

## Gone viral: Do QAnon beliefs relate to preventive behaviors and vaccine intentions for COVID-19?

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### Abstract

QAnon is a conspiracy theory that is increasingly prevalent in the United States; however, there is scarce empirical literature on this conspiracy and its effects. Among many claims, QAnon declares COVID-19 does not exist, or alternatively that it was purposefully manufactured for hostile purposes and is accompanied by political distrust among its believers. Considering nascent scientific work on conspiracy theories, we test the relationship between QAnon beliefs and prevention behaviors and vaccine intentions among South Carolina residents (N=1695). Beliefs in QAnon were negatively related to COVID-19 preventative behaviors and vaccine intentions. Provided the reach of QAnon, it is imperative that scientists further develop an understanding of its consequences and role in diminishing the effectiveness of public health interventions.

### Introduction

COVID-19 is described by the World Health Organization (WHO) as a disease caused by a coronavirus that induces respiratory symptoms combined with fatigue and fever (World Health Organization [WHO] [14]. Clinical outcomes of COVID-19 vary, with some infected individuals presenting no symptoms at all, while others endure severe symptoms that can result in death. Consequently, the World Health Organization declared COVID-19 as a pandemic, starting in March of 2020 [15].

COVID-19 transmission occurs primarily through respiratory droplets and reports have shown approximately 50% of transmission occurs from asymptomatic or presymptomatic individuals. Public health interventions have become crucial for breaking the chain of transmission and controlling incidence rates. To mitigate spread, recommendations have been made to quarantine, social distance, implement curfews, wear masks, and wash hands frequently. Some of these recommendations have turned into requirements and subsequently faced backlash from communities. Conspiracy theories have fueled part of this retaliation and disobedience, combined with mistrust, misinformation, and personal feelings. A conspiracy theory is the

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assumption that some outgroup, usually secretive in nature, is pursuing malevolent goals [6,13]. Scientists have argued that these conspiracies tend to develop as a coping mechanism during times of crisis where events and reasons are unexplainable and undefined [2,13].

Van Prooijen's existential threat model of conspiracy theories suggests there are three collective motives that influence the rise of conspiracy theories: 1) existential threat, 2) sense-making processes, and 3) an antagonistic outgroup. These three motives apply to QAnon's expansion in the United States. Firstly, it is widely believed that the first outbreak of COVID-19 was in Wuhan, China; the threat of the virus came from overseas and had unknown origins at the beginning. Secondly, there was a small perception of threat as many did not identify with those who were at risk of being infected, like those with compromised immune systems or were older in age. Therefore, even though the virus is nondiscriminatory, many assumed there were not at risk due to age and health. Additionally, it is important to consider how media outlets were fueled with one-sided political discourse at the time, possibly pushing those with negative attitudes towards media to look towards non-mainstream sources.

Thirdly, during the 2020 election, and conspiracy theories of the virus started to bind with political theories and mistrust.

15-20% of Americans believe in QAnon, and over 1/3 of Americans adhere to conspiracy theories in general [3,11]. QAnon is headed by a mysterious computer personality that goes by "Q." Supporters believe "Q" to be a part of American intelligence or an individual with high clearance credentials, whose aim is to expose the truth of the "deep state" (a secret sector of government that has a malevolent hidden agenda) and Satan-worshipping elites that are corrupting the country [7]. To communicate with followers called "Patriots," Q allegedly posts on online chat channels such as 4Chan and 8Chan. Q's main tool for expanding support is by encouraging followers to pass on these ideas and messages through social media or word of mouth, as the media is not to be trusted [7]. QAnon's goal is to reach a "Great Awakening," where an intellectual awakening is found through the public's awareness of the enslavement they suffer in a corrupt political system. Relating to COVID-19, Q claims the virus is a hoax created by the "deep state" [7]. The conspiracy theory proposes many contradictions such as the invalid existence of the virus, and yet also identifies the creators of the "non-existent" virus (i.e., the Chinese government). It is possible that the vast percentage of Americans that support QAnon also believe that the virus is non-existent, thus leading to the substantial number of Americans who do not comply with government ("deep-state") policies. With over 33,000,000 Americans infected with COVID-19, it is important to investigate how the belief in QAnon affects compliance with prevention and protection policies against this coronavirus [14].

