

Spike Protein Shedding on Reddit: Analyzing Online Discussions of an Anti-Vax Conspiracy Theory

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Abstract

During the COVID-19 pandemic of 2020-2023, public opposition to vaccination was fueled in large part by online misinformation and disinformation. This content included a range of conspiracy theories that were shared on social media platforms. These theories spread rapidly and proved remarkably resistant to elimination through debunking. To shed light on this phenomenon, we conducted a qualitative examination of the "spike protein shedding" theory that gained prominence in 2021 on Reddit, a popular news and discussion platform. The theory centered on the claim that a harmful component of mRNA COVID-19 vaccines could be transmitted from vaccinated to unvaccinated individuals, presenting a significant health hazard. Some of those propounding the theory also claimed that government agencies and/or vaccine manufacturers were aware of the risk but chose to conceal it from the public. A thematic analysis of 63 Reddit threads taken from various subreddits revealed themes and patterns in how the topic was discussed by posters and those who responded to their posts. The results revealed that the theory was subject to surprisingly little critical debate on Reddit. Discussions instead took place in subreddit communities that functioned more as affinity spaces: Posters mainly invited and received support and/or advice from community members to shore up their existing beliefs on the issue and negatively caricatured those who disagreed with them rather than engaging with the substance of opposing arguments. The findings help explain the resilience of conspiracy theories that are shared online.

Keywords: online debate, social media, online misinformation sharing, conspiracy theories

1. Introduction

In a time when false information pollutes our digital media, there is great uncertainty about which sources to trust and which claims to accept as true. The proliferation and popularity of news content produced by non-professionals and bad actors contributes to this doubt. Information carries persuasive and motivational force, and false claims can be especially problematic in this regard. False information comes in two forms. *Misinformation* is false information that is introduced by those who either wrongly believe it to be true or are indifferent to its truth status. *Disinformation* is false information that is introduced by those who know it to be false and want to misinform or deceive others (Lewandowsky et al., 2020). Facts accepted in common are essential for rational discourse in a liberal democracy. The scourge of misinformation and disinformation, together with increasingly partisan media outlets and the challenge of information overload in a competitive attention economy, have put considerable pressure on our ability to connect around a broadly shared sense of reality.

There is growing awareness of, and concern over, the resilience and spread of misinformation and disinformation within digital communication networks, especially on social media platforms. Historically, media disinformation has been used strategically to promote white supremacy and the subordination and denigration of outgroups (Kuo & Marwick, 2021). The spread of such information is accelerated by contemporary media, as people are increasingly turning to dominant platforms such as Facebook, X (formerly Twitter), and YouTube for their daily news and commentary. Accordingly, "Big Tech", the world's large and incredibly influential technology companies, are facing increasing demand to combat the growth of false information on their platforms and reduce its harmful or divisive impact on society. The speed and range of the internet, and the lag in fact-checking and corrective action in online spaces, allows misinformation and disinformation to evade preventative detection and spread quickly within and across social networks. Much false information is "sticky" in that it attracts disproportionate attention, engagement, and sharing (Khan & Idris, 2019). Even when a specific claim is debunked by trustworthy sources, it may continue to spread through its resistant believers

(Lewandowsky et al., 2020). Known as the “continued-influence effect,” even the strong, public refutation of a false claim often fails to eliminate its acceptance and impact (Lewandowsky et al., 2017; Lewandowsky et al., 2012). Even when faced with compelling arguments to the contrary, people are remarkably adept at maintaining false beliefs (Dutta et al., 2020). The burden of correcting false information often falls upon friends and family, as a large share of misinformation is disseminated through private instant messaging, providing limited opportunity for platforms to remove or flag it (Malhotra, 2020). Bad information has proven dangerously stubborn in the digital age. As such, the dynamics of how it is communicated and how it is received deserve close study.

The problem of misinformation and disinformation presents many pressing questions. How does patently false information survive refutation in social media networks? How does the way it is received within networked communities contribute to that persistence? How do those who introduce it respond to debunking efforts by others? Do people choose to communicate within specific virtual communities because they expect their controversial claims will be welcomed there? We will be addressing these questions through examination of a particular example of false conspiratorial thinking as it was taken up in Reddit discussion communities during the COVID-19 pandemic.

