The impact of COVID-19 and political identification on framing bias in an infectious disease experiment: The frame reigns supreme

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Abstract
Background: Behavioral responses to the COVID-19 pandemic have become highly polarized, and public health initiatives often try to use different frames to influence behavior. If the polarization of behaviors is related to differences in responses to frames, then different health messages could be targeted to different groups to influence behavior.

Objective: To determine whether risk preferences and susceptibility to gain/loss frames have been affected by COVID-19 and whether they differ along partisan lines.

Methods: Using repeated cross-sectional data from a nationally representative dataset in the United States replicating the disease outbreak scenario collected before and after the onset of COVID-19, we test whether responsiveness to the gain/loss frames has changed over time and whether the responsiveness varies by political affiliation.

Results: The experimental results show that the risk preferences of the U.S. population is very susceptible to the framing of choices, consistent with the literature finding risk loving preferences under the loss frame and risk aversion under the gain frame. However, the experience of COVID-19 does not appear to have changed the responsiveness, nor are there significant differences between conservatives/Republicans and liberals/Democrats.

Conclusion: Targeting different partisan groups with different risk-related message frames is unlikely to be effective at altering behaviors.
Goodman, and Pepinsky 2020; Gollwitzer et al. 2020; Grossman et al. 2020), a reasonable research question is whether those differences in behaviors are related to differences in risk aversion and responsiveness to gain/loss frames by political ideation. Has COVID-19 changed risk preferences in the United States? Has it changed risk preferences by political ideology/party?

How framing affects risk preferences is the central question of prospect theory. It is perhaps ironic that one of the seminal experiments that established this theory used a disease outbreak scenario (Tversky and Kahneman 1981). When given a numerically equivalent choice between a certain outcome and a gamble, respondents preferred the certain option when it was expressed as lives saved but the gamble when the certain option was expressed in terms of deaths (Tversky and Kahneman 1981). As these are numerically equivalent choices and differ only in the phrasing used to describe them, the switching of preferences implies that cognitive mistakes are being made (i.e., one should either prefer the risk-averse option or not). However, these results have not been uniformly replicated, which has contributed to the development of the dual-process theory explanations for the variation in sensitivity to framing. Under the dual-process theory, strong emotions move individuals away from a slow, rational thought process to one that relies instead on heuristics and is subsequently susceptible to framing effects (Kahneman 2003; Kahneman and Frederick 2007). The COVID-19 pandemic has certainly changed the environmental context, thus leading to the question—has the pandemic changed the emotional response to infectious disease in the United States?

We develop several competing hypotheses about the effect of COVID-19 on framing effects. It could have increased emotional reactions due to COVID-19 raising the salience of infectious disease among the public, or it could have decreased the emotional reactions as the infectious disease becomes more normalized. Furthermore, there may be very different reactions for partisan subgroups in the United States. Surveys have established clearly that Democrats rate both their personal and population health risks higher than Republicans (Wolaver & Doces 2021; McCarthy 2020). This disparity in the emotions elicited by the polarized messages from partisan elites combined with the observed partisan differences in behaviors begs the question of whether there are also partisan differences in the gain/loss frame effect.

To test these claims, we use repeated cross-sectional data set on risk perceptions. We have been replicating the Tversky and Kahneman (1981) disease outbreak scenario in nationally representative samples in the United States periodically since 2018. We can therefore test whether there have been changes over time in the susceptibility to framing bias by using the serendipitously collected pre-COVID-19 data with additional post-COVID-19 samples from February and December 2020. With nationally representative survey data at the beginning of the pandemic and a year later, we are uniquely able to test for COVID-19 effects. We also test hypotheses about partisanship and framing effects based on competing theories. Our results show that there is no significant change in the framing effect due to COVID-19 and that there is very limited support for a difference between Republicans and Democrats. We do find a strong, consistent framing effect.

**LITERATURE REVIEW AND HYPOTHESES**

We first discuss the framing literature both generally and with attention to studies explicitly addressing different aspects of the COVID-19 pandemic. We then turn to various theories for potential partisan differences in responses to the gain/loss frame experiment.

