Will I get COVID-19? Partisanship, Social Media Frames, and Perceptions of Health Risk in Brazil *

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Abstract

In these polarized times, not even perceptions of personal risk are immune to partisanship. We report results of a COVID-19 social media framing experiment with positive and negative partisan messages from high-level politicians in Brazil. Descriptive results show that pro-government and opposition partisans report very different expectations of health and job risks. Job and health policy have become wedge issues that elicit partisan responses. Experimental treatment shows that responses are sensitive to negative frames (i.e. blame avoidance) and positive frames (i.e. cross-the-aisle partnership). Negative social media messages from a pro-Bolsonaro politician reduces overall support for the government and increases perceptions of health and job risks. The experiment explains key cognitive mechanisms driving partisan differences in perceptions of health risks and job security during the COVID-19 pandemic.

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1 Introduction

In these polarized times, not even perceptions of personal risk are immune to partisan considerations. In this article, we report results of an experiment that examined high-level politicians' positive and negative partisan framing of COVID-19 on social media. After being exposed to social media messages, voters report different expected health and job risks associated with the COVID-19 pandemic. The experiment also explains key cognitive mechanisms driving partisan differences in perceptions of health risks and job security. We provide evidence of changes in risk assessments when social media messages deflect responsibility for the crisis to the *out-group* or, alternatively, when social media messages signal the willingness of politicians to collaborate. We describe these differences as the result of voters interpreting negative messages by *out-group* politicians as partisan posturing and positive messages as informative signals on the severity of the crisis. Therefore, negative messages from opposing actors activate partisan responses to the COVID-19 crisis while positive messages inform of a more severe crisis as well as the willingness of government officials and constituents to minimize its costs. While this has been frequently documented for assessments of government performance, our results show that partisan identities also affect perceptions of job and health risks.

Experimental results contribute to a significant literature that documents changes in perceived risk in response to framing over the last forty years. Such contextual messages are the result of how individuals update their beliefs about the progression of a critical event (Gneezy and Potters, 1997; Thaler et al., 1997), such as COVID-19, as well as their myopic responses to messages that emphasize potential gains or losses in health response (Tversky and Kahneman, 1981; Iyengar, 1990). They can also alter risk perceptions by increasing the salience of particular elements of framing that activate partisan interpretations of an event (Iyengar and Westwood,

2015; Green et al., 2004) and shape trust in political facts and scientific evidence (Nisbet et al., 2015; Bullock et al., 2013; Kraft et al., 2015).

Our experiment shows that negative social media messages from *out-group* politicians activate partisan response mechanism, prompting personal risk assessments that align with the voter's partisan preferences.[1] Positive "cross-the-aisle" messages, on the other hand, signal that the elites agree on the negative consequences of the crisis and are willing to work together. As in Gneezy and Potters (1997), who model risk updating, positive messages that inform voters about the severity of the crisis will produce two competing effects. On the one hand, they provide information about the severity of the crisis, updating information that the health and job consequences are likely more severe. On the other hand, it also signals that politicians are working together to minimize health and job losses, informing the public that the government response will seek to minimize potential health and job risks. While information about the severity of the crisis will likely increase perceptions of risks, a willingness of politicians to work together should decrease these perceptions. We remain agnostic about which of these effects is dominant and report our findings as recorded. In contrast, we hypothesize and test whether negative social media messaging from the opposing camp elicit partisan posturing responses, with health and job risks responses that align with the voter's reported preferences.

The consequences of competing social media framework for managing the COVID-19 pandemic is substantively relevant . Since the beginning of the COVID-19 crisis, social distancing has become the single most important health response promoted by authorities in every country of the world. Social distancing compliance, however, requires voters to accept collective and personal costs of the health crisis. Cognizant of this, a number of researchers have investigated how political beliefs and behavior interact and, consequently, how they affect individual responses

[1]For a discussion of contextual frames that activate motivated reasoning see Nisbet et al. (2015).

to the COVID-19 pandemic in the United States and in a comparative perspective (Kushner Gadarian et al., 2020; Allcott et al., 2020; Barrios and Hochber, 2020; Mariani et al., 2020; Ajzenman et al., 2020).

We extend this line of work using an experimental design, with an IRB-approved and pre-registered instrument [2], to detect the effect of social media political exposure on personal risk to the consequences of COVID-19. While recent research with observational data shows that partisanship and polarization drive citizens' perceptions of risk and compliance with health policy recommendations, our research finds experimental evidence of framing effects on perception of personal risks. Results in this article stem from a national probabilistic online panel of 2,400 respondents in Brazil completed on May 3 of 2020. Results provide information about the importance of understanding partisan messages that frame social risk during major health crises.

Results from our experiment find support for two of our pre-registered hypotheses [3]. As proposed in our pre-registration instrument, we find that negative frames increase the mean of reported rates of health and job risks and, secondly, that negative messages from *out-group* politicians trigger partisan responses. Interestingly, results are mixed when negative messages are delivered by an *in-group* politician. We find strong evidence that pro-government supporters increase their perception of health and job risks in response to negative messaging by the pro-government politician Eduardo Bolsonaro, congressman and son of President Jair Bolsonaro. Therefore, negative messages that are cognitively congruent do not trigger identity responses from supporters of the right-wing populist President Jair Bolsonaro. Indeed, his polarizing behavior during the crises seems to be hurting presidential support and increasing perceptions

[2] Our pre-registration and pre-analysis plan, available here: https://osf.io/vg68y/

[3] We pre-registered four hypothesis in total in our PAP.

of risk among his supporters. Further testing of this finding shows that supporters of President Bolsonaro are less likely to "retweet" and "like" negative messages on Twitter, compared to positive ones. Although we find partisan identity responses to negative messages from *out-group* politicians, results show that negative messages are also poorly received by large segments of *in-group* respondents.

The organization of this article is as follows: in the following section we discuss how framing shapes perceptions of job security and health risk. In the second section, we introduce the problem of motivated partisan reasoning and discuss the effects of negative and positive frames. In section three, we introduce the Brazilian case and present descriptive evidence of partisan differences in government performance assessments, perceptions of job security, and perceptions of health risks. In section four, we introduce the hypothesis and survey instruments, testing for the effect of negative and positive social media frames on perceptions of risk. In section five, we describe our results, showing positive findings for the effects of negative frames among partisans. We find out-of-design effects for independents. Finally, section six describes an extension of our findings that models Bolsonaro's speech interventions during our survey collection process.

2 Framing Populist Responses to the COVID-19

Following Entman (1993), we consider the concept: "to frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation and/or treatment recommendation for the item described" (Entman, 1993: 5). In social media networks, partisan messages frame events by altering the frequencies of words, handles, and images (frame elements) that focus the attention of users on particular partisan traits(Aruguete and Calvo, 2018;

Lin et al., 2014). Posts are made accessible to users when peers publish content that makes salient moral evaluations of blame attribution by increasing the frequency of loaded terms (e.i. the "Chinese virus"), as well as cognitive assessments of likely threats (i.e. just a cold ["Uma gripezinha ou resfriadinho"]) (Banks et al., 2020). Framing is critically dependent on the willingness of individuals to share content they observe in their social media feeds (i.e. cascading activation in networks (Aruguete and Calvo, 2018)). Once activated, peers observe social media messages that "promote a particular problem definition".

Since Kahneman and Tversky (1982) landmark studies on *framing* and *risk*, we have come to understand that presenting questions to voters in terms of losses yields responses that are substantively different from the responses produced by the same questions presented in terms of gains. Similarly, competing frames that focus the attention of distinct issues, such as job losses or health risks, alter the weights that voters attach to the negative consequences of the COVID-19 crisis.

Consider first how voters may perceive a politician's message, such as, "we need to work together to address this crisis." In this case, the speaker's willingness to cooperate with political rivals provides novel information to voters about the seriousness of the crisis as well as the importance of investing in reducing health and economic costs, thereby converting enemies into allies. Now, compare the previous message with one that attributes responsibility to *out-group* politicians, such as, "the government response has been careless." The second message contains less information, as attacks are interpreted by constituents as a politics-as-usual jab among contenders. Negative messages, therefore, activate partisan identities and trigger a politically congruent affective response (Iyengar et al., 2012; Iyengar and Westwood, 2015; Mason, 2016). In polarized political environments, 'cross-the-aisle' frames and congruent messages from *in-*

group politicians provide new information to voters about the severity of COVID-19. On the other hand, negative framing by *out-group* politicians activates partisan identities and reduces the informative value of political or scientific facts being reported (Nisbet et al., 2015).

As in Banks et al. (2020), our experiment presents respondents with a particular type of frame, procedural or generic, which alters the perceived legitimacy of the actors' response to a crisis (Entman, 1993). We then inquire on the extent to which negative and positive frames alter the voter's evaluations of government performance and, more importantly, their relative perceptions of job security and health risk. As in Iyengar and Westwood (2015) and Nisbet et al. (2015), our interest lies in understanding how partisanship shapes voters' beliefs about likely outcomes.

Findings carry important policy implications, as negative frames from the president and opposing party minimize perceptions of risks, induce partisan responses, and might seriously damage "social distancing" responses during the pandemic. Brazil, Mexico, and the United States figure prominently among those countries that failed to enact clear social distance policies during the COVID-19 crisis. In all three cases, populist leaders minimized the economic and health consequences of the virus, triggering significant internal strife that weakened federal responses. Research by Kushner Gadarian et al. (2020), using a nationally-representative survey in the United States, found that individual policy preferences are linked to public compliance with authorities' health recommendations. As in our research, framing political responses to activate partisan preferences is likely to alter perceptions of risk. In their research, Painter and Qiu (2020) and Allcott et al. (2020) use GPS data from smartphones to show heterogeneous compliance by Republicans and Democrats to social distancing, indicating that partisan effects may in fact affect risky behavior during the health crisis. Similarly, Barrios and Hochber (2020)

documents partisan differences in mobility using Google Health Trends data, again providing a clear connection between partisanship and individual perceptions of risk. Similar evidence has been found in Brazil regarding the effects of Bolsonaro's speeches on TV and pro-government demonstrations in the early days of the pandemic (Mariani et al., 2020; Ajzenman et al., 2020).

