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Gabriel Andrade and Jairo Lugo-Ocando

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Article abstract

Although medical conspiracy theories have existed for at least two centuries, they have become more popular and persistent in recent times. This has become a pressing problem for medical practice, as such irrational beliefs may be an obstacle to important medical procedures, such as vaccination. While there is scholarly agreement that the problem of medical conspiracy theories needs to be addressed, there is no consensus on what is the best approach. In this article, we assess some strategies. Although there are risks involved, it is important to engage with medical conspiracy theories and rebut them. However, the proposal to do so as part of "cognitive infiltration" is too risky. Media outlets have a major role to play in the rebuttal of medical conspiracy theories, but it is important for journalists not to politicize this task. Two additional long-term strategies are also necessary: stimulation of critical thinking in education, and empowerment of traditionally marginalized groups.

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ARTICLE (ÉVALUÉ PAR LES PAIRS / PEER-REVIEWED)

How Should We Address Medical Conspiracy Theories? An Assessment of Strategies

Gabriel Andrade[a], Jairo Lugo-Ocando[b]

Résumé
Bien que les théories de la conspiration médicale existent depuis au moins deux siècles, elles sont devenues plus populaires et plus persistantes ces derniers temps. C'est devenu un problème urgent pour la pratique médicale, car ces croyances irrationnelles peuvent constituer un obstacle à des procédures médicales importantes, telles que la vaccination. Si les spécialistes s'accordent à dire que le problème des théories de la conspiration médicale doit être abordé, il n'y a pas de consensus sur la meilleure approche à adopter. Dans cet article, nous évaluons quelques stratégies. Malgré les risques encourus, il est important de s'intéresser aux théories de la conspiration médicale et de les réfuter. Toutefois, la proposition de le faire dans le cadre d'une "infiltration cognitive" est trop risquée. Les médias ont un rôle majeur à jouer dans la réfutation des théories de la conspiration médicale, mais il est important que les journalistes ne politisent pas cette tâche. Deux autres stratégies à long terme sont également nécessaires: la stimulation de la pensée critique dans l'enseignement et l'autonomisation des groupes traditionnellement marginalisés.

Mots-clés
théories du complot médical, hésitation vaccinale, stratégies, infiltration cognitive, médias

Abstract
Although medical conspiracy theories have existed for at least two centuries, they have become more popular and persistent in recent times. This has become a pressing problem for medical practice, as such irrational beliefs may be an obstacle to important medical procedures, such as vaccination. While there is scholarly agreement that the problem of medical conspiracy theories needs to be addressed, there is no consensus on what is the best approach. In this article, we assess some strategies. Although there are risks involved, it is important to engage with medical conspiracy theories and rebut them. However, the proposal to do so as part of "cognitive infiltration" is too risky. Media outlets have a major role to play in the rebuttal of medical conspiracy theories, but it is important for journalists not to politicize this task. Two additional long-term strategies are also necessary: stimulation of critical thinking in education, and empowerment of traditionally marginalized groups.

Keywords
medical conspiracy theories, vaccine hesitancy, strategies, cognitive infiltration, media

Affiliations
[a] College of Medicine, Ajman University, Ajman, United Arab Emirates
[b] College of Communication, Sharjah University, Sharjah, United Arab Emirates
Correspondance / Correspondence: Gabriel Andrade, Gabrielernesto2000@gmail.com

INTRODUCTION

A major challenge in the management of the COVID-19 pandemic has been vaccine hesitancy (1). While there are multiple causes for this phenomenon, the proliferation of vaccine conspiracy theories is especially noteworthy. Long before the start of the pandemic, there were already concerns about conspiracy theories regarding the MMR and polio vaccines (2), amongst others (3). The proliferation of medical conspiracy theories is in fact a wider phenomenon that warrants concern from public health officials. It has been posited that, from the moment Edward Jenner produced the smallpox vaccine in the late 18th Century, there were rumors that vaccines were dangerous (4), with some people apparently even believing that smallpox vaccines could make people grow horns (5). Such was the proliferation of these conspiracy theories that the British government eventually had to impose vaccine mandates. These conspiracy theories opened up a proverbial "can of worms" in medicine.

In more recent times, conspiracy theories regarding vaccines have been augmented by the influence of Dr. Andrew Wakefield and his unfounded allegations that the MMR vaccine causes autism (6). Likewise, it has been reported that some Muslim countries have struggled with the eradication of polio (7), because apparently there is a widespread belief that the polio vaccine is a ploy to make Muslim men infertile. The fact that the CIA has used polio vaccinators as cover for some of their operations, has contributed to the further spread of this theory (8). But medical conspiracy theories also go beyond vaccines. For example, in the United States, there have long been fears of water fluoridation (a proven procedure to improve public dental health) as a Communist plot to weaken the population and exercise mind control (9). Pharmaceutical companies are occasionally accused of having the cure for cancer but keeping it secret, so as to generate greater profits by selling products to cancer patients (10). AIDS is occasionally claimed not to be caused by HIV (but rather by recreational drugs or sexual behaviour) and the antiretrovirals used to treat AIDS are thus useless drugs pushed by pharmaceutical companies (11). It is also common to hear claims that epidemics are forms of engineered control to reduce the population size of particular ethnic groups; as per this narrative, AIDS was an engineered virus targeted against the African American population (12). Similar claims have been made regarding COVID-19, as it is baselessly posited that it originated as a biological weapon engineered by either the Chinese or American governments (13).

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While medical conspiracies have existed for a long time, the rise of populist political parties in the last decade has warranted additional concern, as some observers believe that with this style of politics, conspiracy theories have become more prevalent (14). That has not been proven to be conclusively the case, but be it as it may, it is nevertheless true that medical conspiracy theories represent a significant problem for the advancement of public health (15-17). And yet, there is no consensus as to how this problem should be addressed. In what follows, we assess the strategic values of some possible approaches, considering the pros and cons of each, as there may always be potential negative effects. This assessment can, we suggest, provide useful information for government officials, public health practitioners and journalists, as the curbing of medical conspiracy theories requires a joint effort from many agents in society at large.

WHY DO PEOPLE BELIEVE IN MEDICAL CONSPIRACY THEORIES?

Any assessment of strategies to address medical conspiracy theories must first consider why people would believe such conspiracies in the first place. There is no unified cause, and research suggests various causal factors (18-20). Given the way human brains evolved, it has been posited there is a natural tendency for people to be captivated by narratives that rely on the spread of rumours (21). In an evolutionary context, social alliances were fundamental for survival, and in that regard, gossiping and rumours played an important part (22). Given that conspiracy theories rely extensively on rumours and hearsay, it may become more common and easy for people to listen to and spread conspiracy narratives. Further, evolutionary psychology posits that it was advantageous to be aware not only of who are one's friends, but also one's enemies, given that such information was crucial for survival (23,24). Apart from predators, in an evolutionary context, a major threat to survival was other people. Consequently, given that conversations are dominated about references to other people, it becomes natural that when discussing particular health problems, there will be a tendency for people to talk about the threat that other people pose.

Research also suggests that the human mind is prone to be captivated by the occurrence of minimally counterintuitive effects (25), in which concepts that seem to run counter to some minimal expectations nonetheless become very interesting. For example, the conventional explanation of the COVID-19 pandemic (i.e., zoonosis) may not be attractive enough for conspiracists because it is not overly counterintuitive (26). Likewise, some bizarre explanation (e.g., COVID-19 has been planted by beings from the 11th dimension as a blessing to humanity) is too counterintuitive to be accepted. But to explain the origin of the COVID-19 pandemic as a bioweapon to advance a government's national interests (either the United States or China, depending on the version), is counterintuitive but only minimally so. This makes it more likely to be accepted as a conspiracy theory (27).

