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Framing Vaccine Mandates: Messenger and Message Effects

Christopher Buccafusco* and Daniel Hemel**

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— DRAFT —

ABSTRACT

In September 2021, President Biden announced that the Occupational Safety and Health Administration (OSHA) would require all employers with 100 or more employees to ensure that their workers are fully vaccinated against Covid-19 or show a negative test for the virus at least once a week. The policy has been widely characterized in the media as “President Biden’s vaccine mandate,” though it could be described with equal accuracy as “OSHA’s testing mandate” (since OSHA, rather than Biden, officially promulgated the policy, and once-a-week testing and vaccination are both valid compliance options). Some commentators have speculated that reframing the policy as a testing mandate (with a vaccination option) rather than a vaccine mandate (with a testing option) would boost public support. This study seeks to gain empirical insight into how framing effects shape attitudes toward vaccination and testing policies.

In October 2021, we presented a nationally representative sample of 1500 U.S. adults with different descriptions of the same vaccinate-or-test requirement. We find that recharacterizing “President Biden’s vaccine mandate” as “OSHA’s testing mandate” yields a substantively and statistically positive effect on support, boosting the policy’s net approval margin by approximately 13 percentage points. The effect of reframing is particularly strong among self-identified Republicans, who overwhelmingly oppose the policy when it is framed as President Biden’s vaccine mandate but are more evenly split when the policy is framed as OSHA’s testing mandate. Further analysis reveals that the positive effect is driven by the change in the messenger frame (i.e., switching the promulgator of the policy from President Biden to OSHA). By contrast, changing the message frame from a vaccination requirement (with a testing exception) to a testing requirement (with a vaccination exception) has little independent effect on respondents’ attitudes.

Our results suggest that messenger framing can have meaningful effects on public opinion toward a policy even after the policy is widely known. Beyond the Covid-19 context, our study points to a potential cost of presidential administration when partisan divisions are deep. Our results suggest that framing a regulatory policy as an extension of the president can elicit strong—and in this case, negative—reactions that may be avoidable if the same policy is framed as the work of a bureaucratic agency.

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Introduction

In September 2021, President Biden announced that all employers with 100 or more employees would be required to ensure that their workers are fully vaccinated against Covid-19 or show a negative test for the virus at least once a week. “Biden’s vaccine mandate”—as it has been characterized by virtually every national news outlet¹—elicited widespread debate and polar responses in the weeks after its announcement. Notwithstanding its framing as “Biden’s vaccine mandate,” though, the policy does not in fact require anyone to be vaccinated, since once-a-week testing also is a permissible compliance option. Moreover, although Biden announced the policy in an address from the White House, the president did not impose the vaccinate-or-test requirement himself. The Occupational Safety and Health Administration (OSHA), an agency within the Department of Labor, promulgated the requirement as an emergency temporary standard pursuant to section 6(c)(1) of the Occupational Safety and Health Act, a statute that delegates authority to the secretary of labor rather than the president.²

Initially, the White House embraced the framing of OSHA’s vaccinate-or-test policy as “Biden’s vaccine mandate.” White House press secretary Jen Psaki told reporters that President Biden had “announced *his* vaccine mandates for businesses,” and in late September she spoke in defense of “Biden’s vaccine mandate.”³ Later on, though, the Biden administration backed away from the “vaccine mandate” framing. For example, during a briefing on November 5, 2021, White House principal deputy press secretary Karine Jean-Pierre suggested that the widespread characterization of the policy as a “vaccine mandate” was “misinformation or disinformation.” According to Jean-Pierre: “As has been explicit for months, it is a standard for a safe workplace to either comply with weekly testing *or* to be vaccinated.”⁴ The *Washington Post*

¹ See, e.g., Chip Cutter, *Biden’s Covid-19 Vaccine Mandate Divides U.S. Companies, Like the Country*, Wall St. J. (Nov. 4, 2021), <https://www.wsj.com/articles/bidens-covid-19-vaccine-mandate-divides-u-s-companies-like-the-country-11636047345>; Lauren Hirsch & Isabella Grullón Paz, *A Court Temporarily Blocks Biden’s Vaccine Mandate*, N.Y. Times (Nov. 6, 2021), <https://www.nytimes.com/2021/11/06/world/americas/biden-osha-vaccine-mandate-blocked.html>; Meryl Kornfield et al., *Republicans Ramp Up Challenges of Biden Vaccine Mandate*, Wash. Post (Nov. 4, 2021), <https://www.washingtonpost.com/nation/2021/11/04/covid-delta-variant-live-updates>.

² Occupational Safety and Health Act, sec. 6(c)(1), 29 U.S.C. § 655(c)(1); 86 Fed. Reg. 61,402 (Nov. 5, 2021).

³ Press Briefing by Press Secretary Jen Psaki, White House (Oct. 12, 2021), <https://www.whitehouse.gov/briefing-room/press-briefings/2021/10/12/press-briefing-by-press-secretary-jen-psaki-october-12-2021>; Press Briefing by Press Secretary Jen Psaki, White House (Sept. 29, 2021), <https://www.whitehouse.gov/briefing-room/press-briefings/2021/09/29/press-briefing-by-press-secretary-jen-psaki-september-29-2021>. The White House website continues to cast the vaccinate-or-test policy as “the President’s ... vaccination requirement.” White House, WHITE HOUSE REPORT: Vaccination Requirements Are Helping Vaccinate More People, Protect Americans from COVID-19, and Strengthen the Economy (Oct. 7, 2021), <https://www.whitehouse.gov/wp-content/uploads/2021/10/Vaccination-Requirements-Report.pdf>.