**Framing literature**

In the political sphere, choices can be framed in many ways. The emphasis of the message can be varied between prioritizing one set of values over others, for example, public health versus economic concerns. Varying the information source, perhaps between in-group or out-group figures or different institutions, is another example of possible alternative frames. The type of framing we examine in this study is equivalency framing, where the certain/risk-averse and gamble/risk-loving choices are numerically identical, but the
expression of the certain choice varies between a loss and a gain. We first detail the results of other types of framing experiments on attitudes in the COVID-19 context.

There are mixed results on whether framing affects intentions to receive the COVID-19 vaccination and other protective behaviors. Chen et al. (2021) found that intention to vaccinate was not affected by altering the gain/loss frame. Similarly, Case et al. (2021), who used experimental treatments that altered both the source (expert/non-expert) and content (fact/experience-based) of the message in addition to the gain/loss frame, did not find any effect of the gain/loss frame on support for stay-at-home orders, mail-in voting, the return of college football, or prisoner release programs. Sanders et al. (2021) also found no framing effect on the support for COVID-19 policy choices. On the other hand, Gantiva, Jiménez-Leal, and Urriago-Rayó (2021) found that loss frames increased risk perceptions and gain frames increased intentions to engage in protective measures.

There are a few studies that examine whether responsiveness to gain/loss frames varies by political ideology. Steffen and Cheng (2021) found that there were similar levels of support for protective behaviors across party lines under the gain frame, and liberals increased their intentions to engage in those activities under the loss frame more than conservatives did. However, their experimental treatment included information on COVID-19 mortality that referenced the Institute for Health Metrics and Evaluation at the University of Washington, which may have had an independent impact from the frame on responses due to partisan differences in institutional trust.

The second study that tested for party effects is Palm, Bolsen, and Kingsland’s (2021), although they did not use equivalency frames. They vary the content of messages on COVID-19 vaccines and test for interactions between political parties and the treatments. The first test alters the content of messages between vaccines being safe/effective versus unsafe/ineffective; the second randomizes between high versus low rates of public acceptance; and the third between messages about whether the liberal media is advocating vaccination versus President Trump rushing approval of the vaccine. The only differential party effect was that Republicans who received the message that the vaccine is safe and effective decreased their vaccine intentions.

There have also been COVID-19-specific examinations of the gain/loss frame on risk preferences. Doerfler et al. (2021) replicated the disease outbreak scenario but replaced the generic “Asian disease” descriptor with COVID-19. They found reversals in risk preferences by frame at similar levels to Tversky and Kahneman (1981). Hameleers (2021) also found that risk preferences are affected by the gain/loss frames, although the preferences do not completely reverse across frames. These studies used a generic policy descriptor (e.g., program A vs. B).

The lack of strong framing responses in Chen et al. (2021); Case et al. (2021), and Sanders et al. (2021) compared to Doerfler et al. (2021) and Hameleers (2021) could be explained by Druckman (2001). Druckman (2001) replicated the original disease outbreak scenario and introduced an elite cue variation; Programs A and B were randomly replaced with “Democrats’ Program” and “Republicans’ Program.” The gain/loss framing effects were greatly reduced when these cues were added. From early in the pandemic, mask-wearing, stay-at-home orders, and other such policy choices quickly became associated with Democrats while fewer or no restrictions on behavior became associated with Republicans. The specific named policies in these treatments may have become associated with implicit partisan cues, dampening the other framing effects.

Dual-process theory: Explaining variations in responsiveness to gain/loss frames

The Tversky and Kahneman reversal of preferences results are not always replicated (Kühberger, Schulte-Mecklenbeck and Perner 1999; Weber, Blais, and Betz 2002). In particular, the responses have been found to differ by gender (Fagley and Miller 1990), place (Doces and Wolaver 2021a, 2021b), and are not robust to the inclusion of partisan cues (Druckman 2001). The dual-process theory may be useful in explaining these variations through differences in whether a topic elicits an emotional response for different populations.
Depending on the context, some populations may be emotionally triggered by some threats, but other populations will not. Doces and Wolaver (2021b) found evidence consistent with this hypothesis in Côte d’Ivoire by randomly varying the scenario topic between infectious disease, corruption, and a terrorist attack. Of these scenarios, they hypothesize that disease and corruption should not evoke an emotional response since they are a normalized part of life but that terrorism would remain emotionally triggering. Thus, terrorism should induce irrational behavior but others should not. The findings were consistent with this hypothesis. One reason that the disease outbreak scenario has been associated with framing bias in the United States may be because of differences in the day-to-day experiences for the average American. Perceived threats from infectious diseases are more normalized for West Africans but not for Americans because of the difference in the experience of infectious diseases.

