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

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October 31, 2020

*Forthcoming at Latin American Politics and Society*

**Abstract**

In these polarized and challenging times, not even perceptions of personal risk are immune to partisanship. This paper introduces results from a new survey with an embedded social media experiment conducted during the first months of the COVID-19 pandemic 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. We exploit random variation in the survey recruitment to show the effects of the President's first speech on national TV on perceived risk and the moderating effect of partisanship. We present a framing experiment that models key cognitive mechanisms driving partisan differences in perceptions of health risks and job security during the COVID-19 crisis.

*This research is part of the *Inter-American Development Bank* project: "Transparency, trust, and Social Media", 1300600-01-PEC. PI: Ernesto Calvo, 2019-2020. We thank Elizabeth Zechmeister, Noam Lupu, and Maita Schade from LAPOP, who coordinated the probabilistic selection of respondents from a Netquest panel of Brazilian voters. We also thank Julia Rubio, who contributed to the survey design and Sandra Ley and Francisco Cantu, who are collaborators of the three surveys fielded in this project. We received invaluable feedback from the members of the interdisciplinary Lab for Computational Social Science (iLCSS-UMD) as well as important suggestions from Fernando Guarnieri, Antoine Banks, Natalia Aruguete, Maria Victoria Murillo, Isabella Alcaniz, Mario Pecheny, Mariana Carvalho, Amaro Grassi, Lorena Barberia, Guilherme Russo, Jonathan Phillips and Marisa Van Bülow. Replication materials for the article are available at: https://github.com/TiagoVentura/Calvo_Ventura_LAPS_2021

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# 1 Introduction

Will partisan messages alter the voters' perceived risk of contracting COVID-19? Will voters internalize elite messages and align perceived risks with the policy preferences of their parties? Since the seminal studies on framing and risks by behavioral economists Daniel Kahneman and Amos Tversky(1982), researchers have documented framing effects in the subjective assessments of risk and in policy preferences.[1] Frames can induce myopic responses when the messages emphasize potential gains or losses, which are weighted differently by voters (Thaler et al., 1997; Iyengar, 1990). Frames may also alter perceptions of risk by increasing the salience and memory *accessibility* of features of an event (Kahneman, 2011). Accordingly, as polarization increases, scholars have documented distinctive partisan responses that align with changes in perceptions of risks (Iyengar and Westwood, 2015; Green et al., 2004) and in perceived trust in political facts and scientific evidence (Nisbet et al., 2015; Bullock et al., 2013; Kraft et al., 2015).

Political and public health responses to the COVID-19 pandemic provide significant anecdotal evidence of the effects of partisanship on risk perceptions, risky behavior, and policy responses. Populists leaders such as Jair Bolsonaro in Brazil, Donald Trump in the United States, and Manuel Lopez Obrador in México, publicly challenged scientific recommendations and the adoption of strict sanitary measures. Following these cues, government supporters in all three countries publicly challenged and actively mobilized against social distancing rules, the use of masks, and other measures that would limit the propagation of the virus. Nevertheless, the extent to which partisan messages are associated with changes in subjective perceptions of risk is less clear.

Understanding the effect of competing partisan frames on perceived (or *subjective*) risk is

[1] For an illuminating reading of this problem from behavioral economics see Kahneman (2011).

critical to manage the COVID-19 pandemic successfully. Since the early days of the pandemic, social distancing became the most important public health response. Compliance with social distancing measures, however, requires voters to accept the individual and collective risks that may affect them personally. Accordingly, a successful health response needs to evaluate how political beliefs affect perceived risks and interact with policy implementation (Kushner Gadarian et al., 2020; Allcott et al., 2020; Barrios and Hochber, 2020; Mariani et al., 2020; Ajzenman et al., 2020).

Our research brings new and timely survey data[2] to understand subjective perceptions of risks during the COVID-19 pandemic. We analyze how perceptions of risks vary among party supporters, how sensitive voters are to information shocks, and how they react to social media frames. To this end, we first introduce descriptive evidence of partisan[3] differences in perceived risk. We show that supporters of the Bolsonaro administration in Brazil report lower subjective levels of job and health risks along with greater support for the government's response to the COVID-19 pandemic. The results are robust to several control variables and to model specification.

Second, we take advantage of random variation in the recruitment of survey respondents and model the effect of the first national address on COVID-19 by President Jair Bolsonaro. Using a difference-in-difference design with respondents interviewed in the two days before/after the

[2]Our survey field started on March 23 and went on until May 8. The first official death due to COVID-19 in Brazil occurred only a week before, on March 17. Our timely survey collects a snapshot of citizens' reactions during the first months of the pandemic.