⁴ White House, Press Briefing by Principal Deputy Press Secretary Karine Jean-Pierre (Nov. 5, 2021), <https://www.whitehouse.gov/briefing-room/press-briefings/2021/11/05/press-briefing-by-principal-deputy-press-secretary-karine-jean-pierre-4> (emphasis added).

has suggested that the recent recharacterization—“as a mandate for testing with a vaccination opt-out”—might boost public support for the policy.⁵

If citizens were completely rational and perfectly informed, then it ought not matter whether the vaccinate-or-test policy is framed as a “vaccine mandate” or a “testing mandate,” or whether it is framed as President Biden’s or OSHA’s. The descriptive invariance axiom implies that an agent’s choice among options should not vary based on the way those options are described, provided that the alternative descriptions are all accurate (Mandel, 2014). Yet a long and rich literature in behavioral social science finds strong evidence of *framing effects*, or changes in respondents’ attitudes and behaviors resulting from different descriptions of the same substantive choice (Tversky & Kahneman, 1981; for a literature review, see Amsalem & Zoizner, 2020). These framing effects arise both from the *messenger* (*who* presents the choice) and the *message* (*how* the choice is presented), with the relative strength of messenger and message framing effects varying across contexts (Druckman, 2001; Joslyn & Haider-Markel, 2006; Diamond & Zhou, 2021).

In the context of a federal agency promulgating a controversial new policy, the framing-effects phenomenon intersects with an active debate among legal scholars and political scientists regarding *presidential administration* (Kagan, 2001; Merrill 2015; Mashaw & Berke, 2018). As defined by then-Professor Elena Kagan, “presidential administration” refers to a form of governance in which the regulatory activity of the executive branch becomes “an extension of the President’s own policy and political agenda” (Kagan, 2001, p. 2448). If messenger framing effects are robust, then the trend toward presidential administration in recent decades may have important consequences for public attitudes toward—and potentially, for compliance with—federal regulations.

Our study seeks to shed light on the relative strength of messenger and message framing effects and the attitudinal implications of presidential administration. In October 2021, we presented a nationally representative sample of 1500 U.S. adults with different descriptions of the same vaccinate-or-test policy, varying both the *messenger frame* and the *message frame*. To test the effect of the messenger frame, we alternately described the policy as promulgated by President Biden and by OSHA. To test the effect of the message frame, we alternately described the policy as a requirement that workers be vaccinated (with an exception for employees who are tested for Covid-19 once a week) and as a requirement that workers be tested for Covid-19 once a week (with an exception for vaccinated workers). We randomly assigned each participant to receive one of four possible frames (“President Biden’s vaccine mandate”; “President Biden’s testing mandate”; “OSHA’s vaccine mandate”; “OSHA’s testing mandate”).

In the base case, where we used the messenger and message frames initially embraced by the White House (i.e., “President Biden’s vaccine mandate”), 48.7 percent of participants supported

⁵ See Aaron Blake, *The Reality of the Testing Option in Biden’s Vaccine-or-Testing Mandate*, Wash. Post (Nov. 9, 2021), <https://www.washingtonpost.com/politics/2021/11/09/testing-option-vaccine-mandate>.

the policy and 41.2 percent opposed—a net approval margin of 7.5 percentage points. When we changed both the messenger and the message (i.e., “OSHA’s testing mandate” instead of “Biden’s vaccine mandate”), 50.9 percent of participants supported the policy and 30.0 percent oppose—a net approval margin of 20.9 percentage points. The effect of reframing was particularly strong among self-identified Republicans, who overwhelmingly opposed the policy when it was framed as President Biden’s vaccine mandate (22.3 percent in favor; 66.2 percent opposed) but were more evenly split when the policy was framed as OSHA’s testing mandate (36.9 percent in favor; 44.3 percent opposed). By contrast, reframing did not have a significant effect on attitudes among self-identified Democrats.

Our research design allows us to disentangle messenger framing effects from message framing effects. In our study, changing the messenger frame from President Biden to OSHA produced a substantively and statistically significant positive effect on support for the policy. However, changing the message frame from a vaccination requirement (with a testing exception) to a testing requirement (with a vaccination exception) generated substantively small and statistically insignificant effects. In other words, the messenger mattered much more than the message in our study—and at least in the fall of 2021, for this particular policy, the president was not the most popular messenger.

Our results suggest that messenger framing can have meaningful effects on public attitudes toward a policy even after the policy is widely known. The famous framing-effect result in Tversky and Kahneman (1981) involved hypothetical epidemiological interventions to address an imaginary disease.⁶ By contrast, our study involved a much-publicized policy to address a pandemic that participants had been living amid for more than a year and a half. Approximately two-thirds of participants in our study who were asked whether they had heard about President Biden’s vaccine mandate responded affirmatively. Nonetheless, redescribing the policy as emanating from an executive branch agency—rather than the president himself—reduced opposition by more than a quarter.

Beyond the Covid-19 context, our study points to a potential cost of presidential administration when partisan divisions are deep. Our results suggest that framing a regulatory policy as an extension of the president can elicit strong—and in this case, negative—reactions that may be avoidable if the same policy is framed as the work of a bureaucratic agency. Some skeptics of presidential administration have argued that delegating risk regulation to bureaucratic agencies will help to insulate policymaking from the vicissitudes of public opinion (e.g., Breyer, 1993; Shah and Forman, 2020). Our study highlights a corollary phenomenon: delegating risk

⁶ In that study, researchers asked respondents to “[i]magine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people.” The researchers then presented two “alternative programs”: one that would reduce the death toll to 400, and another that would reduce the death toll to zero with 1/3 probability and have no effect with 2/3 probability. Respondents favored the first program when researchers emphasized the number of lives saved but favored the second program when researchers emphasized the number of lives lost (Tversky & Kahneman, 1981). For a meta-analysis of follow-on studies replicating and modifying Tversky and Kahneman’s “Asian disease problem,” see Kühberger (1998).

regulation to bureaucratic agencies may help to insulate public opinion regarding regulatory policies from attitudes toward the president.

Research Design

To evaluate messenger and message framing effects in the context of the federal government's vaccinate-or-test policy, we administered an online two-by-two between-subjects survey experiment to 1500 participants from October 20 to 28, 2021.⁷ To put the survey period in temporal context: Our survey launched approximately six weeks after President Biden first announced the vaccinate-or-test policy on September 9. The survey concluded one week before OSHA issued the emergency temporary standard on November 4, and nine days before a panel of the U.S. Court of Appeals for the Fifth Circuit stayed the standard. If the stay is lifted, the vaccinate-or-test requirement will take effect on January 4, 2022.