Previous research has linked general conspiracy theory beliefs to authority and COVID-19 behaviors. Karić and Međedović [6] found that the more an individual believed in conspiracy theories, the less likely they were to adhere to containment-related behaviors for COVID-19 protection. Political trust was a mediator, seeing that those who held a higher trust for their political government tended to trust protocols and follow them. Marinthe et al. [8] found that those with a conspiracy mentality often failed to engage in normative behaviors and increased non-normative behaviors; also finding that when protocols were government-driven, those with high conspiracy mentality disengaged unless there was a perception of direct risk. Additionally, Bierwaczzonek et al. [3] found that those who had stronger conspiracy beliefs tended to social distance less; when questioned a second time, they showed less of an increase in social distancing compared to non-believers.

Furthermore, Milošević Đorđević et al. [9] found vaccine hesitancy for COVID-19 to be motivated by the belief in corresponding vaccine conspiracy theories and mediated by vaccine knowledge and/or trust in medical institutions and scientific findings. Our study also seeks to measure vaccine intentions coupled with conspiratorial beliefs, specifically QAnon. At the time the survey was presented to participants, not all US adults were not eligible for vaccination until the following April [1]. Thus, this study was only able to capture self-reported participation in preventative behaviors like social distancing and intentions for receiving the vaccine when it became available to each population.

Despite many recent reviews linking conspiracies and conspiratorial thinking to COVID-19 phenomena [12], we were not able to identify any empirical research that linked QAnon beliefs to Covid-19 preventative behaviors and related phenomena. We have several reasons to believe that such a link exists and deserves attention. First, the politically charged nature of

the conspiracy theory and the politicization of public health measures regarding COVID-19 suggest that QAnon beliefs may influence an individual's discretionary preventative behaviors (e.g., wearing a mask or socially distancing). Second, existing research into conspiratorial thinking and conspiracy theories, albeit less prominent and/or public health related, has found negative relationships between belief in those theories and adherence to preventative measures. Lastly, the sheer prevalence of QAnon beliefs, which have even been touted by members of the federal government and numerous elected officials, implies that there is likely great practical value in investigating where believers are less likely to practice preventative behaviors or receive an FDA-approved vaccine. Taken together, we believe that QAnon beliefs will be negatively related to prevention behaviors and vaccine adoption. Identifying the factors contributing to compliance with mitigation strategies is important to public health scientists working to combat misinformation and provide educational campaigns in the community.

**Hypothesis 1:** Beliefs in the Qanon conspiracy theory will be negatively related to COVID-19 prevention behaviors.

**Hypothesis 2:** Beliefs in the Qanon conspiracy theory will be negatively related to intentions to receive a COVID-19 vaccine.

## Methods

Data in the current study were collected as part of a larger project investigating COVID-19 phenomena across the state of South Carolina. Using Qualtrics to source participants from October 15<sup>th</sup> to November 8<sup>th</sup> of 2020, we obtained a sample of South Carolina residents above the age of 18 from each county in the state. A total of 1707 individuals provided informed consent and started the survey, with 74.1% female, 75% white, and an average age of 43 years. Most participants reported having some college (24.2%), followed by a high school diploma (23.1%), and a bachelor's degree (22.2%). A screen for careless responding was performed whereby participants providing more than nine consecutive, identical responses (e.g., "strongly agree") across multiple scales with positive and negatively coded items were removed, leaving 1695 participants for analyses.

## Measures

To test our hypotheses, we included several control variables in our models. Educational level was measured on a 6-point scale (less than high school to post graduate education) and age was treated as a continuous variable, while gender and race were dummy-coded where 1 = female and 1 = nonwhite, respectively. In order to distinguish QAnon beliefs from political partisanship, we also included a measure of political partisan identification [4] in our model. Following previous convention, participants first indicated party affiliation, and those that reported identifying as Republican or Democrat were then asked whether they considered themselves to be "strong" or "weak." Participants that didn't consider themselves to belong to either major political party then indicated whether they were closer to the Republican or Democratic Party, or neither ([10] for more). This procedure produced a scale anchored with the following: 1 = Strong Democrat, 2 = Weak Democrat, 3 = Democratic Leaner, 4 = Independent, 5 = Republican Leaner, 6 = Weak Republican, 7 = Strong Republican.