We extend this line of work using an experimental design with an IRB-approved and preregistered instrument, in order to detect the effects of exposure to divergent social media content on citizens' responses to COVID-19. Our experiment on partisan effects of framing in social media messaging speaks highly to the cognitive mechanisms that might underpin the observational patterns of differential responses to health policies in Brazil and elsewhere during the COVID-19 pandemic.

3 Brazilian Populism, out and about

In the first weeks of January, 2020, news about the rapid spread of COVID-19 in the Hubei province of China circulated around the world. As Chinese authorities quarantined millions of citizens, governments around the world struggled to assess the potential domestic damage of the virus and to identify the proper health emergency protocols to halt its spread. Timid responses in February of 2020, both in Europe and the United States, included travel and trade restrictions both to and from the affected areas. On March 11, 2020, the World Health Organization declared the rapidly-spreading COVID-19 virus a pandemic, likely to spread to every country on the globe.

3.1 A defiant Bolsonaro

While some governments promptly adopted social distancing protocols to mitigate the consequences of the pandemic, leaders in a few countries resisted calls for swift action. The President

of the United States, Donald Trump; the President of Mexico, Lopez Obrador; and the president of Brazil, Jair Bolsonaro all asked their citizens to dismiss the threat. Among these three leaders, Bolsonaro's response serves as a textbook example of a defiant, unflinching, and vocal challenge to scientific recommendations during the crisis. As community spread of COVID-19 was confirmed in major cities of Brazil, Bolsonaro asked citizens to maintain their regular work schedule and prop up the economy. On the offensive, he criticized the media for their "hysterical" reporting on the virus and accused the political opposition of using COVID-19 for political gain. As he actively impaired Brazil's own federal agencies, Bolsonaro urged mayors and state governors to roll back *stay-at-home* orders and, repeatedly, defied calls for social distancing. He promoted meetings and local gatherings, walked the streets to defy *stay-at-home* orders, and used his social media account and the bully pulpit of his office to dismiss the health consequences of the virus.

Bolsonaro's supporters were equally vocal, sharing his social media posts, echoing his *business-as-usual* demeanor, defying *stay-in-place* orders, and minimizing the health risks of the crisis. In contrast, the opposition, the media, and most health professionals criticized the President for polarizing messages that failed to respond to the challenges of the health crisis. Anti-Bolsonaro activists pushed back against the President's message, circulating their own distinct health messages.

As a young democracy with a large and fragmented menu of parties, researchers considered that partisanship in Brazil is a weak predictor of voters' attitudes and preferences. The Brazilian party system was frequently described as *weakly institutionalized* (Mainwaring, 1991, 1999; Mainwaring and Scully, 1995), with candidate-centered incentives driving politicians' electoral behavior (Samuels, 2003; Ames, 2001). Recent studies have begun to challenge some of these

preconceptions, confirming that partisan and anti-partisan sentiments affect candidate evaluation and policy preferences (Samuels and Zucco, 2018; Power and Rodrigues-Silveira, 2018; Baker et al., 2016). Our findings bring further support to these views, with partisan preferences and partisan frames having measurable effects on perception of job and health risk during the COVID-19 crisis.

3.2 Partisan Risk Assessments of COVID-19

As in the United States, partisan assessments of personal job and health risks are noteworthy in Brazil. Figure vividly portrays differences in perceived risks by supporters of President Bolsonaro and supporters of the opposition's candidate Fernando Haddad.[4]

A total of 29% and 23% of respondents who support Haddad consider it very likely that they will lose their jobs or become infected with COVID-19. By contrast, Bolsonaro supporters reported a much lower probability, 22% and 12% respectively. The differences are even more salient when reporting their evaluation of the government's response to the crisis, resulting in 20 percentage points of difference between supporters of the government and of the opposition that consider the government response very appropriate.

Measures of positive and negative partisanship towards the Workers Party, (Samuels and Zucco, 2018), yield broader differences on risk assessments, with 33% of pro-PT supporters losing their job and 25% ery likely becoming infected by COVID-19, compared to 22% and 14% for anti-PT respondents.

We also present results from linear models regressing the three outcome variables on partisan preferences and a set of socio-demographic variables such as income, education, occupation in the labor market, and gender. Our regression estimates using both the voter choice for the last

[4]We consider respondents as Bolsonaro supporters, Haddad supporters, or independents depending on their reported preference if the presidential election "were to take place next week".

presidential election and positive and negative partisanship towards the Workers Party render similar results. These results hold when the models are estimates controlling by age, income, occupation, and education of the respondents. Figure 2 presents the results.

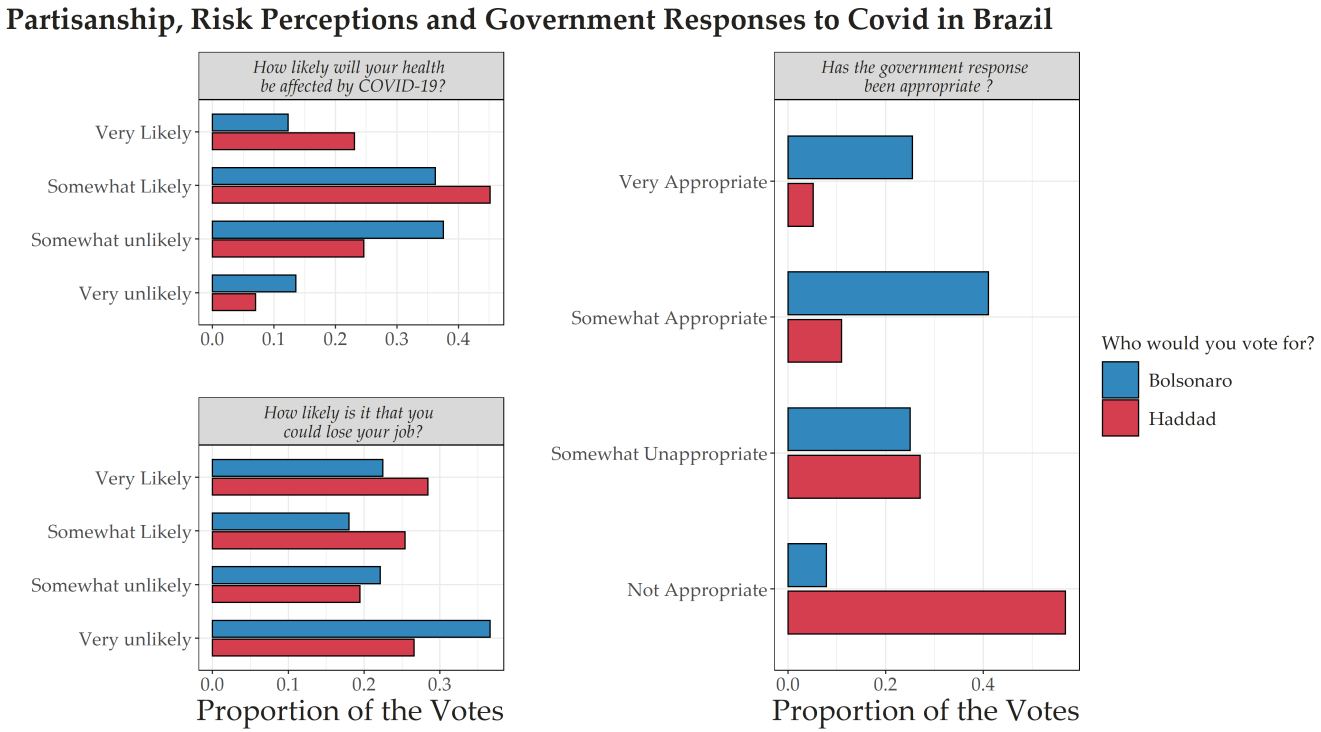
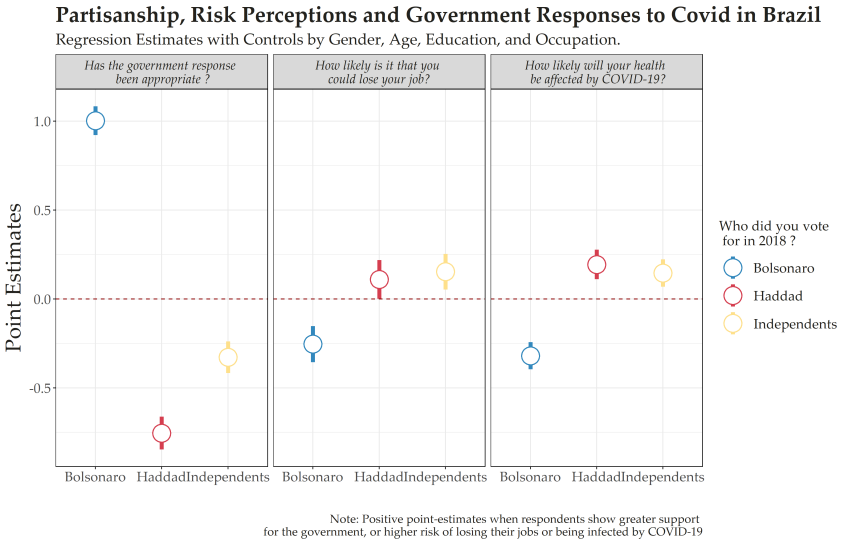
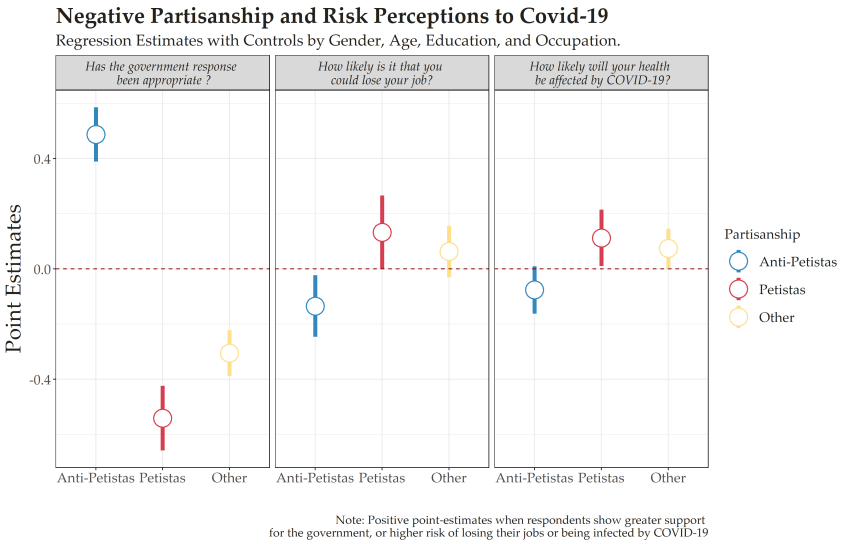


