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Misperceptions, Depression, and Voting for Election Deniers in the United States[1]

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Abstract

Two of the most significant concerns about the contemporary United States are the erosion of democratic institutions and the high rate of depression. We provide evidence connecting these phenomena. We use a survey (N=11,517) to show a relationship between misperceptions (about COVID-19 vaccines) and voting, in 2022, for gubernatorial candidates who denied or cast doubt on the legitimacy of the 2020 election results. We further predict and find that the presence of moderately-severe-to-severe depressive symptoms exacerbates the relationship between misperceptions and voting for election deniers or doubters. The results offer insight into the links between misperceptions, depression, and democratic backsliding (i.e., supporting candidates who challenge election results). We also contribute to a growing line of research on how mental health affects democratic functioning, potentially worldwide.

Keywords: Misperceptions, Misinformation, Depression, Election Denial, Democratic Backsliding

Democracy, at a minimum, requires the peaceful transfer of power based on election results. That did not occur in the U.S. in 2020, given the violent insurrection on January 6th, 2021. Concerns remained in 2022 with gubernatorial candidates in 28 states (of the 36 states holding gubernatorial elections) denying outright or casting doubt on, without credible evidence, the legitimacy of the 2020 election (PBS, 2022). This is concerning given that states have, until recently, been seen as laboratories of democracy, but now may instead be domains of backsliding (Rocco, 2021). Much of the literature on democratic erosion in the U.S. focuses on partisan motivations (Finkel et al., 2020), often pointing to anti-democratic tendencies among Republican elites (Grumbach, 2022). Indeed, all the major party election deniers and doubters on the 2022 gubernatorial ballot were Republicans.

The focus on partisanship, even asymmetrically, is sensible but incomplete. Other factors likely shape anti-democratic behaviors. Here, we explore the relationship between holding misperceptions in a related domain, COVID-19, and supporting an election denying or doubting (for convenience, henceforth "denying") gubernatorial candidate in 2022. We also theorize and test whether exhibiting moderately-severe-to-severe depressive symptoms (for convenience, henceforth "severe") moderates the correlation between COVID-19 misperceptions and supporting an election denying candidate. Our results provide evidence that misperceptions, depression, and their interaction can have negative democratic consequences.

Misperceptions and Depression

Misperceptions refer to "cases in which people's beliefs about factual matters are not supported by clear evidence and expert opinion – a definition that includes both false and unsubstantiated beliefs about the world" (Nyhan and Reifler, 2010, p. 305). Substantial research shows that misperceptions relate to maladaptive attitudes and behaviors such as ignoring health advice (e.g., masking, vaccination) (Jolley and Douglas, 2014; Oliver and Wood, 2014b; Romer

and Jamieson, 2020), dismissing environmental threats (van der Linden, 2015), displaying hostility toward out-groups including political adversaries (Kennedy and Pronin, 2008), and supporting political violence (Baum et al., 2023). In their synthesis of COVID-19 policy relevant research, Ruggeri et al. (2024) review 60 articles on misperceptions and report clear evidence of a relationship with vaccine hesitancy.

A stream of work also reveals a relationship between misperceptions and vote choice (Gunther et al., 2019; Weeks and Garrett, 2014). Negative misperceptions about a candidate can straightforwardly lead one to vote against that candidate. For instance, in 2016, many past Obama voters who believed incorrect negative information about Clinton tended to defect to supporting Trump or refrain from voting (Gunther et al., 2019). Generally, politically relevant misperceptions vary as to whether they have partisan content (Enders and Uscinski, 2021, p. 586). When they do, misperceptions can straightforwardly influence support for a particular candidate from a given side, such as misperceptions about illegal Latino voters generating support for conservative candidates who embrace strict immigration policies (Smith, 2017). When misperceptions do not have partisan content, they can promote support for a candidate who shares the general predisposition invoked by the misperceptions. For example, some non-partisan conspiratorial misperceptions, like the belief that the people who really "run" the country are not known to voters, correlate with voting for Trump, consistent with his embrace of the "deep state" (Enders and Uscinski, 2021; also see Oliver and Wood, 2014a; Sutton and Douglas, 2020).[1] These examples make clear that misperceptions not directly about candidates can still influence vote choice.

Both the partisan and non-partisan logics suggest a potential connection between 1) COVID-19 vaccine misperceptions (e.g., vaccines alter people's DNA) and 2) voting for candidates who challenged the legitimacy of the 2020 election. Republican elites endorsed

misinformation about vaccines and all the 2022 denying candidates were Republican (e.g., Annenberg IOD Collaborative, 2023; Jones and McDermott, 2022). Additionally, both COVID-19 vaccine misperceptions and supporting a denying candidate invoke suspicions of elites, be they scientific or government elites (see Jennings et al., 2023). Voting for an election denying candidate enables one to act on their displeasure with the "system" (Chen et al., 2021; Enders et al., 2023).

> **Hypothesis 1**: Relative to those who do not, those holding misperceptions about COVID-19 vaccines will be more likely to support a candidate who questioned the legitimacy of the 2020 election, all else constant.

Just as there exists notable heterogeneity in who holds misperceptions based on psychological differences such as authoritarianism and narcissism (e.g., Cichocka et al., 2016; Douglas, 2021; Druckman et al., 2021), some people will be more likely than others to connect their (vaccine) misperceptions to their voting behavior (e.g., Ahmed and Tan, 2022; Rottweiler and Gill, 2020). Indeed, there is considerable work on heterogeneous reactions to misperceptions (Douglas, 2021). We focus here on variation stemming from depression, a common mood disorder where an individual experiences a persistent feeling of sadness and hopelessness and/or loses interest in most activities. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), states that a diagnosis of a severe depressive episode is appropriate when an individual experiences five or more of nine identified symptoms for at least two weeks. These include a depressed mood; diminished interest in daily activities; significant weight loss or gain; sleep difficulties; slowing of thought and reduction of physical movement; fatigue; feelings of worthlessness or excessive guilt; diminished ability to concentrate or make decisions; and recurrent suicidal ideation. Depression is the most prevalent mental health disorder in advanced societies (Lépine and Briley, 2011) and it increased nearly four-fold in the U.S. during the COVID-19 pandemic (Ettman et al., 2022).