We partnered with the survey research firm Dynata to recruit a nationally representative sample. At the outset, we collected information on participants' age, gender, race, political party identification, and ZIP code. After collecting demographic data, we presented participants with information about the federal government's vaccinate-or-test policy, manipulating both the messenger frame (whether the policy was proposed by President Biden or by OSHA) and the message frame (a vaccine mandate with a testing exception or a testing mandate with a vaccine exception). Our manipulation produced four different descriptions of the vaccinate-or-test policy, with each participant randomly assigned to receive one of the four descriptions:

President Biden's Vaccine Mandate. *President Biden plans to issue a rule mandating all employers with 100 or more employees to require that their employees are vaccinated against Covid-19. Employees will not have to be vaccinated if they are tested for Covid once a week.*

President Biden's Testing Mandate. *President Biden plans to issue a rule mandating all employers with 100 or more employees to require that their employees are tested for Covid-19 once a week. Employees will not have to be tested if they have been vaccinated against Covid.*

OSHA's Vaccine Mandate. *The U.S. Occupational Safety and Health Administration (OSHA) plans to issue a rule mandating all employers with 100 or more employees to require that their employees are vaccinated against Covid-19. Employees will not have to be vaccinated if they are tested for Covid once a week.*

President Biden's Testing Mandate. *The U.S. Occupational Safety and Health Administration (OSHA) plans to issue a rule mandating all employers with 100 or more*

⁷ In total, 1578 participants started the survey. After excluding individuals who did not agree to the terms of the consent form and individuals who were under the age of 18, we ended up with 1500 participants who completed the survey.

employees to require that their employees *are tested for Covid-19 once a week*. Employees will not have to be tested if they have been vaccinated against Covid.

After presenting one of these four descriptions, we asked participants to rate their level of support for the policy on a five-point Likert scale:

- Strongly oppose (0)
- Somewhat oppose (1)
- Neither support nor oppose (2)
- Somewhat support (3)
- Strongly support (4)

Next, we asked participants whether they believed that President Biden (or, for the OSHA groups, OSHA) had proposed a mandate like the one described previously. At the end of the survey, we presented participants with an instructional manipulation check to test attentiveness (Oppenheimer, Meyvis & Davidenko, 2009).⁸

Results

Sample Characteristics

Table 1 reports sample characteristics for each treatment group. Demographic and partisan differences across treatment groups are well within the range that we might expect from random assignment.⁹ A sizeable portion of the sample failed the instructed-response attention check at the end of the survey (45.6 percent across all four frames). Failure rates nearing 50 percent for instructed-response attention checks are not unusual: for example, Oppenheimer, Meyvis, and Davidenko (2009) report a 46 percent failure rate for a similar question in a sample primarily composed of Stanford University undergraduates who were considering a major or minor in psychology. Although screening out inattentive subjects can reduce noise in survey

⁸ Following the suggestion of Hauser and Schwarz (2015), we placed the attention check at the end of the survey to avoid the possibility that the intention check would itself affect substantive responses. The attention check asked:

We are interested in learning how people view different sorts of policy interventions. But we want to make sure that participants are paying attention so our results are valid. Below, please ignore the question, click “other” and enter the name of your favorite band or musician.

Which is your least favorite federal agency?

The multiple-choice options were FDA, NHTSA, USDA, and “Other.”

⁹ To test randomization, we ran a multinomial logistic regression model with frame assignment as the left-hand-side variable and age, gender, race/ethnicity, and political party identification variables on the right-hand side (probability > $\chi^2 = 0.95$). For doubts about the need for randomization checks in the analysis of survey experiments, see Mutz, Pemantle, and Pham (2019).

data, it also introduces the risk of bias because performance on attention checks is potentially correlated with politically relevant characteristics (Berinsky, Margolis & Sances, 2013).¹⁰ Moreover, screening out inattentive subjects may inflate the magnitude of framing effects that depend upon subtle variations in word choice (Anduiza & Galais, 2016). Following Berinsky et al.'s suggestion, we therefore report results both for the full sample and for the subsample that passed the attention check.

Summary Statistics

Figure 1a reports the mean Likert score and the standard error of the mean for each of the four frames for the full sample; Figure 1b reports the means and standard errors for participants who passed the attention check. Across the full sample and the subsample of participants who passed the attention check, mean scores are higher for the OSHA-Vaccine and OSHA-Testing frames than for the Biden-Vaccine and Biden-Testing frames.

Table 2 and Figures 2a and 2b provide more granular detail on the distribution of Likert scores across the four frames. The most striking observation from visual inspection is the drop in the percentage of respondents who strongly oppose the policy as we move from the Biden-Vaccine frame to the OSHA-Testing frame. The share of respondents who strongly oppose the policy falls from 32.1 percent in the Biden-Vaccine frame to 18.8 percent in the OSHA-Testing frame across the full sample and from 32.2 percent to 14.1 percent among participants who passed the attention check.¹¹

An intuitive way to interpret the findings—though one that lacks the nuance of examining the full distribution—is to consider the change in the net support margin across the conditions (i.e., the percentage of respondents who say that they “strongly support” or “somewhat support” the policy minus the percentage of respondents who say that they “strongly oppose” or “somewhat oppose” the policy). In the full sample, net support rises from +7.5 percentage points under the Biden-Vaccine frame to +23.3 percentage points under the OSHA-Testing frame and +20.9 percentage points under the OSHA-Vaccine frame. Among participants who passed the attention check, net support rises from +13.1 percentage points under the Biden-Vaccine frame to +27.9 percentage points under the OSHA-Testing frame and +35.6 percentage

¹⁰ For example, in our study, participants who passed the attention check were slightly older (50.9 vs. 46.2) and slightly less likely to identify as Democrats (37.4 percent vs. 42.4 percent) than those who failed.