To measure Qanon conspiracy theory beliefs, participants were asked, "Which answer best reflects your beliefs about the QAnon Theory" and responded with: *I don't know/Never heard of it* (n=871), *Completely False* (287), *Some Parts True* (215), and

Mostly True (82). Preventative behaviors were assessed with three items, “How often do you thoroughly wash your hands with soap and water or use alcohol-based hand sanitizer,” “How often do you wear a mask when entering a public place even if it is not required,” and “How often do you practice social distancing of 6 feet when you are in public?” Participants answered using a four-point scale anchored from never to always ( $\alpha = .70$ ). Participants also answered *yes* or *no* to, “Assuming approval by the FDA, do you plan to take a vaccine for COVID-19 if and when it becomes available?”.

## Results

Descriptive statistics are found in (Table 1). To test hypothesis 1, we ran a two-step hierarchical multiple regression analysis. In step one, we regressed our aggregate preventative behaviors variables on our demographic control variables and political partisan identification, which was coded in a way that greater values reflected higher Republican identification (Table 2). In step two, we then included QAnon beliefs into our model (1 = Completely False, 2 = Some Parts True, 3 = Mostly True) and found evidence of incremental validity beyond the variables in step one ( $\Delta R^2 = .008, p < .05$ ). In the final model, age ( $\beta = .173$ ), political par-

**Table 1:** Frontal CT scan showing the mass an upper polar tissue mass of the left kidney.

	Mean (SD)	Age	Nonwhite	Female	Education	PID	QAnon	PB	Vaccine
Age	43.35(17.5)	--							
Nonwhite	.29(.45)	-.192*	--						
Female	.74(.44)	-.117*	.056*	--					
Education	3.60(1.42)	.190*	-.072*	-.076*	--				
PID	4.10(2.25)	.190*	-.372*	-.065*	-0.002	--			
QAnon	1.65(.71)	-.159*	.104*	0.001	-.152*	.303*	--		
PB	3.41(.62)	.164*	.069*	.092*	.073*	-.192*	-.180*	--	
Vaccine	.53(.50)	.141*	-.116*	-.161*	.165*	-.060*	-.196*	.226*	--

\*= $p < .05$ . PID: Political Partisan Identification; QAnon: Beliefs in QAnon Theory; PB: Preventative Behaviors; Vaccine: Vaccine Intentions.

**Table 2:** Regression analyses predicting preventative behaviors.

	Step 1		Step 2	
	<i>b</i>	SE	<i>b</i>	SE
Constant	3.27	0.114	3.27	0.113
Age	.189*	0.001	.173*	0.001
Female	0.022	0.051	0.02	0.051
Nonwhite	0.01	0.062	0.026	0.063
Education	0.051	0.017	0.042	0.017
PID	-.212*	0.011	-.176*	0.011
QAnon			-.096*	0.037
R <sup>2</sup>		.076*		.083*

\*( $p < .05$ ). *b*: Standardized Coefficient (except for “Constant,” where *b*: Unstandardized Coefficient); SE: Standard Error.

**Table 3:** Logistic regression analyses predicting vaccine intentions.

	Step 1			Step 2		
	<i>b</i> (SE)	Odds ratio	Model	<i>b</i> (SE)	Odds ratio	Model
Constant	-0.4032	0.33		1.02*(.49)	2.78	
Age	.009(.01)	1.01		.007(.01)	1.01	
Female	-0.18711	0.41		-0.19026	0.404	
Nonwhite	-0.15594	0.508		-0.13872	0.561	
Education	.280*(.07)	1.32		.263*(.07)	1.3	
PID	-0.00708	0.837		-0.0069	0.871	
QAnon				-0.04816	0.709	
Log likelihood			701.07			694.92
Nagelkerke R <sup>2</sup>			0.16			0.172
$\chi^2$			72.70*			78.85*

\*( $p < .05$ ). *b*: Standardized Coefficient (except for “Constant,” where *b*: Unstandardized Coefficient); SE: Standard Error.

tisan identification ( $\beta = -.176$ ), and QAnon beliefs ( $\beta = -.096$ ) were all statistically significant predictors of preventative behaviors ( $R^2 = .083; F_{6,576} = 8.709, p < .001$ ), thereby supporting hypothesis 1.

To test hypothesis 2, we performed a logistic regression similar to the previous analyses but instead regressing vaccine intentions on our predictor variables. Results indicated that the full model was statistically significant,  $\chi^2 = 78.85, p < .001$  (Table 3). Importantly, the effect of QAnon beliefs on vaccine intentions was incrementally predictive ( $\Delta\chi^2 = 6.15, p < .05$ ), whereby the odds ratio shows that as belief in QAnon increases, the odds of intending to get a vaccine decrease (.709). Thus, hypothesis 2 was supported.