Depression is often accompanied by a sense of a loss of control (e.g., Cheng et al., 2013; Rehm, 1977). Lower control, in turn, increases the link between misperceptions and taking non-normative political actions (Douglas, 2021, p. 2). Rottweiler and Gill (2022) show this is the case for conspiracy beliefs and violent intentions. We extend the idea to COVID-19 misperceptions and voting for an election denier. To be clear, depression on its own often quells action (Landwehr and Ojeda, 2021); however, when conjoined with misperceptions that offer a culprit – in this case, societal institutions – individuals will come to view actions against the threatening culprit (i.e., institutions) as a way to regain control (Moulding et al., 2016). Here, that means supporting those who challenge the institutions. Depression could exhibit this relationship via either of the aforementioned routes (e.g., among Republicans, given elite cues against science and electoral institutions, or among those with connected anti-system inclinations).

> **Hypothesis 2**: The relationship in Hypothesis 1 will manifest more strongly among those who suffer from severe depression, relative to those who do not, all else constant.

Data

We focus our analyses on gubernatorial elections. As mentioned, 36 states had such contests in 2022 and election deniers ran in 28 of those states. To obtain a suitable sample, we relied on the PureSpectrum survey recruitment platform, which aggregates and deduplicates paid panelists from multiple online survey sources. Though not a probability sample, the large scale of the sample and its demographic breadth provides the necessary flexibility for including quotas for gender, race, and age at the state level and reweighting of observations to match official U.S. Census figures. Emerging evidence suggests this methodology can perform as well as traditional probability sampling (Enns and Rothschild, 2021; Lazer et al., 2020; Lehdonvirta et al., 2021). We collected our data between October 6 and November 9, 2022.

Our analyses include eligible voters who lived in a state with at least one election denier on the gubernatorial ballot (N=11,517) (see the appendix for sample demographics). As explained, we study misperceptions about COVID-19 vaccines. We selected five misperceptions based on Google searches for prevalent misinformation at the time and the Centers for Disease Control's website area on common myths. They include assertions that the COVID-19 vaccines: alter people's DNA; contain microchips that can track people; contain the lung tissue of aborted fetuses; can cause infertility, making it more difficult to get pregnant; and contain a bioluminescent marker used to trace people. We created a scale by counting the number of misperceptions endorsed (normalized on a 0-1 interval) ($\alpha = .79$).

We identified the stances of gubernatorial candidates from coding by the PBS Newshour (PBS, 2022) that identified the 28 (all Republican) gubernatorial candidates who publicly either claimed outright that the 2020 election was stolen or fueled doubts about the integrity of the 2020 election. Respondents were asked which candidate they supported in their particular state from a list of all candidates on the ballot in the given race. Our dependent variable is voting for an election denying or doubting candidate, coded 0 for no and 1 for yes (i.e., "supported" [prior to voting] or "voted for" [if they had already voted] the candidate who disputed the 2020 election result). As noted, we use the shorthand of "denying" for these candidates.

We measured depressive symptoms with the Patient Health Questionnaire (PHQ-9), which is used to screen patients in primary care settings (Arroll et al., 2010) and has been validated for use in general population surveys (Kocalevent et al., 2013). Each of the nine items (listed above and in the appendix) asks about symptoms on a 0 (not at all) to 3 (nearly every day) scale, which is then summed for a total score ranging from 0 to 27. We employed the common threshold of 15 (/27) to indicate moderately-severe-to-severe depression, which, as noted, we refer to as "severe" (Kroenke and Spitzer, 2002). We use this as our operationalization of

"depression." In our sample, 13% of individuals exhibited severe depressive symptoms. The survey also measured various control variables that we include in all analyses: party identification, political interest, age, education, income, ideology, election confidence, race/ethnicity, COVID-19 vaccination status (e.g., whether the respondent was vaccinated), support for political violence ever or now, frequency of discussing COVID-19, following political news, voting turnout, and gender. The appendix provides details on all question wordings.

Results

We evaluate our hypotheses with logit models that regress supporting an election denier on the key variables and controls. Table A.1 in the appendix presents the regression results. Below, we present the results with figures depicting the relevant relationships. We use *Clarify* (King et al., 2000) to transform the logit coefficients into probabilities of voting for a denying candidate, while setting other variables to their mean values.

Figure 1's top panel (from Table A.1, Model 1) reveals a moderate relationship between misperceptions and the likelihood of supporting an election denying candidate. As COVID-19 vaccine misperceptions increase from the minimum to the maximum values, the probability of supporting/voting for a denier increases by 10 percentage points (.16 to .26; $p<.01$). This suggests, as predicted by Hypothesis 1, that holding misperceptions (about COVID-19 vaccines) is associated with a significantly higher likelihood of supporting a candidate who questions the legitimacy of the government.

Figure 1's bottom panel (from Table A.1, Model 2) offers evidence supporting Hypothesis 2. Among respondents who do not suffer from severe depression, variations in misperceptions have some association with the likelihood of voting for deniers (a maximum 7-point increase in likelihood of voting for a denier; $p<.10$). However, among severely depressed

respondents, we find a far stronger relationship between misperceptions and vote choice: a more than threefold increase in the likelihood of supporting/voting for a denier (29 percentage points, from .13 to .42; $p<.01$). The difference in the magnitudes of the effects of misperceptions on the probability of voting for election deniers between those with and without severe depression is itself significant ($p<.05$). This vote model is robust to adding belief that Trump won in 2020 as an independent variable (see the Table A.2 in the appendix). In short, the presence of severe depression correlates with up to a 19-point increase in the likelihood of supporting a candidate for executive office (governor) who denies the legitimacy of what was, by all legal accounts, a sound election. This is certainly enough to swing a close election.

[Insert Figure 1 Here]

While we cannot make definitive causal statements about the relationships, we offer two re-assuring robustness checks, detailed in the appendix. First, a small sub-sample of respondents from states with deniers on the gubernatorial ballot were empaneled from a prior wave of the survey conducted in August/September 2022. Our results hold when we operationalize depression as the change from the prior wave to the present wave, suggesting depression preceded casting a vote. Second, we confirmed there is no evidence that the electoral realities of Republican candidates' underperforming affected Republicans' depression levels.

Effects By Partisanship

We next look for the same relationships for Republicans, Democrats, and independents separately (i.e., *within* each partisan group). This provides insight into the mechanism a la our prior discussion regarding partisan or anti-system perspectives. Among eligible voters in states with a denier on the ballot, the percentage voting for a denying candidate, by party, are: 4% for Democrats, 23% for independents, and 77% for Republicans.[2]

In Figure 2, we present analyses equivalent to Figure 1, but separately for each partisan group. We find a significant relationship between misperceptions and voting for a denier among Democrats and independents (respectively, Figure 2a, from Table A.1, Model 3; and Figure 2c, Table A.1, Model 7). Consistent with the earlier percentages, independents exhibit a higher likelihood of voting for a denying candidate, relative to Democrats. Interestingly, we do not find a significant relationship between misperceptions and voting for a denier among Republicans (Figure 2e, from Table A.1, Model 5). These results suggest that the connection between the COVID-19 misperceptions and voting for a denier does *not* simply stem from Republicans with misperceptions supporting Republicans. As mentioned, there may be an underlying anti-system belief coherence driving the relationship.