¹¹ Using a nonparametric Kolmogorov-Smirnov test, we can reject the null hypothesis that the distributions of Likert scores for the Biden-Vaccine and OSHA-Testing frames are identical at the $p < 0.01$ level in both the full sample and the attention-check subsample. We also can reject the null hypothesis that the distributions of Likert scores for the Biden-Testing and OSHA-Testing frames are identical at the $p < 0.01$ level in the full sample and at the $p < 0.05$ level in the sample of participants who passed the attention check ($p = 0.02$). Interestingly, although the mean scores for the OSHA-Vaccine and OSHA-Testing frames are similar, we cannot reject the null hypothesis of equality of distributions between either of the Biden frames and the OSHA-Vaccine frame. No significant differences emerge between the Biden-Vaccine and Biden-Testing frames or between the OSHA-Vaccine and OSHA-Testing frames.

points under the OSHA-Vaccine frame. These results indicate the possibility of a substantial effect from changing the messenger, but little or no effect from changing the framing of the message.

After collecting our primary outcome-variable data, as noted above, we asked participants whether—to the best of their knowledge—President Biden (or for the OSHA treatment groups, OSHA) actually had proposed the policy in question. Approximately two-thirds (66.4 percent) of participants in the Biden-Vaccine treatment group answered affirmatively. Given that assignment to treatment groups was random, we would expect that approximately the same percentage of participants in the other treatment groups had been exposed to the policy. Self-reported recognition rates were in fact significantly lower in the other treatment groups, which may be attributable to two factors. First, some of the participants in the Biden-Testing, OSHA-Vaccine, and OSHA-Testing groups may not have realized the policy presented to them is identical to the Biden vaccine mandate. Second, we conducted our survey before OSHA had formally published the emergency temporary standard. Thus, highly knowledgeable participants may have believed—arguably correctly—that the answer at the time to the question of whether OSHA had put forward a vaccinate-or-test policy was no.

Regression Analysis

Table 3 reports the results of ordinary least squares (OLS) and ordered logistic regressions with Likert score as the outcome variable and controls for demographic and partisan characteristics. OLS regression imposes artificial structure on the data (implicitly assuming an equal distance between each level on the Likert scale), but it brings the benefit that coefficients are easily interpretable. We place greater emphasis on the ordered logistic regression models, which reflect the ordinal structure of the outcome variable.

Across all six models in Table 3, coefficients on the OSHA-Vaccine and OSHA-Testing frames are positive, indicating that these frames elicit more favorable responses than the Biden-Vaccine frame which we use as a baseline. The effects of the OSHA-Vaccine and OSHA-Testing frames (relative to the Biden-Vaccine baseline) are positive and statistically significant at the $p < 0.1$ level or below across all models. The sizes of the framing effects are not enormous, but they are still large enough to be meaningful. Using the OLS coefficients for ease of interpretation, a switch from the Biden-Vaccine frame to the OSHA-Testing frame has an effect approximately one-third as large as a switch from Republican to independent in the full sample (more than two-fifths as large as a switch from Republican to independent among participants who passed the attention check).

Table 4 disentangles messenger framing effects from message framing effects. We again report results of OLS and ordered logistic regressions for the full sample and for the subsample of participants who passed the attention check. Coefficients on the OSHA messenger frame are positive and statistically significant at the $p < 0.01$ level across all six models, while coefficients on the Testing message frame are inconsistently signed and insignificant. These results strongly indicate that the change in messenger—not the change in message—is the driving force behind

differences across frames. Based on the straightforwardly interpretable OLS coefficients, the effect of switching from Biden as messenger to OSHA as messenger is more than one-third as large as the effect of switching from Republican to independent.

Analysis by Political Party

Tables 5 and 6 repeat the analysis in Tables 3 and 4 with results broken down by political party. The subgroup analysis reveals that framing effects are strongest among self-identified Republicans. The effect of the OSHA-Testing frame, in particular, is large and positive among Republicans: an increase of more than seven-tenths of a point on the zero-to-four Likert scale relative to the Biden-Vaccine baseline across the full-sample and attention-check subsample OLS models. Across all models, the messenger framing effect among Republicans is substantively and statistically significant ($p < 0.01$): reframing the policy as promulgated by OSHA rather than the president boosts support. A more modest but similarly signed messenger framing effect appears among independents.

The positive effect among Republicans and independents of reframing the policy as promulgated by OSHA rather than President Biden is not neutralized by a negative effect among Democrats. As Table 6 illustrates, the effect of reframing the policy as promulgated by OSHA rather than Biden is negatively signed but substantively and statistically insignificant (an OLS point estimate of approximately -0.1 on the zero-to-four Likert scale). In other words, framing the vaccinate-or-test policy as coming from Biden rather than OSHA depresses support among Republicans but does little to lift support among Democrats.

Discussion

Our results raise two distinct questions: (1) Why did participants (and in particular, self-identified Republicans) respond more favorably to the vaccinate-or-test policy when we changed the messenger frame from President Biden to OSHA?; and (2) Why *didn't* our manipulation of the message frame produce a detectable response? While our research design does not allow us to answer these questions definitively, our results point to several possible explanations.

At the time of our study, President Biden's approval rating hovered below 44 percent in the FiveThirtyEight average of all polls, while his disapproval rating exceeded 50 percent (FiveThirtyEight, 2021). Negative attitudes toward President Biden may have influenced responses to the vaccinate-or-test requirement when the policy was framed as emanating from the president. This would help to explain why the shift from President Biden to OSHA as promulgator produced a stronger positive effect among self-identified Republicans and independents than among self-identified Democrats. The monthly Harvard-Harris poll for October 2021, conducted at the end of our study period (October 27 to 28), found that Biden's approval rating was 9 percent among self-identified Republicans and 35 percent among independents versus 83 percent among Democrats (Harvard-Harris, 2021). It may be

unsurprising, then, that President Biden as messenger would dampen support for the policy among Republicans and—to a lesser extent—independents.

