Frames That Matter: Increasing the Willingness to Get the Covid-19 Vaccines

Appendix

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Table of Contents

Research Design

Survey experiments are a highly developed methodological approach. Following best practices, we took care to use existing survey question formulations and research to maximize comparability to the extant literature (ANES 2019; Boxell et al. 2020; Funk and Tyson 2020; Ipsos 2020; JHU Coronavirus Response Center 2021; KFF 2021; Ladd, Tucker and Kates 2018; NCHS 2020; OECD 2017; Pew 2014; Pew 2015). For example, several of our political variables come from the quadrennial American National Election Studies (2019) survey, and some of the health-related questions come from the Kaiser Family Foundation (2021). This said, we also used the opportunity to clarify and improve some questions as needed. An example here is the question from the KFF (2021), which asks whether the respondent has a major illness. Given its importance to the topic of Covid-19 vaccination, we added a clause about severe allergies here. In another example, as we discuss in the main text, a major improvement is the way in which we measure the "maybe"s in our dependent variable, *willingness*, by offering respondents a time frame that enquires when they intend to get vaccinated. For example, Pew has four response values: "Definitely get the vaccine", "Probably get the vaccine", "Probably NOT get the vaccine", and "Definitely NOT get the vaccine" (Funk and Tyson 2020). Gallup uses a binary measure of "yes" or "no" (Saad 2021). KFF has four response options: "Get the vaccine as soon as you can", "Wait until it has been available for a while to see how it is working for other people", "Only get the vaccine if you are required to do so for work, school, or other activities", and "Definitely not get the vaccine" (KFF 2021). In sum, we create a more nuanced and analytically useful temporalized dependent variable than extant studies offer.

The mechanics of the survey rely on several blocks of questions, with both the order of questions in each block and the response option order (high value to low value; low value to high value) fully randomized. The blocks are as follows: first experimental conditions, then quota (for representativeness) demographics, which are age, gender, race, and party affiliation, followed by non-demographic questions, and ending with the remaining demographic questions (i.e. those that are not a part of the representativeness quotas). To elaborate, the experimental conditions are randomized, such that each respondent opening the survey has an equal chance of receiving the control or one of the seven treatments. This is the first question that appears after the informed consent acknowledgement for reasons we detail in the main text. While demographic questions are usually held for the end of the survey per existing survey protocols, given the representativeness requirement of the sample, having some of the demographic questions in the second block ensures that the respondent does not finish the entire survey only to know their response is not logged because that category (again, age, gender, race, and party affiliation) had already met its quota. The third block of non-demographic questions engage subjects like trust in government, media consumption, vote choice in the 2020 presidential election, and confidence in institutions. The final block's questions focus on the remaining key demographics, such as income, educational attainment, and location (state and county).

Institutional Review Board Process

Due the nature of the survey, both as an experiment on live subjects and considering the real-world ramifications of manipulating vaccination willingness, we devoted considerable deliberation time to the ethics of the project. If survey instruments (such as the treatments) have

effects, which do not atrophy with time, that intervention could permanently change someone's perspective on the matter. With an issue as high stakes as vaccination, we determined the most cautious approach is to only test messages with an intended pro-vaccination direction. This is based on the historically important practice of vaccinations in preventing epidemics of the targeted disease. We also took care to not unnecessarily burden the respondents in terms of the questions asked and the length of the survey (estimated to be no longer than 12 minutes).

Second, we sought approval from [Institution Name Redacted for Review]'s Institutional Review Board. To complete this process, each of the authors received training and certification—if they did not already have it up-to-date—through the IRB. We also began the survey with an Informed Consent (IC) acknowledgment, which was a prerequisite for continuing with the survey (i.e., no respondent answered the survey without first providing consent). Preceding the consent question, we provided a brief introduction to the purpose of our survey and our institutional affiliations in order to ensure transparency per convention. Upon review of the survey, IRB approved the project in January.

Public Opinion Firm

As indicated in the main text, upon IRB approval, we contracted with Qualtrics to conduct the survey. We selected this firm due to their ability to ensure a nationally representative sample by group on our criteria (i.e., race, gender, age, and party affiliation). Although the researchers did not directly compensate participants, Qualtrics uses incentives in-house to recruit its panelists. Qualtrics fielded the survey between February 9th and 14th, 2021. Our analysis in the main text is conducted on the resulting yield of 1,642 completed surveys. One of the requirements we had for Qualtrics was to eliminate respondents that answered the survey in less than half of the median response time, removing any entries completed under 3 minutes. Our pre-survey testing suggested that this would be the minimum reasonable time for someone to read and answer the questions of our survey properly, especially given we took care to design a survey that was relatively short. In particular, we wanted to make sure "speedsters" were attentive enough to receive a potential treatment effect. We also recorded the time the respondents took to answer the survey.

Demographic Balance in Experimental Groups

As already noted, our sample of respondents were representative in terms of gender, race, partisan affiliation, and age. There are theoretical and practical considerations for focusing on these four dimensions. For example, the inclusion of age is explained by the vulnerability of older populations to Covid-19 (Liu et al. 2020), consequent group prioritization in vaccination rollout, and positive relationship with vaccination sentiment (Funk and Tyson 2020; KFF 2021).

Further, existing studies find a gender gap in vaccine hesitancy (NPR 2021; Mahdawi 2020). Explanations for this hesitancy include worry about side effects, changes in the media ecosystem, and distrust toward corporations (Mahdawi 2020). An additional explanation is that women are more oriented toward intuitionist approaches to forming opinions, in part, because of a greater empathy and sensitivity to personal distress (Oliver and Wood 2018, 72-73). While mass death in society should ostensibly cue women to become more pro-vaccination, if one

narrows the scope to taking care of one's own family, considerations of personal well-being may offset the valuation of collective good.

Since people of color experience greater rates of mortality from Covid-19 (Artiga, Bradley and Pham 2020), one may expect community members to functionally have the highest levels of willingness to get vaccination. However, polling to date actually shows ethnic minorities—especially African-Americans—have a *decreased* propensity to voice pro-vaccination stances on public opinion surveys. Unfortunately, this makes sense, as the main text notes years of negative experiences with the state and medical community. Even if these practices have ceased—which is not a foregone proposition—the unique collective consciousness of the Black public suggests historical legacies will continue to inform individual decision-making behavior (Dawson 1994). Here, that could mean decreased willingness to get vaccinated, even if the vaccines are safe, effective, and will decrease disproportionate suffering in communities of color.

Recent work also associates vaccine hesitancy with party affiliation, with Republicans displaying a lower tendency to be vaccinated. Part of Republican hesitancy to get vaccinated could be a product of Trump's cultivation of conspiratorial thinking (Oliver and Wood 2018, 123) in a two-way communication channel of aligning with mobilized base voters (Jacobson 2019). This hesitancy may also fit larger dynamics of partisan identifiers adopting a social identity (Green, Palmquist and Schickler 2000) that is emotional and symbolic in form. This partisanship politicizes a formerly non-partisan issue (Lee 2009) and makes it part of a larger culture war (Hunter 1991; Barker and Carmen 2012). This in-group and out-group dynamic motivates groups' focus on negating the agenda of the despised and distrusted out-group (Huddy, Mason and Aarøe 2015; Abramowitz and Webster 2018). Recent scholarship has emphasized the degree to which intuitionist thinkers—people who follow gut reactions and emotions—as opposed to reason-based thinkers, have recently sorted into the Republican Party (Oliver and Wood 2018, 85, 173, 193). This form of thinking also correlates with anti-vaccination sentiment (104), although a key caveat here is that anti-vaccination sentiment has a foothold in the fringes of both parties (112), suggesting Democratic vaccination hesitancy also deserves attention. The ongoing hyper partisanship in American politics necessitated including the leaders of the two major parties, but there is suggestive evidence that positively constructed frames—regardless of the messenger—will motivate individuals across the political divide to hold greater pro-vaccination sentiment (Coppock Forthcoming).

For further details, the survey is available in its entirety in the next section.