Additionally, cognitive theory proposes that agency detection modules in the mind also account for the popularity and spread of conspiracy theories (28). In an evolutionary context, agency detection was quite advantageous, as it provided an alert system to avoid dangers, under the "better safe than sorry" principle (29). Research strongly indicates that subjects who are more prone to detecting patterns in inanimate stimuli are more likely to accept conspiracy theories (30). We naturally seek agency in phenomena, even though many times such agency is not there. In a medical context, this may also give rise to conspiracy theories. For example, instead of accepting the likely truth that COVID-19 began as a natural phenomenon (and consequently it was not deliberately planned), conspiracists may opt to "connect the dots" and seek agency in this unfortunate event and conclude that some evil cabal is to blame.

Sociologically, some specific conditions also make fertile ground for the spread of medical conspiracy theories. Research has shown that those who feel powerlessness in society are more likely to accept conspiracy theories (31). For example, parents of children diagnosed with autism may vehemently uphold vaccine conspiracy theories (32). Given that this disorder is very challenging to treat and, so far, is a poorly understood condition, an attempt to compensate for this lack of control lead parents to grasp at conspiracy theories that provide explanations and so give people some measure of perceived control. Interestingly, there are very few conspiracy theories surrounding diabetes, presumably because we understand this disorder very well, and because there are treatment options available.

Powerlessness and its relation to proneness to accept conspiracy theories is also very salient amongst oppressed minorities (33). Consequently, perceived societal oppression is a strong predictive factor of conspiracist thinking. In situations of societal oppression and marginalization, conspiracy theories fit well with previous expectations (34). Given their unfavourable position in society, oppressed groups frequently expect to be cheated, and consequently, unfortunate events are more likely to be interpreted as the intentional designs of governments or cabals specifically targeting oppressed groups.

TO REFUTE OR NOT TO REFUTE?

The most straightforward way of addressing medical conspiracy theories is by countering the conspiracy narrative with facts. We may thus work under the presumption that most people are rational, and when confronted with evidence, they will sensibly come to the most empirically based and logical conclusion. This is the same approach that is used in court proceedings: trial lawyers seek to persuade jurors of a particular point by presenting evidence that supports their case. Yet, this measure of common sense may not be altogether applicable in countering narratives of medical conspiracy theories, which grow very quickly as rumour plays an essential part in their spread. Refuting conspiracy theories may actually induce some people to learn about them for the first time and eventually come to believe them. For example, a woman who had an autistic brother may be naturally inclined to vaccinate her child. But, if in that process, she encounters a TV program refuting Andrew Wakefield's conspiracy theory concerning the relationship between autism and vaccines, she may begin to wonder if her own

brother's autism was caused by the vaccine. Although the TV program may be critical of Wakefield, the woman may feel curiosity about his ideas, and ultimately come to uphold them. If she had never encountered the TV program, this belief may never have developed.

Admittedly this is a concern, although it must not be overestimated. Similar dilemmas have been presented regarding sex education, for example. Conservative groups may oppose sex education based on the argument that once children learn about the details of sexual activity, they will become more promiscuous. But that assumption has been challenged (35): research suggests that sex education prepares students for a safer and healthier sexuality but does not induce them to have more sex. A similar pattern is observed in educational programs for children to refuse drugs; there are occasional fears that such programs may elicit curiosity and induce drug consumption amongst youngsters, but that is rarely the case in practice (36).

The same could be said of information about conspiracy theories. If a person encounters a conspiracy theory for the first time, it is unlikely that with the mere exposure to such narratives that the person will *ipso facto* come to believe in them. Furthermore, given the prevalence of rumouring in contemporary society, it is likely that the public will become aware of conspiracy theories no matter how they are presented in the media – sooner or later, the conspiracy theory will be widely known. But the important aspect is not exposure to the conspiracy theory, but rather how it is presented. It follows, we argue, that conspiracy theories should be publicly discussed so that they can be refuted. The only possible way of providing people with additional information about conspiracy theories is by addressing them in the public sphere.

Directly confronting medical conspiracy theories may, however, bring forth another difficulty. Conspiracy beliefs can sometimes be incorrigible (37), and when people are presented with evidence that runs counter to the narrative, conspiracy theorists may experience cognitive dissonance and use the evidence as reaffirmation of their own beliefs (38). According to this argument, when rebuttals of conspiracy theories are made, they do not have powerful effects on the adherents of those theories. Believers in conspiracy theories may either dismiss the rebuttals, or more worryingly, interpret those rebuttals as part of the conspiracy itself. So, for example, a person who believes that water fluoridation is a form of mind control may encounter a public awareness campaign that explains that since water fluoridation programs began, population dental health has improved. That person may wonder why it is necessary for the government or media to emphasize this point and may take it as evidence that the information campaign is in fact a ploy to distract the public from the true evil purpose of fluoridation.

Some research seems to confirm the existence of this risk. For example, Nyhan and Reifler term these situations the "backfire effect" (39); in one study, vaccine skeptics became even more hesitant towards vaccination when presented with the story of a baby who was hospitalized with measles (40). But stronger evidence suggests that an "elusive backfire effect" is more powerful (41). As per this phenomenon, the availability of accurate information makes it more likely that the public will reject conspiracy theories. As applied to medicine, this effect occurs to the extent that health information campaigns regularly present positive results and are successful in correcting the distortions of conspiracy narratives (42). In fact, some studies suggest that education directly predicts decreased belief in conspiracy theories (43).

Additionally, if governments choose not to refute conspiracy theories and simply ignore them, this may be taken as evidence in favour of the conspiracy theory; silence may be interpreted as the conspirators' hope to pass unnoticed. The lack of rebuttal would thus be taken as evidence that the government is not in the capacity to refute the conspiracy theorists' claims. For example, someone who believes that HIV was engineered by the US government to reduce the African American population may come to believe that if the government remains silent regarding this claim, it must be true, especially considering that when other (real) conspiracies targeting African Americans (such as the Tuskegee syphilis experiment) took place (44), and at the time, the US government did not bother to refute those who were exposing these unethical practices in detail.

In this endeavour to counter the powerful narratives of conspiracy theories, the insights of psychology are fundamental to providing useful and evidence-based recommendations. Psychologists have established that a sizeable portion – although possibly not the majority – of medical conspiracy theorists will simply not be convinced by any type of evidence (45). It would therefore be a waste of both financial and intellectual resources to try the persuade the unpersuadable. This problem needs to be acknowledged from the beginning. For example, Quassim Cassam argues that,

> the way forward is just to accept from the outset that there is a hard core of Conspiracy Theorists who aren't going to change their minds whatever one says. Especially in cases where there is a clear financial or ideological motive for promoting a particular theory, it's not going to help to point out that the theory has been rebutted. The rebuttal won't be seen as effective and, in any case, there may be conspiracy entrepreneurs who don't really believe their own theories (46).