Notwithstanding Biden's popularity among Democrats, though, the shift from President Biden to OSHA as promulgator did not have a significant negative effect on support among Democrats. One potential reason is that support for the vaccinate-or-test policy is strong among Democrats across all four frames. Across all treatment groups, 54.7 percent of self-identified Democrats "strongly support" the policy and 71.4 percent "strongly support" or "somewhat support" it. Thus, among Democrats, framing has less work to do.

Another possible explanation for our messenger-frame results relates to perceptions of and attitudes toward expertise. While President Biden is a politician, OSHA is a federal agency staffed by professionals—and in many cases, experts—who are responsible for the health of the country's workforce. Thus, participants may trust OSHA more than they do the president when it comes to determining health policies. This expertise-based account, though, fails to explain why the messenger framing effect was so muted among self-identified Democrats.¹²

In contrast to the robust messenger framing effect, our study failed to detect a substantively or statistically significant message framing effect. Again, we cannot say definitively why message reframing failed to lift support. One speculative possibility is that participants perceived the once-a-week testing option to be onerous in its own right. Another possibility is that participants perceived vaccination to be more effective than testing. Emphasizing the more efficacious compliance option may have offset negative reactions from participants who perceived a vaccination mandate to be intrusive.

Conclusion

Our results are broadly consistent with the notion that views about government policies can be influenced by the ways in which those policies are framed. By redescribing President Biden's vaccine mandate (with a testing exception) as OSHA's testing mandate (with a vaccine exception), we were able to boost support and substantially reduce opposition. The magnitude of the framing effect—though not enormous—is nonetheless consequential: more than a third as large as the effect of a shift from Republican to independent self-identification.

As it turned out, manipulating the messenger had a much stronger effect in our study than did manipulating the message. Changing the promulgator from President Biden to OSHA elicited much more favorable responses to the policy, especially from self-identified Republicans. By contrast, switching from a vaccine mandate (with a testing exception) to a testing mandate (with a vaccine exception) had little discernible effect on our participants, suggesting that the Biden administration's new effort to emphasize the testing aspect of the policy is unlikely to soften resistance.

¹² Conceivably, our messenger frame results also could imply that Democrats adhere more closely to the descriptive invariance axiom than independents and Republicans do.

To be sure, no government official enjoys complete control over the messenger frame. Opponents might have cast the vaccinate-or-test requirement as Biden's mandate even if it had been announced by an OSHA administrator rather than by the president. Nonetheless, the fact that our messenger manipulation produced the change that it did—when most participants already said they had heard about the relevant policy—suggests that the messenger framing effect is not entirely negated by significant exposure to alternative framings. Future research—testing different policies in different survey settings at different points in the political cycle—can shed further light on whether the phenomenon observed here is specific to the Covid-19 vaccination context or reflects a generalizable consequence of presidential administration in a deeply polarized society.

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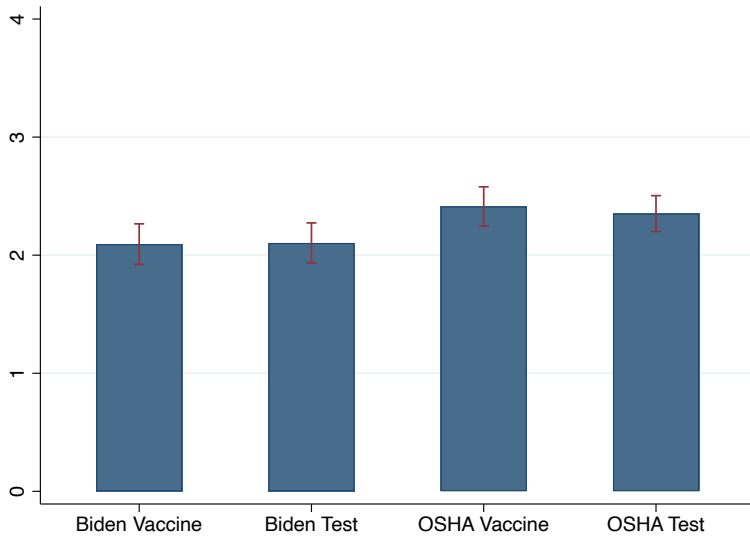
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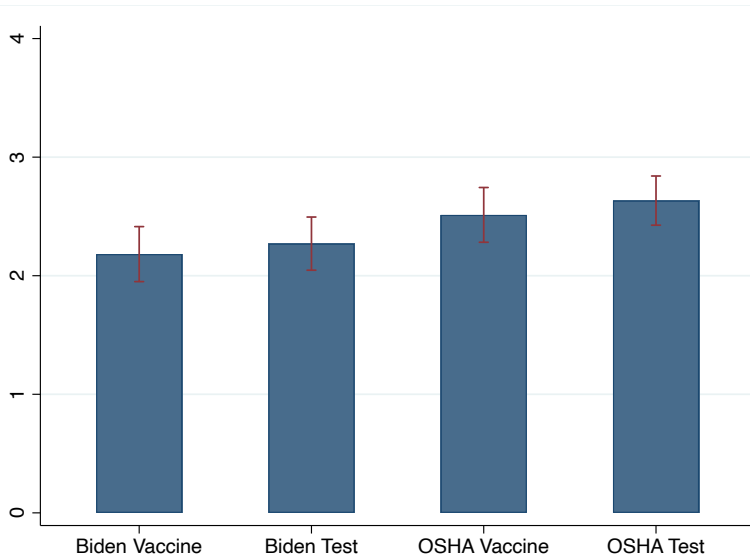
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Figure 1a. Mean and 95% Confidence Interval for Four Frames (Full Sample)



Notes: Dependent variable is 0-4 score: Strongly oppose (0); Somewhat oppose (1); Neither support nor oppose (2); Somewhat support (3); Strongly support (4).

Figure 1b. Mean and 95% Confidence Interval for Four Frames (Passed Attention Check)



Notes: Dependent variable is 0-4 score: Strongly oppose (0); Somewhat oppose (1); Neither support nor oppose (2); Somewhat support (3); Strongly support (4).