Notable examples of the negative impact of misinformation help provide context to this issue. One example is the claim of widespread voter fraud in the 2020 U.S. Presidential Election (Chen et al., 2021; Pennycook & Rand, 2021). Misinformation has also fueled support for QAnon, the American far-right conspiracy theory and movement centered on the claim that sexual and other crimes are being systematically committed by a network of powerful elites in complicity with the “deep state” (Engel et al., 2022; Hannah, 2021). Another prominent example is doubt about the efficacy or safety of vaccination. Although the now infamous theory that vaccines cause autism has no scientific support and has been thoroughly debunked (DeStefano & Thompson, 2004; Godlee et al., 2011), the claim continues to be espoused and has significantly reduced vaccination rates in many communities. Once a false idea gains traction, it can be difficult to change the minds of believers. With the viral rapidity of information-sharing in cyberspace, the spread of false claims is hazardedly easy. Accordingly, the spread of online misinformation was ranked as one of the ten most significant challenges facing the world today by the World Economic Forum (WEF, 2013). The networked circulation of false information can increase distrust of mainstream journalism, government, and science. Anyone can create and share content on the internet. And many of those who follow amateur producers do so because they find them more “relatable,” accessible, and trustworthy than credentialed or official authorities, whom they view as biased or corrupt. Consistent with this, Lyons et al. (2019) found that the reception of a public health conspiracy claim, and any correction made to this false information, depends on the individual’s overall attitude toward mainstream news outlets and pharmaceutical companies. Belief in a conspiracy theory also tends to further erode trust in government, even when the theory does not relate to elected officials or public agencies (Einstein & Glick, 2015). Given these negative consequences, the recent pandemic was declared both a pandemic and an “infodemic” by some (Caulfield, 2020; World Health Organization, 2020). However, there has been some disagreement as to whether this historical event constituted the designation of infodemic (Simon & Camargo, 2021). There were also efforts to curb the spread of misinformation as Meta’s platforms Facebook and Instagram, for example, began to identify and remove posts that did not comply with their COVID-19 and vaccine policies. These platforms claim to have removed 16 million such posts at the height of the pandemic (McEvoy, 2021). Similarly, YouTube enforced a ban on anti-vaccine misinformation (Alba, 2021). Despite these efforts, the issue continued to cause problems for governments, health officials, and the general public. Users have also become skilled at evading content moderation by embedding misinformation in images instead of text, which makes machine detection more difficult (Acker & Chalet, 2020). Recent decisions by Meta and X to scale back on fact-checking and moderation in response to accusations of political partisanship have only increased the spread of scientific and political misinformation (Ortutay, 2024; Roeder, 2025).

Throughout the COVID-19 pandemic, mis- and disinformation proliferated and spread. The direct and indirect costs of such discourse included appalling acts of anti-Asian violence (Le et al., 2020; Tessler et al., 2020; Wright & Duong, 2021), the promotion of unsafe or ineffective remedies to deal with the virus (FDA, 2020; Government of Canada, 2021), and the fomenting of militant opposition to vaccine mandates. Furthermore, distrust of traditional media sources made it difficult to counter these developments with countervailing information. Unjustified skepticism toward approved COVID-19 vaccines was a significant contributor to the rates of illness and death during the pandemic. Most people in countries with readily available vaccines chose to be injected to protect themselves and others. A substantial minority, however, remained fearful of the vaccine or the intentions of their government and/or “Big Pharma,” the giant pharmaceutical companies that developed and manufactured the vaccines. This hesitancy or opposition was often based on false information circulating in their social networks (Basch, 2021). The consequences from this were significant. As the WHO emphasized at the time, it is not a vaccine that will curb the pandemic, it is vaccination (World Health Organization, 2021). This statement reinforces the idea that an effective pandemic response requires unified collective action. Vaccine hesitancy or opposition increases the risk of infection, illness, and death for everyone, not just the individual opting not to get vaccinated.

We will be examining one particular strain of misinformation that spread during the pandemic to better understand the dynamics of how such information is discussed. The notion of “spike protein shedding” involved the idea that vaccinated individuals could harm those who are unvaccinated by simply being close to them (Fiore, 2021; Mosleh, 2021). This specific claim is a telling example of problematic misinformation because it represents an idea that had been repeatedly and publicly debunked yet continued to be disseminated online. The argument for the reality of spike protein shedding is loosely connected to science, making it a good candidate for presentation as a factual truth claim rather than an opinion by its proponents. Evidence for or against the claim can be presented, inviting others to accept, refute, or discuss it further. The topic was also specific enough that the discussion seemed to be contained to niche communities whose public virtual discussions could be identified and captured for analysis. It is more focused than the broad anti-vaccine debate, while revealing similar fault lines and dialogical features. The fear of spike protein shedding stemmed from claims of unvaccinated people experiencing negative symptoms such as disrupted menstrual cycles, body aches, flu-like symptoms, and even miscarriages (Glaser & Zadrozny, 2021). These are often first-person or second-person accounts that are resistant to fact-checking (Glaser & Zadrozny, 2021). The anecdotal nature of such posts gave platforms pause in removing them, as this might have been seen by many as unfairly censoring people from sharing their experiences and interpretations of those experiences. Anecdotal evidence has been shown to present challenges for scientific rebuttal, irrespective of educational background (Rodriguez et al., 2016).