Figure 1 Survey assessments of the quality of the Government response, perceptions of personal health risk, and perceptions of personal job security, March 23 through May 4, 2020.

Figure 2 Regression Estimates for Partisan Effects on Risk Perceptions and Government Assessment during the Covid-19



a) Partisan Effects



b) Negative Partisanship

Descriptive evidence is overwhelming, with significant inter-party differences in perceptions of risk and in assessment of the government response. Next, we describe a survey experiment designed to explain the effect of partisan social media messages on perceptions of personal risk during the COVID-19 crisis.

In Table 4 of the appendix file, we report the effect of the controls. Controls for the models show that employed and highly educated respondents report lower perceived job risks and higher health risks than unemployed and less educated respondents. Also, as age increases, perceptions of job and health risk increase. In particular, older voters see a considerably larger increase in their perceived likelihood of losing their job. By contrast, there are no statistically significant differences in assessments of government performance and age. Full results in Section B, Table 4 of the SIF file.

4 Hypothesis and Instruments

We develop a social media framing experiment with positive and negative partisan messages from high-level politicians to understand the effects of partisan preference and framing on risk perceptions during the COVID-19 pandemic. Our experiment captures cognitive mechanisms driving partisan differences in perceptions of health risks, job security, and assessment to government responses during the crisis. In this section, we present the pre-registered hypothesis and our instruments.

4.1 Negative Messages and Partisanship During the COVID-19 Crisis

The first set of pre-registered hypotheses tests for the effect of social media content on perceptions of risk and government performance. We consider the effects of negative and positive messages and the extent to which the effect interacts with partisan cognitive congruence or dissonance between the authors of the tweet and the respondents' preferences.

The first hypothesis of the experiment predicts negative messages on average to increase perceptions of personal risk and induce partisan responses in reported support for the government's

response to the pandemic. We consider that negative partisan messages are indicative of political posturing. Therefore, negative messages prime voters to partisan conflict and induce responses that are aligned with their partisan beliefs.

- *Hypothesis 1:* We predict that negative messages, compared to positive ones, will increase perceptions of risk and decrease support for the government's response to the COVID-19 pandemic.

In our second hypothesis, we argue that a "politics-as-usual" polarizing message from elites elicits a partisan identity response from voters. Therefore, we expect that cognitive dissonance between the respondents' preferences and the author of the tweets will ensure that health risks and job losses will be interpreted as wedge issues that separate the parties. We expect cognitive dissonance to mitigate responses to the social media message. Consequently, respondents who observe a "cross-the-aisle" message from a politician from a different color (T1 and T3) will decrease risk perceptions and increase support for the government, moderating partisan responses.

- *Hypothesis 2:* Cognitive dissonance and calls for greater collaboration between politicians will decrease party identity responses, decrease perceptions of risk, and increase support for the government.

We expect the opposite effects when cognitive dissonance interacts with negative social media content. As shown in (Banks et al., 2020), exposure to negative dissonant social media messages increases *contrast effects* (Merrill et al., 2003) and hightens perceived polarization, increasing party identity responses and reducing support for the government. After being exposed to negative messages by an out-group politician, voters perceived ideological distance increases (contrast) and provided health and job responses that align with their in-group beliefs.

Following this intuition, we expect that to the extent respondents observe a dissonant partisan signal with a negative frame, partisan identity responses will be exacerbated (Adida et al., 2018). Opposition voters will report heightened risks and lower marks for government response. The opposite effects are expected from Bolsonaro supporters, lowering their risk exposure and increasing support for the government:

- *Hypothesis 3:* Cognitive dissonance and negative frames will heighten partisan identity responses. When exposed to cognitive dissonant negative frames:
  - *H3a:* Respondents aligned with the opposition will report higher health and job risks and lower performance scores for the government.
  - *H3b:* Respondents aligned with the government will report lower health and job risk, and greater performance scores for the government.

In this article we consider two questions that capture respondents' policy preferences: (a) vote choice in the 2018 presidential election, and (b) partisanship (positive and negative).[5]

4.2 Experimental Design

Our experiment implements a four-arm treatment assignment in which each respondent is randomly exposed to one of four different tweets, with a variation on the content and the author of the message. Each respondent will be exposed to only one tweet, and after the treatment assignment, will respond to our outcome variables. Below, we describe the treatment conditions and the outcomes. The experiment was included in a national online survey in Brazil with 2.400 respondents. The survey is fielded by Netquest-Vanderbilt, with probabilistic samples drawn by the LAPOP team in Vanderbilt from users registered with Netquest.

[5] We also estimate alternative models, available upon request, using ideological self-placement.

Treatment Conditions

In order to prime respondents in our experiment, we edited tweets . Although we reduce the external validity of the experiment by not using real tweets for our treatment conditions, we carefully chose the wording of the tweets based on actual public statements and social media activity to maximize the validity of the treatment conditions. The randomization procedures guarantee internal validity [6].

We vary only two features of each tweet, the author and the content. For the author, we use two prominent political figures: Eduardo Bolsonaro, congressmen and son of President Jair Bolsonaro, and Fernando Haddad, the front-runner candidate of the Workers' Party in the 2018 national election. We choose high-level politicians to ensure congruence or dissonance between the message and the respondents' preferences.

For the content, we vary between a neutral and a negative framing of COVID-19. In the neutral, we use precisely the same wording for each author, in which the tweets mainly highlight the existence of a crisis and the importance of President Bolsonaro's leadership of institutional efforts to fight the pandemic. For the negative tweets, we created one for each sender, mimicking their political preferences, thus maximizing external validity for the experiment. With regard to Eduardo Bolsonaro, the tweets reinforce the argument that the crisis is not serious, and that the opposition and the media are responsible for the "hysteria" around the spread of the virus. For Fernando Haddad, the tweet criticizes the government and Bolsonaro's statements, minimizing the consequences of the crises.

Table 1 presents the treatment conditions. In the appendix, we show the tweets as the respondents read, in Portuguese, for each four treatment conditions. Each respondent was

[6]The experiment received the approval of the University of Maryland Institutional Board Review 1552091-3

exposed to only one of the four arms of the treatment and, as Section A of the SIF file shows, we collected balanced samples of respondents across a range of socio-demographic and attitudinal variables.

Table 1 Treatment Conditions

	Positive Tweet	Negative Tweet
Eduardo Bolsonaro	The world is currently living an unprecedented crisis. Countries all over the world rally together to fight against Coronavirus. It is the responsibility of President @jairbolsonaro to coordinate our answers. He needs to act together with Congress, Business leaders, and civil society. This is what we expect in such critical times.	The world is currently living an unprecedented crisis. Countries all over the world rally together to fight against Coronavirus. However, we have already had these types of the virus before, and it did not lead to all this hysteria. But it was the PT in the government here. No panic. Switch off from the pandemic of misinformation from the media
Fernando Haddad	The world is currently living an unprecedented crisis. Countries all over the world rally together to fight against Coronavirus. It is the responsibility of President @jairbolsonaro to coordinate our answers. He needs to act together with Congress, Business leaders, and civil society. This is what we expect in such critical times.	The world is currently living an unprecedented crisis. Countries all over the world rally together to fight against Coronavirus. President @jairbolsonaro is delayed in answering. He is more concerned about attacking his opponents and take part in protests that put in risk the health of the Brazilian people.

To evaluate the validity of partisan perceptions of each of the treatments, we asked respondents to indicate whether they would "like", "retweet", "reply", or "ignore" each tweet. Descriptive information is revealing and worth exploring in some detail.

First, as expected, respondents' decisions to "like" or "retweet" follow clear partisan lines, with voters supporting the government considerably more likely to retweet both negative and positive messages by Bolsonaro. Similarly, supporters of the Workers Party (PT) were considerably more likely to share messages by Haddad.