[3]Partisanship in Brazil is not a term that can be used without a proper discussion. In our survey, we collect three different measures of *party affinity*: (a) vote intention "if the election is next week", (b) self-reported partisanship, and (c) self-reported anti-partisanship (Samuels and Zucco, 2018). All three of the questions were thoroughly tested. In the paper, we report results using (a) and (c). As a young democracy with a large menu of parties, researchers have shown partisanship to be a weak predictor of voters' attitudes and preferences. More recent work by David Samuels and Cesar Zucco (2018), argues that partisanship is better captured by the pro and anti-partisan feelings against the Workers Party. Most parties, other than the PT, failed to built strong labels and score very low on party identification responses in survey data. In this article, we consider "vote intention" as the best alternative to describe party affinity. However, models with the alternative variables are reported in the SIF and/or can be requested from the authors.

speech, we find robust evidence of partisan updates of risk perceptions. Our results show that among opposition voters, perceptions of job and health risk increased after Bolsonaro's speech compared to independents, while no changes are perceived among government's partisans.

We conclude with an experimental design, with an IRB-approved and preregistered instrument,[4] to detect the effect of social media frames on perceived health and job risks. Our experiment exposes respondents to high-level politicians' positive and negative social media messages about COVID-19, and measures *sharing* and *emotional* responses, as well as their effects on perceived risk.

Overall, we find critical partisan differences in risk perceptions. We also find a significant uptake on risk perceptions after Jair Bolsonaro's public speech. However, evidence of framing effects from social media messages in our experiment are modest.[5] Our results align with similar findings in the United States, raising questions about the level of sensitivity of the experimental treatments (Kushner Gadarian et al., 2020).

To understand the modest effect of our social media frames on subjective risk, we conduct a statistical autopsy of our experiment, unpacking the behavioral responses to the experimental frames. The analysis reveals positive effects for the mediation mechanism ("anger") on perceived health risk and in lower support for the government. However, "angry" responses to social media messages are not consistently higher for publications by out-group politicians – in-group polarizing messages also elicited similar reactions. Therefore, while the mediation mechanism elicited the expected response, the different frames did not.

As in the difference-in-difference analysis of Bolsonaro's speech, "anger" was more readily reported by partisans and increased perceived risks among independents. While our experimental

[4]Our pre-registration and pre-analysis plan, available here: https://osf.io/c67m3

[5]Only one of our four pre-registered hypotheses is confirmed by the data

design expected frames to increase partisan anger and anger to increase risk, $frames \rightarrow anger \rightarrow risk$, our findings only validate the effect of anger on perceived risk, $frames \not\rightarrow anger \rightarrow risk$. By troubleshooting our experiment, we are able to pinpoint the mediating factors that increase perceived risks.

The results of our study have important public policy implications. Current studies in the US and Brazil have shown that districts with high voter support for Trump and Bolsonaro respectively, have steeper epidemiological curves for the COVID-19 spread (Ajzenman et al., 2020; Mariani et al., 2020; Allcott et al., 2020). Our research shows that this is consistent with government messages that made COVID-19 a wedge partisan issue. At a time when perceived health risks is critical to manage the COVID-19 pandemic successfully, findings of this article should be of interest to health policy and political communication experts.

The organization of this article is the following: First, we introduce the Brazilian case, how the government has reacted to the COVID-19 pandemic, and partisan dynamics in the country. In section three, we present descriptive evidence of partisan differences in government performance assessments, perceptions of job security, and perceptions of health risks. The next section presents evidence from the difference-in-difference models describing Bolsonaro's speech's effect during our survey collection process. In section five, we introduce the hypothesis and survey instruments, testing for the effect of negative and positive social media frames on perceptions of risk. In section six, we describe our experimental findings. The last section discusses the paper's overall contribution for our understanding of how partisanship affects risk perceptions during the COVID-19 pandemic.

## 2 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 worldwide struggled to assess the potential domestic damage of the virus and 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 affect every country on the globe.

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, 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 the scientific recommendations to address 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 health crisis's challenges. Anti-Bolsonaro activists pushed back against the President's message, circulating their own distinct health messages.

As a young democracy with an extensive 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 having measurable effects on perceptions of job and health risk during the COVID-19 pandemic.

## 3 Partisanship and perceived risk to COVID-19

As in the United States, partisan assessments of health and job risks are markedly different. Figure 1 vividly portrays differences in perceived risks by supporters of President Bolsonaro and supporters of the opposition's candidate Fernando Haddad.[6] For our outcome variables, 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 [7]

[6]We consider respondents as Bolsonaro supporters, Haddad supporters, or independents depending on their reported voting preference for our question: If the runoff presidential election "were to take place next week" who would you vote for? We provided respondents with three possible choices: Jair Bolsonaro, Fernando Haddad, and Other/Blank/Null. We considered independents the respondents who selected the latter option. Results are robust to other specifications either using respondents' voting preference in the first round, or positive partisanship.