Figure 2a. Attitudes by Frame (Full Sample)

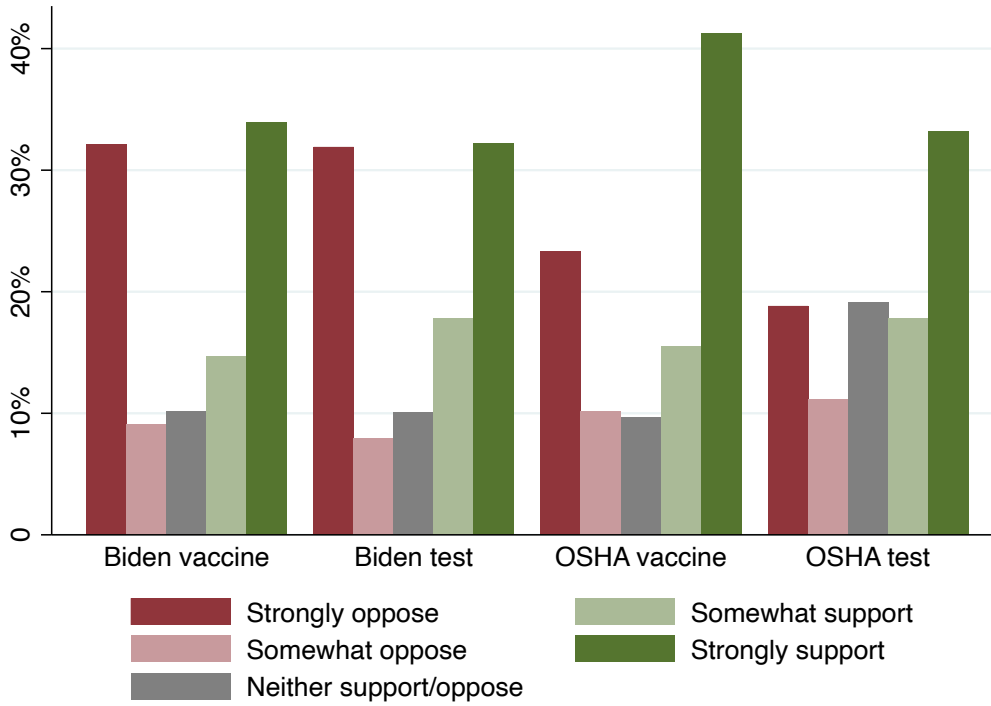
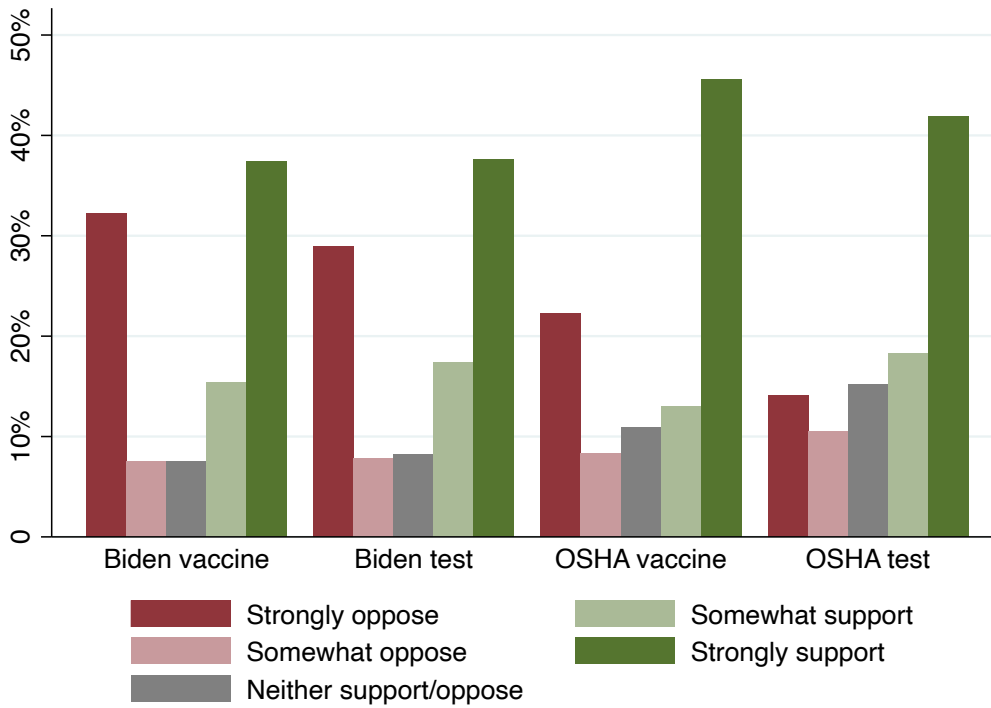


Figure 2b. Attitudes by Frame (Passed Attention Check)



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Table 1. Sample Characteristics

	Biden Vaccine	Biden Testing	OSHA Vaccine	OSHA Testing	Across All Frames
FULL SAMPLE					
Age	46.5	46.2	45.4	46.7	46.2
Female	51.6%	46.8%	50.4%	51.7%	50.1%
White	74.1%	73.4%	70.0%	72.4%	72.5%
Black or African-American	12.6%	11.4%	12.9%	11.9%	12.2%
Latino/a or Hispanic	4.8%	6.1%	7.2%	6.4%	6.1%
Asian	5.6%	5.1%	7.2%	5.8%	5.9%
Democratic	37.4%	38.6%	44.0%	38.5%	39.6%
Republican	34.8%	31.4%	30.3%	32.4%	32.2%
N	374	376	373	377	1500
PASSED ATTENTION CHECK					
Age	51.2	50.9	49.7	51.5	50.9
Female	51.9%	45.4%	55.4%	54.5%	51.6%
White	72.4%	72.9%	67.4%	71.2%	71.1%
Black or African-American	11.7%	12.4%	14.0%	10.5%	12.1%
Latino/a or Hispanic	6.1%	6.4%	6.7%	7.3%	6.6%
Asian	6.1%	5.5%	7.8%	7.3%	6.6%
Democratic	35.5%	36.2%	39.4%	38.7%	37.4%
Republican	37.9%	30.7%	31.1%	29.8%	32.5%
N	214	218	193	191	816

