require this vaccine. To create misinformation, this article mentioned that the Board of Trustees of the University of Arkansas did not think that this was safe creating a possibility of a conspiracy to form. This measure manipulated personal relevance among participants by changing the date that the vaccine mandate would come into effect. The relevance manipulation article shown to the participants was the same except for the last sentence of the first paragraph. This sentence read, "This policy will go into effect by July (2023/2031) to properly protect the University community against the virus." The July 2023 date would have high personal relevance to the participant because they would be personally impacted by the vaccine mandate. The low personal relevance would be the date July 2031 because participants would most likely not be students at the university anymore and not be personally impacted by the new policy.

Next, participants were further randomly divided into three more conditions by being presented with another article to read. These articles manipulated the intervention method used to counter a conspiracy belief. The *cognitive* condition had facts and statistics about the effectiveness of the smallpox vaccine. The cognitive condition was adapted from Jolley and Douglas (2014a). Information given included the effectiveness of vaccines, statistics about the number of adults that think vaccines are safe, and the amount of money saved on the health care system when someone is vaccinated. For example, one sentence read, "…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 *affective* condition article mentioned the safety and the potential benefits of vaccines to those closest to the participant and the larger community by using sentences like, "They recognize that they are protected from diseases that caused lifelong suffering for their parents and grandparents, such as needing an iron lung to breathe for them after contracting polio," to elicit an emotional response. The *control* condition had an article about differences between an asteroid, meteoroid, meteor, and meteorite. The condition paragraphs were written similarly and with similar word counts to decrease the possibility of confounding variables. (See Appendix for the full text of the conditions.)

Next participants completed a 10-item measure to assess the effect of the intervention method manipulation. The statements that participants responded to consisted of "I found the message I read relatable;" "I understood the message I just read;" "I was absorbed in reading the message;" "I was NOT interested in the message I just read (reversed);" "The message I just read contained a lot of facts and statistics;" "The message I just read contained a lot of evidence and reasoning;" "The message I just read contained a lot of evidence and reasoning;" "I experienced some emotion while reading the message." These statements were measured on a 1 (*strongly*

disagree) to a 7 (*strongly agree*) scale. The last three statements were "How much did the

message you just read make you feel afraid;" "How much did the message you just read make

you feel empathetic;" and "How much did the message you just read make you feel calm?"

These items were measured on a 1 (*Not at all)* to 7 (*A great deal)* scale. To check that the

affective message had more general emotional qualities than the other intervention conditions, an

index ($\alpha = .73$) was created using items about relatability, understanding, absorption, interest,

and experiencing emotions. To check that the cognitive message had more cognitive qualities, an

index ($\alpha = .61$) was create composed of two items about facts and statistics and then evidence

and reason. There were individual items assessing feelings of fear, empathy, and calmness that

were not placed into any index.

Then, participants responded to statements to determine their conspiratorial beliefs about

vaccines. This was an 8-item measure where participants rated the following on a scale from 1

(strongly disagree) to 7 (*strongly agree)*: "The medical industry, including pharmaceutical

companies and doctors, is concealing information about the risks associated with vaccines;"

"The US government is concealing information about the risks associated with vaccines;" "The

safety of vaccines is being compromised so the medical industry can profit financially;"

"Vaccines are generally safe;" "I would vaccinate my child;" "It's risky to get most vaccines;"

"The downsides of most vaccines outweigh the benefits;" and "I generally get recommended

vaccines." These items were also reliable ($\alpha = .90$) and were combined to form a conspiratorial

vaccine beliefs index.

Participants finished the survey by answering demographic questions about age, gender,

race/ethnicity, and political ideology. Political ideology was measured with three different scales.

The three questions were measured on a scale of 1 (*very liberal*) to 7 (*very conservative*). The questions asked about their beliefs generally, socially, and economically.

Once the survey was completed, participants were debriefed, thanked, and compensated with partial credit towards the psychology class requirement.