Full Survey

Start of Block: Informed Consent

IC1 You have been invited to participate in a research study conducted by several professors from [Institution Name Redacted for Review]. The purpose of this study is to better understand American residents' political and public health views, and social and economic experiences. The survey will ask you some basic questions about yourself and your views on these topics. You were invited to participate because the study aims to understand the opinions of a large number of individuals about these important issues.

Anyone living in the United States aged 18 or over can participate in this study. If you agree to participate, you will be asked to complete a series of questions online. The survey will take about fifteen minutes. The survey questions are randomized.

The researchers have taken several steps to ensure that your answers will remain confidential and anonymous. Your name and email address will not be linked to the data in the study or be available to the researchers. You will not be identifiable to the researchers.

You will be given an incentive payment for your participation in this study, paid by the survey firm panel provider.

Participation in this study is entirely voluntary. If you decide at any time that you do not want to participate further in the study, you are free to stop filling out the questions to cancel your participation without penalty.

If you have any questions about the study, you may email the researchers at [Author Name Redacted for Review]. This research has been reviewed and approved by [Institution Name Redacted for Review]'s Institutional Review Board.

Your participation will help increase knowledge of American public opinion regarding political, economic, and health issues.

Do you consent to participate in this survey?

- ○ I consent
- ○ I do not consent

Skip To: End of Block If You have been invited to participate in a research study conducted by several professors from... != I consent is Not Selected

End of Block: Informed Consent

Start of Block: Control

E0 As you know, the Covid-19 (coronavirus) pandemic is impacting the United States: about 24 million people have been infected with this virus, and over 400 thousand people have died from it. There are now highly effective Covid-19 vaccines. If access is not an issue, are you willing to get the coronavirus (Covid-19) vaccine?

- Yes, whenever available
- Maybe, but not immediately
- No, I am not willing

Display This Question:
If As you know, the Covid-19 (coronavirus) pandemic is impacting the United States: about 24 million... = Maybe, but not immediately

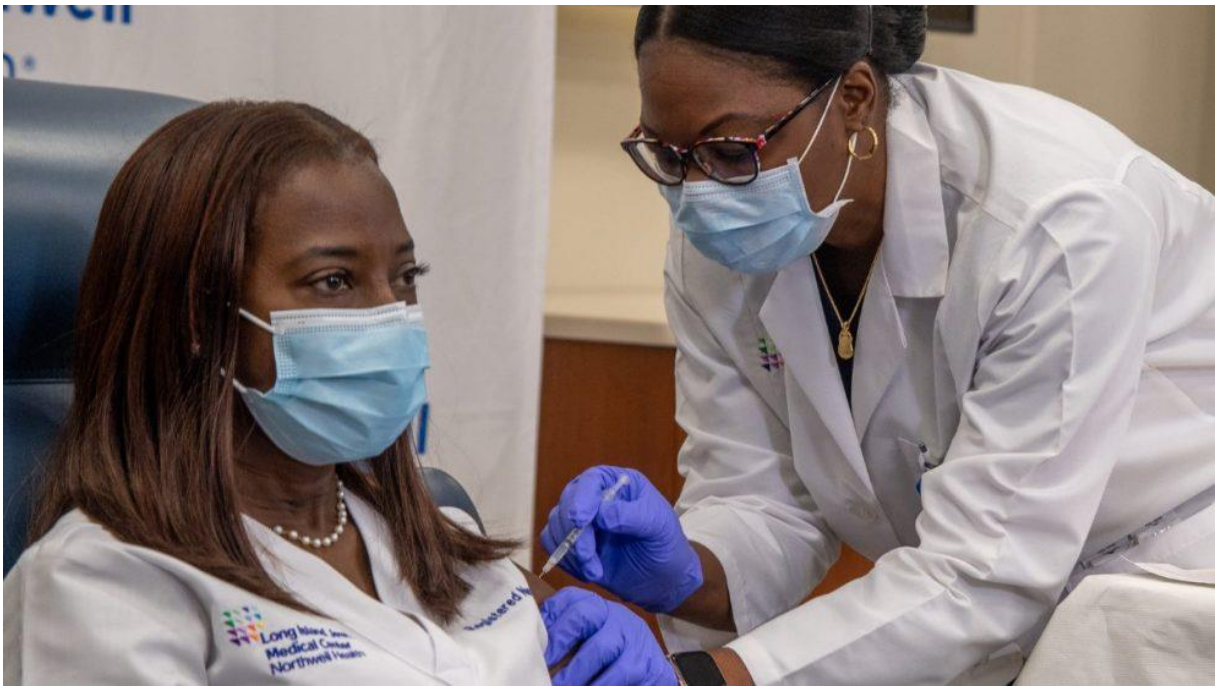
E0a Starting from today, when would you be most willing to get the coronavirus (Covid-19) vaccine?

- Within the month
- Between 1 and 3 months
- Over 3 months to 6 months
- Over 6 months to 1 year
- Over 1 year

End of Block: Control

Start of Block: Demonstration 1

E1 As you know, the Covid-19 (coronavirus) pandemic is impacting the United States: about 24 million people have been infected with this virus, and over 400 thousand people have died from it. There are now highly effective Covid-19 vaccines. The picture below shows a critical care nurse, Sandra Lindsay, receiving the vaccine in December 2020.



If access is not an issue, are you willing get the coronavirus (Covid-19) vaccine?

- ○ Yes, whenever available
- ○ Maybe, but not immediately
- ○ No, I am not willing

Display This Question:
If As you know, the Covid-19 (coronavirus) pandemic is impacting the United States: about 24 million... = Maybe, but not immediately

E1a Starting from today, when would you be most willing to get the coronavirus (Covid-19) vaccine?

- ○ Within the month
- ○ Between 1 and 3 months
- ○ Over 3 months to 6 months
- ○ Over 6 months to 1 year
- ○ Over 1 year

Page Break

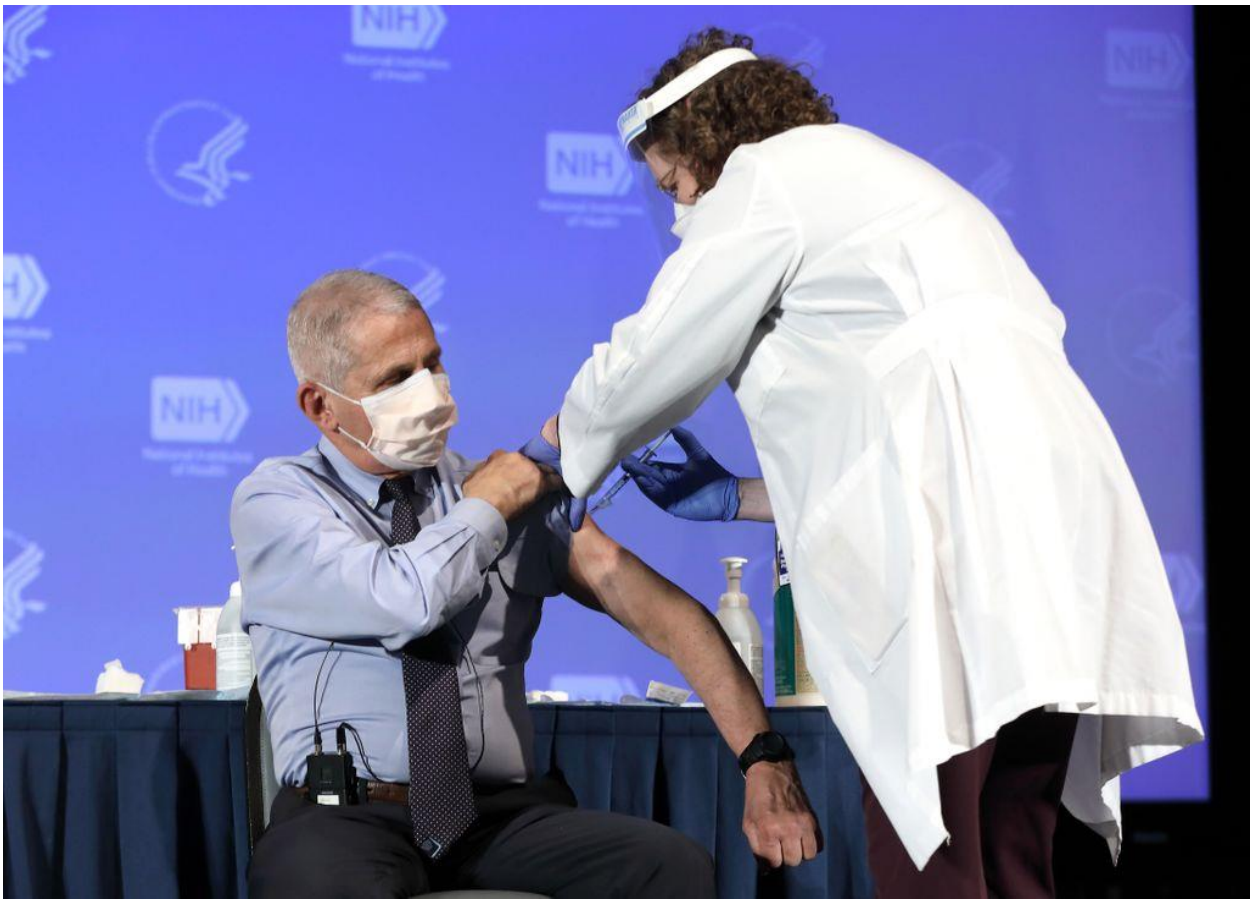
E1b Considering what you just read about Nurse Lindsay, how would you describe Nurse Lindsay's attitude toward the Covid-19 vaccine?