Proponents of spike protein shedding believed that spike proteins in mRNA COVID-19 vaccines are “shed” from a vaccinated person’s body and transmitted to the bodies of others, causing illness and dysfunction. This led to the ironic result of some anti-vaxxers donning masks to protect themselves against the vaccinated. That is, people who previously did not believe in the dangers of the SARS-Cov-2 virus became fearful of a virus they believed originated from vaccinated people (Mosleh, 2021). The conspiracy theory attached to the idea involved the secondary claim that the vaccine was being used as a bioweapon by government and health officials to vaccinate the entire population without their knowledge or consent, to punish the unvaccinated for disobedience, or to induce miscarriages and sterility to reduce global population growth. The evidence behind this claim was largely hearsay with little or no scientific credibility. Some versions were based on tendentious misinterpretations of publicly available documents, such as a clinical protocol document from vaccine producer Pfizer (2020), or ambiguous comments made by experts. Such “evidence” was enough for many to reject vaccination altogether and urge others to do the same. This sowed division and increased distrust of public health authorities, hampering efforts to combat the pandemic. Though vaccine shedding exists, it only occurs in vaccines that contain a live virus and is simply a term used to describe the “release or discharge of any of the vaccine components in or outside of the body” (CDC, 2021). This does not imply that the shed components can be harmful to others. Moreover, the claim strains credibility given that mRNA vaccines such as Pfizer’s did not contain a live virus.

The present study focuses on discussions of spike protein shedding that appeared on the Reddit social networking platform in 2021. Reddit provides an ideal space for studying virtual discussion as it is designed for promoting debate-like interchange (Dutta et al., 2020). Its forum format provides a valuable publicly available resource for qualitative research analysis (Medvedev et al., 2019). It was chosen over other popular platforms because of the libertarian anonymity it provides, the resulting diversity of information, viewpoints, and reactions to posts, the lack of character or word limits, and the specificity and variety of forums and communities for topical debate. Known as “the front page of the internet,” Reddit is for many netizens the go-to place for discussion of just about any topic imaginable. It is also one of the most-visited websites on the internet (Clement, 2021). Anyone can find a community or conversation of interest on Reddit, which helps explain its appeal to 73 million daily active users (Reddit Inc., 2024). Users can simply and efficiently search for topical, thematic, or group-based conversations in various communities, called “subreddits.” These can be read by anyone and commented and voted on by users. We looked at how the topic of spike protein shedding was discussed on Reddit to gain insight into how misinformation survives rational scrutiny and even proliferates. How is a claim as dubious as this so resilient in the face of discrediting and refutation? By examining how individuals discuss and debate the issue within subreddits, we hoped to better understand the social dynamics of online misinformation.

2. Method

In this study, conversation transcripts were captured and downloaded at the peak of discussion of this topic on Reddit. This took place from approximately April to June of 2021, when COVID-19 vaccines were starting to become widely available. Vaccine hesitancy or opposition at this time spawned highly politicized discussions of the hazards of the vaccines themselves and conspiracy theories related to their widespread distribution and administration. Key search phrases turned up a slew of discussions of the topic across multiple Reddit forums. Conversations that directly addressed the phenomenon in the main post and had enough comments to constitute a discussion were retained for analysis. Transcripts of the selected conversations included the original post from a Reddit user and the resulting comments from other users. These provided rich content for qualitative analysis.

2.1 Dataset

This research involved non-intrusive data collection. Publicly available online postings by anonymous Reddit users in the form of chronological “threads” were manually captured by downloading PDFs for analysis. The sample consisted of 63 Reddit transcripts that included both the original post and the response commentary.

2.2 Materials

Reddit’s search function was used to identify and save relevant conversations. These transcripts were examined through thematic analysis (Braun & Clark, 2006, 2019) to identify the themes and commonalities of the virtual discourse.