[7]The wording of all three questions is presented below:

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% reporting being very likely to become infected by COVID-19, compared to 22% and 14% for anti-PT respondents.

- **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 Coronavirus COVID-19? (Very appropriate, somewhat appropriate, somewhat unappropriated, very inappropriate).

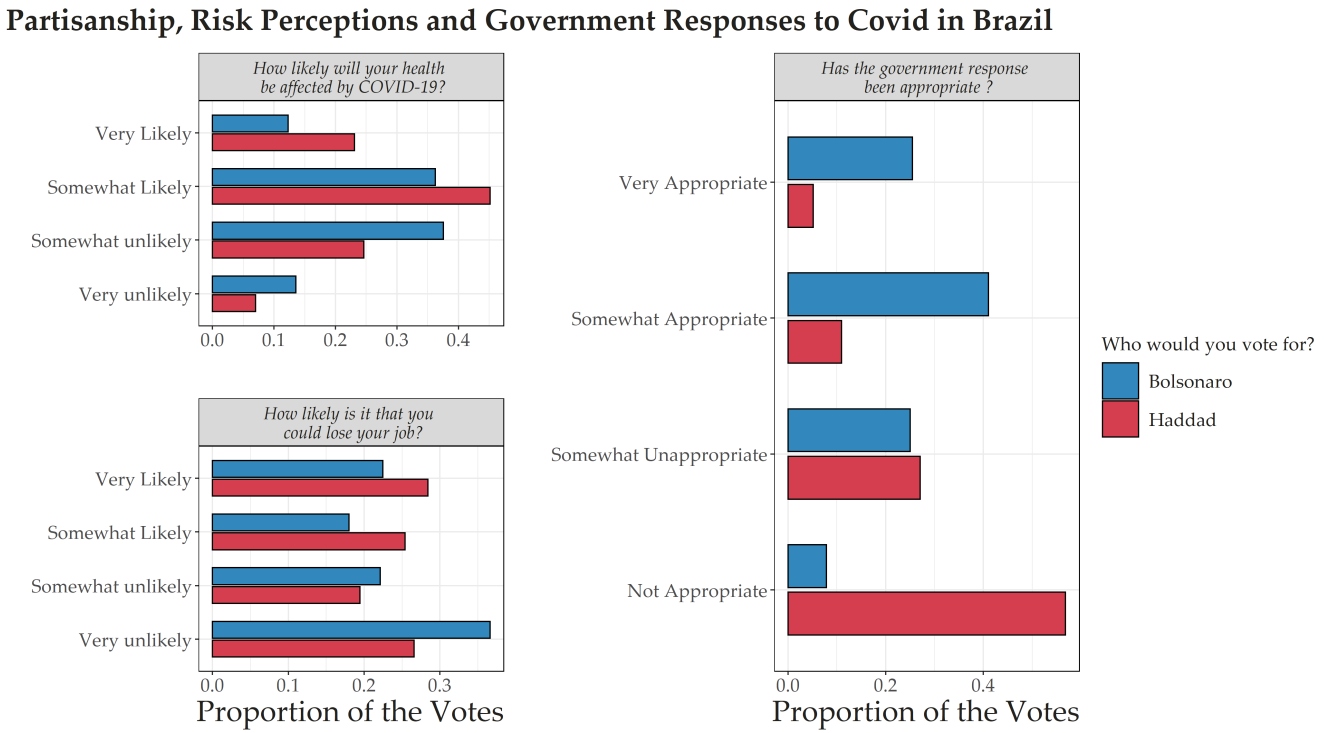
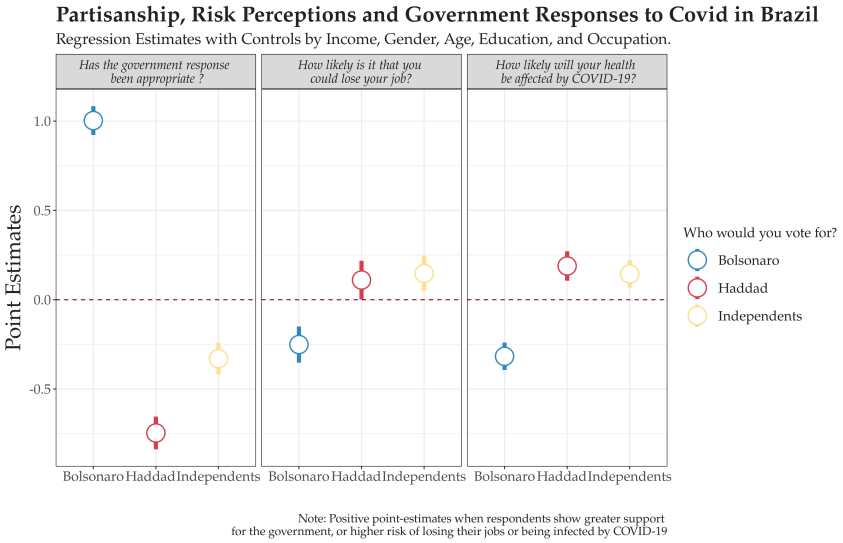
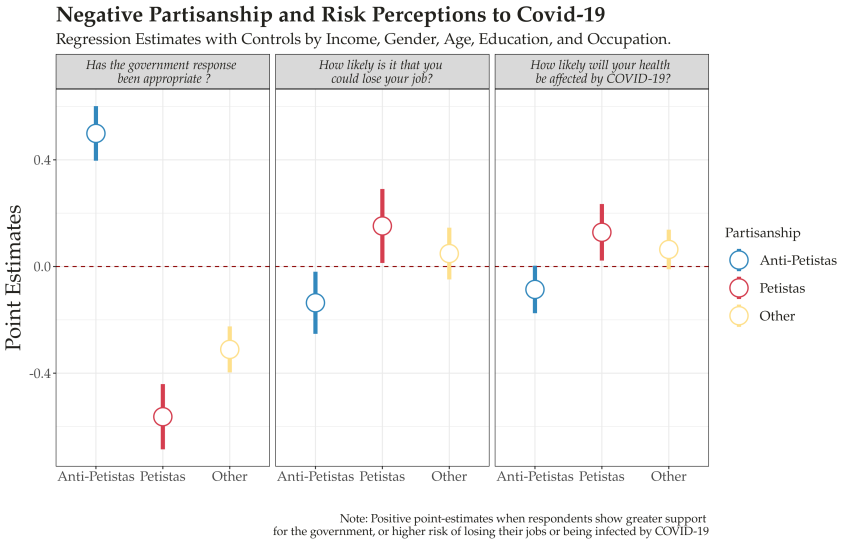