- ○ Nurse Lindsay approves of the vaccine
- ○ Nurse Lindsay disapproves of the vaccine
- ○ Cannot tell

End of Block: Demonstration 1

Start of Block: Demonstration 2

E2 As you know, the Covid-19 (coronavirus) pandemic is impacting the United States: about 24 million people have been infected with this virus, and over 400 thousand people have died from it. There are now highly effective Covid-19 vaccines. The picture below shows the Director of the National Institute of Allergy and Infectious Diseases, Dr. Anthony S. Fauci, receiving the vaccine in December 2020.



If access is not an issue, are you willing get the coronavirus (Covid-19) vaccine?

- ○ Yes, whenever available
- ○ Maybe, but not immediately
- ○ No, I am not willing

Display This Question:
If As you know, the Covid-19 (coronavirus) pandemic is impacting the United States: about 24 million... = Maybe, but not immediately

E2a Starting from today, when would you be most willing to get the coronavirus (Covid-19) vaccine?

- ○ Within the month
- ○ Between 1 and 3 months
- ○ Over 3 months to 6 months
- ○ Over 6 months to 1 year
- ○ Over 1 year

Page Break

E2b Considering what you just read about Dr. Fauci, how would you describe Dr. Fauci's attitude toward the Covid-19 vaccine?

- ○ Dr. Fauci approves of the vaccine
- ○ Dr. Fauci disapproves of the vaccine
- ○ Cannot tell

End of Block: Demonstration 2

Start of Block: Endorsement 1

E3 As you know, the Covid-19 (coronavirus) pandemic is impacting the United States: about 24 million people have been infected with this virus, and over 400 thousand people have died from it. There are now highly effective Covid-19 vaccines. The 46th President of the United States, Joseph R. Biden, has publicly endorsed getting vaccinated against Covid-19. If access is not an issue, are you willing get the coronavirus (Covid-19) vaccine?

- ○ Yes, whenever available
- ○ Maybe, but not immediately
- ○ No, I am not willing

Display This Question:
If As you know, the Covid-19 (coronavirus) pandemic is impacting the United States: about 24 million... = Maybe, but not immediately

E3a Starting from today, when would you be most willing to get the coronavirus (Covid-19) vaccine?

- ○ Within the month
- ○ Between 1 and 3 months
- ○ Over 3 months to 6 months
- ○ Over 6 months to 1 year
- ○ Over 1 year

Page Break

E3b Considering what you just read about 46th President Biden, how would you describe Biden's attitude toward the Covid-19 vaccine?

- ○ President Biden approves of the vaccine
- ○ President Biden disapproves of the vaccine
- ○ Cannot tell

End of Block: Endorsement 1

Start of Block: Endorsement 2

E4 As you know, the Covid-19 (coronavirus) pandemic is impacting the United States: about 24 million people have been infected with this virus, and over 400 thousand people have died from it. There are now highly effective Covid-19 vaccines. The 45th President of the United States, Donald J. Trump, has publicly endorsed getting vaccinated against Covid-19. If access is not an issue, are you willing get the coronavirus (Covid-19) vaccine?

- ○ Yes, whenever available
- ○ Maybe, but not immediately
- ○ No, I am not willing

Display This Question:
If As you know, the Covid-19 (coronavirus) pandemic is impacting the United States: about 24 million... = Maybe, but not immediately

E4a Starting from today, when would you be most willing to get the coronavirus (Covid-19) vaccine?

- Within the month
- Between 1 and 3 months
- Over 3 months to 6 months
- Over 6 months to 1 year
- Over 1 year

Page Break

E4b Considering what you just read about 45th President Trump, how would you describe Trump's attitude toward the Covid-19 vaccine?

- President Trump approves of the vaccine
- President Trump disapproves of the vaccine
- Cannot tell

End of Block: Endorsement 2

Start of Block: Endorsement 3

E5 As you know, the Covid-19 (coronavirus) pandemic is impacting the United States: about 24 million people have been infected with this virus, and over 400 thousand people have died from it. There are now highly effective Covid-19 vaccines. Director of the National Institute of Allergy and Infectious Diseases Dr. Anthony S. Fauci has publicly endorsed getting vaccinated against Covid-19. If access is not an issue, are you willing get the coronavirus (Covid-19) vaccine?

- Yes, whenever available
- Maybe, but not immediately
- No, I am not willing

Display This Question:
If As you know, the Covid-19 (coronavirus) pandemic is impacting the United States: about 24 million... = Maybe, but not immediately

E5a Starting from today, when would you be most willing to get the coronavirus (Covid-19) vaccine?

- ○ Within the month
- ○ Between 1 and 3 months
- ○ Over 3 months to 6 months
- ○ Over 6 months to 1 year
- ○ Over 1 year

Page Break

E5b Considering what you just read about Dr. Fauci, how would you describe Dr. Fauci's attitude toward the Covid-19 vaccine?

- ○ Dr. Fauci approves of the vaccine
- ○ Dr. Fauci disapproves of the vaccine
- ○ Cannot tell

End of Block: Endorsement 3

Start of Block: Approval Process

E6 As you know, the Covid-19 (coronavirus) pandemic is impacting the United States: about 24 million people have been infected with this virus, and over 400 thousand people have died from it. There are now highly effective Covid-19 vaccines. The Food and Drug Administration's (FDA) 23-member panel of medical experts including physicians, statisticians, chemists, pharmacologists and other scientists—which evaluates new vaccines before they are released to the public—recently approved Covid-19 vaccines for public use. If access is not an issue, are you willing get the coronavirus (Covid-19) vaccine?

- ○ Yes, whenever available
- ○ Maybe, but not immediately
- ○ No, I am not willing

Display This Question:
If As you know, the Covid-19 (coronavirus) pandemic is impacting the United States: about 24 million... = Maybe, but not immediately

E6a Starting from today, when would you be most willing to get the coronavirus (Covid-19) vaccine?

- ○ Within the month
- ○ Between 1 and 3 months
- ○ Over 3 months to 6 months
- ○ Over 6 months to 1 year
- ○ Over 1 year

Page Break

E6b Considering what you just read about the FDA, how would you describe the FDA's attitude toward the Covid-19 vaccine?

- ○ FDA approves of the vaccine
- ○ FDA disapproves of the vaccine
- ○ Cannot tell

End of Block: Approval Process

Start of Block: Economy

E7 As you know, the Covid-19 (coronavirus) pandemic is impacting the United States: about 24 million people have been infected with this virus, and over 400 thousand people have died from it. There are now highly effective Covid-19 vaccines. The negative economic impact of the pandemic is similar to the worst recessions this country has experienced—widespread unemployment, business closures, and food and housing insecurity. If access is not an issue, are you willing to get the coronavirus (Covid-19) vaccine?