Yet, when we turn to Hypothesis 2, it is only statistically supported for Republicans (Figure 2f from Table A.1, Model 6). Republicans with neither misperceptions nor depression are surprisingly *more* likely to vote for a denier than their counterparts with depression (.64 versus .51). This relationship quickly flips as the number of misperceptions increases. By the maximum, those with severe depression exhibit a .85 probability of voting for a denier versus a .61 probability for those without depression: a statistically significant ($p<.01$) 24-percentage point difference. In contrast, the moderating role of depression among Democrats and independents is directionally as expected but not statistically significant. In both cases, there are notable increases in the likelihood of voting for a denying candidate among those severely depressed versus those not; at the maximum misperception point, there are respective 11 and 10 percentage point differences between those with and without severe depression (Figures 2b and 2d from Table A.1, Model 4 and Model 8). Yet, the confidence intervals for both groups are so large that the interaction falls short of significance and thus the evidence does not support Hypothesis 2.[3] This mix of results highlights the possible role of partisan belief systems such that

Republicans seeking control (due to depression) connect and act in a partisan consistent way. Regardless, the strong Republican results along with the directionally consistent findings for Democrats and independents suggest that future work exploring the relationship between mental health and democracy is worthwhile.

[Insert Figure 2 Here]

Discussion

Our results add to a robust literature on misperceptions and their consequences. We offer evidence that widely circulating misperceptions that appeal to common identities or dispositions link to one another. The findings raise as many, if not more, questions as they answer. First, we suggested the connecting mechanism could be either shared partisanship or an anti-system perspective. We lack the data to directly differentiate the two, and our analyses paint a mixed picture with Democrats and independents exhibiting clear evidence of the main misperception-denier link and Republicans exhibiting the depression moderation. Our study was a difficult test given extreme polarization (Finkel et al., 2020) and the reality that the partisan and anti-system inclinations substantially overlapped (i.e., both constructs were Republican and anti-system). More work is needed, including that which incorporates measures of anti-establishment beliefs and related psychological constructs, particularly those that relate to misperceptions generally (Douglas, 2021).

Second, we recognize our findings are limited to one case at one point in time using particular measures; as mentioned, we offer some data about causal sequence (in the appendix), but we cannot definitively offer a casual conclusion. Indeed, the beliefs we study are endogenous to contemporary politics and partisan rhetoric. The relative role of elite (partisan and/or anti-system) signaling and psychological inclinations (for misperceptions) remains unclear. It also is

important to extend analyses to other countries, as election denial is far from a U.S.-only phenomenon (e.g., Marie Le Pen in the 2022 French presidential election, Jair Bolsonaro in the 2022 Brazilian presidential election). Third, we opted for a clinically used measure of depressive symptoms (Kocalevent et al., 2013). Future work would benefit from more exploration of its use in survey settings as well as the role of related psychological variables (e.g., loneliness) that could serve as moderators.

Our results also add to a recent stream of findings about how depression can have negative political consequences. This includes reducing the probability of voting by diminishing political motivation and physical energy (Landwehr and Ojeda, 2021), unfairly penalizing candidates who reveal depressive symptoms (Loewen and Rheault, 2021), leading directly to misperceptions (Green et al., 2022), and exacerbating (moderated) support for political violence (Baum et al., 2023). Insofar as low participation, voting based on tangential criteria, misperceptions, violence, and now – as we show – possibly supporting candidates who deny the legitimacy of elections, each contributes to backsliding, a country suffering from poor mental health may find itself confronting poor political health.

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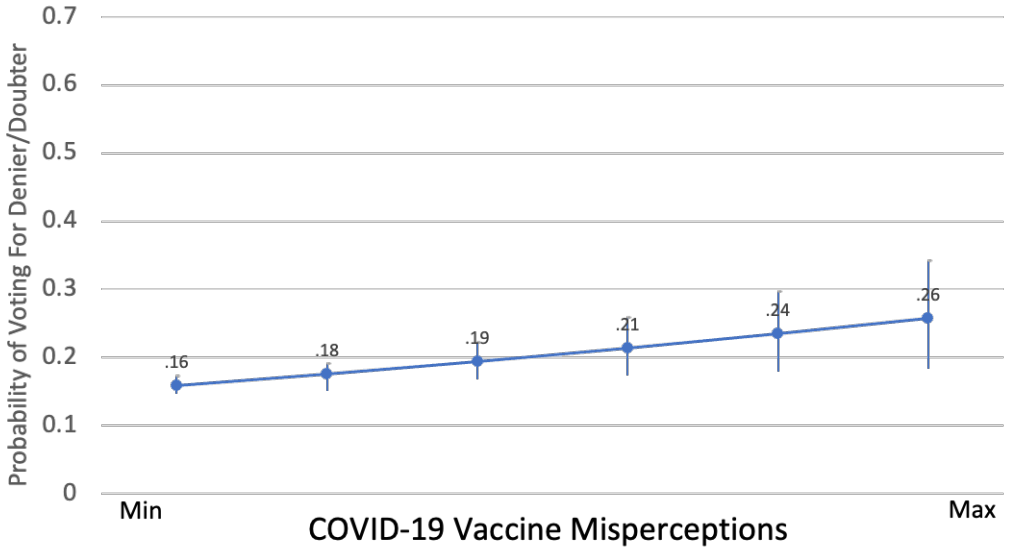
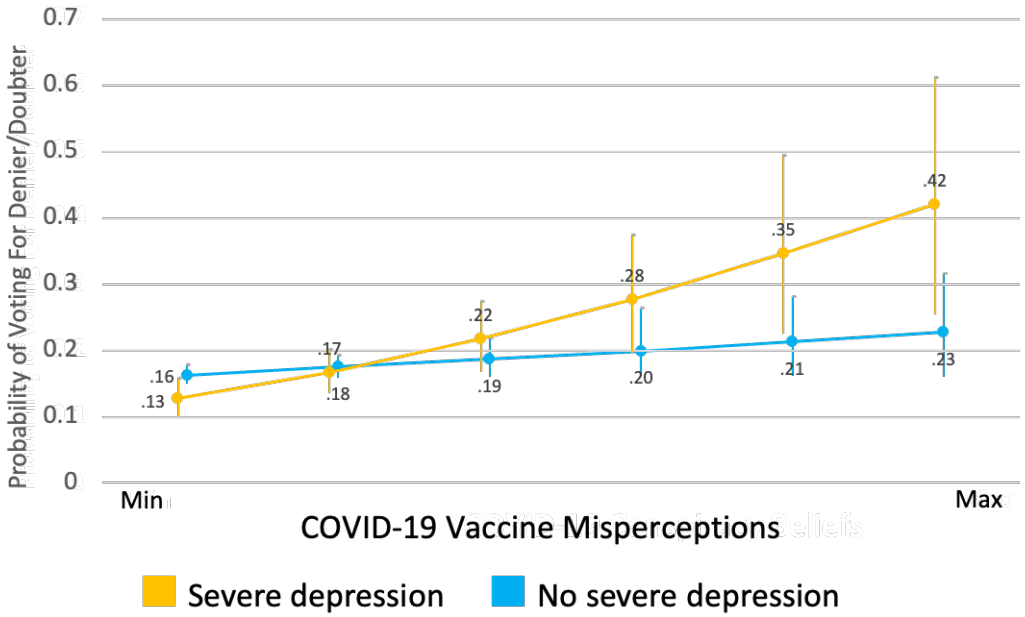
FIGURE 1. Relationship between COVID-19 vaccine misperceptions, depression, and voting for an election denier/doubter gubernatorial candidate