**Figure 1** Survey assessments of the quality of the Government response, perceptions of personal health risk, and perceptions of personal job security, March 23 through May 4, 2020.

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




a) Partisan Effects




b) Negative Partisanship

We also present results from linear models regressing the three outcome variables on partisan preferences and a set of socio-demographic variables such as age, income, education, occupation in the labor market, and gender. Our regression estimates using both the voter choice for the last 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, gender, income, occupation, and education of the respondents. Figure 2 presents the results.

Descriptive evidence is overwhelming, with significant inter-party differences in perceptions of risk and government response assessment. 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 are presented in Section B, Table 4 of the SIF file.

## 4 Beyond Description: Modeling the effect of Bolsonaro's Speech

Descriptive results show dramatic partisan differences in reported health and job risks, as well as in subjective assessments of the government responses. In this section, we take advantage of a public speech by Bolsonaro during data collection and causally identify changes in the respondents' risk perceptions due Bolsonaro's discourses denying the COVID-19 pandemic.[8]

Bolsonaro, in both social media posts and his public appearances, urged local authorities

[8]At the time we pre-registered our experimental design, we could not anticipate that our ongoing survey recruitment would allow us to perform the difference-in-difference analysis measuring the effects of the Bolsonaro's speech on risk perceptions. Therefore, our empirical analysis and theoretical expectations for this section were not pre-registered.

to prioritize growth, challenged (and 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.

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 beginning of the pandemic, allows us to measure risk perceptions when the number of cases was still modest. Our survey field started on March 23, allowing us to collect 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 as answers to who the respondent would be likely to vote if elections were to be held in the following week. To make our sample before and after more

comparable, we limit the analyzes for the time window between 23 and 26 of March [9]. Our parameter of interest is $\tau$, which measures the differences in the outcomes comparing Bolsonaro voters (depicted by the intercept in equation 10) and Haddad supporters.

**The effect of Bolsonaro's speech on perceptions of risk**

Table 1 presents our results. The first three (restricted) models use no control variables, while the remaining three control for the respondents' age, gender, 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 support for the effect of contextual partisan events on perceptions of risk. Related research has found robust evidence that Bolsonaro's denial about COVID-19 increases 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 behavioral explanation for these shocking findings; as the President sends dismissive signals about the pandemic risks, although risk perceptions overall increase, his supporters do not report the same concerns as the rest of the population. Significantly, partisans of the opposition increase

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

their risk perceptions, while government supporters keep their business as usual, decreasing social distancing policies' effectiveness and facilitating the spread of the disease.