- ○ Yes, whenever available
- ○ Maybe, but not immediately
- ○ No, I am not willing

Display This Question:
If As you know, the Covid-19 (coronavirus) pandemic is impacting the United States: about 24 million... = Maybe, but not immediately

E7a Starting from today, when would you be most willing to get the coronavirus (Covid-19) vaccine?

- Within the month
- Between 1 and 3 months
- Over 3 months to 6 months
- Over 6 months to 1 year
- Over 1 year

Page Break

E7b Considering what you just read about the U.S. economy, how would you describe Covid-19's impact on the economy?

- Covid-19 has negatively affected the U.S. economy
- Covid-19 has not affected the U.S. economy
- Cannot tell

End of Block: Economy

Start of Block: Weeder Demo

W1 Do you live in the United States?

- Yes
- No

Skip To: End of Block If Do you live in the United States? != Yes Is Not Selected

W2 What is your age?

- ○ Under 18
- ○ 18-24
- ○ 25-34
- ○ 35-50
- ○ 51-65
- ○ Over 65

Skip To: End of Block If What is your age? = Under 18 is Selected

End of Block: Weeder Demo

Start of Block: Gender

W3 Which of the following best describes your gender identity?

- ○ Male
- ○ Female
- ○ Other

Display This Question:
If Which of the following best describes your gender identity? = Other is selected

W3a Describe your gender identity

_____

End of Block: Gender

Start of Block: Race

W4 Which of the following do you consider to be your primary racial or ethnic group? Select all that apply.

- [ ] White
- [ ] African American
- [ ] Asian American
- [ ] Hispanic or Latino
- [ ] Native American
- [ ] Other

Display This Question:
If Which of the following do you consider to be your primary racial or ethnic group? Select all that... = Other

W4a How would you describe your primary racial or ethnic group?

_____

End of Block: Race

Start of Block: Party ID

W5 What political party do you identify with?

- ○ Independent/no preference
- ○ Democratic Party
- ○ Republican Party
- ○ Other party

Display This Question:
If What political party do you identify with? = Democratic Party

W5a Would you call yourself a strong Democrat or a not very strong Democrat?

- ○ Strong
- ○ Not very strong

Display This Question:
If What political party do you identify with? = Republican Party

W5b Would you call yourself a strong Republican or a not very strong Republican?

- Strong
- Not very strong

Display This Question:
If What political party do you identify with? = Independent/no preference
Or What political party do you identify with? = Other party

W5c Do you think of yourself as closer to the Republican Party or to the Democratic Party?

- Closer to Democratic Party
- Neither
- Closer to Republican Party

End of Block: Party ID

Start of Block: Non-Demo Questions

N2 In general, how interested are you in politics?

- Extremely interested
- Very interested
- Somewhat interested
- Not too interested
- Not at all interested

N3 How often can you trust the government to do what is right?

- ○ Always
- ○ Most of the time
- ○ About half the time
- ○ Some of the time
- ○ Never

N4 How much confidence, if any, do you have in each of the following to act in the best interests of the public?

	A great deal	A fair amount	Not too much	No confidence at all
Elected officials	○	○	○	○
The news media	○	○	○	○
The military	○	○	○	○
Scientists	○	○	○	○
Religious leaders	○	○	○	○
Education-sector officials	○	○	○	○
Business leaders	○	○	○	○
Government employees	○	○	○	○
Pharmaceutical companies	○	○	○	○
Aerospace companies	○	○	○	○
Financial institutions	○	○	○	○
Multinational corporations	○	○	○	○
The Federal Reserve	○	○	○	○

N5 Which statement comes closer to your views, even if neither is exactly right?

- ○ Ordinary citizens can do a lot to influence the government if they are willing to make the effort
- ○ There's not much ordinary citizens can do to influence the government

N6 How often is the government responsive to the needs of the people?

- ○ All of the time
- ○ Most of the time
- ○ Half of the time
- ○ Some of the time
- ○ None of the time

N7 In the past 12 months, have you…

	Yes	No
Learned about government-operated recreational activities, such as the hours of a public park	○	○
Paid a fine, such as a parking ticket	○	○
Used a service such as 311 to report a specific problem to your local government	○	○
Applied for or renewed a hunting or fishing license	○	○
Learned about or applied for government benefits, such as Social Security or unemployment insurance	○	○
Renewed your driver's license or car registration	○	○
Interacted with Emergency Services, such as the Fire Department or EMTs	○	○
Visited or been in contact with someone who is incarcerated	○	○

N8 Which of the following best describes what you think about the scientific method?

- ○ The scientific method generally produces accurate conclusions
- ○ The scientific method can be used to produce any conclusion the researcher wants

N9 How often do you follow the news...?

	Every day	Several days a week	Once a week	Every few weeks/once a month	Never
On television	○	○	○	○	○
On the internet	○	○	○	○	○
In the newspapers	○	○	○	○	○
On the radio	○	○	○	○	○

N10 How concerned, if at all, are you that you might spread the coronavirus to other people without knowing that you have it?

- ○ Very concerned
- ○ Somewhat concerned
- ○ Not too concerned
- ○ Not at all concerned

N11 How concerned, if at all, are you that you will get the coronavirus and require hospitalization?

- ○ Very concerned
- ○ Somewhat concerned
- ○ Not too concerned
- ○ Not at all concerned

N12 Do you personally know someone who has been sick with, hospitalized with, or died as a result of having coronavirus (Covid-19)?

- Yes
- No

N13 Some people have suggested placing new limits on foreign imports in order to protect American jobs. Others say that such limits would raise consumer prices and hurt American exports. Do you favor or oppose placing new limits on imports?

- Favor
- Oppose

N14 Do you think the number of immigrants from foreign countries who are permitted to come to the United States to live should be:

- Increased a lot
- Increased a little
- Left the same as it is now
- Decreased a little
- Decreased a lot

N15 Recently, some big American companies have been hiring workers in foreign countries to replace workers in the U.S. Do you think the federal government should discourage companies from doing this, encourage companies to do this, or stay out of this matter?

- Encourage
- Discourage
- Stay out of this matter

N16 Generally speaking, which do you think would be better for your community:

- ○ A factory owned by an American company that employed 1,000 workers
- ○ A factory owned by a Chinese company that employed 2,000 workers

N17 Would you rather:

- ○ Live in a democracy where government action *sometimes* aligns with your views
- ○ Live in a non-democracy where government action *often* aligns with your views

N18 Rate your agreement with the following statement: in this country, if you work hard, you will get ahead.

- ○ Strongly agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Disagree
- ○ Strongly disagree

N19 How often is individual success determined by forces outside of one's control?

- ○ All of the time
- ○ Most of the time
- ○ Some of the time
- ○ None of the time

End of Block: Non-Demo Questions

Start of Block: Vote2020

N1 Did you vote in the 2020 presidential election?

- Yes
- No

Display This Question:
If Did you vote in the 2020 presidential election? = Yes

N1a Who did you vote for?

- Donald J. Trump
- Joseph R. Biden
- Jo Jorgensen
- Other

End of Block: Vote2020

Start of Block: Regular Demo Questions

D2 Where would you place yourself on this scale?

- Very liberal
- Mostly liberal
- Somewhat liberal
- Moderate
- Somewhat conservative
- Mostly conservative
- Very conservative

D4 What most accurately describes your relationship status?

- Married
- Not married but in a relationship
- Single

D5 Do any children under the age of 18 live in your household?

- Yes
- No

D7 What is the highest level of education you have completed?

- Less than high school graduate
- High school graduate
- Some college
- 2-year college degree
- 4-year college degree
- Advanced degree

D8 In 2020, what was your total family income from all sources, before taxes?

- Less than $10,000
- $10,000 to under $20,000
- $20,000 to under $30,000
- $30,000 to under $40,000
- $40,000 to under $50,000
- $50,000 to under $75,000
- $75,000 to under $100,000
- $100,000 to under $150,000
- $150,000 or more

D9 During the last twelve months, how often have you had difficulties in paying your bills at the end of the month?

- Always
- Most of the time
- Some of the time
- Occasionally
- Never

D13 Do you normally get a flu vaccine each year?

- Yes
- No

D14 Do you have a serious health condition such as high blood pressure, heart disease, lung disease, serious allergies that can cause anaphylactic shock, cancer, or diabetes?