Results

Relevance Manipulation Check

To test the effectiveness of the relevance manipulation, the relevance manipulation item was submitted to a t-test. This analysis indicated no difference in perceptions of relevance to the self, $t(157) = 1.63$, $p = .11$, and in fact, relevance ratings in the low relevance condition were slightly and non-significantly higher ($M = 4.59$, $SD = 1.51$) than in the high relevance condition ($M = 4.19$, $SD = 1.62$).

Intervention Manipulation Checks

A one-way ANOVA was ran on the 5-item affect index to determine if the manipulation of intervention type impacted the participants in an emotional manner. It showed that there was a significant difference across intervention type, $F(2,157) = 16.64$, $p < .001$, $R^2 = .17$. Therefore, the following pairwise comparison test with a Holm method for familywise error rate corrections suggested that there was a significant difference between the affective intervention method ($M = 5.31$, $SD = .79$) and the control intervention ($M = 4.45$, $SD = .97$), $t(103) = 5.11$, $p < .001$. There was a significant difference between the cognitive ($M = 5.25$, $SD = .84$) and control conditions, $t(104) = 4.58$, $p < .001$. However, no difference was found between the affective and cognitive conditions when testing the experience of general affect, $t(102) = .41$, $p = .70$. Therefore, the affective condition did not cause participants to experience affect differently than the cognitive

intervention. There was not a greater degree of emotions reported by the participants when given the affective or cognitive condition.

Next, the cognitive items were used in a one-way ANOVA which suggested a significant difference across conditions, $F(2,157) = 15.2, p < .001, R^2 = .16$. Therefore, a follow-up pairwise comparison was ran. It was found that there was a significant difference between cognitive ($M = 5.44, SD = 1.20$) and control conditions ($M = 4.70, SD = 1.10$), $t(103) = 3.33, p = .004$. There was also a significant difference between affective ($M = 4.12, SD = 1.37$) and control conditions, $t(100) = -2.41, p = .02$. As well as a significant difference between cognitive and affective conditions, $t(102) = -5.24, p < .001$. Participants reported higher scores if they found that the intervention presented to them had more statistics and evidence. Therefore, we can determine that the cognitive condition was the most "cognitive" condition. The cognitive items were able to get the participants to report that they saw statistics and facts that made them understand the evidence more than the affective intervention method.

For the fear item, a one-way ANOVA showed significant differences across conditions, $F(2,154) = 3.89, p = .02, R^2 = .05$. Therefore, we ran a follow-up pairwise comparison which showed a significant difference between the affective ($M = 2.29, SD = 1.35$) and control conditions ($M = 1.65, SD = .83$), $t(82) = 2.94, p = .02$. There was no difference between cognitive ($M = 1.96, SD = 1.33$) and control conditions, $t(85) = 1.45, p = .31$, and no difference between affective and cognitive conditions, $t(101) = 1.26, p = .31$.

The empathy item in a one-way ANOVA showed significant differences across conditions, $F(2,154) = 20.87, p < .001, R^2 = .21$. After this was learned, a pairwise comparisons was used to follow up and suggests a difference between affective ($M = 3.55, SD = 1.49$) and control conditions ($M = 1.87, SD = 1.15$), $t(94) = 6.44, p < .001$. There was also a difference

between cognitive (*M= 4.45, SD = .97*) and control conditions, $t(100) = 4.04$, $p < .001$, as well

as between affective and cognitive conditions, $t(100) = 2.42$, $p = .01$.

There were no differences across the two intervention methods or the control condition in

feeling calm, $F(2,154) = .20$, $p = .82$, when we ran a one-way ANOVA.

Primary Analysis

A 2 × 3 ANOVA was ran with personal relevance (high vs. low relevance) and

intervention method (control, cognitive, and affective) as the independent variables and anti-

vaccine attitudes as the dependent variable. The omnibus test of the ANOVA was

significant, $F(5,154) = 2.32$, $p = .046$, adjusted $R^2=.04$. There was no main effect of personal

relevance , $F(1,154) = .54$, $p = .46$. There was a main effect of intervention techniques, $F(2,154)$

$= 4.09$, $p = .02$. However, there was no interaction between relevance and intervention, $F(2,154)$

$= 1.43$, $p = .24$ (see Figure 1).