Table 2. Descriptive Statistics

	Biden Vaccine	Biden Testing	OSHA Vaccine	OSHA Testing	Across All Frames
FULL SAMPLE					
Strongly support	34.0%	32.2%	41.3%	33.2%	35.1%
Somewhat support	14.7%	17.8%	15.5%	17.8%	16.5%
Neither support nor oppose	10.2%	10.1%	9.7%	19.1%	12.3%
Somewhat oppose	9.1%	8.0%	10.2%	11.1%	9.6%
Strongly oppose	32.1%	31.9%	23.3%	18.8%	26.5%
0-4 Likert scale (mean)	2.09	2.10	2.41	2.35	2.24
0-4 Likert scale (SD)	1.70	1.68	1.64	1.50	1.63
Total support	48.7%	50.0%	56.8%	50.9%	51.6%
Total oppose	41.2%	39.9%	33.5%	30.0%	36.1%
Net support	7.5 ppts	11.1 ppts	23.3 ppts	20.9 ppts	15.5 ppts
Prior knowledge of policy	66.4%	56.5%	44.4%	38.6%	51.3%
N	374	376	373	377	1500
PASSED ATTENTION CHECK					
Strongly support	37.4%	37.6%	45.6%	41.9%	40.4%
Somewhat support	15.4%	17.4%	13.0%	18.3%	16.1%
Neither support nor oppose	7.5%	8.3%	10.9%	15.2%	10.3%
Somewhat oppose	7.5%	7.8%	8.3%	10.5%	8.5%
Strongly oppose	32.2%	28.9%	22.3%	14.1%	24.8%
0-4 Likert scale (mean)	2.18	2.27	2.51	2.63	2.39
0-4 Likert scale (SD)	1.73	1.69	1.64	1.46	1.64
Total support	52.8%	55.0%	58.5%	60.2%	56.5%
Total oppose	39.7%	36.7%	30.6%	24.6%	33.2%
Net support	13.1 ppts	18.3 ppts	27.9 ppts	35.6 ppts	23.3 ppts
Prior knowledge of policy	62.9%	51.2%	30.9%	29.2%	44.2%
N	214	218	193	191	816

Table 3. Multiple Regression Analysis—Comparing Four Frames

	FULL SAMPLE				PASSED ATTENTION CHECK			
	OLS		Ordered Logit		OLS		Ordered Logit	
FRAME								
Biden Testing	0.010 (0.119)	-0.017 (0.109)	-0.004 (0.133)	-0.073 (0.136)	0.088 (0.158)	0.034 (0.140)	0.086 (0.176)	0.025 (0.184)
OSHA Vaccine	0.319*** (0.119)	0.234** (0.109)	0.366*** (0.134)	0.261* (0.137)	0.331** (0.163)	0.260* (0.145)	0.380** (0.183)	0.344* (0.191)
OSHA Testing	0.259** (0.119)	0.236** (0.109)	0.240* (0.130)	0.246* (0.134)	0.451*** (0.163)	0.347** (0.145)	0.432** (0.179)	0.434** (0.188)
DEMOGRAPHIC AND PARTISAN COVARIATES								
Age ≥65		0.491*** (0.107)		0.636*** (0.137)		0.576*** (0.124)		0.745*** (0.166)
Female		-0.123 (0.077)		-0.199** (0.096)		-0.056 (0.103)		-0.120 (0.135)
White		0.319 (0.218)		0.391 (0.262)		0.411 (0.278)		0.502 (0.364)
Black		0.167 (0.241)		0.153 (0.292)		0.210 (0.311)		0.143 (0.408)
Latino		0.508* (0.264)		0.603* (0.321)		0.642* (0.336)		0.795* (0.442)
Asian		0.772*** (0.266)		0.885** (0.322)		0.680** (0.336)		0.798* (0.437)
Democrat		0.778*** (0.097)		1.033*** (0.121)		0.890*** (0.130)		1.265*** (0.174)
Republican		-0.698*** (0.100)		-0.804*** (0.121)		-0.818*** (0.130)		-0.944*** (0.165)
CONSTANT	2.094*** (0.084)	1.698*** (0.236)			2.182*** (0.112)	1.657*** (0.302)		
R²/Pseudo R²	0.008	0.177	0.003	0.066	0.012	0.228	0.004	0.088
N	1500	1500	1500	1500	816	816	816	816
<p>Notes: Dependent variable is 0-4 score: Strongly oppose (0); Somewhat oppose (1); Neither support nor oppose (2); Somewhat support (3); Strongly support (4). Omitted conditions: <u>Frame:</u> Biden Vaccine; <u>Age:</u> <65; <u>Gender:</u> Male/nonbinary; <u>Race/ethnicity:</u> American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Multiple races, and Other; <u>Political party:</u> Independent. Significance key: *p≤0.1; **p≤0.05; ***p≤0.01</p>								