- Yes
- No

D15 How would you describe your current health status?

- Poor
- Fair
- Good
- Very good
- Excellent

End of Block: Regular Demo Questions

Start of Block: Religion

D11 Regardless of whether you now attend any religious services, do you ever think of yourself as part of a particular religion?

- ○ Yes
- ○ No

Display This Question:
If Regardless of whether you now attend any religious services, do you ever think of yourself as par... = Yes

D11a Please write the name of that religion, church or denomination

_____

End of Block: Religion

Start of Block: Location

D12 In which state and county do you reside? [drill-down]
State
County

▼ ALABAMA ... WYOMING ~ Weston WY

End of Block: Location

Table A1. Codebook, Model Variables and Descriptive Statistics

Variable (STATA name)	Description	Source	Type (Levels)	Mean (Std Dev)	Range
id (id)	Assigned ID to each respondent for indexing purposes from the first respondent (1) to the last (1,642).	Original	Nominal (1,642)	N/A	1-1,642
willingness (DVfull)	Respondent selected value for willingness to get vaccinated from "no, I am not willing" (0) to "yes, whenever available" (6). See Table 1 in the main text for all levels. This is the main dependent variable.	Original	Ordinal (7)	4.258 (2.362)	0-6
treatment (Treatment)	Randomly assigned treatment condition that is either a control condition or one of seven experimental treatments. Factor that can be used to create dummy variables. Main independent variable in the experiment.	Original	Nominal (8)	N/A	N/A
race	Self-identified race. Model variable values are White, Black, Hispanic, Asian, Mixed (anyone who selected more than one category), and Other. Factor that can be used to create dummy variables.	Boxell et al. (2020)	Nominal (5 + free entry)	N/A	N/A
gender	Selected or self-identified gender, including male, female, and non-binary. Factor that can be used to create dummy variables.	Boxell, Conway, Druckman, and Gentzkow (2020)	Nominal (2 + free entry)	N/A	N/A
age	Selected age cohort from: 18-24 (0) to over 65 (4).	Boxell et al. (2020)	Ordinal (5)	2.103 (1.217)	0-4
edu	Selected level of educational attainment from less than high school (0) to advanced degree (6).	Boxell et al. (2020)	Ordinal (6)	2.757 (1.479)	0-5
income (inc)	Selected income level from less than $10,000 (0) to $150,000 or more (8).	Adapted from Pew (2015)	Ordinal (9)	4.124 (2.382)	0-8
religion	Whether respondents consider themselves religious (1) or not (0).	American National Election Survey (2016)	Binary (2)	0.617 (0.486)	0-1
party_likert (PartyLikert)	Series of questions first assessing whether respondent identifies with a party, then if so, asking how much (strong or not very strong). If they do not identify with a party, we ask if they lean toward one party. The resulting 7-level likert scale ranges from strong Democrat (0), to pure independent (3), to strong Republican (6).	ANES (2016)	Ordinal (7)	2.909 (2.174)	0-6
ideo_likert (IdeoLikert)	Selected ideological position from "very liberal" (0) to "moderate" (3) to "very conservative" (6).	Adapted from Boxell et al. (2020)	Ordinal (7)	3.19 (1.710)	0-6

Table A1. Codebook, Model Variables and Descriptive Statistics (Cont.)

Variable (STATA name)	Description	Source	Type (Levels)	Mean (Std Dev)	Range
vote (N1n)	Whether respondent claimed to have voted in the 2020 presidential election (1) or not (0).	Adapted from Ipsos (2020)	Binary (2)	0.780 (0.414)	0-1
candidate_choice (N1an)	Selected from: Joseph R. Biden, Donald J. Trump, Jo Jorgensen, and Other. Factor that can be used to create dummy variables.	Adapted from Ipsos (2020)	Nominal (4)	N/A	N/A
pol_trust (trust_gov)	How often a respondent trusts the government "to do what is right" from never (0) to always (4).	ANES (2016)	Ordinal (5)	1.604 (1.071)	0-4
govt_services (GovtServicesIndex)	Battery of binary questions about interacting with the government on a host issues, including, for example, using city service like 311 to report a problem and applying to or renewing a fishing/hunting license. Answers are "no" (0) or "yes" (1), then summed across the eight questions for a total score.	Adapted from Pew (2014) and Organisation of Economic Co-operation and Development (2017)	Ordinal (9)	1.990 (1.962)	0-8
govt_services_rescale (GovtServicesIndexscale)	The above variable rescaled by dividing by the maximum value (8) to reach a continuous value from 0 to 1.	Adapted from Pew (2014) and OECD (2017)	Ordinal (9)	0.249 (0.245)	0-1
media_index (MediaIndex)	Measure of a respondent's media consumption by asking how often one follows news on four mediums (newspaper, radio, television, and internet) from "never" (0) to "every day" (4), Summed across the mediums to create cumulative index.	Adapted from Boxell et al. (2020)	Ordinal (17)	9.050 (3.858)	0-16
media_index_rescale (MediaIndexscale)	The above variable rescaled by dividing by the maximum value (16) to reach a continuous value from 0 to 1.	Adapted from Boxell et al. (2020)	Ordinal (17)	0.566 (0.241)	0-1
health_status (health)	How a respondent rates their physical health from poor (0) to excellent (4).	National Health Interview Survey (2020)	Ordinal (5)	2.321 (1.000)	0-4
flu_shot (flu)	Whether the respondent normally gets a flu shot every year (1) or does not (0).	Kaiser Family Foundation (2020)	Binary (2)	0.538 (0.499)	0-1
incident_rate (incident_ratepct)	JHU's Covid-19 case counts per 100,000 individuals by county as of 2/9/21. For better interpretability, we divided by 1,000 to create a measure of cases per 100 people. Lack of county reporting in two Utah counties reduces n to 1,640.	Adapted from Johns Hopkins University Coronavirus Response Center (2021)	Numeric (728)	8.23 (2.516)	0.25-23.81

Table A1. Codebook, Model Variables and Descriptive Statistics (Cont.)

Variable (STATA name)	Description	Source	Type (Levels)	Mean (Std Dev)	Range
severe_condition (allergy)	Whether a respondent has serious medical conditions (such as high blood pressure, heart disease, lung disease, serious allergies that can cause anaphylactic shock, cancer, or diabetes) (1) or not (0).	Adapted from KFF (2020)	Binary (2)	0.320 (0.467)	0-1
concern_sick (concernillness)	Whether the respondent is worried about getting coronavirus and needing hospitalization (1) or not (0).	Pew (2020)	Ordinal (4)	1.747 (0.995)	0-3
know_covid (knowCovid19pat)	Whether a respondent personally knows someone who has been sick with, hospitalized with, or died as a result of Covid-19 (1) or not (0).	Original	Binary (2)	0.666 (0.472)	0-1
covid_deaths (Covid_Deaths)	JHU's Covid-19 deaths by county as of 2/9/21. Lack of county reporting in two Utah counties reduces n to 1,640.	JHU CRC (2021)	Numeric (427)	1707.142 (3303.942)	0-18,367
covid_deaths_log (lnCovid_Deaths)	+1 to previous variable (some counties report zero deaths and cannot be logged), then calculate natural log to normalize a skewed distribution. This is especially prudent given the standard deviation suggests sub-zero values.	Adapted from JHU CRC (2021)	Numeric (426)	6.144 (1.766)	0-9.818
manip_correct (ManipCorr)	Whether the respondent correctly identifies the directionality of the treatment (either pro-vaccination stance of the messenger/message or the negative impact of Covid-19 on the economy) (1) or not (0).	Original	Binary (2)	0.817 (0.387)	0-1
duration	Number of seconds it took the respondent to complete the survey.	Original	Numeric (654)	624.014 (2610.214)	190-83,489

Table A2. Ordered Logit Predicting Willingness Using Four Survey Quotas

Variable	Log Odds Coefficients	Standard Error	P-Value
T1 Lindsay	1.215	0.247	0.339
T2 Fauci	0.963	0.187	0.847
T3 Biden	1.138	0.234	0.527
T4 Trump	1.198	0.246	0.378
T5 Fauci	0.885	0.175	0.536
T6 FDA	1.419*	0.283	0.079
T7 Economy	1.548**	0.325	0.038
Age	1.285***	0.051	0.000
Black	0.644***	0.108	0.009
Hispanic	1.093	0.157	0.535
Asian	1.092	0.251	0.703
Mixed	0.727	0.309	0.453
Other Racial Group	0.274**	0.140	0.012
Female	0.555***	0.057	0.000
Non-Binary	0.920	0.550	0.889
Party Likert	0.796***	0.020	0.000
n		1,642	
Model χ^2		163	
df		16	
Loglikelihood		-2054	
Pseudo R^2		0.040	

Notes: ***p<0.01, **p<0.05, *p<0.1.