Second, more interestingly, results show a clear preferences of all voters to "like" and "retweet" positive partisan messages. While government supporters shared 43% of the negative posts by Bolsonaro, sharing increased to 63% for the positive post. Numbers also increased among Haddad voters from 11% to 22%, and among independents from 11% to 34%. Figure also shows that supporters of Bolsonaro and independents were considerably more likely to share positive messages by Haddad.

Third, sharing behavior also reflects a much higher propensity by independents to share messages from Haddad compared to those of Bolsonaro. Finally, while partisan negative and cognitively dissonant messages trigger "reply" behavior by *out-group* voters, this is clearly observed among Haddad voters in response to negative Bolsonaro messages, but not government supporters in response to negative Haddad messages.

Overall, the sharing behavior of survey respondents shows that the different treatments were properly interpreted and triggered the expected responses. It is worth noticing, however, the very significant difference in the share of "liked" tweets among Bolsonaro supporters when considering positive or negative messages by Eduardo Bolsonaro. Later in this article we circle back to the relatively low rate of "likes" for Bolsonaro's negative message in the analysis of the four treatments in the next section.

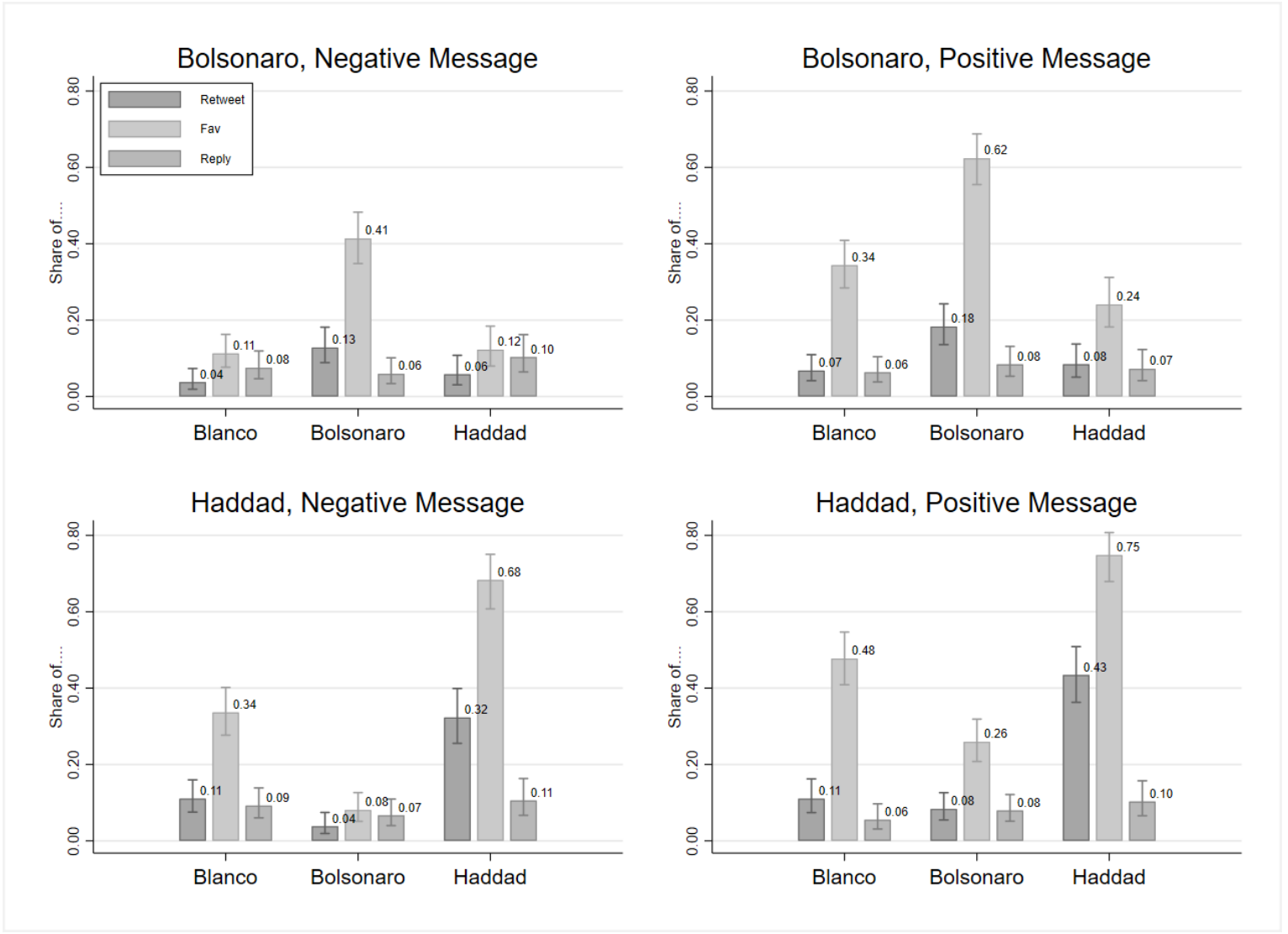


Figure 3 Favs, Retweets, Replys in response to each of the four treatments.

4.3 Outcome Variables

For our outcome variable, we consider three main questions. These questions capture perceptions about personal risk during the COVID-19 pandemic and the respondents' assessments about the government's performance during the crises. The wording of all three questions is presented below.

- **Question 1:** How likely is it that your health would be affected by COVID-19? (very likely, somewhat likely, somewhat unlikely, very unlikely)
- **Question 2:** Given the current health and economic crisis produced by the Coronavirus COVID-19, how likely is it that you could lose your job? (very likely, somewhat likely, somewhat unlikely, very unlikely)
- **Question 3:** Has the government response been appropriate when faced with the corona COVID-19? (Very appropriate, somewhat appropriate, somewhat unappropriated, very inappropriate).

5 Results of the Framing Treatments

We now turn to our survey experimental results. We present the results for all our sample of respondents (N=*2362*) who answered the survey from the last week of March up to May 6. Our key independent variable is the respondent's treatment assignment. We manipulate our four treatment arms to identify the effects previously described. For presentation purposes, we concentrate on describing the relevant comparisons of all treatments as reported in Figure 4, and report the p-values for the statistically significant and theoretical relevant comparison.[7]

[7] We direct readers to the SIF file for all estimation details, matching each test to the relevant hypothesis.

Earlier in the article, Figure 2 showed significant inter-party differences in evaluations of the governments as well as in perceptions of job and health risks. Estimates in Figure 4 manipulate those average results, showing inter-party deviations when respondents are treated with the different frames.

Consider the first row of Figure 4, which reports differences in the variables of interest for each treatment for all respondents. In the top plot of the left, we see that a negative tweet by Eduardo Bolsonaro reduces reported perceptions of government responses while a negative tweet by Fernando Haddad does the opposite. In fact, respondents move on average counter to the political leaning of the author of the tweet, with perceptions of government performance increasing when Haddad posts a message and decreasing with Bolsonaro ($p < 0.05$). Results also show that, on average, negative tweets by Bolsonaro increase perceptions of personal job risk ("losing your job") while negative tweets by Haddad reduce job risk ($p = 0.12$). Health risks, however, do not seem affected by the different treatments.

In the second row we present estimates for the subsample of Bolsonaro voters. Similar to the full sample, negative messages decrease overall perceptions of government response to the crisis and increase perceptions of job risk . However, we again find no significant variation when answering the health question. The effect of cognitive dissonance is large with tweets by Haddad resulting in lower reported risks and those by Bolsonaro reporting high job risks, although not statistically different from zero at conventional levels for the latter. The results are more dramatic for negative tweets, exacerbating the risk gap between supporters of Bolsonaro and supporters of Haddad. Interestingly, as mentioned above, negative tweets by Bolsonaro have a significant effect compared to all the other three treatments of lower reported government performance. This is an unexpected result, as respondents as negative tweets by Bolsonaro are

not activating a partisan response by the in-group. Therefore, while cognitive dissonance with Haddad triggers the expected partisan response, Bolsonaro's respondents do not seem to respond well to negative appeals from party elites.

In the third row we present the estimates of Haddad (Workers' Party) voters. Results show that messages from Haddad reduce the approval for government performance. Messages by Bolsonaro, on the other hand, increase perceptions of job risks. As it was the case of Bolsonaro, we find no significant results on health risks. Social media frames, therefore, have measurable effects only on government performance evaluations and in perceptions of job insecurity. The effect of negative and political dissonant frames behaves as expected, increasing perceptions of job insecurity. In particular, we find a large gap on job risks perceptions comparing negative message by Bolsonaro with positive cross-the-isle message by Haddad ($p < 0.05$). However, as it was also the case in Bolsonaro voters, we observe significant declines in overall job risks for respondents treated with negative messages by in-group politician. In all negative messages by out-group politicians increase the risk gap while negative messages by in-group politicians reduce the risk gap between Bolsonaro and Haddad supporters.