**Table 1** 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 |

Up to this point, our paper has shown robust descriptive evidence for partisanship moderating risk perceptions in Brazil. We identify strong partisan differences on risk perceptions in Brazil, and a direct effect of the Bolsonaro's speech denying the severity of the COVID-19 on in-group risk updates. Next, we use an online experiment to discuss how partisanship interacts with framing in the context of social media positive and negative messages about the pandemic.

## 5 Framing and Risk Perceptions during the COVID-19 Pandemic

Following Entman (1993), we define framing as the act of selecting "some aspects of a perceived reality and mak[ing] them more salient in 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's (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 economic or health consequences of COVID-19.

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), who models the effect of anger on preferences, 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.

**Hypotheses**

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. In this section, we present the pre-registered hypothesis and our instruments.

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.

Positive messages bring to voters the willingness of political elites to cooperate with rivals to fight the COVID-19 pandemic. In an era of high polarization, these messages provide voters with novel information, reinforcing the importance of unity and cooperation to address the crises. The negative frames blame political opponents for sowing conflict and weakening the needed response to the crises. By contrast, positive messages minimize party identity responses and signal that politicians do not behave as in a "politics-as-usual" way. Consistent evidence show people weight negative messages more heavily when compared to positive information (Arceneaux and Nickerson, 2010), and, when thinking about risk, negative messages frame risks as dynamic losses for respondents affecting the attention to the topic (Kahneman and Tversky, 1982). 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.

- *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.

A broad literature in political behavior shows that partisanship is central to attitude formation, in areas as distinctive as candidates evaluation, economic perceptions, support for democracy and authoritarianism, and policy preferences (Green et al., 2004; Arceneaux, 2008; Slothuus and De Vreese, 2010; Evans and Andersen, 2006; Zaller, 1992). Based on this literature, we expect the framing effect from negative and positive messages to be conditional on partisan identities. In our second hypothesis, we argue that a "politics-as-usual" polarizing message from elites elicits a partisan identity response from voters. 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 when framing in a "crossing-the-isle" style politics. 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 heightens perceived polarization, increasing party identity responses and reducing support for the government. After being exposed to negative messages by an out-group politician, Banks et al. (2020) show that voters perceived ideological distance increases (contrast), driving responses to align further with their in-group

beliefs. Similar dynamics have been found on previous studies with a focus on political behavior during a health crisis (Adida et al., 2018). 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. Opposition voters will report heightened risks and lower marks for government's 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.

**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 was exposed to only one tweet, and after the treatment assignment, responded to our outcome variables [10]. In order to prime respondents in our experiment, we edited tweets. Although we reduce the experiment's external validity 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

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

conditions. Internal validity is achieved by randomization, and Section A of the appendix shows a balanced sample of respondents across a range of socio-demographic and attitudinal variables between the treatment arms.

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 positive and negative framing of COVID-19. In the positive, 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. Appendix C presents the wording of each treatment, and the tweets as the respondents read in Portuguese.[11]

## 6 Results: Framing Risk Perceptions

We now turn to our experimental results. We manipulate our four treatment arms to identify the effects previously described, expecting negative messages from out-group politicians to

[11] All the respondents were debriefed that the tweets were not factual by the end of the survey.

increase perceptions of risk among opposition voters and reduce them among government supporters. The proposed mechanism rests on angry reactions to negative out-group politicians altering the interpretation of the COVID-19 questions to better follow the policy cues of their preferred parties.

For presentation purposes, we concentrate on describing the relevant comparisons of all treatments as reported in Figure 3, and report the p-values for the statistically significant and theoretical relevant comparison. Earlier in the article, figure 2 showed significant inter-party differences in evaluations of the governments and in perceptions of job and health risks. For visualization purposes, estimates in Figure 3 manipulate those average results by demeaning our dependent variables, and showing inter-party deviations when respondents are treated with any of the different frames.[12]

Consider the first row of Figure 3, 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.

[12]All the respondents in our survey are exposed to at least one tweet. Therefore, we do not have a classic control group with no information. To model this particular design, we estimate a simple linear regression of the demeaned outcomes on all the four frames. To capture the effects for all the frames, the model is estimated without a constant. We report the point-estimates of the model and compare each point-estimate against each other, using a t-test to assess their statistical difference.