2.3 Procedure

An initial, open-ended examination of Reddit-based discussions around COVID-19 vaccines and related conspiracy theories was conducted. This revealed the prominence of the spike protein shedding theory, which was selected as the focal issue. The distinctive language used in discussions of the theory was recorded. Recurrent phrases such as “spike protein shedding” “mRNA shedding” “covid vaccine shedding” and “post-vaccine shedding” were identified. These phrases were then entered in the Reddit search bar to find all conversations focused on the topic. The time period for postings was limited to April-June 2021. This extended from the first instance the topic appeared on Reddit to the point of data capture. At the time of capture, it was clear that discussions on the topic had peaked and were starting to wane. The time period examined coincided with COVID-19 vaccines becoming readily available to the public in the United States and Canada and the emergence of vocal anti-vaccination sentiment in these countries. Discussions were excluded from analysis if the content of the original post did not squarely address the topic of spike protein shedding or if there were fewer than 20 comments in response to the post. Posts with no or few responses would not have permitted meaningful analysis of conversational exchanges. Data capture using the above criteria resulted in 206 search results, 63 of which qualified as suitable for analysis. Comments were sorted from old to new to maintain the chronology of the conversations.

To gain insight into the form and content of the conversations, trends and recurring themes were identified. The purposes and objectives of posters were interpretively inferred from their original post and any follow-ups. The emotions conveyed in the posts were documented. The reception of the post in the community, frequency of follow-up by the original poster, and consistency in viewpoint across the conversation were also examined. These features were inferred from the content of the posts, the conversational dynamics of the subreddit community, and the volume and form of comments the post received. Thematic analysis and interpretation were conducted using Nvivo 12. This allowed for the extraction and organization of themes and commonalities, providing a portrait of how people debate controversial claims in an inclusive and informal online context. The focus of attention was on the quality of social interaction in this virtual space, participants’ communicative objectives and strategies, the significance of social identity in the exchanges, and the qualities of Reddit culture.

3. Results

This study sought to gain insight into the presence and persistence of misinformation within online networks and the role of the virtual community in that regard. To examine the data in the light of these concerns, thematic analysis was structured around interpreting the possible intentions and claims of the poster, the sources of information referenced, and the reception of the post by the community. This frame of consideration highlighted two dimensions of primary relevance – the characteristics of the poster and the nature of the online discussion produced by the post. The first dimension consisted of three related themes: the goals of the poster, the sources they trust, and the features of identity at play. The second dimension consisted of four related themes: the divisiveness of the topic, the emotional quality of the content, commitment to one’s statements, and the supportiveness/consistency of responses to the post. These seven themes are explored below for what they reveal about the social and rhetorical dynamics of false information in an online discussion forum.

3.1 The Vaccine Shedding Theory

Discussions in this sample of Reddit posts pertained to a discredited theory of unvaccinated people becoming sick from vaccinated people who “start shedding the actual spike protein toxins that are being injected in them” (user_1). Proponents of this shedding theory posted to communities such as r/conspiracy and r/NoNewNormal to share what they saw as evidence of its harmful effects. As one user explained:

“Worldwide cases of pericarditis, shingles, pneumonia, blood clots in the extremities and brain, Bell’s Palsy, vaginal bleeding and miscarriages have been reported in persons who are near persons who have been vaccinated” (user_2).

Support for the theory was most often tied to second-hand accounts. However, the theory was rendered more credible by a handful of doctors and health experts who voiced vaccine-critical opinions online. Most were well-known for spreading anti-vaccine rhetoric and related misinformation. For example, user_3 quoted a doctor who claimed:

“We should be alarmed when we perceive that people who have surrounded themselves with vaccinated people suffer typical covid symptoms and, in addition, miscarriages, heavy bleeding, disturbances of the menstrual cycle.”

This doctor’s prescription was to stay away from the “vaccinated sheep.” Though aspects of these claims sound scientific and convincing, the theory had been thoroughly debunked, with the overwhelming majority of medical professionals strongly recommending vaccination.

3.2 Goals of the Poster

Over 200 posts to Reddit communities were collected for this sample. Reddit is a popular outlet for those seeking to share content and comments with others. We were interested in knowing why those concerned with the vaccine shedding theory were posting on Reddit and, more specifically, in specific subreddits of relevance to the theory. What were their possible intentions in starting a thread? What did they hope to accomplish? A discussion of potential aims and the extent to which they were fulfilled are discussed below.