Psychological research suggests that acceptance of medical conspiracy theories is not a discrete variable but rather a continuum (47). Consequently, an important psychological recommendation in responding to conspiracy theories is that interlocutors of conspiracy theorists ought to distinguish those who are open to the weight of evidence from those who are not. Admittedly, while this can be done on the basis of psychometric instruments that assess a person's degree of rationality and openness to evidence (48-52), it cannot easily be done in informal conversations. Nevertheless, interlocutors ought to be able to spot some hints to whether a person is prepared to rationally consider an argument. For example, disinformation expert Joan Donovan recommends to "test the waters" first by asking interlocutors what it would take to change their mind (53). Arguments need to be presented in simple structures, and from there move to more elaborate levels. If in the early stages of

this progression it becomes clear that even the most basic of facts or logical operations are denied, then there is no point in pursuing the attempt at persuasion, and the target should change. Cassam meaningfully makes the case as follows: “what is needed is a strategy that has a realistic chance of dissuading the undecided or moderate Conspiracy Theorists from fully going over to the dark side” (46). Likewise, Van Prooijen asserts that “while these interventions may fail to persuade a relatively small group of people that is strongly invested in the belief that the world is governed by evil conspiracies, they are likely to persuade a much bigger majority that is susceptible to both conspiratorial and nonconspiratorial explanations of impactful societal events” (54).

Once it has been decided that it is worth attempting to persuade a particular group of people to disregard a medical conspiracy theory, psychologists also recommend that the debunking of conspiratorial claims need to be well-prepared in advance. Psychological research shows that conspiracy theorists are not completely uninformed about the workings of the world; if they were completely oblivious to information, they would not be able to persuade others and spread their claims. Instead, conspiracy theorists are more likely to be very selective in the information they convey. In that regard, debunking their arguments requires proper preparation. Cassam advises that “it’s no good rejecting Conspiracy Theories unless one has solid intellectual grounds for doing so” (46); indeed, a poorly researched or reasoned attempt to debunk a conspiracy theory may prove dangerously counterproductive. Since the ultimate goal is persuasion, psychologists would also strongly recommend not to engage in tactics that entail talking down to or belittling medical conspiracy theorists. Recall that perceived disenfranchisement is a big driver of acceptance of conspiracy theories. This implies that, from the onset, people with a conspiratorial bent are more likely to feel alienated. Debunkers who approach people holding conspiracy theories with an elitist or patronizing attitude will further encourage a sense of alienation. In contrast, psychologists strongly recommend an approach based on “conversational receptiveness”, i.e., skillfully using language “to communicate one’s willingness to thoughtfully engage with opposing views” (55).

Furthermore, this conversational receptiveness needs to maintain an adequate level of open-mindedness and acknowledging that the counterpart may have valid reasons to accept conspiratorial claims. In this endeavour, a psychological strategy is no different from the effective persuasive methods that have been used in deradicalizing people who have engaged in terrorist acts (56). Admittedly, as Carl Sagan memorably argued, “it pays to keep an open mind, but not so open your brains fall out” (57), and this is especially the case in the realm of medical conspiracy theories. An equilibrium must be sought – at some point proponents of medical conspiracy theories must be confronted, but this must be done with sufficient skill so as to not alienate them. A substantial measure of modesty is necessary when approaching conspiracy theorists. It is important to remember that, given the cognitive factors that sustain an inclination towards the acceptance of conspiracy theories, all human beings may be susceptible to their influence, and this must be acknowledged from the onset in any debunking engagement. This levels the ground to a significant extent, and consequently, interlocutors become more likely to rationally consider the evidence given that they are less likely to feel alienated.

Research in persuasion psychology also suggests that the method of “fact-fallacy-fact” is useful in getting conspiracy theorists to abandon their claims. George Lakoff proposes a “truth sandwich” in which the debunker splits the arguments into manageable sizes by first stating what is true, and then debunks a false conspiratorial claim (58). This may be repetitive, but it serves the purpose of restating truths so that, ultimately, the interlocutor is more willing to accept them. Very much like the way that conspiracy theories and falsehoods spread through repetition – i.e., Goebbel’s infamous yet seemingly accurate observation that if one repeats a lie often enough people will believe it (59) – their debunking must also follow that approach.

Any attempt at persuasion can rely on the ancient wisdom of the Socratic approach. It is far more fruitful to get the conspiracy theorists to acknowledge the absurdity of the conspiratorial claim by asking them questions that cast doubt on their allegations. In pedagogical terms, it has long been known that, by and large, Socratic questioning is more efficient than simply lecturing. Indeed, when it comes to conspiratorial thinking, research suggests that this method is quite effective, to the extent that it allows people to change their minds without feeling attacked. For example, in one relevant study with eleven adult learners using Socratic questioning, it is reported that “adult learners value the mutual relationship between the learner and the teacher in managing the learning process” (60).

Finally, persuasion in health issues can draw upon insights from the tenets of behaviourist psychology. The concept of “observational learning” is particularly useful. In a series of famous experiments, Albert Bandura concluded that children model their behaviour by watching others (61). This can elicit destructive behaviours (such as children becoming more violent after watching an adult hit a Bobo Doll[1]), but it can also elicit healthy habits. In the context of medical conspiracy theories, a useful strategy is to encourage trusted members of communities to disavow false claims, thereby providing a model so that followers do the same. For example, due to the infamous history of unethical experimentation and social exclusion that African Americans have endured, this group may be more likely to endorse medical conspiracy theories. However, during the COVID-19 pandemic, prominent members of the African American community encouraged the acceptance of vaccination, and this had a positive effect on the vaccination rates amongst members of that community. In a study examining this phenomenon, Romer and Jamieson report that “changes in misinformation beliefs among Black respondents over the course of the vaccine rollout were predictive of changes in vaccination for this population”, and this can be attributed to “pro-vaccination efforts by credible sources such as the Black clergy who encouraged their worshippers to overcome their conspiratorial thinking about the health system and accept the vaccine” (62).

[1] The Bobo Doll Experiment tests modelling of reward and punishment.

Even former President Donald Trump has been known for engaging in this type of positive modeling behaviour. Although many critics point out that Trump has been responsible for encouraging numerous medical (and other) conspiracy theories (63,64), when it came to promoting vaccination uptake, his modeling had a significant positive influence on his followers. Romer and Jamieson report this phenomenon as follows: “There also has been evidence that when statements by former president Trump were sent to hesitant communities via social media, those regions were more likely to take up the COVID vaccine... In addition, when Republicans were shown a message from former president Trump supporting COVID vaccination, their intentions to receive the vaccine increased” (62).

THE RISKS OF COGNITIVE INFILTRATION

Considering that overt rebuttals of conspiracy theories by media and governments may run the risk of further reinforcing such beliefs, perhaps *covert* operations may be necessary. This is the controversial program of so-called “cognitive infiltration” that has been proposed by Vermeule and Sunstein (65). In their view, “conspiracy theorists are not likely to be persuaded by an attempt to dispel their theories; they may even characterize that very attempt as further proof of the conspiracy. Because those who hold conspiracy theories typically suffer from a “crippled epistemology,” in accordance with which it is rational to hold such theories, the best response consists in cognitive infiltration of extremist groups.”

Such operations could be carried out by government agents (or other debunkers) infiltrating the websites where conspiracy theories are frequently discussed. By initially posing as sympathizers of conspiracy theories, they would gradually ask difficult questions and poke holes in the conspiracy narrative. Sustein and Vermeule’s rationale is that “polarization tends to decrease when divergent views are voiced within the group”, and consequently, “introducing a measure of cognitive diversity can break up the epistemological networks and clusters that supply conspiracy theories.” So, for example, in a conspiracy theory group discussing how the Chinese deliberately engineered COVID-19 to harm Western countries, a cognitive infiltrator might initially express disdainful comments about the Chinese and their culture (say, a common rude stereotype such as the Chinese cultural custom of eating dogs), and once welcomed into the group, the infiltrator could then begin to express doubts about the conspiracy by showing how the genetic evidence does not properly fit the engineering hypothesis.