COVID-19 has induced emotional reactions that could change susceptibility to framing effects, but these reactions may change over the course of the pandemic. If people in the United States and other western countries are becoming desensitized to disease because of COVID-19, then they may become less susceptible to gain/loss framing effects. On the other hand, COVID-19 may increase the saliency of infectious disease, and the availability heuristic implies heightened emotional response and more susceptibility to frames (Hameleers 2021).

Evidence from surveys shows some of the ways that the COVID-19 pandemic has elicited emotional responses. Examining social media wording trends in January through April, Lwin et al. (2020) find high levels of fear, although these decreased over time, while expressions of anger increased. The American Psychological Association (APA 2020a) reported that eight in 10 adults in the United States reported stress due to the pandemic in May. They report increases in stress and being scared and angry through the first half of the year, with a geographic variation that tracked trends in COVID-19 infections (APA 2020b). However, the emotional reaction to COVID-19 might dissipate with time as it becomes normalized in U.S. society. Jacobson et al. (2020), using variations in state stay-at-home orders, find that internet searches for mental health problems, including anxiety and depression, increased just before the orders were implemented but then reverted to the previous levels as the stay-at-home orders were enacted.

The dual-process theory combined with the evidence regarding the emotional impact of COVID-19 provides two competing hypotheses:

H1: If the availability heuristic is important, fear of disease will have increased and there should be more responsiveness to the framing of choices in the post-COVID-19 data.

H2: If the ongoing effects of COVID-19 have normalized infectious disease, an individual’s fear of disease will have decreased, and there should be less responsiveness to the framing of choices.

Political polarization and responsiveness to gain/loss framing

There are multiple theoretical reasons why political orientation might affect responsiveness to gain/loss frames in an infectious disease scenario. The possible explanations include differences in personality traits, elite cues and information sources, trust in science, and cultural values. We examine these factors below but note that demographically that Republicans are older and therefore more at risk from COVID-19, which should heighten their emotional response. There are other differences along socioeconomic dimensions, which are also explored in the empirical analysis.

Personality factors

There are a variety of theories that posit certain personality traits are connected with political ideology. Conservatives have been characterized as more fearful (Altemeyer 1998), which is one of the possible emotional triggers leading to systematic cognitive biases. Oxley et al. (2008) measure higher physiological responses to noises and threatening pictures in conservatives. Similarly, Johnston and Wronski (2015, p. 35)
cite an extensive literature linking “high needs for certainty and security” for conservative respondents. Hibbing, Smith, and Alford (2013) provide a similar analysis. To the extent that fear and anxiety underlie this need for security, one would hypothesize that conservatives may be more susceptible to the framing bias and more risk-averse.

The discourse surrounding COVID-19 in the United States to date has been highly politicized (Green et al. 2020; McCarthy 2020). The content of the messages has been starkly different, with Democratic leaders emphasizing the risk to health/lives of others and Republican leaders emphasizing the risk to personal freedom and the economy. In contrast to the underlying personality factors, these elite cues could heighten the probability of an emotional response from liberals and decrease the emotional responses of conservatives with respect to infectious disease. It is difficult to disentangle cues from political elites from differences in information sources. These elite cue differences are mirrored in the messages sent by conservative and liberal media outlets (Featherstone, Bell, and Ruiz 2019; Jamieson and Albarracin 2020).

Institutional trust has been declining prior to the onset of COVID-19 (Cook and Gronke 2001; Smith 2012), and there are partisan differences in the decline. Conservatives’ trust in science/scientific consensus has been eroded more than liberals’ (Mann and Schleifer 2020; Merkley and Stecula 2020). Rutjens, Sutton, and van der Lee (2018) note, however, that the differences in skepticism vary by topic. Specific to trust in information about COVID-19, Latkin et al. (2020) document declines in trust in local health departments, Johns Hopkins University, mainstream media, the White House, and the Centers for Disease Control (CDC) among all, with both lower levels of trust and steeper declines over time for Republicans relative to Democrats. Palm, Bolsen, and Kingsland (2021) finding that Republicans decreased support for vaccines when receiving a frame about their safety reinforces this idea. Their experimental treatment included references to the information being generated by scientists and the FDA, which may explain the partisan response to this content. While other factors may also have an impact, elite cues are likely connected to the differential levels of trust in science (Gauchat 2015; Hamilton and Safford 2020; Merkley and Stecula 2020). To the extent that conservatives are more likely to mistrust expert warnings and to downplay the health risks of COVID-19, their risk preferences should be less susceptible to framing.