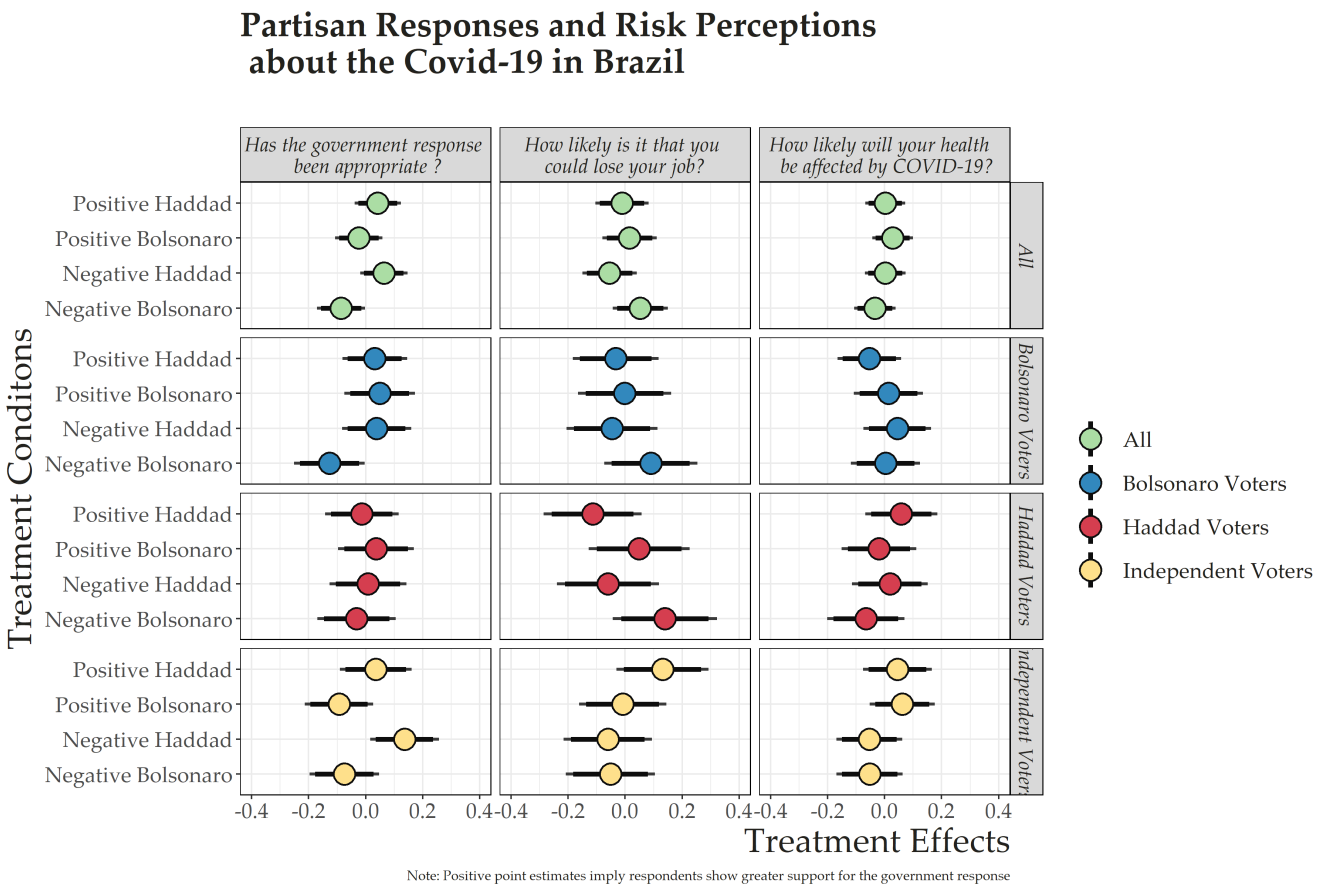


Figure 4 Framing Estimates by likely Vote

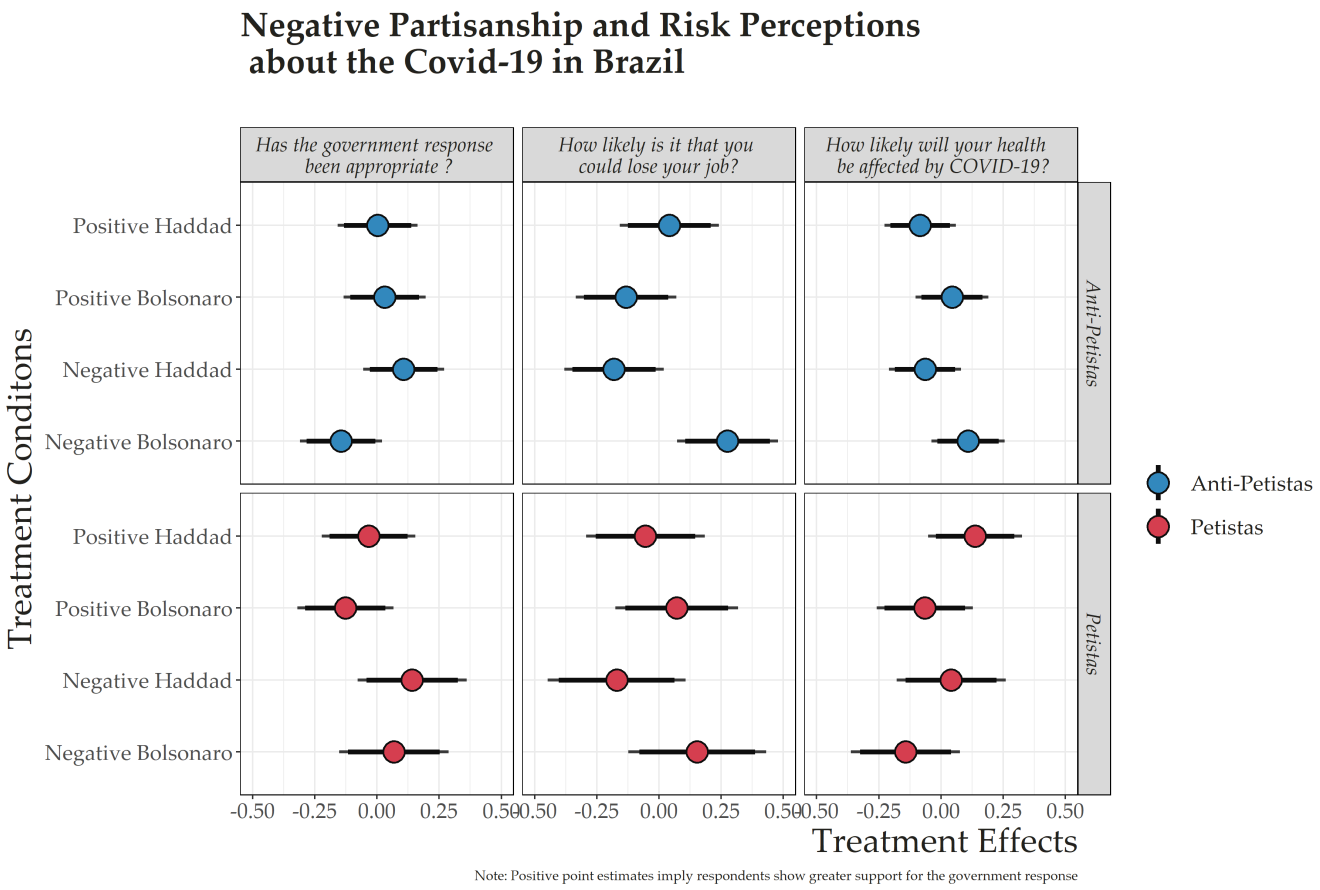


Figure 5 Framing Estimates by Negative Mass Partisanship

Finally, the fourth row presents the estimates for independent voters, who in the run-off election preferred to mark blank rather than voting for either Bolsonaro or Haddad. Among independent, we see that messages by Haddad increase evaluations of the government while messages from Bolsonaro decrease them ($p < 0.05$). Differences are large and statistically significant, with independent voters reacting poorly to messages by Eduardo Bolsonaro. Different from partisans, the most interesting finding is that positive messages modestly increase perceptions of job and health risks. We interpret this as independents identifying partisan messages as posturing, thereby reducing the information value of the message, while considering positive messages as informative.

Figure 5 re-estimates our models for the sub-samples of self-identified partisans of the Workers' Party (PT), negative partisans (anti-PT), and others. Results align well with those in Figure 4. Results indicate that self-identified anti-PT respondents are particularly sensitive to the treatments, with a significant decline in support for the government and and increase in job risk assessment when treated to negative messages by Bolsonaro ($p < 0.05$). In other words, in the broader partisan group of anti-petistas, a political factor that was crucial for Bolsonaro's election in 2018, his polarizing message is indeed increasing perceptions of risk, and hurting the his support.

Effects for self-identified PT voters (Petistas) are also substantively larger and more significant when considering job risks ($p < 0.05$). However, perceptions of health risk remain statistically insignificant.

Our survey experiments exhibit partial support for our pre-registered hypothesis. In particular, we find negative messages increase perceptions of risk and decrease support for the government, as in the hypothesis 1, but the effect is mostly driven by polarizing framing from the

government. Partisan responses to negative framing is also detected, as suggested in hypothesis 3, mainly among voters of the opposition. Two important findings run sort of in the opposite of our pre-registered hypothesis, but are theoretically relevant. Negative messages minimizing the risks of COVID-19 sent by core members of the government seem to hurt Bolsonaro's popularity among his voters, and partisans anti-petistas, and independents update their risk assessment when observing a politicians crossing-the-isle to offer help for his opponent.

6 Extension: Modeling the effects of Bolsonaro's Speech

As the number of cases and fatalities increased, President Jair Bolsonaro repeatedly minimized the health risks of the pandemic and warned about its economic consequences. Descriptive results show wide partisan differences in reported job and health risks, with different sensitivity to social media posts. In this section, we take advantage of a public speech by Bolsonaro during data collection and evaluate changes in the respondents answers to our job and health risk questions.