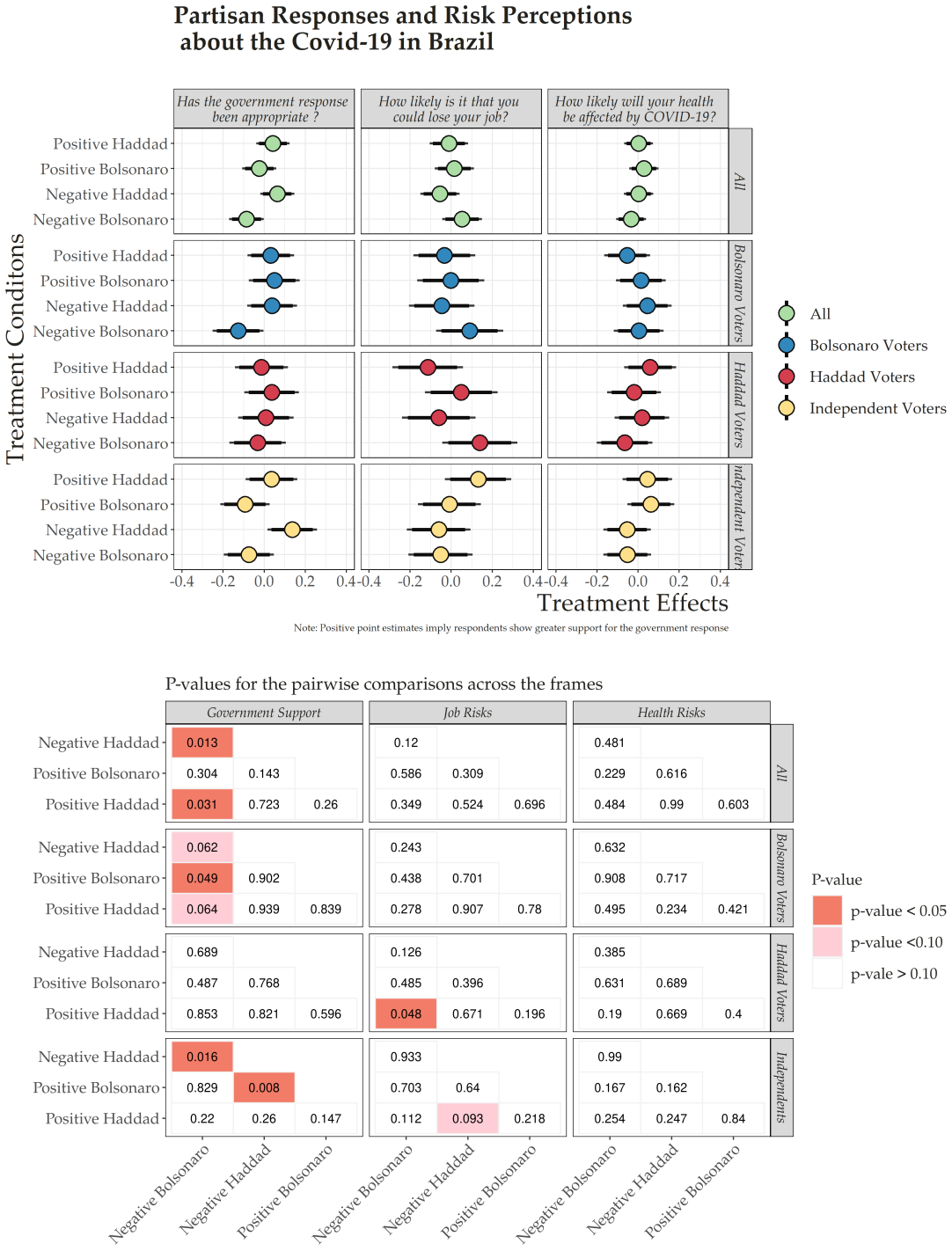



**Figure 3** Framing Estimates by likely Vote

In the second row, we present estimates for the subsample of Bolsonaro voters. Like the full sample, negative messages by Eduardo Bolsonaro decrease overall perceptions of government response to the crisis and increase perceptions of job risk. This is an unexpected result, as respondents treated with negative tweets by Eduardo Bolsonaro are not activating a partisan response by the in-group. In the third row, we present the estimates of Haddad (Workers' Party) voters. Messages by Eduardo Bolsonaro 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 effect in perceptions of job insecurity among voters of the opposition, as argued in hypothesis 3b. We find a large gap on job risk perceptions comparing negative message by Bolsonaro with positive cross-the-isle message by Haddad ($p < 0.05$).

Finally, the fourth row presents the estimates for independent voters, who preferred to mark blank in the run-off election rather than voting for either Bolsonaro or Haddad. We had no pre-registered expectation for this group, however, we believe the discussion and results are worthy of being reported. Among independents, we see that messages by Haddad increase evaluations of the government while messages from Bolsonaro decrease them ($p < 0.05$). 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 message's information value while considering positive messages as informative.