Table A3. Willingness Estimations Replacing *party_likert* with *ideo_likert*

Variable	Model 3: Political Views/ Engagement	Model 4: Media Exposure	Model 5: Personal Health Status	Model 6: Local Covid-19 Situation
T1 Nurse Lindsay (Demo)	1.178	1.19	1.092	1.076
	(0.257)	(0.26)	(0.243)	(0.24)
T2 Dr. Fauci (Demo)	0.95	0.944	1.008	0.995
	(0.19)	(0.19)	(0.213)	(0.213)
T3 President Biden (Text)	1.163	1.192	1.056	1.063
	(0.241)	(0.252)	(0.233)	(0.237)
T4 President Trump (Text)	1.291	1.294	1.191	1.174
	(0.266)	(0.268)	(0.259)	(0.258)
T5 Dr. Fauci (Text)	0.966	0.983	1.107	1.108
	(0.198)	(0.203)	(0.234)	(0.236)
T6 FDA Approval (Text)	1.439*	1.392	1.135	1.126
	(0.293)	(0.288)	(0.245)	(0.245)
T7 Economy (Text)	1.472*	1.439*	1.384	1.355
	(0.318)	(0.313)	(0.315)	(0.311)
Age Cohort	1.321***	1.265***	1.162***	1.155***
	(0.059)	(0.0581)	(0.0581)	(0.0585
Black	0.846	0.799	0.725*	0.717*
	(0.146)	(0.138)	(0.129)	(0.128)
Hispanic	1.22	1.19	1.023	0.969
	(0.179)	(0.179)	(0.160)	(0.154)
Asian	0.972	0.996	0.798	0.738
	(0.226)	(0.235)	(0.222)	(0.211)
Mixed	0.666	0.672	0.567	0.593
	(0.296)	(0.301)	(0.286)	(0.317)
Other	0.422*	0.447*	0.421**	0.411***
	(0.199)	(0.205)	(0.154)	(0.140)
Female	0.695***	0.702***	0.633***	0.633***
	(0.075)	(0.076)	(0.072)	(0.073)
Non(Binary	0.886	0.826	1.703	1.655
	(0.687)	(0.694)	(1.751)	(1.696)
Education Level	1.117***	1.094**	1.06	1.049
	(0.047)	(0.047)	(0.047)	(0.048)
Income Level	1.104***	1.097***	1.103***	1.098***
	(0.028)	(0.028)	(0.030)	(0.030)
Religious	0.971	0.946	0.863	0.869
	(0.109)	(0.106)	(0.103)	(0.104)
Ideology Likert	0.781***	0.781***	0.813***	0.821***
	(0.027)	(0.027)	(0.030)	(0.031)
Trust in Government	1.685***	1.627***	1.458***	1.450***
	(0.097)	(0.095)	(0.091)	(0.091)
Government Services Index	2.267***	1.780**	1.586	1.6
	(0.578)	(0.457)	(0.458)	(0.463)
Media Consumption Index		3.145***	2.582***	2.427***
		(0.796)	(0.696)	(0.655)
Self-Identified Health Level			1.137**	1.143**
			(0.070)	(0.071)
Receive Flu Shot			3.646***	3.671***
			(0.416)	(0.421)
Serious Health Conditions			1.051	1.077
			(0.142)	(0.146)
Concern About Getting Sick			1.615***	1.618***
			(0.101)	(0.102)
Know Covid Patient			0.876	0.884
			(0.104)	(0.106)
Covid Incidence per 100 People by County				0.959*
				(0.021)
ln(Covid Deaths by County)				1.086**
				(0.036)
n	1,642	1,642	1,642	1,640
Model χ^2	299.8	320.7	452.6	465.5
df	21	22	27	29
Loglikelihood	-1968	-1956	-1847	-1840
Pseudo R^2	0.080	0.086	0.137	0.139

Odds ratio coefficients with robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: Models 1 and 2 withheld since neither political variable was used in those models.

Table A4. Non-Cumulative and Cumulative Ordered Logit Models

Variables	Model 1: Experimental Treatments	Model 2: Socio-Demographics	Model 3: Political Views/ Engagement
T1 Nurse Lindsay (Demo)	1.286	1.243	1.255
	(0.250)	(0.256)	(0.258)
T2 Dr. Fauci (Demo)	0.997	0.922	0.962
	(0.189)	(0.178)	(0.187)
T3 President Biden (Text)	1.172	1.130	1.160
	(0.235)	(0.231)	(0.235)
T4 President Trump (Text)	1.171	1.140	1.264
	(0.231)	(0.232)	(0.250)
T5 Dr. Fauci (Text)	0.871	0.906	0.944
	(0.167)	(0.179)	(0.186)
T6 FDA Approval (Text)	1.420*	1.383	1.466*
	(0.273)	(0.280)	(0.287)
T7 Economy (Text)	1.461*	1.455*	1.481*
	(0.295)	(0.304)	(0.315)
Age Cohort		1.179***	
		(0.048)	
Black		1.199	
		(0.193)	
Hispanic		1.554***	
		(0.215)	
Asian		1.251	
		(0.286)	
Mixed Race		0.781	
		(0.316)	
Other Race		0.331**	
		(0.162)	
Female		0.659***	
		(0.068)	
Non-Binary		0.971	
		(0.780)	
Education Level		1.160***	
		(0.045)	
Income Level		1.111***	
		(0.026)	
Religious		0.900	
		(0.094)	
Party Likert			0.863***
			(0.021)
Trust in Government			1.725***
			(0.095)
Government Services Index			1.693**
			(0.386)
n	1,642	1,642	1,642
Model χ^2	12.6	142.6	180.1
df	7	18	10
Loglikelihood	-2,134	-2,066	-2,034
Pseudo R^2	0.003	0.035	0.050

Odds ratio coefficients with robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A4. Non-Cumulative and Cumulative Ordered Logit Models (Cont.)

Variables	Model 4: Media Exposure	Model 5: Personal Health Status	Model 6: Local Covid-19 Situation	Model 7: Full Model
T1 Nurse Lindsay (Demo)	1.286	1.171	1.239	1.084
	(0.257)	(0.249)	(0.245)	(0.243)
T2 Dr. Fauci (Demo)	0.975	1.023	0.954	0.934
	(0.188)	(0.208)	(0.182)	(0.197)
T3 President Biden (Text)	1.187	1.017	1.178	1.019
	(0.240)	(0.215)	(0.238)	(0.222)
T4 President Trump (Text)	1.199	1.063	1.135	1.151
	(0.240)	(0.224)	(0.228)	(0.253)
T5 Dr. Fauci (Text)	0.913	1.023	0.858	1.112
	(0.178)	(0.210)	(0.167)	(0.236)
T6 FDA Approval (Text)	1.327	1.133	1.361	1.085
	(0.264)	(0.238)	(0.263)	(0.236)
T7 Economy (Text)	1.381	1.295	1.396	1.312
	(0.283)	(0.290)	(0.289)	(0.300)
Age Cohort				1.138***
				(0.057)
Black				0.577***
				(0.106)
Hispanic				0.860
				(0.140)
Asian				0.668
				(0.195)
Mixed Race				0.479
				(0.266)
Other Race				0.374***
				(0.137)
Female				0.637***
				(0.074)
Non-Binary				1.491
				(1.305)
Education Level				1.056
				(0.047)
Income Level				1.105***
				(0.030)
Religious				0.836
				(0.098)
Party Likert				0.858***
				(0.024)
Trust in Government				1.449***
				(0.090)
Government Services Index				1.597
				(0.461)
Media Consumption Index	7.968***			2.455***
	(1.764)			(0.669)
Self-Identified Health Level		1.300***		1.116*
		(0.074)		(0.069)
Receive Flu Shot		4.063***		3.635***
		(0.437)		(0.420)
Serious Health Conditions		1.139		1.051
		(0.140)		(0.143)
Concern About Getting Sick		1.886***		1.617***
		(0.112)		(0.102)
Know Covid Patient		0.934		0.894
		(0.104)		(0.106)
Covid Incidence per 100 People by County			0.945***	0.966
			(0.018)	(0.022)
ln(Covid Deaths by County)			1.189***	1.081**
			(0.033)	(0.036)
n	1,642	1,642	1,640	1,640[a]
Model χ^2	100.7	322.8	53.2	467.2
df	8	12	9	29
Loglikelihood	-2,084	-1,948	-2,110	-1,841
Pseudo R^2	0.026	0.090	0.013	0.139

Odds ratio coefficients with robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: [a] Some smaller counties in Utah report pooled Covid-19 metrics, leading to two less respondent observations.