At the time of data extraction, the shedding theory was novel and its discussion in social media networks was characterized by a high degree of uncertainty. Accordingly, some posters were soliciting confirmation or evidence of the truth of this new theory from the subreddit community. Others were either already convinced by the theory or incredulous that such nonsense was gaining traction in the anti-vax community. In the sample, 63% of posters discussed the shedding theory under the belief that it was true, 33% discounted its validity, and the remainder’s acceptance of the theory was unclear from their post. The divisiveness of the topic was clear from this distribution. Many posters appeared to seek support for their own side in the debate, placing trust in some sources but not others accordingly.

Most sought to discuss the conspiracy theory, share an idea about it, or warn the public. Many felt silenced or ignored. For them, Reddit offered the opportunity to share unpopular or marginalized beliefs without fear of judgment and banishment from the forum. They were likely attracted by the opportunity to have an open discussion on a topic that might be censored or discredited elsewhere, and to find others who share their views and would not ridicule them (Grusauskaite et al., 2022).

Another common purpose was seeking understanding, guidance, or advice. Some posters talked about conflict with a close other who believed in the false theory and the strain that this put on their relationship. They turned to Reddit to ask other users if they have had similar experiences, how they handled them, and what evidence they might provide to disabuse their friend or family member of the misinformation. This was the main reason for posting for the third of posters who did not believe in the theory. In fact, one of the most common subreddits in the sample r/QAnonCasualties has the following community description:

“Have a friend or loved one taken in by QAnon? Look here for support, resources and a place to vent.”

These posters had apparently learned about the false shedding theory from someone close to them who was aligned with QAnon, the far-right conspiracy theory and political movement. The theory was just one manifestation of a broader rift between these users and the person they felt had been “lost” to QAnon. One user mentioned that posting in the Reddit community:

“has helped me to feel a lot less alone in some of the unique struggles that Q has brought to not only my relationship with my parents, but also your relationships with friends and family as well” (user_4).

Posting about one’s personal struggles with a QAnon supporter connected these users to a potential support community. The anonymity afforded by Reddit provided a degree of safety. Users provided as much detail as they were comfortable with and were not required to reveal their personal identities.

Reddit users enjoy considerable choice in deciding which specific community to speak to. Conspiracy theorists, in particular, compete for epistemic authority which is more successfully done among like-minded community members (Harambam & Aupers, 2014). Regular users, and especially conspiracy subreddit participants, tend to self-select communities they are familiar with (Klein et al., 2019). This allows them to anticipate how their post will be received by a majority of community members. For example, posting an opinion that is dissonant with the prevailing ideology, slant, and values of a particular group is likely to invite disagreement, conflict, and disapproval. This negative reaction may well have been the intention of a few posters, who hoped to act as provocateurs in “enemy territory.”

How successful were people in achieving their goals? Most who sought support or advice did receive sympathetic responses. In contrast, those making the most extreme claims were less successful. For example, the far-fetched belief that vaccine shedding was part of a government plot to depopulate the earth received little if any support from users. Encouragingly, the less plausible a claim was in relation to science and common sense, the less support it received by members of the community.

At a broader level, all posters had the goal of generating replies and thereby achieving some degree of social visibility. Given that posts receiving few replies were excluded from the present sample, it can be assumed that this broader goal was at least minimally achieved by all users represented here.

3.3 *Trust and Sources of Information*

Productive debate involves a search for common ground as a foundation for mutual influence or persuasion. This search is often hampered when the opposing sides draw supporting content from highly politicized, partisan news outlets and information sources. Reddit users with opposing opinions on the topic of vaccine shedding appeared to differ markedly on the sources they followed and trusted. This helps explain why disputes about the validity of the theory were so resistant to resolution. Users who rejected the theory pointed to the lack of fact-checking and dubious sources of support cited by those on the other side of the debate. For example, user_5 argued that her mother “keeps going on about how Wikipedia and all reputable science websites are lying about how a vaccine works.” A similar claim is made by user_6:

“I was a little horrified and concerned about where she was getting all of this “information.” She insists all of this stuff is true and it’s backed with evidence but none of it makes any sense to me at all.”