(1a) Overall relationship with voting for an election denier/doubter

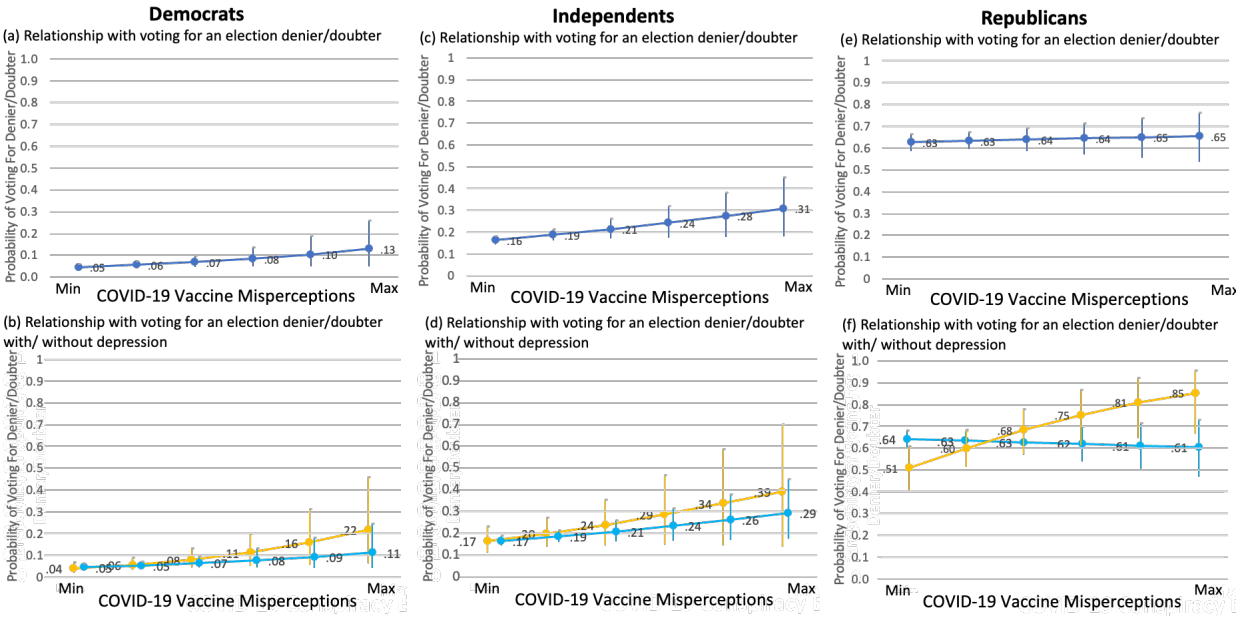


(1b) Relationship with voting for an election denier/doubter with/without severe depression



The x-axes are normalized from 0 to 1, with .2 increments.

FIGURE 2. Relationship between COVID-19 vaccine misperceptions, depression, and voting for an election denier/doubter gubernatorial candidate, by party



Appendix

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Sample

Our weighted (full) sample included 51.7% women, and 48.3% men; 64.9% White, 12.4% Black or African American, 5.9% Asian American, and 15.7% Hispanic or Latino; 26.4% 20-34 years old, 32.9% 35 to 54 years old, 29.3% 55 to 74 years old, and 11.4% 75 years old or older; and 6.7% some high school or less, 27.9% high school graduate, 26.1% some college, 24.6% college degree, and 14.7% graduate degree. The respective percentages from the 2021 American Community Survey (ACS) are 50.5%, and 49.5%; 68.2%, 12.6%, 5.7%, and 18.4%; 27.1%, 34.1%, 30.2%, and 8.6%; 11.1%, 26.5%, 20.0%, 29.3%, and 13.1%. (The education data are for individuals 25 years old or older.) Across categories, the sample matches the ACS benchmarks fairly well. The largest discrepancies are that the sample includes more older people (and fewer middle-aged people) and fewer without a high school degree (and more with some college). These are well-known limitations of any survey sampling procedure, not just ours. Most notably, the least-educated are less likely to be online. There also are ostensibly fewer Hispanic or Latino people but that likely reflects the question we report here does not have a distinct item that asked about being Hispanic or Latino (i.e., it is one category for the overall question whereas for the ACS, it is a separate question).

Question Wording

Outcome Variable: Voting/Supporting a Denier/Doubter for Governor

Do you plan to vote in the 2022 election for Governor of [State]?
Yes, I already voted (1)
Yes, I plan to vote (2)
No, I do not plan to vote (3)
No, I am voting in another state (4)
No, I am not eligible to vote (5)

Which candidate for Governor from [State] do you support?
--Response options included every candidate in the respondent's state (including the options "another candidate" and "I do not support any candidate." Thus, there were 36 unique versions of this for each state with a gubernatorial election. The following is an example from Alabama.

Which candidate for Governor from Alabama do you support?
Kay Ivey (Republican) (1)
Yolanda Flowers (Democrat) (2)

James Blake (Libertarian) (3)
Jared Budlong (Independent) (4)
Another candidate (99)
I do not support any candidate (100)
--Among respondents who indicated that they supported or had voted for a gubernatorial candidate, in a state that had a denier/doubter on the ballot, per the PBS designations, and given that the respondent was eligible to vote, we recoded responses so that 0 = did not vote for an election denier/doubter for governor; 1 = voted for an election denier/doubter for governor. We excluded respondents who indicated that they were ineligible to vote in 2022 or who resided in a state without a denier/doubter on the ballot.