Figure 1
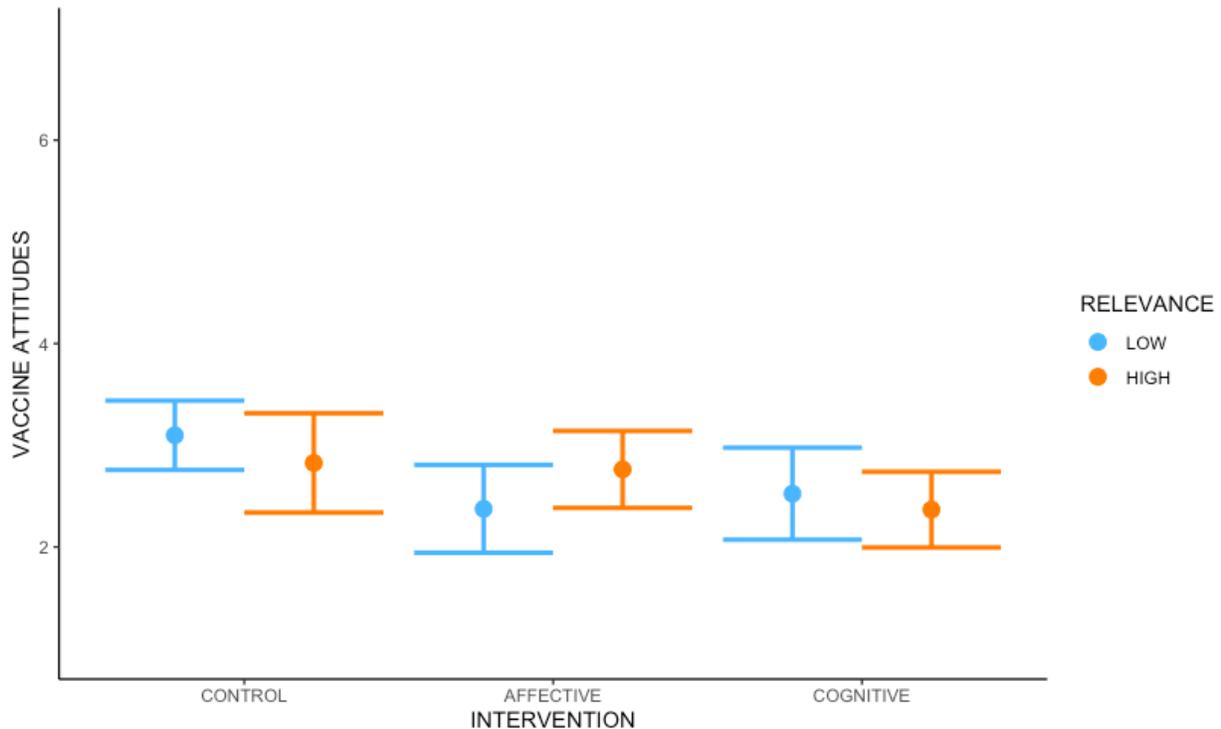
We conducted follow-up pairwise comparisons to decompose the main effect of intervention, using the Holm method to correct for familywise error rates. There was a significant difference between the cognitive ($M = 2.43$, $SD = 1.17$) and control ($M = 3.01$, $SD = 1.01$) conditions, $t(101) = 2.73$, $p = .02$, such that there was a reduction in anti-vaccine beliefs in the cognitive condition. This was the only effect seen.

Discussion

In this experiment, we manipulated personal relevance to a possible conspiracy theory as well as types of intervention to prevent it from taking hold. Personal relevance was manipulated by creating a story in which a new vaccine mandate would be put into place starting in July 2023 or July 2031. Then, participants reported their anti-vaccine beliefs after they underwent an intervention. The intervention was either cognitive or affective.