Bolsonaro, in both social media posts and in his public appearances, urged local authorities to prioritize growth, challenged (and the fired) his Minister of Health, and minimized the potential health risks of the pandemic. On March 24, President Bolsonaro gave one of his more widely publicized, and dismissive, messages on the COVID-19 crisis and on his administration's response. In a nationally televised address to the country, which was also his first presidential speech dedicated solely to the COVID-19 pandemic, Bolsonaro displayed this confrontational tone. Contrary to most pundits' beliefs that he would moderate his attacks and hedge his political *bets*, the President accused governors of overreacting, challenged social distancing policies, criticized schools closures, described himself as an athlete who would "not even notice" if he got

infected, and labelled the virus, in the worst case, as just a little flu.

In this section, we make use of the granularity of our survey data over time to model the effect of Bolsonaro's dismissive behavior about the COVID-19 pandemic during its first days in Brazil. Modeling this event, at the begining of the pandemic, allows us to measure risk perceptions when the number of cases was still modest.

Data and Model

Our survey field started on March 23, therefore allowing us to collected a small part of our sample two days before the Presidential Pronouncement. As before, we focus the analysis on the differential effects among partisans and non-partisans of the President. To identify the effects, we use a differences-in-differences approach on a narrow window of days before and after the event, described by the following estimation.

$$\begin{aligned} y_{it} = \alpha_i + \beta_1 \cdot Haddad + \beta_2 \cdot Independents + \beta_3 \cdot Post - March - 24 + \\ \tau \cdot Haddad * Post - March - 24 + \beta_4 \cdot Independents * Post - March - 24 + \epsilon_{it} \end{aligned} \tag{1}$$

Where y_{it} is the survey responses on risk perceptions and assessments of government responses, and the partisan variables come from the reported votes for runoff round in the 2018 Presidential election. To make our sample before and after more comparable, we limit the analyzes for the time window between 23 and 26 of March [8]. Our parameter of interest is τ which measures the differences in the outcomes comparing Bolsonaro's and Haddad supporters.

[8]Such decision reduces the chance our estimate is capturing some omitted factor varying over time. It is unlikely something else, in such a small interval, have affected perceptions of risk about the COVID other than the Presidential speech

The effect of Bolsonaro's speech on perceptions of risk

Table 2 presents our results. The first three (restricted) models use no control variables, while the remaining three control for the respondents' age, occupation, education, and income. Among Haddad's supporters, perceptions of job and health risk increased after Bolsonaro's speech compared to government supporters. The estimates for Health Risk are statistically significant at $p<.05$, while the effects for job risk are statistically significant at p<.1. More interestingly, results show that Haddad voters did no change their overall assessment of the government's performance. By contrast, we observe a small decline of-0.441 in evaluations of the government performance among pro-government voters, significant at p<0.1. The models that include all controls provide substantively similar, although slightly stronger, statistical results.

The findings provide more support for the effect of contextual partisan events on perceptions of risk. Related research has found robust evidence that Bolsonaro's denial about the COVID-19 increase the spread of the disease and reduced levels of compliance to social distance in pro-government localities (Ajzenman et al., 2020; Mariani et al., 2020). Our results provide a behavior explanation for this shocking findings; as the President sends dismissive signals about the risks of the pandemic, altough risk perceptions overall increases, his supporters do not report the same concerns as the rest of the population, in particular partisans of the opposition, decreasing effectiveness of social distancing policies, and facilitating the spread of the disease.

Table 2 The Effects of Bolsonaro's Presidential Pronouncement of March 24 on Risk Assessments

	Dependent variable:					
	Job Risk	Health Risk	Government Assessment	Job Risk	Health Risk	Government Assessment
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	2.062***	2.538***	3.091***	1.811***	2.316***	2.427***
	(0.132)	(0.102)	(0.115)	(0.393)	(0.303)	(0.348)
Post-March 23	−0.362	−0.338	−0.441*	−0.393	−0.378*	−0.331
	(0.272)	(0.210)	(0.238)	(0.278)	(0.215)	(0.246)
Haddad Voters	0.524**	0.242	−1.310***	0.589**	0.121	−1.166***
	(0.212)	(0.164)	(0.186)	(0.234)	(0.181)	(0.207)
Independent Voters	0.127	−0.048	−0.600***	0.129	−0.165	−0.535***
	(0.197)	(0.152)	(0.172)	(0.214)	(0.166)	(0.190)
Post-March 23 x Haddad Voters	0.867*	0.740**	0.297	0.799*	0.967***	0.246
	(0.452)	(0.350)	(0.397)	(0.468)	(0.361)	(0.414)
Post-March 23 x Independent Voters	0.273	0.248	0.050	0.253	0.304	−0.119
	(0.390)	(0.301)	(0.342)	(0.398)	(0.307)	(0.353)
Controls	No	No	No	Yes	Yes	Yes
Observations	210	210	211	195	195	195
Adjusted R^2	0.062	0.042	0.220	0.089	0.058	0.226
Note:						*p<0.1; **p<0.05; ***p<0.01

7 Concluding Remarks

In a time when social distancing is the primary policy response to the COVID-19 crisis, understanding how voters perceive health and job risks and assess government policies is essential. In countries such as Brazil, Mexico, and the United States, health and job policies have become deeply contested issues that separate partisans and trigger identity responses. In this article, we (1) provide descriptive evidence of large differences in perceptions of risk by pro-government and opposition voters; (2) test for the effect of negative and positive social media frames on perceptions of individual risk; and (3) test for the effect of public discourses by Bolsonaro on perceptions of individual risks.

Our results verify the existence of partisan differences in perceptions of risks; a partisan identity response to negative social media messages by out-group politicians; and a heightened effect of government speeches on opposition voters perceptions of personal risk. However, results also show the existence of backlash against negative messages by in-group politicians for the government supporters in Brazil. Rather than triggering partisan responses, negative messages from in-group politicians triggered opposite responses. Bolsonaro voters exposed to negative messages by Bolsonaro increased their perceptions of job and health risks, and decrease their support for the government. Similarly, Haddad voters exposed to negative messages by Haddad reduced their perceptions of job and health risks. Therefore, while negative messages from the *others* trigger a partisan identity response, negative messages from *our own* were perceived as unacceptable posturing.

Our pre-registerd instruments, therefore, find positive results for only two of the expected effects of negative messages: negative messages increase overall perceptions of risk and negative messages from the out-group politician triggers party identity responses.

While the COVID-19 crisis lingers, political acts such as rallies, party meetings, and fundraising move to the virtual world. In a context of restricted physical mobility, social media and technologically mediated information exchanges become increasingly important. Beyond the pre-registered findings, our research provides novel evidence on the partisan online behavior of negative and positive social media messages. Measures of the social media response to our treatments provide clear evidence that positive messages were more extensively shared by all voters, in-group and out-group, and that negative messages activated a smaller number of intense voters. The associated SIF file to this article shows that intense partisan that retweeted the negative social media messages had a heightened response to the tweets. Negative social media messages, therefore, both induce identity responses by strong partisans but also reduce participation by less committed voters. This is an important effect that is worth exploring in future research, as it provides evidence of content in social media data being considerable more partisan than that expected from in-group voters. Therefore, at least in the case of Brazil, activating partisan identities to energize the base also reduces overall support for the government among its own constituency.

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Will I get COVID-19?
Negative Partisanship, Social Media Frames, and Perceptions of Health Risk in Brazil

Supporting Information Files (SIF)

Section A: Socio-Demographics across the samples

We present here some socio-demographic information for our respondents across the four treatment conditions. As the reader can assess, there are no significant differences across the treatment groups in our sample. Since most of these variables are nominal, the values do not have a direct interpretation.

Table 3 Demographics Across the Treatment Arms

Variable	Quantity	Negative Bolsonaro	Negative Haddad	Positive Bolsonaro	Positive Haddad
Age					
	Mean	3.01	3.12	3.11	3.08
	Standard Error	3.36	3.30	3.20	3.39
Education					
	Mean	2.15	2.11	2.19	2.18
	Standard Error	1.50	1.55	1.54	1.56
Gender					
	Mean	4.36	4.57	4.50	4.50
	Standard Error	0.63	0.63	0.63	0.62
Ideological Placement					
	Mean	5.24	5.55	5.22	5.36
	Standard Error	1.28	1.27	1.22	1.26
Occupation					
	Mean	6.47	6.62	6.41	6.32
	Standard Error	0.96	0.96	0.97	0.94
Income Assistance					
	Mean	1.50	1.47	1.47	1.49
	Standard Error	2.18	2.00	2.12	2.02
Relative Income					
	Mean	1.75	1.73	1.78	1.71
	Standard Error	0.50	0.50	0.50	0.50
Total Cases					
	Total Number of Cases	571.00	588.00	590.00	613.00

Section B: Negative Partisanship and Risk Perceptions

In this section, we provide further descriptive evidence for the presence of deeper partisan divisions on on risk perceptions and government assessment. We first replicate figure 1 in paper but using a measure for negative and positive partisanship towards the Workers Party (PT). As argued by (Samuels and Zucco, 2018), mass partisanship in Brazil is strongly connected to voters' assessment about the PT, therefore, we test for this explanation to increase robustness of our findings.

Figure 6 presents the results. We manipulate positive and negative partisanship as suggested in (Samuels and Zucco, 2018), and use the excluded cases as others in our sample. 32% of Pro-PT supporters report fell very likely chance of losing their job and 24% of becoming infected by COVID-19, compared respectively to 22% and 13% for anti-PT respondents. In terms of assessment of government responses, half of our sample of PT supporters considered them very unappropriate, while only 29% among anti-petistas have the same assessment.

We also provide in table 4 the numerical results from the models summarized on Figure 2. To make the presentation more intuitive, we use Bolsonaro voters, and Anti-Petistas, as the reference group for the models. We do not explore in the main paper the results for the control variables, yet their interpretation provides some interesting correlational insights about factors associated with risk perceptions in Brazil. Older, wealthier men report across all the models lower risk perceptions. On the other side, more education decreases risks on the job market, but increases fear of being infected by COVID-19. A similar effect is detected when comparing employed versus unemployed respondents, with the former predicting higher health risk, and lower perception regarding the labor market.