COVID-19 Vaccine Misperceptions

Below are some statements about the COVID-19 vaccines that are currently being distributed. To the best of your knowledge, are those statements accurate or inaccurate?

1. The COVID-19 vaccines will alter people's DNA.
2. The COVID-19 vaccines contain microchips that could track people.
3. The COVID-19 vaccines contain the lung tissue of aborted fetuses.
4. The COVID-19 vaccines can cause infertility, making it more difficult to get pregnant.
5. The COVID-19 vaccines contain a bioluminescent marker used to trace people

--Respondents were given one point for each false claim they classified as accurate. The answers were then summed and normalized to a 0-1 interval, where 0 indicates that the respondent did not believe any of the false claims and 1 indicates that a respondent believed all five false claims were accurate.

Depressive Symptoms

Over the last <u>two weeks</u>, how often have you been bothered by the following problems?

- Little interest or pleasure in doing things
- Feeling down, depressed, or hopeless
- Trouble falling or staying asleep, or sleeping too much
- Feeling tired or having little energy
- Poor appetite or overeating
- Feeling bad about yourself - or that you are a failure or have let yourself or your family down
- Trouble concentrating on things, such as reading the newspaper or watching television
- Moving or speaking so slowly that other people could have noticed -- or so fidgety or restless that you have been moving a lot more than usual
- Thoughts that you would be better off dead, or thoughts of hurting yourself in some way
    - Not at all (0)
    - Several days (1)
    - More than half the days (2)
    - Nearly every day (3)

--Each of nine items was summed for a total score ranging from 0 to 27. We employed the common threshold of 15 (/27) to indicate moderately-severe-to-severe depression (Kroenke and Spitzer 2002).

Demographic Variables

Raw household income as provided by vendor.
--*Numeric value of income.*

Gender as provided by vendor (M/F only)
Female = Female
Male = Male
--*Re-coded so that 0 = not Male and 1 = Male.*

Race as provided by vendor (select one, 5 categories)
Black/African American
Asian American
Hispanic
White
Other
--*Re-coded so there are binary indicators (0/1) for Black, Asian American, and Hispanic.*

Education level
Some High School or Less (1)
High School Graduate (2)
Some College (3)
College Degree (4)
Graduate Degree (5)
--*Numeric value as captured by scale values above.*

What is your current age?
--*Numeric value of age.*

Political Variables

Generally speaking, do you think of yourself as a...
Republican (1)
Democrat (2)
Independent (3)
Other (4)
--*Re-coded so there are binary indicators (0/1) for Republican, Democrat, and Independent.*

In general, do you think of yourself as...
Extremely liberal (1)
Liberal (2)
Slightly liberal (3)
Moderate, middle of the road (4)
Slightly conservative (5)
Conservative (6)
Extremely conservative (7)
--*Numeric value as captured by scale values above.*

In general, how interested are you in US politics and government?
Extremely interested (5)
Very interested (4)
Somewhat interested (3)
Not very interested (2)
Not at all interested (1)
--*Numeric value as captured by scale values above.*

How closely do you follow news and information about politics and current affairs?
Very closely (4)
Somewhat closely (3)
Not very closely (2)
Not closely at all (1)
--*Numeric value as captured by scale values above.*

How confident are you in the fairness of the 2020 presidential election?
Very confident (4)
Mostly confident (3)
Not very confident (2)
Not at all confident (1)
--*Numeric value as captured by scale values above.*

Is it justifiable to engage in violent protest against the government right now?
Definitely yes (1)
Probably yes (2)
Probably not (3)
Definitely not (4)
--*Numeric value as captured by scale values above.*

Is it ever justifiable to engage in violent protest against the government?
Definitely yes (1)
Probably yes (2)
Probably not (3)
Definitely no (4)
--*Numeric value as captured by scale values above.*

The voting in 2022 in the state variable requires an affirmative answer (voted or plan to vote) to one of the following three questions.
Do you plan to vote in the 2022 election for Senate in [State]?
Yes, I already voted (1)
Yes, I plan to vote (2)
No, I do not plan to vote (3)
No, I am voting in another state (4)
No, I am not eligible to vote (5)

Do you plan to vote in the 2022 election for Governor of [State]?
Yes, I already voted (1)
Yes, I plan to vote (2)
No, I do not plan to vote (3)
No, I am voting in another state (4)
No, I am not eligible to vote (5)

Do you plan to vote in the 2022 election for the House of Representatives?
Yes, I already voted (1)
Yes, I plan to vote (2)
No, I do not plan to vote (3)
No, I am not eligible to vote (4)

Trump Won 2020 Election

How much do you agree or disagree with the following statement: "If votes were fairly counted, Donald Trump would have won the 2020 election"?
Strongly agree (5)
Somewhat agree (4)
Neither agree nor disagree (3)
Somewhat disagree (2)
Strongly disagree (1)
--Numeric value as captured by scale values above.

COVID-19 Variables

Have you received a COVID-19 vaccine?
No (1)
Yes, one dose (2)
Yes, two doses (3)
Yes, three doses (4)
Yes, four or more doses (5)
--Numeric value as captured by scale values above. This is the COVID-19 Vaccinated (or vaccination status) variable.

How often do you talk to people about COVID-19, either in person, over the phone, or electronically?

A few times a day (6)
Daily (5)
A few times a week (4)
Once a week (3)
Less than once a week (2)
Never (1)
--*Numeric value as captured by scale values above.*

TABLE A.1. Probability of Voting for an Election Denier or Doubter among Eligible Voters in States with Deniers/Doubters on Gubernatorial Ballot*