Figure 4 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 3. Results indicate that self-identified anti-PT respondents are particularly sensitive to the treatments, with a significant decline in support for the government and an increase in job

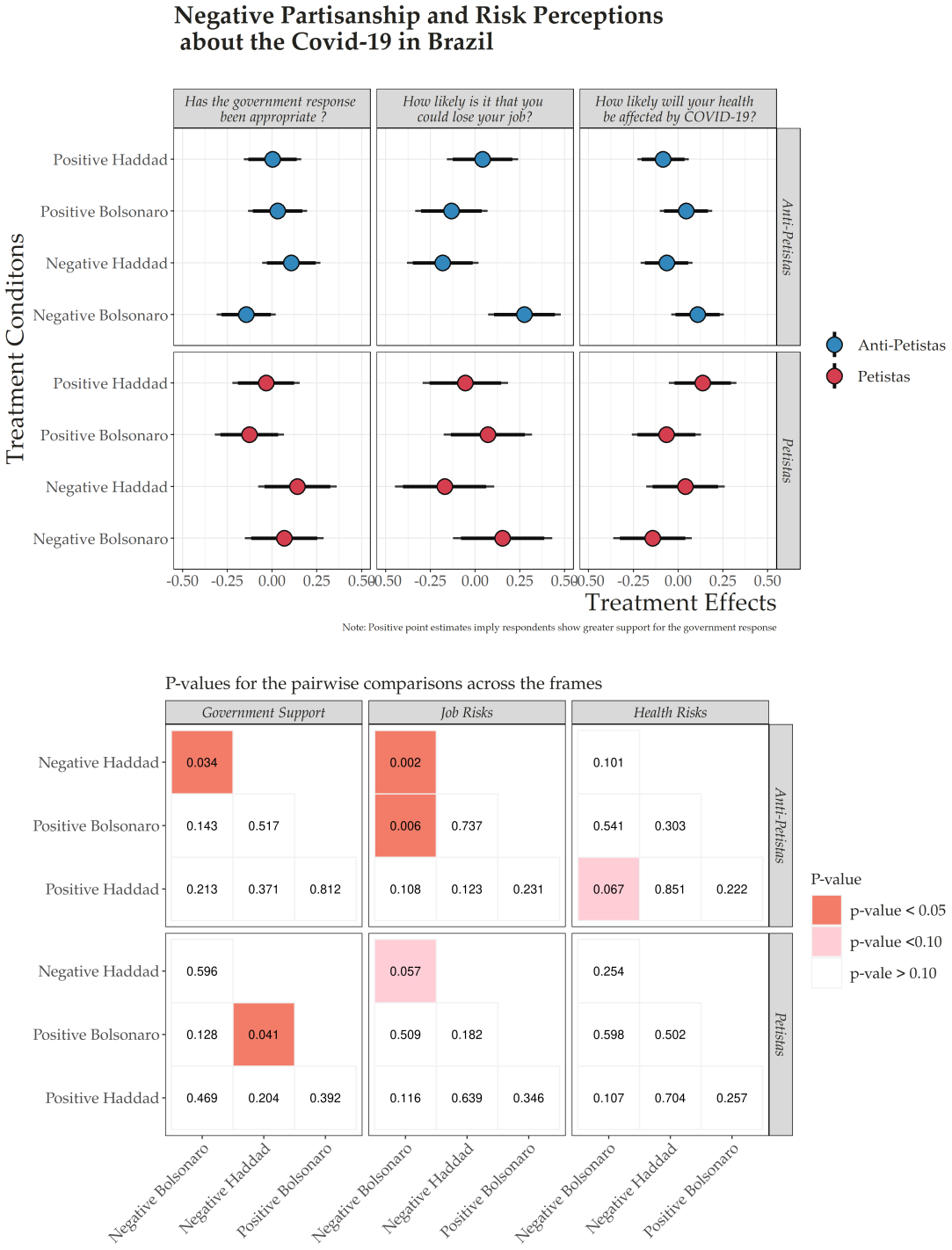



**Figure 4** Framing Estimates by Negative Mass Partisanship

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 his support.

Overall, our survey experiment finds no robust evidence for our pre-registered hypothesis. Although we find consistent and robust partisan differences on non-experimental survey responses to risk and support for the government during the pandemic, exposure to distinct framing on social media seems to alter little how citizens' update their beliefs. Only one of our hypotheses is confirmed: voters of the opposition fell more at risk when treated with a negative message by a high-level politician aligned the Bolsonaro's government. Giving that we conduct multiple tests, and do not confirm most of our pre-registered hypotheses, we report our experimental results as indicating null effects for framing. As discussed in the introduction, this finding goes in the direction of previous investigations about COVID-19 pandemic in the American context (Kushner Gadarian et al., 2020), and suggests an environment where respondents are dealing with a saturated social media environment, which would explain why framing and endorsement effects have no effects on risk perceptions.