This proposal is ingenious, but it raises some important ethical questions. Albeit not exactly identical, Sustein and Verneule’s plan of action elicits the same concerns as any espionage or infiltration operation, i.e., that these are morally questionable to the extent that they entail some degree of deception, and therefore raise the problem of the morality of lying. Philosophers of a strict deontological bent insist that there is an intrinsic duty not to lie, no matter the consequences. In a famous thought experiment, Kant argued that if a person is hiding in your house and a murderer comes asking if she is inside the house, you should still tell the truth. Unsurprisingly, Kant had little esteem for spies. He referred to espionage as the “infernal art” (66). Following this line of argument, Sustein and Verneule’s plan would be intrinsically immoral. Yet, most ethicists would agree that the ethics of espionage is far more complex, and in some cases, acts of espionage may be ethically justifiable. In her extensive examination of the ethics of espionage, Cecil Fabre argues that spying may be justified provided that it serves a just cause. In the context of war, an aggressor is not entitled to engage in espionage, but a wronged party is. In her words, she defends “the resort to deception as a means of procuring secret information about other foreign-policy actors and of defending one’s own secrets against the latter’s attempts to procure them” (67). If we extrapolate this insight to the infiltration of conspiracy theory forums, we could conclude that such a strategy would serve a just cause. Conspiracy theories harm society at large, and consequently, using some degree of deception to limit conspiracy theorists’ influence is morally acceptable in order to protect society from the wrongdoings of conspiracy theorists.

However, the prospect of “cognitive infiltration” is more morally dubious, given its potential to enhance government propaganda. Although governments are usually the target of wild conspiracy theories, some do turn out to be true, for example, as in the case of the Tuskegee syphilis experiments. If governments are given the power to infiltrate groups, they may ultimately sow confusion, not only amongst conspiracy theorists but also amongst those who defend more plausible views, and more worryingly, amongst those who simply express dissent. In examining the prospect of cognitive infiltration, Glenn Greenwald expresses the following concern: “there are severe dangers to the Government covertly using its resources to “infiltrate” discussions and to shape political debates using undisclosed and manipulative means. It’s called “covert propaganda” and it should be opposed regardless of who is in control of it or what its policy aims are” (68). Furthermore, Sustein and Vermeule’s proposal may be very risky, to the point of possibly defeating its own purpose of curbing the spread of conspiracy theories. Leaks are always bound to happen, and if it were ever disclosed that such cognitive infiltrations are taking place, that would play into the narrative of conspiracy theorists. In such a scenario, cognitive infiltration would be easily interpreted as evidence that conspirators have something to hide, otherwise why would they go to such great lengths to infiltrate discussion boards?

Cognitive infiltration would also open a Pandora’s box of misinformation. The recent phenomenon of Russian trolls warrants concern. In their case, infiltration of discussion boards may be done with misinformation purposes to cause tensions in Western societies and to expand Russia’s geopolitical power (69). Although such trolls are mostly concerned with political issues, having possibly had a notable influence in the 2016 US elections (70), on occasion they have also planted misinformation regarding medical matters (71). For example, one study found that Russian trolls promote discord in web communities by “eroding public consensus on vaccination” (72). So, if it were ever discovered that Western government agencies engage in cognitive infiltration, authoritarian governments, like Russia, that extensively rely on trolls could feel emboldened to continue their misinformation campaigns abroad, and when confronted with these questionable tactics, could plausibly claim that there is little room for critique given that democratic nations also employ such practices. Ultimately, the public health sector would be at greatest risk since it is already vulnerable to misinformation campaigns.

THE MEDIA'S ROLE IN REBUTTING CONSPIRACY THEORIES

The risks of cognitive infiltration being too high, a better strategy is to rebut conspiracy theories with the transparency that is required for any other debate. In so doing, journalists and public health officials have a very important role to play, and a special ethical responsibility to adequately confront the issues. For example, while many medical conspiracy theories are typically politicized – usually involving a particular politician or public health official such as Dr. Anthony Fauci (73) – it is important not to place the label "conspiracy theorists" on others merely to score political points. In recent years, in the United States and other Western nations there has been a tendency to identify conspiracy theorists on the conservative side of the political spectrum. That is the case for some medical conspiracy theories but by no means all. For example, conservatives are more likely to believe that vaccines cause autism, but liberals are more likely to believe that HIV was engineered to reduce African American population (74). Recent evidence suggests that, on the whole, belief in conspiracy theories is equally likely between conservatives and liberals (75).

Belief in conspiracy theories is far better predicted by psychological variables and powerlessness than by the contents of particular ideologies. At most, the political factor that may serve as predictor of belief in conspiracy theories is extremism (76), but again, that is not the exclusive purview of those on the right of the political spectrum. Addressing conspiracy theories without politicizing them is a very important part of the rebuttal strategy, because to the extent that audiences perceive that only the facts are being presented (without any political motive), they are more likely to rationally consider the evidence and reject conspiracist claims.

As part of this endeavour, it is important to preserve a clear definition of the term "conspiracy theory". Zonis and Joseph's definition is a good starting point: "the belief that a number of actors join together in secret agreement, in order to achieve a hidden goal which is perceived to be unlawful or malevolent" (77). The term should be used by media strictly to address such phenomena. For example, positing that the COVID-19 pandemic arose as a result of an accidental leak in a Wuhan lab – a theory defended by an increasing number of reasonable authors (78) – should not be dismissed as a conspiracy theory, as it does not presume a malevolent intention. Using the term "conspiracy theory" to describe any idea that we do not like dilutes its meaning, and any critique of conspiracy theories will eventually become ineffectual, as conspiracy theorists will claim, with reason, that the term is tossed around recklessly.

Furthermore, an honest intellectual approach should be used when attempting to refute medical conspiracy theories. That implies that journalists have the ethical responsibility to avoid one-sided coverage. For example, in addressing the Big Pharma conspiracy theory, the main theses can be criticized (e.g., that pharmaceutical companies have already the cure for cancer but withhold it from the market). But media representations of these conspiracy theories should not be painted with too thick a brush; quite the opposite, there should be further consideration of what these conspiracy theorists claim. And in that regard, while refuting the idea that pharmaceutical companies withhold the cure for cancer, journalists can still acknowledge that pharmaceutical companies do engage in questionable lobbying practices (79), and the validity of some diagnoses (e.g., Restless Leg Syndrome) (80) may even be questioned given their links to particular treatments pushed by companies.

Again, it should be kept in mind that the goal of refuting medical conspiracy theories is not to score political points but rather to persuade the public to abandon dangerous ideas with potentially harmful effects on public health. Representing conspiracy theorists simply as stupid or mentally ill will not get us closer to that goal. Although there is some research suggesting that people with lower intelligence are more likely to believe in conspiracy theories (81), this evidence is not conclusive (82). And even if such correlations were to exist, the best way to refute the claims of conspiracy theories is not to remind them how foolish they are, but rather to rationally persuade them to critically examine the evidence.

In this endeavour, it is necessary not to engage in clinical language when discussing conspiracy theories. Conspiratorial thinking is not necessarily delusional, even though, regrettably, many media outlets claim that conspiracy theorists are afflicted by forms of psychopathology. While some leading conspiracy theorists may very well be mentally unstable, such theories are accepted by a far larger number of people, and it is doubtful that they can all be pathologized. It is true that some studies show that subclinical psychotic traits (most notably, schizotype) correlate with adherence to conspiratorial narratives (83), but more studies need to be done to arrive at stronger conclusions; for the time being, the consensus amongst psychiatrists is that conspiratorial narratives are not the exclusive purview of the mentally ill (84). Avoiding the pathologizing and politicization of medical conspiracy theories, and representing them fairly, should naturally lead to a measured response that does not rely on the instigation of moral panic. Admittedly, the political climate of Western democracies over the last ten years seems to have increased the prevalence of conspiracy theories, especially in the medical field. But it should be kept in mind that for the better part of the 20th Century, observers have raised the alarm over and over about the incremental increase of conspiracy theories, but their prevalence has been mostly stable. QAnon and other conspiracy theory movements do warrant concern, but it is important to keep separate the fringe from the mainstream. If the response to a particular problem is overhyped, the response becomes ineffective.