	All Respondents		Democrats		Republicans		Independents	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES								
Severe Depression	-0.144	-0.301*	0.00685	-0.182	-0.270	-0.541*	0.0319	-0.0167
	(0.126)	(0.146)	(0.270)	(0.333)	(0.186)	(0.211)	(0.204)	(0.228)
Misperceptions	0.600**	0.390^	1.080*	0.882	0.126	-0.156	0.820*	0.741^
	(0.213)	(0.232)	(0.511)	(0.584)	(0.271)	(0.283)	(0.351)	(0.379)
Severe Depression x Misperceptions		1.226*		0.948		1.988**		0.453
		(0.477)		(0.894)		(0.737)		(0.838)
Democrat	-1.009***	-1.018***						
	(0.206)	(0.206)						
Republican	2.322***	2.313***						
	(0.181)	(0.181)						
Independent	0.526**	0.519**						
	(0.178)	(0.177)						
Political Interest	0.213***	0.211***	0.112	0.111	0.176*	0.173*	0.282***	0.281***
	(0.0502)	(0.0500)	(0.143)	(0.143)	(0.0789)	(0.0783)	(0.0796)	(0.0793)
Age	0.0136***	0.0135***	0.0172*	0.0172*	0.00809*	0.00813*	0.0173***	0.0173***
	(0.00266)	(0.00267)	(0.00779)	(0.00782)	(0.00399)	(0.00400)	(0.00420)	(0.00420)
Education	-0.0154	-0.0173	-0.173	-0.180^	-0.0102	-0.0122	0.0373	0.0368
	(0.0404)	(0.0404)	(0.106)	(0.106)	(0.0609)	(0.0609)	(0.0629)	(0.0629)
Income	1.15e-06	1.15e-06	2.46e-06	2.50e-06	3.60e-07	3.49e-07	8.25e-07	8.34e-07
	(7.19e-07)	(7.21e-07)	(1.76e-06)	(1.81e-06)	(9.09e-07)	(9.02e-07)	(9.16e-07)	(9.15e-07)
Ideology	0.404***	0.407***	0.299***	0.302***	0.284***	0.290***	0.570***	0.572***
	(0.0323)	(0.0324)	(0.0817)	(0.0823)	(0.0493)	(0.0495)	(0.0563)	(0.0564)
Election Confidence	-0.500***	-0.504***	-0.667***	-0.675***	-0.335***	-0.338***	-0.589***	-0.591***
	(0.0433)	(0.0433)	(0.135)	(0.137)	(0.0616)	(0.0613)	(0.0702)	(0.0701)
Black	-0.465*	-0.470*	0.190	0.161	0.0238	-0.00901	-1.024**	-1.020**
	(0.206)	(0.204)	(0.609)	(0.600)	(0.448)	(0.451)	(0.333)	(0.332)
White	-0.0609	-0.0685	0.370	0.347	-0.00510	-0.0503	-0.0453	-0.0425
	(0.175)	(0.173)	(0.595)	(0.588)	(0.383)	(0.387)	(0.256)	(0.254)
Asian American	0.0148	0.0182	1.108^	1.082^	-0.306	-0.332	0.0154	0.0237
	(0.238)	(0.236)	(0.656)	(0.651)	(0.458)	(0.461)	(0.347)	(0.345)
Hispanic	-0.277	-0.274	0.357	0.336	-0.184	-0.216	-0.488	-0.480
	(0.206)	(0.204)	(0.622)	(0.616)	(0.429)	(0.432)	(0.312)	(0.311)
COVID-19 Vaccinated	-0.124***	-0.128***	-0.236**	-0.238**	-0.0983*	-0.105*	-0.104*	-0.105*
	(0.0319)	(0.0319)	(0.0813)	(0.0813)	(0.0487)	(0.0489)	(0.0510)	(0.0509)
Violence Ever Justified	0.0844	0.0827	-0.435	-0.449	0.00868	7.21e-05	0.295	0.297
	(0.124)	(0.124)	(0.342)	(0.347)	(0.206)	(0.206)	(0.192)	(0.192)
Violence Justified Now	-0.139	-0.152	0.586	0.594	-0.109	-0.130	-0.368	-0.372
	(0.166)	(0.166)	(0.381)	(0.385)	(0.263)	(0.262)	(0.256)	(0.255)
Discuss COVID-19	-0.111***	-0.114***	-0.0623	-0.0655	-0.116*	-0.118*	-0.118*	-0.119*

	(0.0330)	(0.0331)	(0.0862)	(0.0870)	(0.0499)	(0.0501)	(0.0563)	(0.0561)
Follow Political News	0.0669	0.0685	-0.199	-0.196	0.108	0.107	0.129	0.130
	(0.0620)	(0.0618)	(0.158)	(0.158)	(0.0918)	(0.0912)	(0.100)	(0.0998)
Voted in 2022	1.433***	1.434***	1.087**	1.097**	1.464***	1.464***	1.344***	1.346***
	(0.125)	(0.124)	(0.408)	(0.406)	(0.165)	(0.165)	(0.203)	(0.203)
Male	0.346***	0.346***	0.533*	0.532*	0.265*	0.274*	0.262*	0.259*
	(0.0777)	(0.0777)	(0.213)	(0.213)	(0.118)	(0.119)	(0.125)	(0.126)
Constant	-4.142***	-4.087***	-3.130***	-3.042***	-1.379**	-1.300*	-4.703***	-4.693***
	(0.306)	(0.306)	(0.783)	(0.780)	(0.522)	(0.527)	(0.449)	(0.448)
Observations	11,517	11,517	4,584	4,584	3,150	3,150	3,243	3,243
Robust standard errors in parentheses								
*** p<0.001, ** p<0.01, * p<0.05, ^ p<0.10								

*The quantities of interest are not the coefficients themselves, but the first differences in predicted probabilities or expected values on the outcome variables as the key causal variables (here, depression and COVID-19 misperceptions) vary in combination (see Tomz et al., 2003, p. 19). This is what is displayed in the Figures, revealing clear significance.

Table A.2. Robustness Test adding belief that "Trump Won in 2020" as Control Variable

Severe Depression	-0.275^
	(0.148)
Misperceptions	0.0841
	(0.242)
Severe Depression x Misperceptions	1.095*
	(0.469)
Democrat	-1.049***
	(0.207)
Republican	2.155***
	(0.182)
Independent	0.480**
	(0.178)
Political Interest	0.190***
	(0.0503)
Age	0.0133***
	(0.00269)
Education	-0.0136
	(0.0405)
Income	1.32e-06^
	(7.01e-07)
Ideology	0.397***
	(0.0325)
Election Confidence	-0.373***
	(0.0467)
Black	-0.410*
	(0.202)
White	-0.0564
	(0.172)
Asian American	0.0394
	(0.236)
Hispanic	-0.246
	(0.205)
COVID-19 Vaccinated	-0.114***
	(0.0321)
Violence Ever Justified	0.0800
	(0.126)
Violence Justified Now	-0.230

	(0.169)
Discuss COVID-19	-0.119***
	(0.0333)
Follow Political News	0.0536
	(0.0620)
Voted in 2022	1.396***
	(0.125)
Male	0.349***
	(0.0785)
Trump Won in 2020	0.713***
	(0.0983)
Constant	-4.445***
	(0.305)
Observations	11,510