## Discussion/conclusion

This study explored whether there was a negative relationship between beliefs in the conspiracy theory QAnon and COVID-19 prevention behaviors and vaccine intentions in the United States. Results substantiated the hypothesized negative relationship between beliefs in QAnon and preventative behaviors. Further, these relationships were found after controlling for several demographics that are related to preventative behaviors and/or vaccine intentions, as well as for political partisanship identity, which was negatively related to preventative behaviors and vaccine intentions. While this is the first study to our knowledge that tests the effects of QAnon beliefs on pandemic-related phenomena, we believe further research can delve into the complex, and perhaps convoluted, interplay between various political, identity, and background factors with beliefs in the QAnon conspiracy theory. These findings are congruent with the results of Karić and Međedović’s [6] study which found the more an individual believed in conspiracy theories, the less likely they were to adhere to containment-related behaviors for COVID-19, and Bierwaczzonek and colleagues [3] found those who had stronger conspiracy beliefs had the tendency to social distance less. Further, those believing QAnon

as *completely false* had the highest intentions to receive the vaccine (72.1%), while those who believe QAnon to be *mostly true* (48.8%) had the lowest intentions to receive the vaccine. Interestingly, groups who believed the conspiracy theory to be *some parts* (54%) and *mostly true* (48.8%) produced remarkably similar responses of low vaccine intentions.

Given the nature of QAnon's beliefs, it is important to acknowledge how the political mistrust established in its belief system influences (dis)trust in protocol and government. Again, QAnon discourages trust in elite, corrupt, political figures of the deep state, while only encouraging support for a few figures (e.g., Donald Trump). While it may be surprising that any QAnon believers engaged in preventative behaviors and intended to receive a vaccine, it is possible that Donald Trump's attempts to tether himself personally to the creation, production, and value of the vaccines made some QAnon adherents less skeptical/resistant. Thus, as QAnon followers had trust in Donald Trump, the president and face of the government at the time, the political trust could have increased, reflecting Karić and Međedović's [6] findings.

Another possible explanation could be the contradiction that exists in the conspiracy theory itself and how the theory is communicated throughout society. As mentioned, Q communicates through web posts and as followers try to recommunicate and spread the message, often the message becomes misinterpreted, simplified, and the connection between the leader and their idea separate from each other. Misconceptions of the origins of such rumors is commonplace; therefore, it is possible to conclude lack of adherence to policy and low vaccine intentions is due to supporting QAnon directly or through acceptance of QAnon ideas unknowingly of its origins. To this end, future research may analyze how conspiracy theories spread and become accepted by society without any connection to the original theory.

While our stratified sampling procedure offered a snapshot of SC residents, it is unknown to what extent these findings may generalize to the broader American population. Additionally, the data analysis only included participants who had knowledge of QAnon, so it did not include those unaware or believing in additional conspiracy theories that may or may not have affected their reported behaviors and intentions. Considering the combination of conspiracy beliefs, vaccine hesitation, and behaviors involving vaccines, the influence of anti-vaxx beliefs and the COVID-19 vaccination should be examined in future research. Milošević-Đorđević et al. [9] found belief in anti-vaccine conspiracy theories did in fact directly impact vaccine intentions; however, current research does not yet capture COVID-19 vaccine actions or lack thereof, only intentions. Practically, our findings indicate that QAnon beliefs, and perhaps conspiratorial beliefs more broadly, pose a threat of disobedience or non-normative behaviors to public safety measures proposed by authorities. It is important for authorities, like government officials and nongovernment health experts, to inform citizens of the truth quickly and publicly regarding disease transmission and containment, as well as the possible misinformation that may hinder adherence to important public health policies. However, QAnon believers may be quite resistant to education and outreach as followers are instructed to not accept news media and to only listen to those approved by QAnon (i.e., other followers, supporters, non-elite, etc.). Thus, the swiftness of authority figures becomes a critical part in diminishing conspiratorial belief and increasing policy acceptance. Recent research has investigated possible barriers and/or precipitating conditions that hin-

der the utility of possible interventions [5] but further research may illuminate how the cycle of misinformation for a unique conspiracy like QAnon can be broken.

## Declarations

### Ethical guidelines

The data used in this study are available from the corresponding author upon reasonable request.

All data were collected under ethical guidelines and with the approval of the local institutional review board.

**Conflict of interest:** On behalf of all authors, the corresponding author states that there is no conflict of interest.

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