Nevertheless, it is important to be prepared for the appearance of new medical conspiracy theories. Given what we know about the psychology underlying this phenomenon, we should accept that conspiracy theories will never disappear. As such, we ought to anticipate the spread of such theories and require media outlets to act on their ethical responsibility to provide the public with the relevant and reliable information. This should be especially the case with topics that have a greater likelihood

of being subject to conspiracy mongering. For example, the COVID-19 pandemic was certainly not the first epidemic in the history of humanity, and unfortunately will not be the last. Given that a new pandemic is bound to happen, journalists and public health officials ought to expand the public's understanding of why and how pandemics develop, so that people are better prepared to examine its likely causes, including whether it has been deliberately engineered by an evil cabal of conspirators.

Research shows that such a pre-emptive approach can be successful in various settings through the use of "resistance to persuasion" (85). In this program, it is assumed that inoculating individuals with counterarguments works as protection against gullibility and lowers the probability of accepting conspiracy theories. For the case of medical conspiracy theories, this technique has given interesting results. For example, in one relevant study, participants read pro-vaccine arguments, following which they exhibited higher intentions to vaccinate as compared to the participants who were given anti-vaccine arguments to read (86). This is especially important, because it has been fairly well established that changing people's mind once they believe in a conspiracy theory is more difficult than preventing them from accepting the medical conspiracy theory before it arises. In another important study by Jolley and Douglas (87), it is reported that "anti-conspiracy arguments increased intentions to vaccinate a fictional child but only when presented prior to conspiracy theories... These findings suggest that people can be inoculated against the potentially harmful effects of anti-vaccine conspiracy theories, but that once they are established, the conspiracy theories may be difficult to correct." Similar findings have been reported in other studies (88-92). Consequently, presenting accurate information and promoting sound reasoning skills in advance is a recommended policy, as it may be effective in curbing the spread of conspiracy theories.

One important aspect of this strategy is for news outlets to be more fact-oriented and less inclined to continuously disseminate commentaries and opinions. Admittedly, there is a growing tendency in news outlets to include fact-checking segments, but a thorough examination of this has so far revealed that much fact-checking is political commentary in disguise. Medical conspiracy theories are more efficiently countered with facts (adequately presented), and this implies a greater need for objectivity in the presentation of events. Objectivity in this endeavour implies being independent of ideological influence. If a conspiracy theory is debunked, political consequences should matter little, as ultimately, the ethical duty of media outlets is to communicate truth, regardless of what political party is favoured. If objectivity and lack of ideological interference persist in science and public health communication, then public trust in the establishment can be increased, and consequently laypeople will be more receptive to the debunking of absurd conspiratorial claims.

Admittedly, this task is made more difficult due to the accessibility to conspiratorial arguments made possible by the Internet, and especially social media. Conventional wisdom dictates that technologies have played a major role in the expansion of medical conspiracy theories (93), as they reach an increasing number of people, and with sufficient speed to make their refutation more difficult – as the adage goes, "a lie travels more quickly than the truth". But it is not altogether clear that the Internet is to blame. Conspiracy theories have existed long before the invention of Internet, suggesting that other psychological or cultural factors play a relevant role. Nonetheless, these technologies certainly facilitate the more rapid dissemination of conspiracies. Additionally, traditional media no longer has the same power as in previous decades to counter conspiracy theories, with social media increasingly becoming the dominant venues of information (and disinformation). In this regard, some ethical reflection is needed on the responsibility social media corporations (Facebook, X, TikTok, YouTube, etc.) have in curbing the spread of medical conspiracy theories.

The central issue up for debate is whether these corporations should enable forms of censorship that block the spread of medical disinformation. This could be done either via algorithms, or disclaimers stating that the posted medical information is false. Ethicists of a libertarian bent are concerned that such attempts suppress free speech – a fundamental principle of democracies. In their view, there should simply be a "marketplace of ideas" in which, ultimately, truth will prevail. They appeal to John Stuart Mill's famous statement:

> the peculiar evil of silencing the expression of an opinion is, that it is robbing the human race; posterity as well as the existing generation; those who dissent from the opinion, still more than those who hold it. If the opinion is right, they are deprived of the opportunity of exchanging error for truth: if wrong, they lose, what is almost as great a benefit, the clearer perception and livelier impression of truth, produced by its collision with error (94).

Following this reasoning, social media corporations ought to allow medical conspiracy theorists to freely express their views. Ultimately, if they were correct all along, then it was a good thing that they expressed the truth; and if they were wrong, then the expression of their views allowed everyone to see why they were wrong.

It is interesting to note that as per libertarian philosophy itself, to the extent that social media corporations are private companies they are entitled to decide who gets access to their platforms and who does not, on the basis of property rights (95,96). But a more conventional rebuttal of the libertarian argument against the suppression of conspiracy theories in social media appeals to the high stakes of the issue. The marketplace of ideas appeals to the rationality of consumers, and that is not always a guaranteed assumption. The market is not absolutely self-regulating, and this also applies to the realm of exchange of ideas. In an issue in which a large number of lives are at stake (such as the spread of medical conspiracy theories), it cannot simply be left to abstract principles of free speech that, while noble in spirit, ultimately may have severe deleterious consequences for public health.

Admittedly, there is a very short leap separating the suppression of free speech for public health purposes, from simply suppressing dissenting political views. Consequently, social media corporations (and the governments that regulate them) must always be mindful of this risk. This implies that when deciding to suppress medical conspiracy theories, it must be done on a case-by-case basis. Special consideration should be given to more plausible medical conspiracy theories. Recall that this is a persuasion game and there needs to be some engagement with conspiracy theorists so as to change their minds. If from the onset they perceive that they are not given the fair chance of expressing their views in social media, that will further contribute to alienation and will in turn strengthen their adherence to these ideas. This is a difficult balance to achieve, and there cannot be a blanket proposal when it comes to regulating content on social media to curb the spread of conspiracy theories; the devil is in the details.

THE IMPORTANCE OF CRITICAL THINKING AND EMPOWERMENT

Debunking medical conspiracy theories is a complex task, and there are no simple, short-term solutions. If anything, policymakers need to consider root causes and long-term solutions. One key aspect is the promotion of critical thinking. It has been well established that the development of analytic thinking is negatively correlated with the acceptance of conspiracy theories. Again, it is important to keep in mind the elusive backfire effect: education and enhancement of analytic thinking do make a difference. For example, in one important study by Swami et al (97), priming subjects with tasks that require analytic skills reduced the likelihood of accepting conspiracy theories.