Cultural values may also influence what types of risks we view as threatening. Individuals and groups who prioritize independence will view events that threaten that value as more important, and groups who value community will have a different view of the same event. Wildavsky and Dake (1990) test whether political beliefs affect the risk perception of technology, the environment, and social deviance. They find that liberals rate the risks of the first two topics more highly, while conservatives rate the risk of the latter more highly. These factors would again tend toward less responsiveness to the choice frame on the part of conservatives in this context.

The various factors related to partisanship also produce multiple hypotheses summarized in Table 1. The theoretical sources are presented as distinct factors, but in reality, there is likely to be feedback loops between elite cues, decreased trust in science, and differences in cultural values. Our experiment cannot distinguish between the sources of any partisan differences in responses to the loss/gain frames as we are simply testing for the existence of differential reactions.

DATA AND METHODS

Our pre-COVID-19 samples of U.S. respondents come from a nationally representative Bucknell Institute for Public Policy survey of 1000 U.S. adults, conducted by YouGov from March 18 to 22, 2018, and April 22 to 25, 2019 (980 usable responses). The post-COVID-19 surveys were conducted from February 13 to 20 and December 3 to 7, 2020, with samples sizes of 252 and 1200, respectively. See the Appendix for further details regarding the sampling and for additional details of statistical tests performed and robustness checks of the analysis.

The timing of the post-COVID-19 samples coincides with two very different points in the development of the pandemic in the United States. The first, in February, was very early in the outbreak in the United States. There had been media reports of the outbreak in Wuhan, and the first cases in the United States
TABLE 1 Competing hypotheses on the susceptibility of Conservatives relative to Liberals to gain/loss frames in an infectious disease scenario

| Theoretical differences | Hypothesized effect on responsiveness to gain/loss frames |
|-------------------------|----------------------------------------------------------|
| Demographics: Age = more threat from the disease | H3: Average age of conservatives is higher; they, therefore, face more personal threat = more susceptible to frame |
| Personality: Right-wing authoritarians view the world as threatening | H4: Fearful in general = more susceptible to frame |
| Personality: Conservatives crave certainty | H5: More risk-averse, regardless of frame |
| Elite cues: Conservative leaders/media downplay health risks, liberal leaders emphasize | H6: Lower threat perception = less susceptible to frame |
| Trust in institutions: Conservatives have less trust in science, will discount messages about risk from public health experts | H7: Lower threat perception from health effects = less susceptible to frame |
| Cultural values: Conservatives value independence more, liberals value community | H8: Lower threat perception from health effects = less susceptible to frame |

had been identified, but the known cases were concentrated in Washington state and New York City. Our data collection preceded the first known community spread cases in the United States. In February, about a quarter of Democrats and 30 percent of Republicans expressed fear about catching COVID-19; in March, these numbers had grown to three-quarters of Democrats but only 42 percent of Republicans (McCarthy 2020). The December data, however, are from a very different stage in the pandemic. The United States was deep in the “third,” and highest-to-date, wave of COVID-19 infections. Record numbers of new cases were being recorded, and all regions of the United States were affected. Although the data revealed alarming health effects, Americans had also been living with COVID-19 restrictions for months.

 Turning to the methods used in the analysis, to test for partisan differences within and across the frames, we run population-weighted logistic regressions of the following form:

\[ Y_i = \beta_0 + \beta_1 X_i + \beta_2 Z_i + \varepsilon_i, \]  

(1)

where \( Y \) = 1 if respondent \( i \) chooses the certain option, \( X \) is a vector of interaction terms between the experimental frame and indicators for partisan affiliation, \( Z \) is a vector of other demographic controls, and \( \varepsilon \) is the error term. To test for changes in preferences for certainty over time by partisan status, we conduct a similar analysis that replaces the \( X \) vector with interaction terms between the partisan indicators and the sample year and adds the indicator for the experimental treatment to the \( Z \) vector of other controls.