It was hypothesized that the effectiveness of the intervention method would depend on personal relevance of the conspiracy theory. More specifically, we predicted that affective intervention methods would work better to decrease anti-vaccine conspiracy beliefs when it was highly personal, and cognitive intervention methods for when a conspiracy has low personal relevance. This hypothesis must be rejected.

When examining the intervention manipulation checks, it can be seen that the affective condition was not significantly better at eliciting emotions than the cognitive condition. However, both these intervention techniques were better at getting participants to lower their anti-vaccine conspiracy beliefs than the control condition. The affective intervention condition was only marginally better at preventing conspiracy beliefs than the control condition. The cognitive condition was better at preventing conspiracy theory beliefs than the control condition. We can conclude that the cognitive intervention method was more effective in keeping participants from endorsing a conspiracy belief.

There was no significant difference for personal relevance when the check on this manipulation was considered. There was also no main effect of personal relevance in the primary analysis, nor an interaction with intervention type. Because our manipulation of personal relevance was unsuccessful in creating personal relevance in the participant, we can neither conclude nor reject the idea that personal relevance plays a role in whether a person choose to endorse a conspiracy theory. Failing to create personal relevance might be due to limitations in the experiment. The participants might not have noticed the manipulation. The participant could have simply missed *July 2023* or *July 2031* at the bottom of a paragraph. The relevance manipulation was too subtle. The participant might not have noticed it and fully processed it. Repetition is very important and may play a part in whether central or peripheral processing is

employed. Research done by Garcia-Marques and Mackie (2001) and Claypool et. al (2004) highlights the importance of repetition in determining the route of processing the participant takes. However, these studies differ on if more repetition would cause the participant to use the central, more cognitive way of processing or peripheral, more emotional way.

Further Research and Limitations

Another reason that personal relevance did not matter in decreasing anti-vaccine conspiracy beliefs is because many people find conspiracy theories to be fun. This makes sense when thinking about situations that are of low relevance to a person. Many of the participants were not around during the Moon Landing or the assassination of John F. Kennedy. It would be less boring (Brotherton & Eser, 2015) to research the convoluted history that surrounds such events rather than do homework. People may enjoy reading or learning about conspiracy theories because they are "interesting, exciting, and attention-grabbing narratives," (van Prooijen, 2022). The participants are used to thinking about conspiracies in terms of entertainment and something to talk to friends about. The participants have not seen any conspiracy theories be proven true like the conspiracies surrounding Watergate.

Additionally, the participants in our study were also in college and have developed tools to help them sift through information to determine if it is real or fake. The current participant pool is more likely to endorse a conspiracy theory for the mere entertainment it offers. Whereas, the older generation, the Baby Boomers and Generation X, might endorse a conspiracy theory because they do not know any better. The Baby Boomer generation is far more likely to share false information than any other generation (Guess, et.al., 2019). Possibly because they did not grow up with the need to search through Facebook to weed out misinformation. Baby Boomers do not know that Facebook uses an algorithm to develop their feed and recommendations

(Hobbs, 2020). This is making the older generation more prone to false information. Besides generational differences, education level, political ideology, and race may impact a person's willingness to believe in a conspiracy theory. Our sample size is all getting a higher education and race was majority white. These two qualities are not characteristics of a person who is likely to believe in conspiracy theories. They have the knowledge to determine what a credible source. Most likely, they have never been marginalized. Political ideology was evenly distributed.

Another limitation is that this study only had 160 participants when roughly 600 participants were needed to have sufficient statistical power to find significant effects. The lack of participants was in part because of COVID-19. This study was ran in-person for two semesters. At the beginning of both semesters, COVID-19 cases were high. Therefore, the study was not conducted during that time decreasing the time available to get 600 participates.