The constant offer of rational arguments to the public can better equip people to identify fallacies in conspiracist thinking. For example, people who believe vaccines cause autism frequently do so as a result of considering the sequence of events. Autistic children begin to show signs of this disorder shortly after receiving the MMR vaccine. Understandably, there is a tendency for people to believe that, given the sequence, one event caused the other. But, in most cases, to assume as much is a fallacy known as *post hoc ergo propter hoc* (after this, therefore because of this) (98). The temporal sequence of events does not necessarily imply causality, as many other confounding factors may be in place, as indeed is the case with vaccines and autism. Admittedly, the sequence of events may serve as an initial hint in determining causal relations, and many scientific discoveries have followed that guideline. For example, Jenner himself posited that the vaccine for smallpox may be found in cows because he had noticed that milkmaids' faces were not scarred by smallpox injuries. But a sound methodological approach would insist that before asserting firm positions, thorough analyses that isolate variables and control for confounding factors (e.g., regression models in statistics) be done to arrive at truly definite conclusions. In the case of the relationship between vaccines and autism, symptoms of autism may come soon after the timing of vaccination. Fortunately, researchers have considered many other possible variables (e.g., brain development during gestation, etc.), and have found that those factors are far more predictive than the administration of vaccines.

This type of logical and statistical reasoning does not come to us naturally, and lay people need to be trained in programs that include critical thinking skills. If from an early age people benefit from educational programs that teach about the risk of fallacies and how to avoid them, they will be in a better position to identify the logical and statistical mistakes that permeate throughout many medical conspiracy theories. This should also be complemented with general medical education. For example, if the general public is sufficiently informed about scientific facts regarding autism, then it is less likely that people will assume that vaccines have anything to do with autism. Admittedly, the etiology of autism is not well understood (99), but there is reason to believe that pre-birth factors play a major role (100). If people are made aware of this in public awareness campaigns, then they are less likely to accept the medical conspiracy theory linking autism to vaccines.

While there may be natural psychological tendencies to accept conspiracy theories, it is important to keep in mind that these tendencies are strengthened by fear and uncertainty. Recall that conspiracy theories present a very bleak picture of the world, given that it is assumed that actors join together to pursue perverse hidden goals. If this pessimistic view is properly converted into a more optimistic approach to life and society, then the likelihood of accepting medical conspiracy theories is reduced. Pessimism, fear and uncertainty typically arise out of perceived lack of control. Therefore, people who feel powerless in society are more likely to accept medical conspiracy theories. This has been observed in many studies. For example, it is particularly worrisome that during the COVID-19 pandemic, vaccine hesitancy has been greater in ethnic and religious minorities (101). To the extent that minorities feel oppressed, they may be more primed to believe that, given that they have suffered oppression in the past, vaccines are yet another ploy to keep them down.

Consequently, one important long-term strategy in addressing medical conspiracy theories is to empower marginalized communities. Research suggests that empowerment protects against belief in conspiracy theories. For example, in one study, when participants were primed to remember an occasion in their lifetime when they felt to be in control of the situation, their willingness to believe conspiracy theories was reduced (76). To pursue this end, medical practitioners and educators need to take a more active political role. While (as mentioned above) it is important not to politicize the refutation of conspiracy theories, it is nevertheless very relevant to address powerlessness in society as a way to prevent the rise of conspiracy theories. And this can only be done with effective political action intended to reduce discrimination and social alienation from oppressed minorities.

But empowerment goes beyond political activism. In a medical context, giving patients a greater space to make decisions on their own will likely also contribute to a decreased acceptance of medical conspiracy theories. Ethicists and practitioners in medicine must strongly uphold the principle of autonomy and ensure that patients feel more empowered in their decisions.

Admittedly, there may be situations in which the pressing reality of public health emergencies may not allow for fully autonomous decision making; for example, there are sufficient ethical reasons to establish COVID-19 vaccine mandates (102-104). But public health officials also need to be aware that these sorts of impositions are likely to trigger conspiracist thinking. For that reason, it is important to impose mandates only when strictly necessary (as indeed was arguably the case with the COVID-19 pandemic), as such tactics may backfire and the risks outweigh benefits. Ultimately, public health officials need to find a balance between protecting public safety and respecting individual autonomy, but empowerment – which is autonomy promoting – is a fundamental aspect in long-term protection against the spread of conspiracy theories.

CONCLUSION

Medical conspiracy theories are unlikely to ever disappear completely due to a proneness to believe them being hardwired into human nature. But we are not prisoners to our nature, and we can attempt to protect society from the nefarious influence of conspiracist thinking. This is an urgent task in medicine, as the indisputable success of medicine in the last two centuries runs the risk of being stalled by the irrational tendencies of promoters of falsehoods. Yet, there is no simple or clear path on how to do prevent such beliefs. Refuting medical conspiracy theories in the public forum carries some risks, but ultimately, this is an option that must be pursued. This must be done openly and with transparency. So, while the proposal of "cognitive infiltration" is audacious and potentially appealing, it is too risky, and its deleterious effects outweigh the benefits. Instead, we argue that focus should be given to education and the development of critical thinking; and this can and should be done in collaboration with the media. Media outlets have a major role to play in refuting medical conspiracy theories, to the extent that in this age, they have an immense power to transmit information. Yet, in order to preserve credibility in the conveying of accurate information, it is crucial for media not to politicize this task. This implies not overusing the term "conspiracy theory" to describe any unconventional claim in medicine, representing conspiracy theorists fairly, and avoiding the instigation of moral panic. Perhaps more importantly, governments need to implement long-term strategies that make medical conspiracy theories less likely to be spread. This includes stimulating critical thinking in education and empowering traditionally oppressed groups.

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REFERENCES

1. Troiano G, Nardi A. Vaccine hesitancy in the era of COVID-19. Public health. 2021;194:245-51.
2. Bricker B, Justice J. The postmodern medical paradigm: a case study of anti-MMR vaccine arguments. Western Journal of Communication. 2019;83(2):172-89.
3. Paterson P, Meurice F, Stanberry LR, Glismann S, Rosenthal SL, Larson HJ. Vaccine hesitancy and healthcare providers. Vaccine. 2016;34(52):6700-6.
4. Fassina A, Fassan M, Dosio GB, Barzon L. Triumphs and tribulations of COVID-19 vaccines: Lessons to be learned from smallpox epidemics in the 1700s. Virchows Archiv. 2021;478(5):1033-5.
5. Wolfe RM, Sharp LK. Anti-vaccinationists past and present. BMJ. 2002;325(7361):430-2.
6. DeStefano F, Shimabukuro TT. The MMR vaccine and autism. Annual Review of Virology. 2019;6(1):585-600.
7. Khan YH, Mallhi TH, Alotaibi NH, et al. Threat of COVID-19 vaccine hesitancy in Pakistan: the need for measures to neutralize misleading narratives. The American Journal of Tropical Medicine and Hygiene. 2020;103(2):603-4.
8. Andrade GE, Hussain A. Polio in Pakistan: political, sociological, and epidemiological factors. Cureus. 2018;10(10):e3502.
9. Carstairs C, Elder R. Expertise, health, and popular opinion: Debating water fluoridation, 1945-80. Canadian Historical Review. 2008;89(3):345-71.
10. Blaskiewicz R. The big Pharma conspiracy theory. Medical Writing. 2013;22(4):259-61.