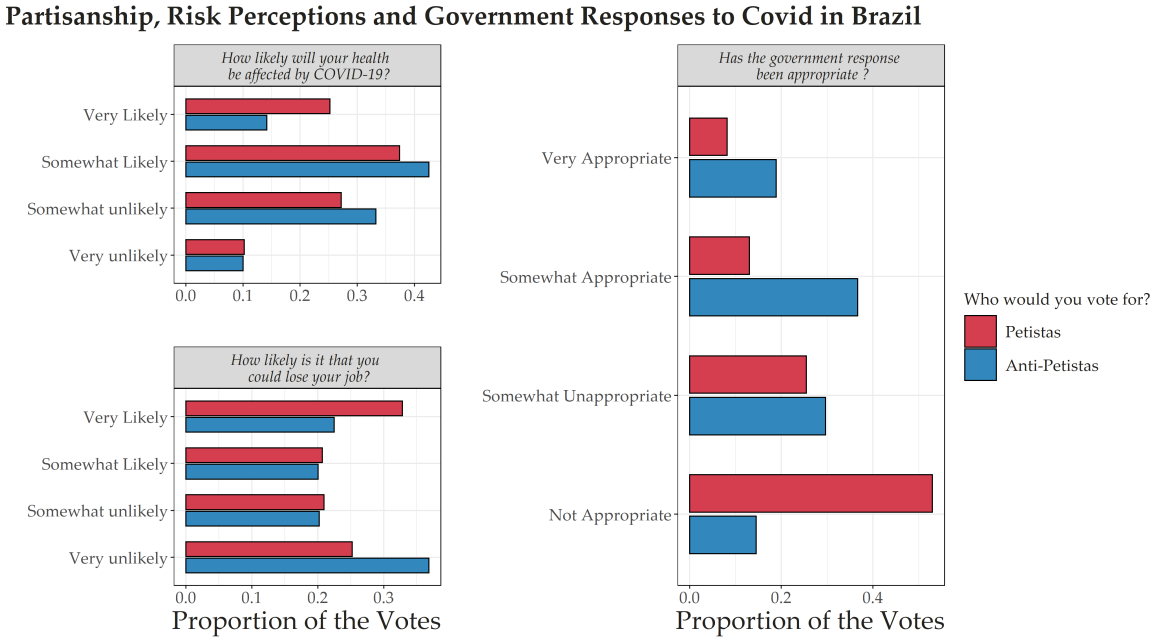


Figure 6 Survey assessments conditional on Negative Partisanship of the quality of the Government response, perceptions of personal health risk, and perceptions of personal job security, March 23 through May 4, 2020.

Table 4 Regression models of perception of risk and government assessments with full controls

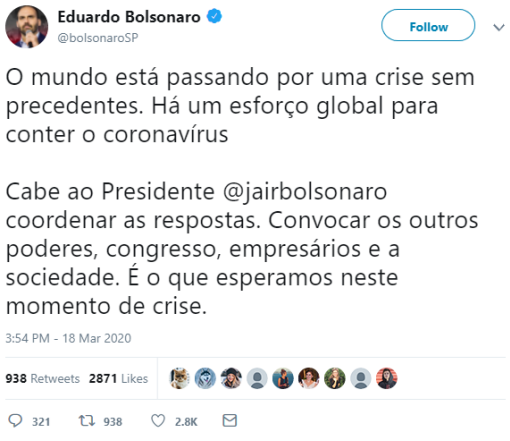
	Dependent variable:					
	Job Risk	Health Risk	Government Assessment	Job Risk	Health Risk	Government Assessment
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	3.309***	2.514***	3.001***	3.349***	2.655***	2.793***
	(0.112)	(0.084)	(0.087)	(0.115)	(0.087)	(0.097)
Voters Haddad	0.202***	0.337***	−1.203***			
	(0.063)	(0.047)	(0.049)			
Voters Independents	0.238***	0.296***	−0.868***			
	(0.058)	(0.044)	(0.046)			
Petistas				0.225***	0.192***	−0.922***
				(0.079)	(0.059)	(0.067)
Others (Non-Partisans)				0.118**	0.121***	−0.591***
				(0.055)	(0.042)	(0.047)
Income	−0.055***	−0.035***	−0.012	−0.056***	−0.036***	−0.007
	(0.012)	(0.009)	(0.010)	(0.012)	(0.009)	(0.010)
Gender:Male	−0.037	−0.072*	−0.025	−0.052	−0.097**	0.048
	(0.050)	(0.038)	(0.039)	(0.050)	(0.038)	(0.042)
Employed	−0.155***	0.122***	0.055	−0.146***	0.132***	0.025
	(0.052)	(0.039)	(0.041)	(0.053)	(0.040)	(0.045)
Education	−0.055***	0.055***	−0.039**	−0.050**	0.058***	−0.060***
	(0.020)	(0.015)	(0.016)	(0.020)	(0.015)	(0.017)
Age	−0.140***	−0.038***	0.021	−0.141***	−0.047***	0.034**
	(0.016)	(0.012)	(0.013)	(0.017)	(0.013)	(0.014)
Observations	2,159	2,163	2,158	2,142	2,146	2,142
Adjusted R^2	0.074	0.057	0.247	0.070	0.035	0.115

Note: *p<0.1; **p<0.05; ***p<0.01

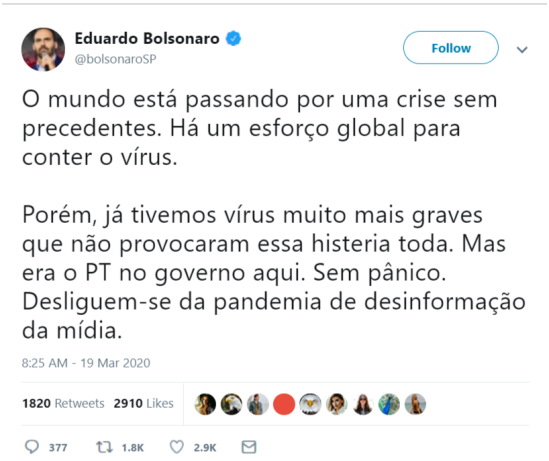
Section C: Tweets for the Treatment Conditions

We present here the images, as the respondents read, in Portuguese, of the tweets used in each of the treatment conditions.

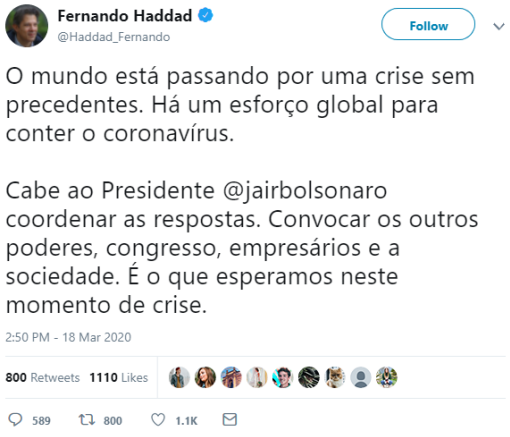
Figure 7 Tweets for the Treatment Conditions



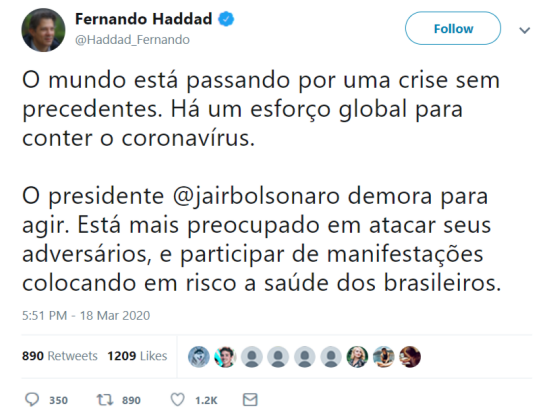
a) Eduardo Bolsonaro x Neutral Tweet (T1)



b) Eduardo Bolsonaro x Negative Tweet (T2)



a) Fernando Haddad x Neutral Tweet (T3)



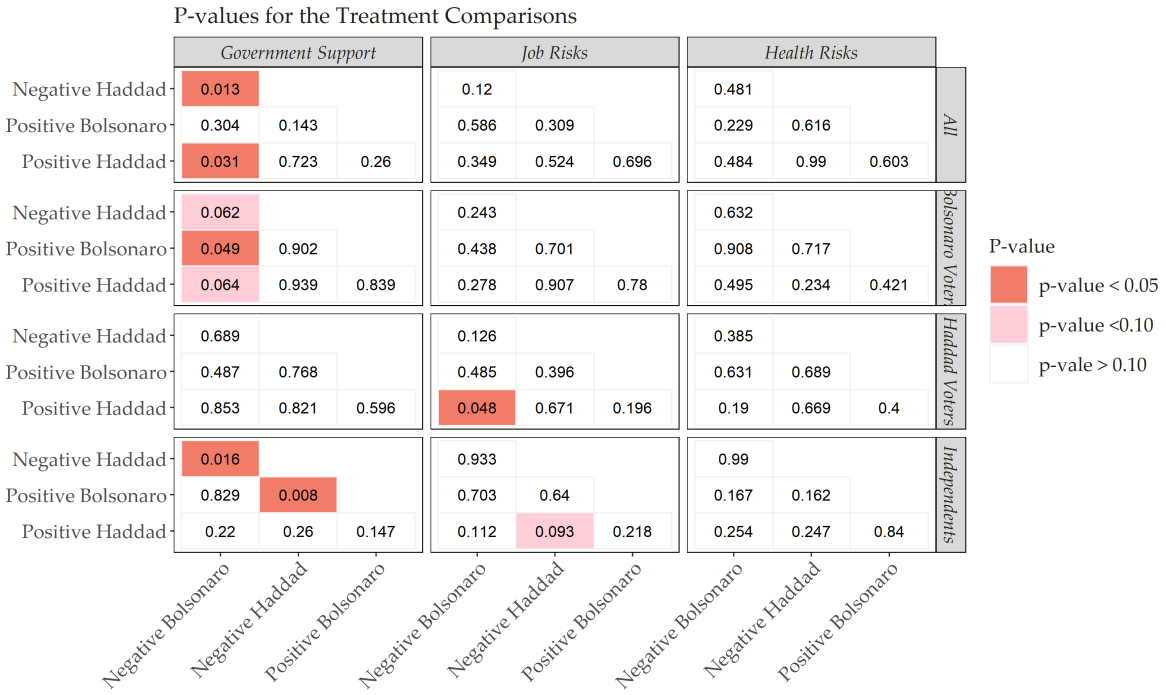
b) Fernando Haddad x Negative Tweet (T4)