Conclusion

Conspiracy theories are dangerous to society and people individually. Conspiracy theories about climate change and vaccine can increase harmful behavior, such as vaccine refusal and decreases efforts to decrease a person's carbon footprint (Jolley & Douglas, 2014a). Their possible entertainment value does not take away from this. While they might be fun to read, exposure to conspiracy theories still impacts people's behaviors and attitudes (Jolley & Douglas, 2014b). It is very important to develop effective intervention methods to decrease conspiracy beliefs. This will help decrease intergroup conflict and hostility towards others. Research on intervention techniques is essential to determine how to educate the public and stop the spread of misinformation and, furthermore, create a more cohesive and collaborative community.

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Appendix

Personal Relevance Condition

Since the beginning of 2020, the world has been involved in the ongoing battle against SARS-CoV-2. Roughly 12 months later, the United States began to distribute vaccines to help build antibodies against COVID-19. The University is taking additional steps to prevent future disease outbreaks and ensure that the community will be protected by updating their required vaccinations. Currently, the University of Arkansas only requires the MMR, or measles, mumps, and rubella combination vaccine. However, the University has required others in the past, including the smallpox vaccine. After a thorough evaluation, the Arkansas Department of Health has recommended adding the smallpox vaccination to the required vaccination list based on evidence that this disease will begin to impact humans within the next 5 years. This policy will go into effect by *July (2023/2031)* in order to properly protect the University community against the virus.

However, the University of Arkansas Board of Trustees has some concerns about the smallpox vaccine. They believe that this vaccine might be harmful. Some people are concerned that vaccines cause other health conditions. These possible complications include MMR causing autism, the swine flu vaccine triggering type 1 diabetes, or the COVID-19 vaccine leading to infertility. The smallpox vaccine has not been updated since it was last required in 1972. In addition, the Board of Trustees do not believe that the smallpox disease will resurface. Smallpox has been eradicated worldwide due to the vaccination. However, the Arkansas Department of Health has reason to believe that this virus was able to survive in the permafrost that is currently melting in the Arctic. The Board of Trustees do not think that smallpox will become a problem.

Control Condition

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.

Cognitive Condition

Condition adopted from Jolley and Douglas (2014).

Some question the safety and effectiveness of vaccines. They're concerned that pharmaceutical companies and the government are concealing information about potential risks and side effects, but are motivated by profit to distribute vaccines anyway. But is this truly the case? There have, after all, been some cases of vaccine injury.

Fortunately, these concerns have little evidence to support them. Millions of people have been vaccinated worldwide, and less than .005% have ever had an adverse reaction to a vaccine. There is also a significant amount of evidence for the effectiveness of vaccines – they have eradicated deadly diseases such as smallpox and paralytic polio, increasing both life expectancy and quality of life for the world's population.

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. Vaccines also result in considerable benefits to society, including reduced spending on healthcare. 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.

Affective Condition

Some question the safety and effectiveness of vaccines. They're concerned that pharmaceutical companies and the government are ignoring their health and safety, but instead distributing dangerous vaccines so they can profit. But is this truly the case? After all, some people really have become sick after receiving a vaccine.

Fortunately, it's unnecessary to worry about such potential problems. Millions of people have been vaccinated worldwide, and only very few have been ill due to a reaction to a vaccine. These few cases have been widely reported precisely because they are so rare. Vaccines have also eradicated diseases such as smallpox and paralytic polio, which once caused widespread death and suffering.

Perhaps unsurprisingly, therefore, the vast majority of people believe vaccines are safe. They recognize that they are protected from diseases that caused lifelong suffering for their parents and grandparents, such as needing an iron lung to breathe for them after contracting polio. Having seen and heard of the devastating effects such diseases can have, they are also happy they can protect their children from those diseases with something as simple as a shot.

Despite the obvious benefits of vaccines, some people are still afraid they are unsafe. This is because they have been given the wrong information and used that to make decisions that they thought would keep themselves and their children safe. Unfortunately, they instead must watch their children suffer severe illness, or they themselves become sick and even die of preventable diseases, such as COVID-19. These cases are particularly tragic, but fortunately easy to prevent by getting vaccinated against a range of diseases.