RESULTS

Looking first at whether the responses to framing have changed over time, the first panel of Figure 1 shows the margin plots with 95 percent confidence intervals by sample and experimental frame. First, the pattern of reversal in preferences for certainty is largely replicated in these data, with about 60 percent of participants preferring the certain option of 200 lives saved, and only about 35 percent of participants preferring the 400 deaths certainty option, with some variation in the point estimates across samples. There are no apparent differences in preferences for certainty in the pre- versus post-COVID-19 samples, however.

We have one sample where we can compare responsiveness to different hypothetical scenarios. The February 2020 sample was randomized into the experiments, which varied by topic between infectious disease, corruption, and terrorism to replicate our Côte d’Ivoire experiment. We expected all of these
### TABLE 2  Results by income, education and age group

| Income group | Education level | Age group |
|--------------|----------------|-----------|
|              | Income less than 40K | Income 40K or more | Less than high school | High school degree only | Some college or more | Non-elderly | Elderly |
|              | Odds ratio (std. error) | Odds ratio (std. error) | Odds ratio (std. error) | Odds ratio (std. error) | Odds ratio (std. error) | Odds ratio (std. error) | Odds ratio (std. error) |
| Loss frame, Republican | 1.429 (0.408) | 1.464* (0.290) | 1.024 (0.733) | 1.251 (0.349) | 1.636** (0.341) | 1.450* (0.277) | 1.562 (0.523) |
| Loss frame, Independent | 1.538* (0.397) | 1.058 (0.201) | 0.893 (0.701) | 1.255 (0.366) | 1.221 (0.225) | 1.194 (0.207) | 1.333 (0.487) |
| Loss frame, third party | 0.938 (0.528) | 1.015 (0.386) | 1.122 (0.657) | 1.050 (0.393) | 0.914 (0.319) | 1.179 (0.797) |
| Loss frame, party = not sure | 1.662 (0.618) | 2.189** (0.796) | 1.807 (1.473) | 1.746 (0.768) | 2.182** (0.793) | 1.806** (0.476) |
| Save frame, Democrat | 3.228*** (0.893) | 4.652*** (0.981) | 2.441 (2.114) | 3.736*** (1.100) | 4.381*** (0.926) | 3.462*** (0.645) | 8.321*** (3.252) |
| Save frame, Republican | 2.899*** (0.919) | 4.818*** (1.022) | 2.906 (2.724) | 3.374*** (1.040) | 4.786*** (1.067) | 3.724*** (0.751) | 6.339*** (2.461) |
| Save frame, Independent | 4.357*** (1.322) | 3.594*** (0.775) | 2.615 (2.148) | 3.334*** (1.071) | 4.322*** (0.928) | 3.565*** (0.709) | 5.371*** (2.107) |
| Save frame, third party | 5.104*** (2.427) | 4.293*** (1.567) | 17.05*** (12.48) | 3.775*** (1.240) | 5.115*** (1.722) | 2.240 (1.493) |
| Save frame, party = not sure | 3.496*** (1.560) | 2.229** (0.862) | 2.177 (2.439) | 3.784*** (1.783) | 2.375*** (0.902) | 2.515*** (0.744) |
| Observations | 1194 | 2257 | 182 | 1108 | 2160 | 2758 | 687 |

**Source:** 2018–2021 U.S. nationally representative surveys. 95 percent confidence intervals noted.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

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**FIGURE 1**  Percent choose certainty option, over frame of question and sample. **Source:** Authors’ calculations of nationally representative U.S. surveys. 95 percent confidence intervals noted.
topics to have been unfamiliar to Americans and for terrorism to have been the most emotionally triggering and to produce the largest effect from the gain/loss frame. The second panel in Figure 1 displays margins plots of the framing responses across topics. As expected, based on Covello et al. (2001), the greatest framing response was to the terrorism scenario. Interestingly, the percent of the sample preferring the risk-averse option under the loss frame is nearly identical across all three scenarios; the responsiveness differences are found entirely in the shift toward risk aversion in the save frame treatment.

Turning to the odds ratio estimates from the logistic regressions in Figure 2, the framing effects are stronger than the party effects. These regressions include controls for the post-COVID-19 time period, gender, race/ethnicity, education, marital status, and family income. None of the other demographic controls (in the Appendix) are statistically significant predictors. The effect of the frame is large across the partisan subgroups, with the odds ratios ranging from just under 3 to over 5; all of these estimates are statistically significant at the 1 percent level.