Table 4. Multiple Regression Analysis—Messenger Frame vs. Message Frame

	FULL SAMPLE				PASSED ATTENTION CHECK			
	OLS		Ordered Logit		OLS		Ordered Logit	
FRAMING EFFECT								
Messenger Frame (OSHA)	0.284*** (0.084)	0.243*** (0.077)	0.302*** (0.093)	0.291*** (0.096)	0.347*** (0.115)	0.287*** (0.102)	0.363*** (0.128)	0.377*** (0.134)
Message Frame (Testing)	-0.025 (0.084)	-0.007 (0.077)	-0.066 (0.093)	-0.044 (0.096)	0.104 (0.115)	0.059 (0.102)	0.070 (0.127)	0.056 (0.134)
DEMOGRAPHIC AND PARTISAN COVARIATES								
Age ≥65		0.492*** (0.107)		0.637*** (0.137)		0.577*** (0.124)		0.746*** (0.166)
Female		-0.123 (0.077)		-0.198** (0.096)		-0.055 (0.103)		-0.119 (0.135)
White		0.319 (0.218)		0.390 (0.263)		0.411 (0.278)		0.501 (0.364)
Black		0.167 (0.241)		0.152 (0.292)		0.208 (0.311)		0.139 (0.408)
Latino		0.508* (0.264)		0.600* (0.321)		0.642* (0.336)		0.794* (0.443)
Asian		0.772*** (0.266)		0.884*** (0.322)		0.679** (0.336)		0.797* (0.437)
Democrat		0.777*** (0.097)		1.032*** (0.121)		0.890*** (0.129)		1.266*** (0.174)
Republican		-0.698*** (0.100)		-0.804*** (0.121)		-0.817*** (0.130)		-0.943*** (0.165)
CONSTANT	2.111*** (0.073)	1.693*** (0.233)			2.175*** (0.098)	1.644*** (0.297)		
R²/Pseudo R²	0.008	0.177	0.002	0.066	0.012	0.228	0.004	0.088
N	1500	1500	1500	1500	816	816	816	816
Notes: Dependent variable is 0-4 score: Strongly oppose (0); Somewhat oppose (1); Neither support nor oppose (2); Somewhat support (3); Strongly support (4). Omitted conditions: Messenger: Biden; Message: Vaccine; Age: <65; Gender: Male/nonbinary; Race/ethnicity: American Indian/Native American, Native Hawaiian/Pacific Islander, Multiple races, and Other; Political party: Independent. Significance key: *p≤0.1; **p≤0.05; ***p≤0.01								

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Table 5. Multiple Regression Analysis—Comparing Four Frames (by Political Party Identification)

	FULL SAMPLE						PASSED ATTENTION CHECK					
	Democrat		Independent		Republican		Democrat		Independent		Republican	
	OLS	Ordered Logit	OLS	Ordered Logit	OLS	Ordered Logit	OLS	Ordered Logit	OLS	Ordered Logit	OLS	Ordered Logit
FRAME												
Biden Testing	0.034 (0.170)	-0.077 (0.231)	-0.214 (0.206)	-0.295 (0.252)	0.069 (0.197)	0.049 (0.245)	0.107 (0.203)	0.051 (0.333)	-0.273 (0.277)	-0.340 (0.329)	0.184 (0.263)	0.255 (0.325)
OSHA Vaccine	0.061 (0.166)	0.044 (0.228)	0.124 (0.216)	0.146 (0.261)	0.539*** (0.200)	0.639*** (0.246)	-0.054 (0.206)	-0.027 (0.337)	0.241 (0.295)	0.312 (0.349)	0.558** (0.271)	0.715** (0.331)
OSHA Testing	-0.177 (0.170)	-0.317 (0.230)	0.202 (0.209)	0.176 (0.245)	0.723*** (0.195)	0.865*** (0.232)	-0.053 (0.207)	-0.050 (0.342)	0.315 (0.290)	0.294 (0.334)	0.719*** (0.275)	0.875*** (0.320)
Demographic Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CONSTANT	2.579*** (0.341)		1.959*** (0.407)		0.337 (0.482)		2.824*** (0.404)		1.614*** (0.534)		0.383 (0.651)	
R²/Pseudo R²	0.032	0.016	0.047	0.015	0.067	0.024	0.054	0.027	0.054	0.017	0.093	0.035
N	594	594	420	420	483	483	305	305	246	246	265	265
<p>Notes: Dependent variable is 0-4 score: Strongly oppose (0); Somewhat oppose (1); Neither support nor oppose (2); Somewhat support (3); Strongly support (4). Omitted condition: Frame: Biden Vaccine. Demographic covariates: Age ≥65; Gender (female); Race/ethnicity (White, Black or African-American, Latino/a or Hispanic; Asian). Significance key: *p≤0.1; **p≤0.05; ***p≤0.01</p>												

Table 6. Multiple Regression Analysis—Messenger Frame vs. Message Frame (by Political Party Identification)

	FULL SAMPLE						PASSED ATTENTION CHECK					
	Democrat		Independent		Republican		Democrat		Independent		Republican	
	OLS	Ordered Logit	OLS	Ordered Logit	OLS	Ordered Logit	OLS	Ordered Logit	OLS	Ordered Logit	OLS	Ordered Logit
FRAMING EFFECT												
Messenger Frame (OSHA)	-0.072 (0.119)	-0.101 (0.160)	0.279* (0.149)	0.323* (0.176)	0.597*** (0.141)	0.730*** (0.172)	-0.107 (0.147)	-0.064 (0.241)	0.427** (0.202)	0.491** (0.235)	0.547*** (0.197)	0.667*** (0.234)
Message Frame (Testing)	-0.108 (0.118)	0.227 (0.159)	-0.073 (0.149)	-0.131 (0.178)	0.125 (0.141)	0.139 (0.171)	0.054 (0.144)	0.015 (0.239)	-0.109 (0.202)	-0.183 (0.238)	0.174 (0.197)	0.209 (0.236)
Demographic Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CONSTANT	2.656*** (0.334)		1.883*** (0.400)		0.307 (0.476)		2.845*** (0.399)		1.515*** (0.521)		0.389 (0.641)	
R²/Pseudo R²	0.030	0.016	0.045	0.014	0.067	0.024	0.053	0.027	0.051	0.016	0.093	0.035
N	594	594	420	420	483	483	305	305	246	246	265	265
Notes: Dependent variable is 0-4 score: Strongly oppose (0); Somewhat oppose (1); Neither support nor oppose (2); Somewhat support (3); Strongly support (4). Omitted condition: <u>Messenger:</u> Biden; <u>Message:</u> Vaccine. Demographic covariates: Age ≥65; Gender (female); Race/ethnicity (White, Black or African-American, Latino/a or Hispanic; Asian). Significance key: *p≤0.1; **p≤0.05; ***p≤0.01												