Several users pointed to bitchute.com as the source from which many anti-vaccine and protein shedding theory proponents receive their information. The website promotes itself as a “free speech” platform and is known for its tolerance of far-right conspiracy theories and hate speech. Supporters of the conspiracy theory were highly selective in their mention of scientific sources, trusting only those rare doctors and scientists who shared their views. This was justified by their belief that dissident views on the issues were being censored by the government and “liberal tech platforms.” One personalized focus of these doubts was Chief Medical Advisor to the President, Dr. Anthony Fauci. Many posters did not trust him and therefore doubted all official communications produced or disseminated with his involvement. Proponents of the vaccine shedding threat saw themselves as fringe view-holders dedicated to publicizing a position that was being suppressed and censored. They saw themselves as courageous truth-seekers, free thinkers, and patriots – not misinformation spreaders. In contrast, those on the other side of the debate placed their trust in scientists and medical professionals, as well as elected officials and health policy experts.

Some proponents of the theory cited a Pfizer COVID-19 vaccine protocol document, stating that it implied that spike protein shedding was plausible and dangerous. This information was in fact taken out of context and the claim was debunked in the weeks that followed its initial appearance. Weak links to scientific research made the theory superficially credible and stoked the fear that “elites” were censoring important information. Users mentioned that critical information on the subject was hard to find, suggesting that the truth was being kept from the public. Fact-checkers, doctors, politicians, and the like were condemned as part of a corrupt regime of truth. They were guilty of colluding to suppress awareness of the dangers of the vaccine. As one user wrote,

“My wife and I are both adamantly anti-COVID-19-vax but neither of us has any real understanding of what vaccine shedding is and I can’t find a source to trust” (user_7).

The lack of evidence was attributed to concealment, not absence.

3.4 *Identity*

People on both sides of the debate tended to categorize themselves and those who disagreed with them in strong terms. Vaccinated “rule-followers” were referred to as “sheep,” “guinea pigs,” and “walking science experiments.” Those opposed to vaccination were called “anti-vaxxers” and “covidiot.” The full range of perceptions and identities, however, did not reduce to a stark dichotomy. Some of those who felt anxious about the COVID-19 vaccine and its possible connection to shedding seemed dismayed to be grouped with the hardcore anti-vaxx community. They pointed out that they would gladly take other vaccines but were uncomfortable with the accelerated development and rollout of the COVID-19 vaccine. They resented being accused of not trusting science and not caring about community safety. They felt unfairly judged for trusting in the efficacy of their own immune system or relying on natural remedies. In a highly polarized online debate, nuanced or mixed positions were often distorted when viewed through a simplifying “us vs. them” lens. Those on the other side were characterized as stupid and lacking in agency. One user posted about her mom becoming an “anti-vax QAnon cultist” (user_8), a rather extreme characterization of someone who holds a fringe view on the safety of a particular vaccine. The caricaturing of the other side in this debate belied the presence of considerable diversity on both sides, each made up of a range of individuals who (loosely) agreed on a single issue but most likely disagreed on many others. This reflects the heterogenous participatory culture of conspiracy theories (de Wildt & Aupers, 2023).

Some made a point to distance themselves from the more extreme views that might otherwise be attributed to them. As someone without plans to vaccinate themselves, user_9 raised the following concern:

“If we’re not worried about getting COVID naturally, why would we be worried about being exposed to the

shedding from vaccinated individuals?”

This user points to a flaw in the logic expressed by some community members, thereby creating a third position that avoids the following criticism by someone on the other side:

“the absurdity of how anti-maskers who don’t want to wear masks will now wear masks and stay 6ft apart from those who don’t wear masks. They’re literally doing the thing they were rallying against doing” (user_10).

The diversity of views on both sides was clear. Some were concerned about the vaccine but were not against masking, whereas some were opposed to both. Some feared the vaccine but not the virus itself, whereas others feared both. For some, the information about spike protein shedding only buttressed their preexisting rejection of the vaccine. Others were fearful about some COVID-19 vaccines but not others. For example, user_11 wrote,

“I don’t want to be part of the mRNA experiment but I’d be willing to get the J & J vaccine.”

Ironically, the Johnson & Johnson vaccine referred to had a lower efficacy rate and higher risk of serious adverse effects than the mRNA vaccines available at the time (CDC, 2021). It also contained a stabilized variant of the SARS-CoV-2 spike protein, whereas the mRNA vaccines did not. Some were against vaccination but committed to other precautions to minimize spread of the virus:

“I feel safer around people who are unvaccinated and still taking precautions compared to the vaccinated who have stopped all precaution and are acting like it is over.” (user_12)

This range of views within and across the “sides” of the debate reflected the complexity of the concerns involved and belied the tendency toward binary categorization by those involved.