With one exception, partisanship, however, does not have an effect on the risk preferences of respondents within the experimental frames. As shown in Figure 2, Republicans who received the loss frame have statistically significantly higher levels of risk aversion than Democrats who received the loss frame (the omitted category). This result is consistent with the literature in political psychology that links conservative-leaning individuals with a greater need for security (Johnston and Wronski 2015; Hibbing, Smith, and Alford 2013). However, all of the other measures of partisanship are statistically indistinguishable from one another within each experimental frame, and this result is not robust when other measures of conservativism are used.

The political polarization in the United States has coincided with changes in the demographic composition of party voters by income, education, and age in ways that are germane to how emotions are hypothesized to impact framing response in the COVID context. Table 2 presents the findings from regression analyses that divide the sample by high- and low-income levels, educational levels, and the elderly versus the nonelderly. By and large, the effect of the save frame treatments interacted with party affiliation is similar across these delineations, with somewhat larger effects of the save frame for higher income relative to lower-income respondents. Similar patterns also occur across the different education levels. The difference between the elderly and non-elderly, however, is much more pronounced, with elderly Democrats and Republicans being much more responsive to the experimental treatment than the non-elderly, but elderly Democrats are more responsive to framing than Republicans.

**DISCUSSION**

Given the stark partisan differences in behavior and messaging around COVID-19 and the literature on political psychology and party affiliation, it is quite surprising that there are no discernable differences...
by a party in preferences for certainty in the disease outbreak experiment. The fact that different partisans respond in similar ways to loss and gain frames indicates that there is some common ground in the underlying psychology of these different groups.

It is also quite striking that the susceptibility to the framing bias in the classic disease outbreak scenario has not been altered by the contextual environment of the ongoing pandemic. The interpretation here is slightly complicated in that it is possible that the underlying theoretical predictions could both be relevant for separate subsets of respondents. The disease could become more normalized for some, reducing their responses to framing, and at the same time for others, the disease could become more salient, increasing their framing responses. In aggregate, these effects could cancel each other out. If this latter conjecture is true, however, these subgroups appear to be orthogonal to our measures of partisanship despite the divide in political elite messaging.

While no hypothesized partisan differences are found, the results split along different demographic groups hint at additional factors. The elderly face much greater personal risk from contracting COVID-19, so the dampening effect of a party on their response is consistent with there being limits on the impact of elite messaging. The somewhat greater responsiveness to framing for the higher income and more educated samples is also consistent with the hypothesis that these groups have been more sheltered from the risks of disease and that these risks are more normalized for lower-income/lower educated persons.

Despite these slight differences across sample selection, however, the frame reigns supreme. The one strong, statistically significant predictor of preferences for the risk-averse policy choice across time is the experimental frame. While others have found that framing effects are sensitive to factors such as gender (Fagley and Miller 1990), to sampling non-Western, Educated, Industrialized, Rich, Democratic (WEIRD) populations (Doces and Wolaver 2021a, 2021b), and to adding political messaging to the frames (Druckman 2001), our nationally representative samples consistently show very high levels of loss aversion in the death frame and risk aversion in the save frame. The mean responses are nearly mirror images of one another and come close to the original Tversky and Kahneman (1981) results. In and of itself, this is an important finding because it confirms a body of research that questions the assumption of rationality. To date, tests of this claim have been remarkably limited in their sampling often focusing on samples from elite U.S. universities (Henrich, Heine, and Norenzayan 2010), compromising the studies’ external validity. Here, we show repeatedly that nationally representative samples in the United States are also subject to this type of framing.

One possible explanation for the consistency in the framing despite the onset of COVID-19 may be related to the scale used in the treatment. In order to maintain consistency with the pre-COVID-19 experimental conditions, we kept the scale of the outbreak in the question at 600 persons. Perhaps in the context of the hundreds of thousands of new cases weekly in the United States in December, the relatively low number of deaths in the hypothetical situation did not register as alarming and therefore did not induce increases in loss aversion.

Another limitation of our analysis is in the timing of the surveys conducted. While technically the February surveys were after the emergence of COVID-19, it was very early in the outbreak in the United States. At that time, the full extent of the pandemic was not widely appreciated and had not yet been greatly politicized. In between the February and December 2020 surveys, there were multiple waves of disease cases at different times across different regions in the United States. There may have been effects of COVID-19 on the psychological responses to framing effects in between the surveys that had returned to baseline, pre-COVID-19 levels by December as the population became inured to the disease.