Robust standard errors in parentheses

*** p<0.001, ** p<0.01, * p<0.05, ^ p<0.10

Panel Data Analysis

One concern with any cross-sectional analysis is the difficulty of establishing the direction of causality between the dependent and independent variables, as well as the possible relationships between causal variables (e.g., partisan preferences and depression). Our data do not allow us to definitively address either problem. However, we are able to offer suggestive evidence concerning the direction of causality and the relationship between depression and other causal variables. A relatively small (N=1,848) subset of our respondents who were both eligible to vote and resided in a state with a denier or doubter on the ballot participated in both our August/September 2022 and October/November 2022 survey waves. For these respondents, we replicated our primary models, using, for our depression indicator, the *change* in the propensity to have moderately-severe-to-severe depression from August/September to October/November. This measure thus divides respondents into three categories: people who were not severely depressed in August/September but *were* severely depressed in October/November, people whose depression status did not change, and people who were severely depressed in August/September but were not severely depressed in October/November. For this analysis, all other causal variables, including COVID-19 vaccine misperceptions, are taken from the August/September wave. (One of the COVID-19 vaccine misperceptions questions, concerning bioluminescent markers in the vaccine, from the October/November survey was not available in the August/September survey. Consequently, our misperceptions scale for this wave includes only the four false vaccine claims that were available in both survey waves.) The outcome variable, of course, is drawn from the election wave (October/November). The much-reduced N in our panel precludes separate analyses of partisan subgroups (in effect a 3-way interaction, which greatly reduces the number of severely depressed respondents within subgroup models). Hence, we limit this analysis to the main effects of depression and COVID-19 vaccine misperceptions on the propensity to vote for a denier/doubter. Table A.3 presents our results, which we then graphically illustrate in Figure A.1.

TABLE A.3. Panel Analysis of Probability of Voting for an Election Denier or Doubter among Eligible Voters in States with Deniers/Doubters on Gubernatorial Ballot, Using *Change* in Moderately-Severe-to-Severe Depression from Aug/Sep ’22 to Oct/Nov ’22

	(1)	(2)
Change in Severe Depression (from Aug/Sep to Oct/Nov ’22)	0.327	0.131
	(0.301)	(0.327)
Misperceptions (Aug/Sep '22)	1.484**	1.353*
	(0.548)	(0.535)
Change in Severe Depression x Misperceptions (Aug/Sep '22)		2.411**
		(0.910)
Democrat (Aug/Sep '22)	-1.543**	-1.456*
	(0.594)	(0.608)
Republican (Aug/Sep '22)	2.244***	2.345***
	(0.530)	(0.548)
Independent (Aug/Sep '22)	0.490	0.583
	(0.530)	(0.549)

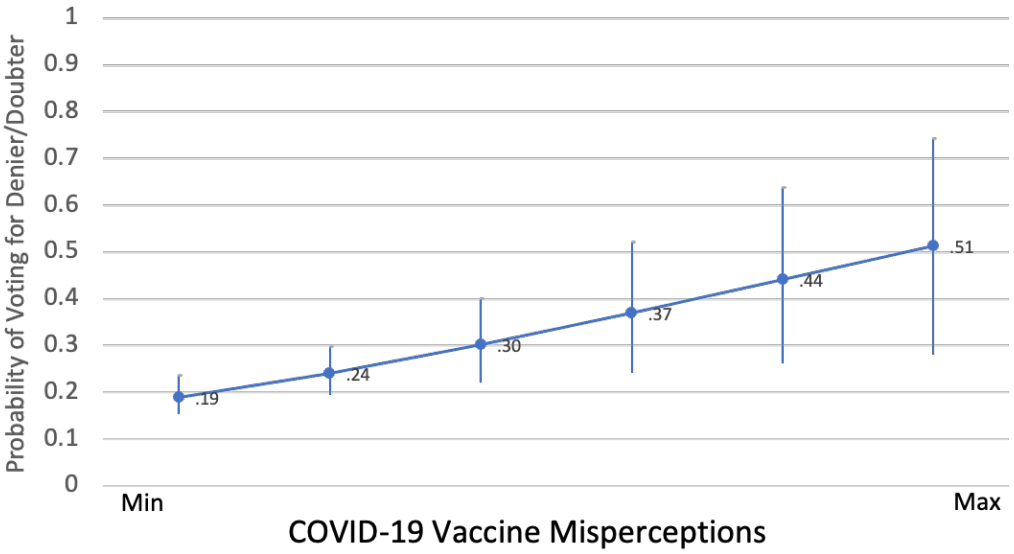
Political Interest (Aug/Sep '22)	0.143	0.158
	(0.141)	(0.141)
Age (Aug/Sep '22)	0.00761	0.00785
	(0.00675)	(0.00674)
Education (Aug/Sep '22)	-0.163^	-0.158^
	(0.0918)	(0.0923)
Income (Aug/Sep '22)	2.85e-06*	2.83e-06*
	(1.30e-06)	(1.31e-06)
Ideology (Aug/Sep '22)	0.512***	0.509***
	(0.0818)	(0.0821)
Black (Aug/Sep '22)	-1.485*	-1.548*
	(0.678)	(0.684)
White (Aug/Sep '22)	-0.764	-0.804
	(0.598)	(0.606)
Asian (Aug/Sep '22)	-0.663	-0.697
	(0.724)	(0.734)
Hispanic (Aug/Sep '22)	-0.708	-0.738
	(0.497)	(0.496)
COVID Vaccinated (Aug/Sep '22)	0.00234	0.0112
	(0.192)	(0.193)
Violence Ever Justified (Aug/Sep '22)	0.159	0.151
	(0.130)	(0.131)
Violence Justified Now (Aug/Sep '22)	-0.389*	-0.371*
	(0.170)	(0.174)
Discuss COVID (Aug/Sep '22)	-0.365***	-0.369***
	(0.0835)	(0.0837)
Follow Political News (Aug/Sep '22)	0.278	0.266
	(0.176)	(0.176)
Election Confidence (Aug/Sep '22)	0.518***	0.523***
	(0.107)	(0.107)
Voted in 2022 (Aug/Sep '22)	-0.388***	-0.388***
	(0.101)	(0.102)
Male (Aug/Sep '22)	0.506**	0.503**
	(0.182)	(0.182)
Constant	-2.948**	-3.082**
	(1.119)	(1.131)
Observations	1,848	1,848