3.5 Division

The ingroup-outgroup nature of virtual affinity groups and the heated nature of the vaccine debate during the pandemic – which was literally a matter of life and death – motivated many posters to distance themselves from and assume the worst about those who disagreed with them. Many also engaged in invidious name-calling. The following examples are revealing in this regard:

“They’re not interested in learning the truth about anything, they just look for sources to reinforce their opinions. Which are usually emotionally based.” (user_13)

“Why are *they* like this?!” (user_14),

“vaccinated people spreading their poison to us” (user_15),

“I just wish all these QAnon and Covidiot would give their head a shake and wake up. They are the ones prolonging this, they are the ones spreading both misinformation and the virus” (user_16).

Political identities presumably played into the debate around the spike protein shedding theory but, interestingly, most posters did not express their political affiliation. The only frequently recurring reference was to QAnon. These posts came from Reddit users discussing encounters with those they described as QAnon supporters. Some posts that mentioned QAnon also mentioned President Trump and his vaccination status. Trump, however, did not figure prominently in the discourse, suggesting that support for the President was not a strong indicator of where posters stood on the issue. Although opposition to masking and vaccination was far more prevalent on the political right throughout the pandemic, endorsement of the shedding theory did not cut along traditional party lines, perhaps due to its fringe conspiratorial nature. The political identity of proponents of the theory, where evident, was roughly populist and anti-establishment, revealing an underlying distrust of “elites” (Santos, 2021). Some pointed to a “ruling class” that was behind the pandemic policies and restrictions, whose real motives were to “get back to making money and implementing their various agendas” (user_12). Beyond this sentiment, political allegiance did not emerge as a clear aspect of identity that separated those who disagreed about the reality of COVID-19 vaccine spike protein shedding.

3.6 Emotional Qualities

Even online, a message communicates more than its literal meaning. Posters in the sample tended to express a variety of negative emotions, including confusion, frustration, fear, anger, loneliness, and anxiety. Posts about spike protein shedding gave distressing accounts of illness, miscarriage, other health problems, conflict with and alienation from close others, and the pain of being ignored or misunderstood. The emotional tone of these conversations was often plaintive or aggrieved, suggesting that the postings were motivated by a need to share negative feelings and adverse experiences in a communal space where they would be understood and accepted.

Except for those intent on alerting the public to what they perceived to be a serious threat, posters on the whole seemed to be communicating with others as a form of personal coping. This was confirmed by a pattern of supportive and

reassuring responses to such posts. In contrast to those seeking support or clarity on the topic, those who zealously pushed one side or the other in polemical fashion received some backlash, with responders often accusing them of spreading misinformation and trying to manipulate others.

3.7 Posters' Investment in the Conversation

Over 80% of posters returned to the conversation with additional commentary rather than disappearing from the ensuing thread. This demonstrates some degree of attachment to the post and the outcome of the conversation. Posters tended to defend their position if it had been attacked or updated concerned users after initially asking for and applying the advice received. For the remaining 20% who did not return to the conversation, it is unknown whether they were passively following the responses or no longer monitoring the thread. Asynchronous virtual communication allows for the latter in a way that face-to-face communication does not. A poster can initiate a controversial discussion simply to stir up conflict and then exit. Moreover, they can do so numerous times in different subreddit communities. Only about one third of posts on the topic were retained for analysis from the hundreds which turned up in the search results. One inclusion criterion was a minimum of 20 responses to the post. Under closer scrutiny, many of the posts that were eliminated according to this criterion appeared to be the same message duplicated across multiple subreddits. A sizable share of these may have been bot-generated. Reassuringly, they received little attention on the whole. The sensational, at times nonsensical, nature of many of these suspicious posts may account for the lack of engagement with them by other users.

3.8 Consistency of Views

Most of the posts generated responses that were consistent and supportive in viewpoint. Only 8 of the 63 original posts generated significant disagreement in more than half of the individual responses. Disagreement was concentrated in three main subreddits: r/alternativehealth, where users discussed “treatments” for shedding and responders disagreed with the validity of these suggestions; r/conspiracy, where vaccine shedding and the dangers of shedding particles were discussed alongside a host of other conspiracy theories; and r/debates, where the plausibility of the theory was squarely debated. Overall, the conversations were far more harmonious than conflictual.