11. Chigwedere P, Essex M. AIDS denialism and public health practice. AIDS and Behavior. 2010;14(2):237-47.
12. Ross MW, Essien EJ, Torres I. Conspiracy beliefs about the origin of HIV/AIDS in four racial/ethnic groups. Journal of Acquired Immune Deficiency Syndromes. 2006;41(3):342-44.
13. Douglas KM. COVID-19 conspiracy theories. Group Processes & Intergroup Relations. 2021;24(2):270-5.
14. Castanho Silva B, Vegetti F, Littvay L. The elite is up to something: Exploring the relation between populism and belief in conspiracy theories. Swiss Political Science Review. 2017;23(4):423-43.
15. Leonard MJ, Philippe FL. Conspiracy theories: A public health concern and how to address it. Frontiers in Psychology. 2021;12:682931.
16. Goertzel T. Conspiracy theories in science: Conspiracy theories that target specific research can have serious consequences for public health and environmental policies. EMBO Reports. 2010;11(7):493-9.
17. Kim S, Kim S. Searching for general model of conspiracy theories and its implication for public health policy: Analysis of the impacts of political, psychological, structural factors on conspiracy beliefs about the COVID-19 pandemic. International Journal of Environmental Research and Public Health. 2020;18(1):266.
18. Douglas KM, Sutton RM, Cichocka A. Belief in conspiracy theories: Looking beyond gullibility. In: Forgas JP, Baumeister R, editors. The Social Psychology of Gullibility. New York, NY: Routledge; 2019. p. 61-76.
19. Uscinski JE, Klofstad C, Atkinson M. What drives conspiratorial beliefs? The role of informational cues and predispositions. Political Research Quarterly. 2016;69(1):57-71.
20. Uscinski JE, Enders AM, Klofstad C, et al. Why do people believe COVID-19 conspiracy theories? Harvard Kennedy School Misinformation Review. 2020;1(3).
21. Davis H, McLeod SL. Why humans value sensational news: An evolutionary perspective. Evolution and Human Behavior. 2003;24(3):208-16.
22. McAndrew FT, Milenkovic MA. Of tabloids and family secrets: The evolutionary psychology of gossip. Journal of Applied Social Psychology. 2002;32(5):1064-82.
23. Buss DM. How can evolutionary psychology successfully explain personality and individual differences? Perspectives on Psychological Science. 2009;4(4):359-66.
24. Sutcliffe A, Dunbar R, Binder J, Arrow H. Relationships and the social brain: integrating psychological and evolutionary perspectives. British Journal of Psychology. 2012;103(2):149-68.
25. Norenzayan A, Atran S, Faulkner J, Schaller M. Memory and mystery: The cultural selection of minimally counterintuitive narratives. Cognitive Science. 2006;30(3):531-53.
26. Hartman TK, Marshall M, Stocks TV, et al. Different conspiracy theories have different psychological and social determinants: Comparison of three theories about the origins of the COVID-19 virus in a representative sample of the UK population. Frontiers in Political Science. 2021;3:642510.
27. Petrović M, Žeželj I. Both a bioweapon and a hoax: the curious case of contradictory conspiracy theories about COVID-19. Thinking & Reasoning. 2023;29(4):456-87.
28. Cohnitz D. On the rationality of conspiracy theories. Croatian Journal of Philosophy. 2018;18(53):351-65.
29. Imhoff R, Bruder M. Speaking (un-)truth to power: Conspiracy mentality as a generalised political attitude. European Journal of Personality. 2014;28(1):25-43.
30. Van Der Tempel J, Alcock JE. Relationships between conspiracy mentality, hyperactive agency detection, and schizotypy: Supernatural forces at work? Personality and Individual Differences. 2015;82:136-41.
31. Biddlestone M, Green R, Cichocka A, Sutton R, Douglas K. Conspiracy beliefs and the individual, relational, and collective selves. Social and Personality Psychology Compass. 2021;15(10):e12639.
32. Gabis LV, Attia OL, Goldman M, et al. The myth of vaccination and autism spectrum. European Journal of Paediatric Neurology. 2022;36:151-8.
33. Freeman D, Bentall RP. The concomitants of conspiracy concerns. Social Psychiatry and Psychiatric Epidemiology. 2017;52(5):595-604.
34. van Prooijen J, Douglas KM. Belief in conspiracy theories: Basic principles of an emerging research domain. European Journal of Social Psychology. 2018;48(7):897-908.
35. Schaalma HP, Abraham C, Gillmore MR, Kok G. Sex education as health promotion: what does it take? Archives of Sexual Behavior. 2004;33(3):259-69.
36. Singh RD, Jimerson SR, Renshaw T, et al. A summary and synthesis of contemporary empirical evidence regarding the effects of the Drug Abuse Resistance Education Program (D.A.R.E.). Contemporary School Psychology. 2011;15(1):93-102.
37. Andrade G. Medical conspiracy theories: cognitive science and implications for ethics. Medicine, Health Care and Philosophy. 2020;23(3):505-18.
38. Leman PJ, Cinnirella M. Beliefs in conspiracy theories and the need for cognitive closure. Frontiers in Psychology. 2013;4:378.
39. Nyhan B, Reifler J. When corrections fail: The persistence of political misperceptions. Political Behavior. 2010;32(2):303-30.
40. Nyhan B, Reifler J, Richey S, Freed GL. Effective messages in vaccine promotion: a randomized trial. Pediatrics. 2014;133(4):e835-42.
41. Wood T, Porter E. The elusive backfire effect: Mass attitudes' steadfast factual adherence. Political Behavior. 2019;41(1):135-63.
42. Bode L, Vraga EK. See something, say something: Correction of global health misinformation on social media. Health Communication. 2018;33(9):1131-40.