Robust standard errors in parentheses

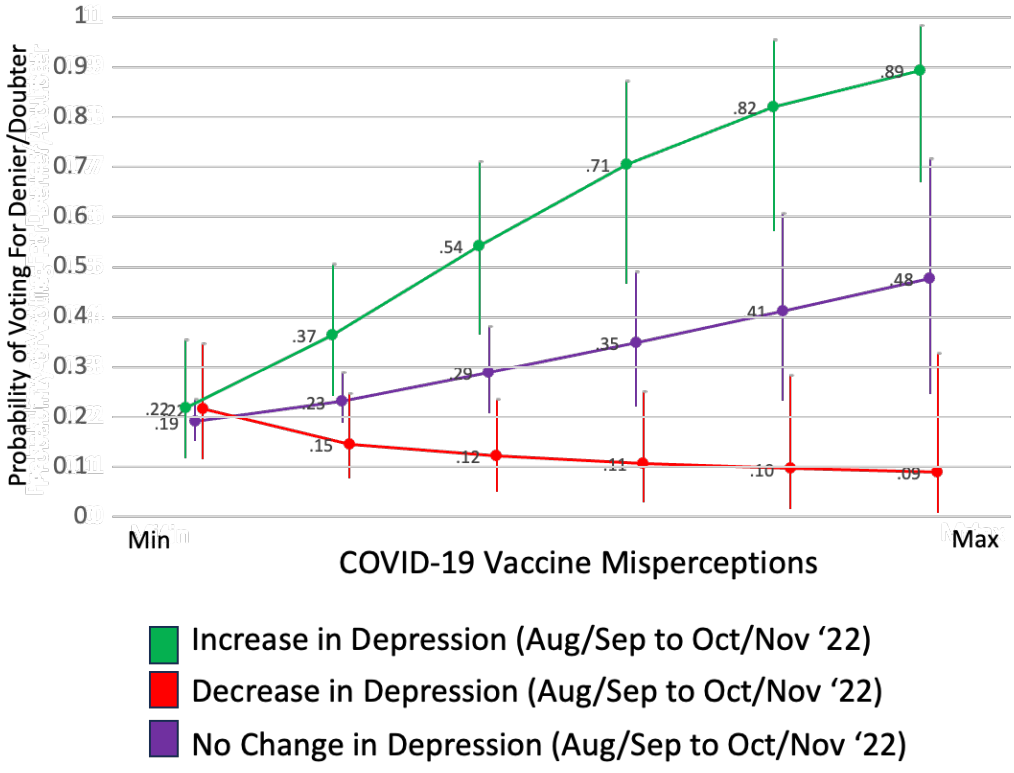
*** p<0.001, ** p<0.01, * p<0.05, ^ p<0.10

FIGURE A.1. Relationship between COVID-19 vaccine misperceptions, change in depression (from Aug/Sep to Oct/Nov '22), and voting for an election denier/doubter gubernatorial candidate

(A1a) Overall relationship with voting for an election denier/doubter



(A1b) Relationship with voting for an election denier/doubter with more, less, or the same propensity to have severe depression



The results from this analysis replicate those from our primary investigations. As shown in the top graphic in Figure A.1, COVID-19 vaccine misperceptions have a strong positive relationship on the likelihood of voting for a denier or doubter when the data from the prior wave are used. As misperceptions increase from their minimum to maximum value, the probability of voting for a denier increases by 32 percentage points, from .19 to .51 ($p<.01$). This supports our first hypothesis. The bottom graphic in Figure A.1, in turn, tests our second hypothesis, this time interacting vaccine misperceptions with the change in the propensity to have severe depression from Aug/Sep 2022 to Oct/Nov 2022 – that is, the depression variable represents the change in severe depression from August/September to October/November, rather than the simple likelihood of having severe depression in the latter period. The results show that as misperceptions increase from their lowest to highest levels, given increased severe depression, the probability of voting for a denier increases by 67 points, from .22 to .89 ($p<.01$). The corresponding changes in the probabilities of voting for a denier or doubter, as misperceptions increase from their minimum to maximum values, are an increase of 29 points (from .19 to .48, $p<.05$) given no change in severe depression and a statistically insignificant *decrease* of 13 points (from .22 to .09) given a decline in severe depression. These results strongly support Hypothesis 2, and offer some suggestive evidence in support of our theorized direction of causality regarding the relationship between depression and voting.

Depression and Partisanship

To assess the possibility that our measure of depression is merely a capturing partisan responses to electoral outcomes (that is, the possibility that Republicans might have grown more depressed following the relatively poor showing of their party in the 2022 midterm elections, which under-performed prevailing expectations (Blake, 2022), we look at the correlations between depression and party, as well as levels of depression across parties and the changes in depression, by party, for a subset of panelists who participated in our survey and in a prior (August/September 2022) survey wave.

Beginning with the correlations between party and depression, the results show small, mostly negative correlations between party affiliation and having moderately-severe-to-severe depression, based on the PHQ9 scale in our October/November wave: about -.05 for Republicans, -.02 for Democrats, and .03 for independents.

Comparing overall levels of depression in this survey wave (again, using the PHQ9 scale), we see that Republicans are the *least* depressed group as a whole, with a (weighted) mean of 5.5. The corresponding PHQ9 means for Democrats and independents are 6.2 and 6.7, respectively.

Next, looking at the change in depression from August/September to October/November by party, both overall and among our repeat panelists, we find similar patterns of very small correlations. The correlations with having moderately-severe-to-severe depression, based on the PHQ9 scale, are near-zero for Republicans and Democrats, and .02 for independents. The overall change in PHQ-9 scores, and in the propensity to be severely depressed, across our repeat respondents are, in both instances, small decreases in depression: -.4 (on the 0-27 PHQ-9 scale) and -.003 (for change in the moderately-severe-to-severe depression), respectively.

Finally, the overall correlation between having moderately-severe-to-severe depression and the propensity to vote for a denier/doubter candidate is also small (-.06), as is the correlation between voting for a denier/doubter and the change in the propensity to have moderately-severe-to-severe depression among our subset of repeat panelists (about -.01). In short, there is no evidence of a partisan-depression confound.

Appendix References

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[1] This work focuses on conspiracy beliefs, but it should generalize to misperceptions, generally.

[2] Some suggestive evidence suggests that having a denier on the ballot may have somewhat suppressed Republican support for their party's candidates. In the eight states without a denier on the ballot, 83% of Republicans voted for their party's gubernatorial candidate, six percentage points higher than in the 28 states with denier on the ballot. This is consistent with the pattern described by Jacobson (2023) with respect to House candidates. That said, Bartels and Carnes (2023) report evidence that among House candidates, election denial was associated with neither better nor worse performance among Republicans in the general election. Since House districts are subject to partisan gerrymandering, which is unavailable in statewide gubernatorial candidates, it is difficult to draw direct comparisons between the electoral dynamics across these two sets of elections.

[3] The insignificance could partially reflect the reality that interactive effects require substantial statistical power to detect (Gelman, 2018) and here we are in essence looking at three-way interactions. The effect size among Republicans is so large that it reaches significance. Also, we cannot replicate the aforementioned panel robustness test on partisan subgroups as the sample sizes are too small.