Statistical Tests for the Treatment Effects

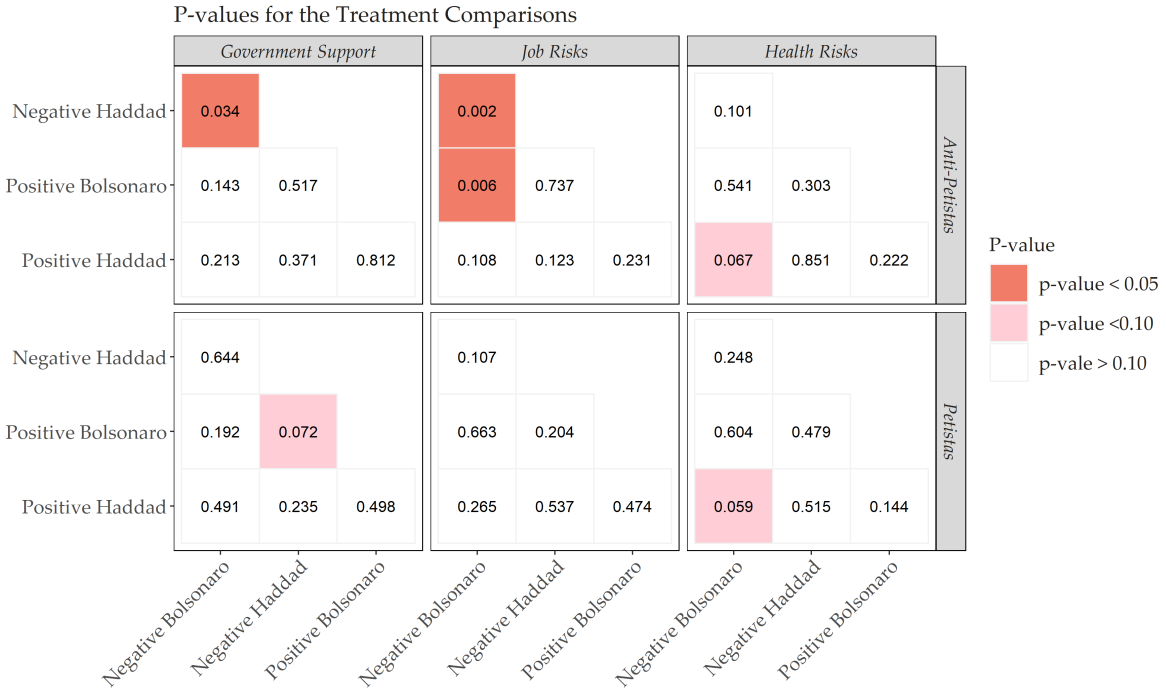
In this section, we present the whole set of statistical test described in the main paper in the results section. Here, figure 8 mimics the presentation of the main results of the paper, and present the p-values for all the comparisons between the four treatment arms.

Figure 8 Statistical Tests for the Treatment Effects

Partisan Responses and Risk Perceptions:



Negative Partisanship and Risk Perceptions:



Section E: Robustness Checks for the Effects of Bolsonaro's Speech

In this section, we provide some robustness checks for the effects of the Bolsonaro's national pronouncement on March 24 discussed in the paper. Our main results show voters of the opposition and independents increased their risk perceptions after this first national speech by the President minimizing the effects of the pandemic, while his supporters did not updated their perceptions at the same rate. We indicate our results provides micro-level behavioral explanations for detected lower levels of compliance to social distancing policies in pro-bolsonaro cities (Ajzenman et al., 2020; Mariani et al., 2020).

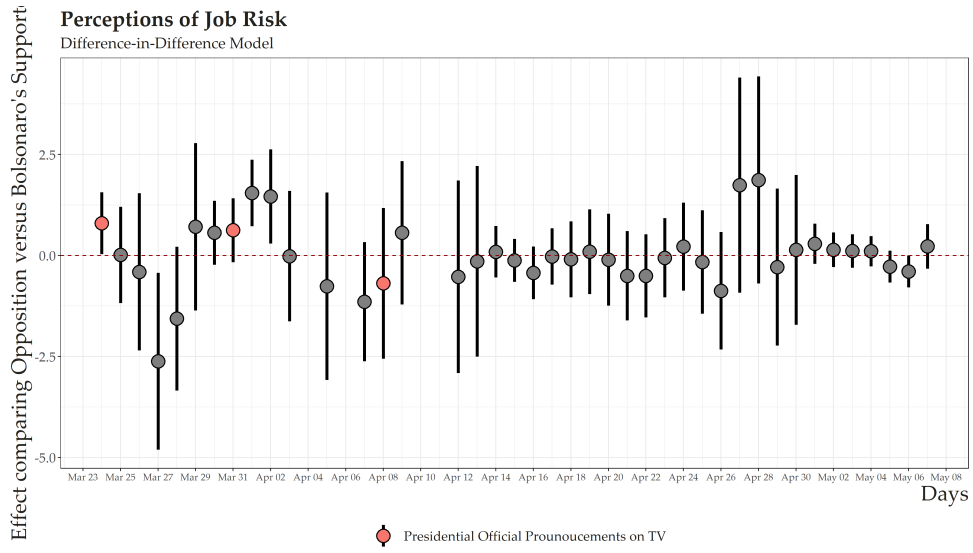
The main inferential threat to our results come from the chance that our measures might be capturing random fluctuations over time of respondents' risk perceptions. Therefore, to increase robustness of our findings, we should examine the extant to which which degree our point estimate differ from changes in our dependent variable over time. We perform a set of placebo checks to analyze this possibility.

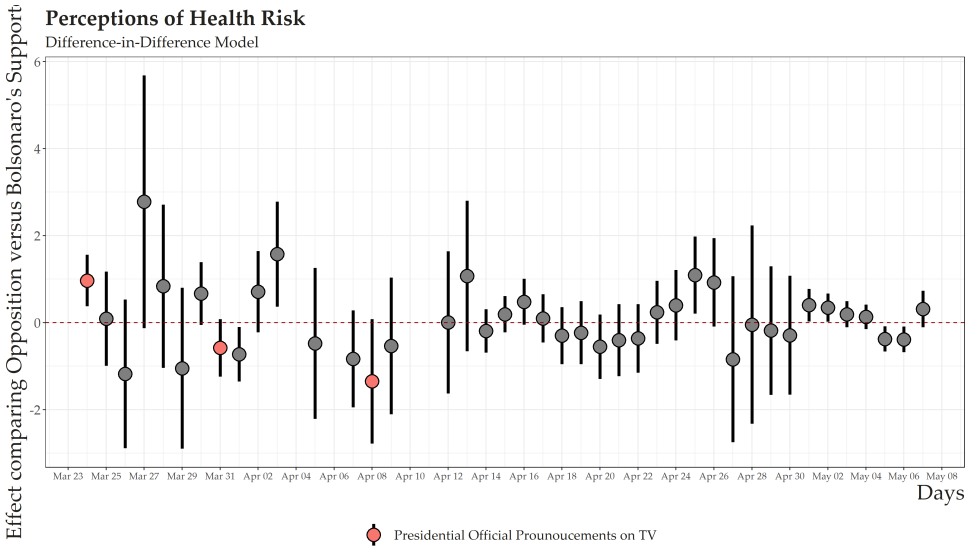
We estimate the same model, as in section six of the paper, but using as a placebo for the treatment effect each other day after March 24. In other words, we simulate as if Bolsonaro speech had happened in all the remaining 45 days we have in our sample. As in the main paper, we estimate the models using data from two days before, and two days for each placebo test.

Figure 9 presents the results. We color in red the treatment results presented in the main paper, and also two other presidential pronouncements made by Bolsonaro to discuss the COVID-19 pandemic on TV. Our results suggest strong support for our argument that the effects of Bolsonaro's speech in March 24 is hardly a random variation from respondents updating their risk assessment over time. For the Job perceptions, only other two point-estimate, out of 45 placebos, are positive and statistically different from zero, as it is the true treatment effect. As

a matter of fact, both estimates happen exactly in the following days of another pronouncement of Bolsonaro. For the Health models, only three out of 45 placebos are positive and statistically different from zero. Overall, the placebo checks give strong support for the robustness of our findings.

Figure 9 Placebo Checks for the Effects of Bolsonaro Speech on March 24.





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