Table A5. Unadjusted P-Values and Q-Values for Ordered Logit Model 6

Variables	P-Value	Q-Value	Difference
T1 Nurse Lindsay (Demo)	0.720	0.470	0.250
T2 Dr. Fauci (Demo)	0.745	0.470	0.275
T3 President Biden (Text)	0.932	0.547	0.385
T4 President Trump (Text)	0.523	0.448	0.075
T2 Dr. Fauci (Text)	0.617	0.470	0.147
T6 FDA Approval (Text)	0.706	0.470	0.236
T7 Economy (Text)	0.236	0.268	-0.032
Age	0.010	0.022	-0.012
Education	0.217	0.258	-0.041
Income	0.000	0.001	-0.001
Female	0.000	0.001	-0.001
Non-Binary	0.648	0.470	0.178
Black	0.003	0.008	-0.005
Hispanic	0.352	0.326	0.026
Asian	0.168	0.226	-0.058
Mixed	0.185	0.227	-0.042
Other Racial Category	0.007	0.017	-0.010
Religion	0.127	0.180	-0.053
Party Likert	0.000	0.001	-0.001
Trust in Government	0.001	0.004	-0.003
Government Services Index	0.104	0.169	-0.065
Media Consumption Index	0.000	0.001	-0.001
Self-Identified Health Level	0.076	0.129	-0.053
Receive Flu Shot	0.000	0.001	-0.001
Serious Health Conditions	0.714	0.470	0.244
Concern About Getting Sick	0.000	0.001	-0.001
Know Covid Patient	0.344	0.326	0.018
Covid Incidence per 100 (by County)	0.118	0.179	-0.061
ln(Covid Deaths by County)	0.019	0.034	-0.015

Notes: Lowest possible q-value is 0.001 because the intervals round up to the nearest one-thousandth (above zero).

Heterogeneous Treatment Effects and Salient Group Analysis

This section (including Tables A6 to A12) extends our analysis to better understand heterogenous treatment effects across groups, but we note in the text that the primary goal of our analysis was not to ascertain sub-group differences; rather to test the effectiveness of treatments on a representative sample of American residents. We focus our attention on groups that are identified as hesitant both by the literature and our analysis: Republicans and Trump voters (in contrast to Democrats and Biden voters), African-American respondents, and women.

We utilize two-tailed t-tests (unequal variance assumption is adopted) to understand within-group differences based on the control versus treatments. The results of these analyses are reported in the ensuing tables. Given the relatively small sample sizes, there could be false negatives, but the constraint of the small sample size means the significant results indicate strong associations. We find the small sample size to be a concern particularly for the African-American sub-sample. Future studies on hesitancy could repeat this exercise by strategically over-sampling target groups (particularly Republicans and African-Americans) and intersectional groups (Republican women; Black women) to calibrate more targeted messages that increase vaccination willingness. With these caveats in mind, the upshot of our findings is that: the FDA condition again performs best across groups.

Table A6. Summary of Difference of Means on Vaccination Willingness (Salient Groups)

Group	Experimental Condition	*n*	Mean	Difference from Control	P-value for Difference
Republican	Control	72	3.236	N/A	N/A
	T1 Lindsay	77	4.000	0.764	0.068
	T2 Fauci (Demo)	81	3.815	0.579	0.159
	T4 Trump	79	3.911	0.675	0.114
	T6 Approval	80	3.963	0.727	0.080
	T7 Economy	78	4.346	1.110	0.008
Trump Voters	Control	65	3.815	N/A	N/A
Democratic	Control	81	4.864	N/A	N/A
	T2 Fauci (Demo)	86	4.337	-0.527	0.117
Biden Voters	Control	85	4.694	N/A	N/A
	T1 Lindsay	85	5.118	0.424	0.162
	T4 Trump	83	5.217	0.523	0.077
	T6 Approval	92	5.217	0.523	0.070
	T7 Economy	92	5.087	0.393	0.194
Female	Control	105	3.914	N/A	N/A
	T6 Approval	104	4.346	0.432	0.196
Black	Control	23	3.696	N/A	N/A
	T4 Trump	26	4.204	0.508	0.177
	T6 Approval	25	4.760	1.064	0.115

Table A7. Difference of Means on Vaccination Willingness among only Republicans

Experimental Group	*n*	Mean	Difference from Control	P-value for Difference
Control	72	3.236	N/A	N/A
T1 Lindsay	77	4.000	0.764	0.068
T2 Fauci (Demo)	81	3.815	0.579	0.159
T3 Biden	78	3.769	0.533	0.210
T4 Trump	79	3.911	0.675	0.114
T5 Fauci (Text)	77	3.117	-0.119	0.779
T6 Approval	80	3.963	0.727	0.080
T7 Economy	78	4.346	1.110	0.008

Table A8. Difference of Means on Vaccination Willingness among only Trump Voters

Experimental Group	*n*	Mean	Difference from Control	P-value for Difference
Control	65	3.815	N/A	N/A
T1 Lindsay	65	4.092	0.277	0.531
T2 Fauci (Demo)	68	3.824	0.009	0.985
T3 Biden	64	4.000	0.185	0.681
T4 Trump	64	3.750	-0.065	0.889
T5 Fauci (Text)	68	3.353	-0.462	0.306
T6 Approval	70	3.729	-0.086	0.847
T7 Economy	64	4.266	0.451	0.317

Continuing with heterogenous treatment effects, we examine the effects of partisanship. For Trump voters, we do not find any treatments that motivate a higher vaccination sentiment. In contrast, Republican-leaning respondents are significantly receptive to three treatments: Nurse Lindsay endorsement (T^1) (p=0.068), the FDA approval process (T^6) (p=0.08), and most effectively, the economy treatment (T^7) increases vaccination sentiment by over a full point (4.346 against 3.236 in the control) at p=0.008. A key takeaway is that a health sector worker unknown prior to the pandemic—Nurse Lindsay—can shift opinions within a group that is considered generally reluctant. The magnitude and significance of the economy treatment comports with stereotypes of Republicans as being generally oriented toward economic self-interest calculations (Rothschild et al. 2019). Trump endorsement (T^4) is borderline (p=0.114) in the expected direction. The overall non-effects among Trump voters and multiplicity of successful treatments among Republicans do suggest examining fissures in contemporary political coalitions deserves additional scholarly attention in the future. In particular, it may be the case that the Republican identifiers are anti-vaccine independent of Trump, and that Trump was cultivating the constituency more than opinion leading (on this issue).