43. Van Prooijen JW, Krouwel AP, Pollet TV. Political extremism predicts belief in conspiracy theories. Social Psychological and Personality Science. 2015;6(5):570-8.
44. Gray FD. The Tuskegee Syphilis study: The Real Story and Beyond. NewSouth Books; 1998.
45. Douglas KM, Sutton RM. What are conspiracy theories? A definitional approach to their correlates, consequences, and communication. Annual Review of Psychology. 2023;74:271-98.
46. Cassam Q. Conspiracy Theories. John Wiley & Sons; 2019.
47. Bilewicz M, Cichocka A, Soral W. The Psychology of Conspiracy. Routledge; 2015.
48. Shorkey CT, Whiteman VL. Development of the Rational Behavior Inventory: Initial validity and reliability. Educational and Psychological Measurement. 1977;37(2):527-34.
49. Epstein S, Pacini R, Denes-Raj V, Heier H. Individual differences in intuitive–experiential and analytical–rational thinking styles. Journal of Personality and Social Psychology. 1996;71(2):390-405.
50. McCrae RR. Social consequences of experiential openness. Psychological Bulletin. 1996;120(3):323-37.
51. Hakstian AR, Farrell S. An openness scale for the California Psychological Inventory. Journal of Personality Assessment. 2001;76(1):107-34.
52. Aarons GA, Glisson C, Hoagwood K, Kelleher K, Landsverk J, Cafri G. Psychometric properties and US National norms of the Evidence-Based Practice Attitude Scale (EBPAS). Psychological Assessment. 2010;22(2):356-65.
53. Basu T. How to talk to conspiracy theorists—and still be kind. MIT Technology Review. 15 Jul 2020.
54. Prooijen JW. The Psychology of Conspiracy Theories. Routledge; 2018.
55. Yeomans M, Minson J, Collins H, Chen F, Gino F. Conversational receptiveness: Improving engagement with opposing views. Organizational Behavior and Human Decision Processes. 2020;160:131-48.
56. Ponsot AS, Autixier C, Madriaza P. Factors facilitating the successful implementation of a prevention of violent radicalization intervention as identified by front-line practitioners. Journal for Deradicalization. 2018;(16):1-33.
57. Rodgers CR. The Art of Reflective Teaching: Practicing Presence. Teachers College Press; 2020.
58. Longhi J. Mapping information and identifying disinformation based on digital humanities methods: From accuracy to plasticity. Digital Scholarship in the Humanities. 2021;36(4):980-98.
59. Kolb L. Argument by repetition. In: Arp R, Barbone S, Bruce M, editors. Bad Arguments: 100 of the Most Important Fallacies in Western Philosophy. Wiley-Blackwell; 2018. p. 215-218.
60. Katsara O, De Witte K. How to use Socratic questioning in order to promote adults' self-directed learning. Studies in the Education of Adults. 2019;51(1):109-29.
61. Bandura A, Ross D, Ross SA. Transmission of aggression through imitation of aggressive models. The Journal of Abnormal and Social Psychology. 1961;63(3):575-82.
62. Romer D, Jamieson KH. The role of conspiracy mindset in reducing support for child vaccination for COVID-19 in the United States. Frontiers in Psychology. 2023;14:1175571.
63. Hellinger DC. Conspiracies and Conspiracy Theories in the Age of Trump. Springer; 2018.
64. Tollefson J. How Trump turned conspiracy theory research upside down. Nature. 2021;590(7845):192-3.
65. Vermeule CA, Sunstein CR. Conspiracy theories: causes and cures. Journal of Political Philosophy. 2009;17(2):202-27.
66. Kant I. Toward Perpetual Peace and Other Writings on Politics, Peace, and History. Yale University Press; 2017.
67. Fabre C. Spying Through a Glass Darkly: The Ethics of Espionage and Counter-Intelligence. Oxford University Press; 2022.
68. Greenwald G. Obama confidant's spine-chilling proposal. Salon. 15 Jan 2010.
69. Jensen M. Russian trolls and fake news: Information or identity logics? Journal of International Affairs. 2018;71:115-24.
70. Kużelewska E, Tomaszuk M. Rise of conspiracy theories in the pandemic times. International Journal for the Semiotics of Law/Revue internationale de Sémiotique juridique. 2022;35(6):2373-89.
71. Karami A, Lundy M, Webb F, Turner-McGrievy G, McKeever BW, McKeever R. Identifying and analyzing health-related themes in disinformation shared by conservative and liberal Russian trolls on twitter. International Journal of Environmental Research and Public Health. 2021;18(4):2159.
72. Broniatowski DA, Jamison AM, Qi S, et al. Weaponized health communication: Twitter bots and Russian trolls amplify the vaccine debate. American Journal of Public Health. 2018;108(10):1378-84.
73. Kearney MD, Chiang SC, Massey PM. The Twitter origins and evolution of the COVID-19 "plandemic" conspiracy theory. Harvard Kennedy School Misinformation Review. 2020;1(3).
74. Oliver JE, Wood TJ. Conspiracy theories and the paranoid style(s) of mass opinion. American Journal of Political Science. 2014;58(4):952-66.
75. Uscinski JE. Conspiracy Theories: A Primer. Rowman & Littlefield Publishers; 2020.
76. van Prooijen J, Acker M. The influence of control on belief in conspiracy theories: Conceptual and applied extensions. Applied Cognitive Psychology. 2015;29(5):753-61.
77. Zonis M, Joseph CM. Conspiracy thinking in the Middle East. Political Psychology. 1994;15(3):443-59.
78. Thacker PD. The covid-19 lab leak hypothesis: did the media fall victim to a misinformation campaign? BMJ. 2021;374:n1656.
79. Arnold DG, Oakley JL. The politics and strategy of industry self-regulation: the pharmaceutical industry's principles for ethical direct-to-consumer advertising as a deceptive blocking strategy. Journal of Health Politics, Policy and Law. 2013;38(3):505-44.
80. Bjerkile D. From the editor–drug companies under investigation. Issues in Mental Health Nursing. 2004;25(8):751-2.

81. Furnham A, Grover S. Do you have to be mad to believe in conspiracy theories? Personality disorders and conspiracy theories. International Journal of Social Psychiatry. 2022;68(7):1454-61.
82. Georgiou N, Delfabbro P, Balzan R. Conspiracy theory beliefs, scientific reasoning and the analytical thinking paradox. Applied Cognitive Psychology. 2021;35(6):1523-34.
83. Darwin H, Neave N, Holmes J. Belief in conspiracy theories. The role of paranormal belief, paranoid ideation and schizotypy. Personality and Individual Differences. 2011;50(8):1289-93.
84. Uscinski JE, Butler RW. The epistemology of fact checking. Critical Review. 2013;25(2):162-80.
85. Banas JA, Miller G. Inducing resistance to conspiracy theory propaganda: Testing inoculation and metainoculation strategies. Human Communication Research. 2013;39(2):184-207.
86. Jolley D, Douglas KM. The effects of anti-vaccine conspiracy theories on vaccination intentions. PloS One. 2014;9(2):e89177.
87. Jolley D, Douglas KM. Prevention is better than cure: Addressing anti-vaccine conspiracy theories. Journal of Applied Social Psychology. 2017;47(8):459-69.
88. Ruiz JB, Bell RA. Predictors of intention to vaccinate against COVID-19: Results of a nationwide survey. Vaccine. 2021;39(7):1080-6.
89. Abebe H, Shitu S, Mose A. Understanding of COVID-19 vaccine knowledge, attitude, acceptance, and determinates of COVID-19 vaccine acceptance among adult population in Ethiopia. Infection and Drug Resistance. 2021;14:2015-25.
90. Zheng H, Jiang S, Wu Q. Factors influencing COVID-19 vaccination intention: The roles of vaccine knowledge, vaccine risk perception, and doctor-patient communication. Patient Education and Counseling. 2022;105(2):277-83.
91. Ullah I, Khan KS, Tahir MJ, Ahmed A, Harapan H. Myths and conspiracy theories on vaccines and COVID-19: Potential effect on global vaccine refusals. Vacunas. 2021;22(2):93-7.
92. Đorđević JM, Mari S, Vdović M, Milošević A. Links between conspiracy beliefs, vaccine knowledge, and trust: Anti-vaccine behavior of Serbian adults. Social Science & Medicine. 2021;277:113930.
93. Grimes DR. Health disinformation & social media: the crucial role of information hygiene in mitigating conspiracy theory and infodemics. EMBO Reports. 2020;21(11):e51819.
94. Mill JS. J. S. Mill 'On Liberty' and Other Writings. Cambridge University Press; 1989.
95. Drake IJ. Free-speech rights versus property and privacy rights. The Independent Review. 2021;25(4):569-92.
96. Underkuffler LS. When should rights "Trump" An examination of speech and property. Maine Law Review. 2000;52(2):312-22.
97. Swami V, Voracek M, Stieger S, Tran US, Furnham A. Analytic thinking reduces belief in conspiracy theories. Cognition. 2014;133(3):572-85.
98. Rudolf RD. The post hoc ergo propter hoc fallacy in medicine. Canadian Medical Association Journal. 1938;38(3):281-84.
99. Currenti SA. Understanding and determining the etiology of autism. Cellular and Molecular Neurobiology. 2010;30(2):161-71.
100. Guinchat V, Thorsen P, Laurent C, Cans C, Bodeau N, Cohen D. Pre-, peri-and neonatal risk factors for autism. Acta Obstetricia et Gynecologica Scandinavica. 2012;91(3):287-300.
101. Razai MS, Osama T, McKechnie DG, Majeed A. Covid-19 vaccine hesitancy among ethnic minority groups. BMJ. 2021;372:n513.
102. Williams BM. The ethics of selective mandatory vaccination for COVID-19. Public Health Ethics. 2022;15(1):74-86.
103. Kowalik M. Ethics of vaccine refusal. Journal of Medical Ethics. 2022;48(4):240-3.
104. Giubilini A. Vaccination ethics. British Medical Bulletin. 2021;137(1):4-12.