Because some of the theories on partisanship would predict larger responsiveness to the gain/loss frame for conservatives and others less, the null findings could imply that the multiple factors are all at play and cancel each other out. However, even if we had found a strong difference in responsiveness by political affiliation, our experimental design would not be able to distinguish between the multiple theories that all predict a similar effect.

Finally, the data are repeated cross-sections and not panel data, so we are unable to track changes over time for the same individuals in their responsiveness to save and loss frames. On the other hand, repeating the same disease outbreak scenario multiple times for the same individual would also create its
own methodological problems, including learning effects. In this case, respondents might infer the point of the analysis and therefore compromise the internal validity of the experiment. In addition, the investigation of partisan differences from the previously collected data was not part of the original study design, which was intended to test variations on the replication of the disease outbreak save/loss frame experiment. In order to take advantage of the pre-COVID-19 data, we were constrained in the tests for partisan effects we could conduct.

Our results contribute to the literature by extending further into the pandemic and by comparing it to pre-pandemic preferences. While Doerfler et al. (2021) and Hameleers (2021) provide evidence that gain/loss frames are certainly relevant to risk preferences related to COVID-19, the former uses a sample of undergraduates, and the latter sample is from March 2020, fairly early in the pandemic. Our repeated cross-sectional data and the “natural experiment” of data from pre-COVID-19 time periods, early in the outbreak and later in the outbreak, allow us to understand whether the susceptibility to framing bias in the infectious disease experiment changed in the United States as COVID-19 has become entrenched in the nation later in the pandemic.

CONCLUSION

The policy-relevant motivation for investigating possible partisan differences in the disease outbreak experiment is the ongoing need to increase population compliance with a myriad of public health recommendations. Masking and social distancing will continue to be life-saving for many months, especially as a significant proportion of the population remains skeptical about the COVID-19 vaccines. While our results are consistent with some of the other framing work, our data are from multiple points in time before and during the epidemic, and thus provide interesting additional evidence. If there had been differences in responsiveness to the framing of choices by partisanship, tailoring messages in various ways for different groups might have been a fruitful strategy to pursue. Our results indicate that varying save/loss frames in messaging across different partisan populations is unlikely to be productive, as all groups respond similarly to the framing. It seems likely, especially given that the level of partisanship around COVID-19 responses is much higher in the United States versus elsewhere (Merkley et al. 2020), that consistent messages across party elites would be more effective than using frames to influence behaviors. In the absence of such messaging, policies such as mask and vaccine mandates may be necessary to change behaviors.

Speaking to the larger picture of what the results tell us about the cross-cultural comparisons to West Africa, more questions have been raised than answers. The COVID-19 pandemic does not appear to have normalized infectious disease for Americans, at least during the timeframe of our study. Perhaps in another round in the future, Americans’ responsiveness to gain/loss frames in the infectious disease experiment would decrease. It could also be that the difference in emotional triggers across places is less explanatory than other environmental differences. An alternative explanation for the low framing response in West Africa is that cognitive errors are too costly for this population; WEIRD populations can “afford” to have irrational risk preferences (Doces and Wolaver 2021a). The slight differences in the responsiveness along income and educational lines are consistent with the ability of more resourced persons being better able to weather decisions based on irrational factors. An intriguing area for future research would be to survey West African immigrants to the United States to compare them to both the American population and to their counterparts in West Africa to assess whether they have been affected by the changed environment.

Finally, it is deeply puzzling that at the same time Republicans’ decision-making process is very responsive to gain/loss frames, they engage in riskier behaviors and have lower assessments of the risks from COVID-19. Motivated reasoning may provide an explanation; Conservatives may be actively discounting information that contradicts their group’s chosen policy position. Evidence for the use of motivated reasoning to discount scientific data has been found in the COVID-19 context (Pennycook et al. 2021) and for climate change (Druckman and McGrath 2019). The seeming contradiction between framing susceptibility and elevated levels of expressed risk aversion in the infectious disease experiment and the reaction to the
reality of COVID-19 could be the product of concerted intellectual efforts to overcome their underlying natural fears regarding the disease.

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**SUPPORTING INFORMATION**

Additional supporting information may be found in the online version of the article at the publisher’s website.

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