Table A9. Difference of Means on Vaccination Willingness among only Democrats

Experimental Group	*n*	Mean	Difference from Control	P-value for Difference
Control	81	4.864	N/A	N/A
T1 Lindsay	90	4.944	0.080	0.792
T2 Fauci (Demo)	86	4.337	-0.527	0.117
T3 Biden	89	4.831	-0.033	0.918
T4 Trump	88	5.023	0.159	0.596
T5 Fauci (Text)	88	4.852	-0.012	0.970
T6 Approval	90	5.078	0.214	0.464
T7 Economy	88	4.830	-0.034	0.913

Table A10. Difference of Means on Vaccination Willingness among only Biden Voters

Experimental Group	*n*	Mean	Difference from Control	P-value for Difference
Control	85	4.694	N/A	N/A
T1 Lindsay	85	5.118	0.424	0.162
T2 Fauci (Demo)	85	4.471	-0.223	0.509
T3 Biden	87	4.839	0.145	0.659
T4 Trump	83	5.217	0.523	0.077
T5 Fauci (Text)	79	4.987	0.293	0.357
T6 Approval	92	5.217	0.523	0.070
T7 Economy	92	5.087	0.393	0.194

Beyond the hesitant groups, we also find Biden voters positively and significantly respond well to Trump endorsement (p=0.077) and FDA approval (0.07). The former finding is unanticipated since Trump is a member of the out-group, but here such an endorsement may allay worries about the development process from the president overseeing its early inception. Alternatively, because Trump could be seen as a vaccine-skeptic, his endorsement may attenuate concerns about safety. The finding on the FDA treatment is consistent with research that shows Democrats hold higher trust levels in science (Funk et al. 2019) and may be responsive to frames that center on the subject. However, it is important to note much of this study suggests individuals *across groups* respond most favorably to learning about the role of scientific experts in the vaccination approval process. Finally, Democrats have a generally high baseline willingness (4.864 in the control) and near conventional levels of significance (p=0.117) with the only observed *negative* response to a treatment: the Fauci (T^2) demonstration.

Table A11. Difference of Means on Vaccination Willingness among only Blacks

Experimental Group	*n*	Mean	Difference from Control	P-value for Difference
Control	23	3.696	N/A	N/A
T1 Lindsay	23	4.087	0.391	0.601
T2 Fauci (Demo)	22	2.773	-0.923	0.218
T3 Biden	25	4.040	0.344	0.650
T4 Trump	26	4.204	0.508	0.177
T5 Fauci (Text)	27	4.556	0.860	0.221
T6 Approval	25	4.760	1.064	0.115
T7 Economy	24	4.124	0.428	0.576

Table A12. Difference of Means on Vaccination Willingness among only Females

Experimental Group	*n*	Mean	Difference from Control	P-value for Difference
Control	105	3.914	N/A	N/A
T1 Lindsay	104	4.077	0.163	0.640
T2 Fauci (Demo)	108	3.815	-0.099	0.771
T3 Biden	106	3.915	0.001	0.998
T4 Trump	105	3.857	-0.057	0.869
T5 Fauci (Text)	108	3.509	-0.405	0.246
T6 Approval	104	4.346	0.432	0.196
T7 Economy	108	4.102	0.188	0.583

Among Black respondents, no frames reach conventional levels of significance, although the most successful treatment is FDA approval (T^6), which raises average sentiment from 3.696 in the control to 4.760 (p=0.115). Given the very low sample size in the experimental groups (23 in control; 25 in FDA), this finding is strongly suggestive that informative frames that speak to the safety procedures in the approval process can, to some degree, overcome years of negative experiences and distrust toward government in the Black community.

While, as already noted, small sample sizes could lead to false negatives, the sample sizes for female respondents are ostensibly large enough (over 100 per treatment) to detect sizeable differences between the control and treatments. We do not, however, find any treatments that significantly shift female respondent willingness, although the most successful frame with this group is also the approval process (p=0.196).

Table A13. Ordered Logit Models Predicting Willingness (Passed the Manipulation Check)

Variables	Model 1: Experimental Treatments	Model 2: Socio-Demographics	Model 3: Political Views/ Engagement	Model 4: Media Exposure	Model 5: Personal Health Status	Model 6: Local Covid-19 Situation
T1 Nurse Lindsay (Demo)	1.755**	1.626**	1.397	1.404	1.371	1.363
	(0.386)	(0.380)	(0.351)	(0.354)	(0.369)	(0.366)
T2 Dr. Fauci (Demo)	1.074	0.975	0.877	0.855	0.918	0.914
	(0.209)	(0.195)	(0.181)	(0.178)	(0.200)	(0.202)
T3 President Biden (Text)	1.458*	1.353	1.287	1.295	1.156	1.167
	(0.309)	(0.296)	(0.285)	(0.289)	(0.263)	(0.268)
T4 President Trump (Text)	1.539*	1.475	1.762**	1.717**	1.660*	1.644*
	(0.369)	(0.357)	(0.433)	(0.424)	(0.437)	(0.431)
T5 Dr. Fauci (Text)	1.128	1.130	1.255	1.245	1.374	1.354
	(0.238)	(0.246)	(0.286)	(0.283)	(0.315)	(0.313)
T6 FDA Approval (Text)	2.006***	1.791***	1.715**	1.649**	1.291	1.278
	(0.424)	(0.401)	(0.397)	(0.387)	(0.317)	(0.316)
T7 Economy (Text)	1.531**	1.463*	1.494*	1.450*	1.369	1.359
	(0.311)	(0.309)	(0.325)	(0.318)	(0.320)	(0.320)
Age Cohort		1.204***	1.363***	1.309***	1.216***	1.214***
		(0.056)	(0.070)	(0.069)	(0.070)	(0.0704)
Black		1.041	0.498***	0.474***	0.471***	0.490***
		(0.192)	(0.100)	(0.096)	(0.099)	(0.103)
Hispanic		1.470**	0.945	0.922	0.818	0.816
		(0.231)	(0.165)	(0.164)	(0.151)	(0.153)
Asian		1.668*	1.088	1.123	1.015	1.022
		(0.489)	(0.344)	(0.349)	(0.368)	(0.383)
Mixed Race		0.629	0.390**	0.395**	0.374*	0.404
		(0.264)	(0.179)	(0.182)	(0.201)	(0.230)
Other Race		0.704	0.756	0.768	0.652	0.650
		(0.364)	(0.334)	(0.331)	(0.223)	(0.201)
Female		0.681***	0.697***	0.713***	0.617***	0.617***
		(0.080)	(0.087)	(0.090)	(0.0824)	(0.083)
Education Level		1.166***	1.114**	1.097*	1.058	1.053
		(0.052)	(0.054)	(0.054)	(0.0542)	(0.055)
Income Level		1.107***	1.109***	1.103***	1.104***	1.099***
		(0.031)	(0.033)	(0.033)	(0.0354)	(0.036)
Religious		0.914	0.964	0.936	0.865	0.873
		(0.111)	(0.124)	(0.121)	(0.117)	(0.119)
Party Likert			0.807***	0.807***	0.850***	0.861***
			(0.025)	(0.025)	(0.0275)	(0.028)
Trust in Government			1.771***	1.718***	1.542***	1.537***
			(0.120)	(0.118)	(0.113)	(0.113)
Government Services Index			2.724***	2.209***	2.111**	2.130**
			(0.826)	(0.663)	(0.710)	(0.721)
Media Consumption Index				3.027***	2.400***	2.216**
				(0.897)	(0.748)	(0.697)
Self-Identified Health Level					1.111	1.115
					(0.0788)	(0.079)
Receive Flu Shot					3.439***	3.470***
					(0.455)	(0.462)
Serious Health Conditions					0.980	0.997
					(0.153)	(0.156)
Concern About Getting Sick					1.666***	1.671***
					(0.118)	(0.119)
Know Covid Patient					0.819	0.828
					(0.117)	(0.120)
Covid Incidence per 100 People by County						0.948**
						(0.025)
ln(Covid Deaths by County)						1.046
						(0.042)
n	1,342	1,342	1,342	1,342	1,342	1,340
Model χ^2	18.5	563.7	774.1	688.6	717.6	699.3
df	7	18	21	22	27	29
Loglikelihood	-1,597	-1,544	-1,458	-1,450	-1,369	-1,365
Pseudo R^2	0.006	0.039	0.092	0.097	0.148	0.149
Odds ratio coefficients with robust standard errors in parentheses						
*** p<0.01, ** p<0.05, * p<0.1						

Notes: Log odds coefficients with robust standard errors in parentheses; ***p<0.01, **p<0.05, *p<0.1; The coefficient for non-binary gender respondents has perfect correlation, since the only three observations all select "yes, whenever available."

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