The paucity of contention leads us to question the extent to which the spike protein shedding theory was subject to “debate” on Reddit, and to consider how it was insulated from refutation in this context. Although ostensibly a platform for debate and deliberation, Reddit appeared to function in the present context more as a community of support than a sounding board to test the legitimacy or validity of ideas. The specific communities sampled here served mainly as affinity groups, not arenas for argumentative combat. Users posted to these select communities because they anticipated their beliefs or experiences would attract more support than rejection overall – almost certainly more than they would from the broader public. Individual subreddits were chosen by most as safe havens for the sharing of minority viewpoints and sentiments. As such, it would be surprising if posting led to the surrender of those beliefs or conversion to the opposing side. This helps us understand how fringe beliefs, including dubious conspiracy theories, can endure and even consolidate online. Most such theories do dissipate in time, but that may have less to do with growing inconsistency with established facts than with waning relevance or loss of interest. This was arguably the case with the spike protein shedding theory, which is now considered a conspiratorial relic of the COVID-19 pandemic.

4. Discussion

Virtual communication on social media platforms was brought into critical focus when an “infodemic” of misinformation undermined public health efforts to vaccinate the world’s population against COVID-19 during the pandemic of 2020-2023. In this study, we examined a specific pandemic-related conspiracy theory – spike protein shedding – that emerged online in 2021 and contributed to vaccine hesitancy and refusal. The discursive features of Reddit conversations about this conspiracy theory were analyzed and interpreted. The qualitative exploration was guided by the questions of why someone might post about this issue, how the posts were received, the identities involved, and the extent to which claims were debated. The overarching motivation was to shed light on how conspiracy theories often prove resistant to debunking and removal from the public sphere.

Emerging themes in the conversation threads revealed scant evidence that the validity of the theory in question was subjected to rational debate. Rather, posters appeared motivated by a desire to solicit support for their preexisting position and invite sympathetic responses to their challenges and frustrations in dealing with contrarian others, including advice on how to deal with those they felt were beyond reason. Posters chose communities that promised more consistency and harmony than debate. The responses they received were mainly consistent with our interpretation of these functional intentions. Despite its identity as a platform for authentic and open debate, Reddit appeared to function more as an affinity space and echo chamber in the present context.

Not surprisingly, the platform was subject to sharp criticism from the U.S. Senate in 2021 for not doing more to combat

the spread of dangerous pandemic-related misinformation (“Letter to Reddit on Ivermectin Misinformation,” October 1, 2021). The resulting insulation of a false theory from critical debate helps explain the persistence and resilience of debunked conspiracy theories in the online world. In 2025, China passed a law requiring social media influencers offering advice on sensitive topics such as medicine, law, education, and finance to possess academic or professional credentials that qualify them to do so. Many condemned the move as censorship and government overreach; others welcomed it as an effective response to the rising tide of online misinformation and disinformation. Centralized regulatory control is one approach to combatting false information on social media networks. Other strategies include increasing critical media literacy through education and public awareness campaigns, integrating fact-checking resources such as Snopes.com, PolitiFact.com, and FactCheck.com into platform functionality, strengthening content moderation, improving misinformation reporting systems, and adjusting content feed algorithms to prioritize credible sources of information.

The results also speak to the discursive challenges of political polarization. References by posters to those who disagreed with them often traded in extreme and derogatory characterizations, leaving little room for considerations of opposing validity claims and countervailing experiences that might serve to bridge differences and moderate disagreement. The diversity and complexity of identities on both sides of the debate were ignored in these negative characterizations, which often amounted to caricatures.

By restricting our exploration to a single issue and a narrow time frame, we were able to produce a nuanced portrait of what was going on in a particular conversational space. By the same measure, this level of resolution and specificity limits the generalizability of the present findings. Validation across a broader range of conspiracy theories and online communities would be required to reinforce the conclusions offered here. Furthermore, the anonymity of posters and responders makes it impossible to know the demographic characteristic of our sample, and how representative they are of all those who participated in conversations about spike protein shedding. Reddit was ranked as the 9th-most visited website in the world in 2024. Although over half of its traffic comes from the U.S., the considerable diversity of its global user base suggests few commonalities beyond shared interest that can be assumed for any subreddit community.

Tenacious adherence to false beliefs is nothing new in human history. What the digital age contributes to this enduring frailty are platforms that serve to insulate virtual communities from rational accountability and public discrediting. Platforms such as Reddit cater more to members’ need for mutual support and information-sharing than the debating of opposing positions. While this is arguably beneficial for the protection of fringe viewpoints and marginalized identities threatened by institutional rejection or majoritarian exclusion, it can also prove costly when truth matters most -- as was the case during the recent pandemic.

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