In addition, two risk differences are robust in our experiment, and are purely exploratory since we did not pre-registered these expectations. First, among independents, positive messages are read as posturing, increasing their job risk perception and support for the government. In a polarized environment, crossing-the-isle seems to signal to independents that the crisis is rather serious. Second, negative messages minimizing the risks of COVID-19 sent by core members of the government seem to hurt Bolsonaro's popularity, and increase job risk perceptions, among his voters, and partisans anti-petistas.

# 7 Why "null findings"? An Autopsy of our Experiment

The experimental results in the previous section are, at first sight, disappointing. The descriptive evidence in the opening pages showed significant party differences in perceptions of health and job risk. Then, the difference-in-difference analysis of Bolsonaro's speech gave new support for the proposed argument, showing that voters are sensitive to partisan messages, with heightened perceptions of health risk after the aggressive standing of Bolsonaro. The sample size of the experiment is large and comfortably exceeds power requirements, even for the subsamples for party voters and independents.[13] So, why are the results of the framing experiment modest and why do we find support for only one of our three hypotheses? Luckily for us, we included in the survey a number of validation checks that allow us to explore the mechanisms behind the modest results of the survey experiment.

**What could have failed...or not?**

Null findings are always important if they disprove theories but are less interesting if they reflect poor design choices. Therefore, it is important to know what could have failed. There are three different reasons that may explain weak findings in our experiment: First, (1) respondents could have failed to interpret and/or react to the partisan message of the four different frames. In that case, weak findings would be explained by the failure of the frame/signal to which respondents had to react. We may test for this potential problem because we included a validation check in the experiment, asking respondents if they would "like", "retweet", "reply", or ignore the tweet. Therefore, we can observe whether partisans' behavior aligns with the content

[13]Finding the minimum sample size that would prevent Type I errors is difficult prior to collecting survey results. We expected a survey of 2,400 respondents to exceed power requirements. This assumption is justified in the analyses in 7.3 of this section, showing that power requirements were sufficient to test for the effect of anger on risk.

of the frames.

Second, findings may be weak because frames did not elicit the expected emotional response to the negative or positive tweets posted by the in-group or out-group politician. Following Banks et al. (2020), we expect the mediation mechanism ("anger") to activate partisan identities and increase perceptions of risk among opposition and independent voters. This would be consistent with results from the difference-in-difference analysis of Bolsonaro's speech. However, if the "angry" response to the social media frames is not consistently higher for negative messages by the out-group politician, there would be modest differences in perceived risk among respondents exposed to the different frames. While our experimental design expects frames to increase partisan anger and, in turn, expects anger to increase perceived risk, $frames \rightarrow anger \rightarrow risk$, failing to elicit the correct behavioral response would dissociated the frames from risk perceptions, $frames \not\rightarrow anger \rightarrow risk$.

Finally, it is possible that the treatment frames are properly interpreted by the respondents and that they elicit the expected response, "anger", without this emotional response changing risk perceptions, $frames \rightarrow anger \not\rightarrow risk$. In this case, the expected hypothesis would be thoroughly rejected.

In this autopsy, proving the first problem would highlight a design failure (e.g. poor frames); support for the second problem would amount to an expectation failure, failing to elicit the correct reaction to the frames (e.g. "anger"). Finally, support for the third problem would disprove the theory, with the emotional trigger failing to affect perceptions of risk. We proceed now to troubleshoot our experiment and isolate the source of the reported weak findings.

**Autopsy of Problem 1: Were the frames properly designed frames**

To evaluate if there is a failure to communicate the partisan content of the frames, we can take advantage of one of the survey questions that asked respondents whether they would "like", "retweet", "reply", or "ignore" the tweet they had just seen. Descriptive information in Figure 5 shows that, as expected, decisions to "like" or "retweet" follow clear partisan lines, with voters supporting the government considerably more likely to retweet the negative and positive messages of Bolsonaro. Similarly, voters of the PT (Workers Party) were considerably more likely to share messages by Haddad.

More interestingly, results show a clear preference by voters to "like" and "retweet" positive partisan messages. While government supporters shared 43% of the negative Bolsonaro post, 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 5 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 negative and cognitively dissonant messages trigger "reply" behavior by *out-group* voters, this is only true of Haddad voters in response to negative Bolsonaro messages. By contrast, there is no equivalent change in "reply" rates when government supporters read a negative Haddad message.

Overall, sharing behavior shows that the treatments were properly interpreted by respondents and triggered the expected sharing response. Results rule out that the source of the weak findings was a failure to communicate the partisan content of the tweets. Respondents understood and reacted as expected to each of the four treatments.However, there is a clear inclination for

positive messages among Bolsonaro voters. This will be relevant when troubleshooting the second problem.

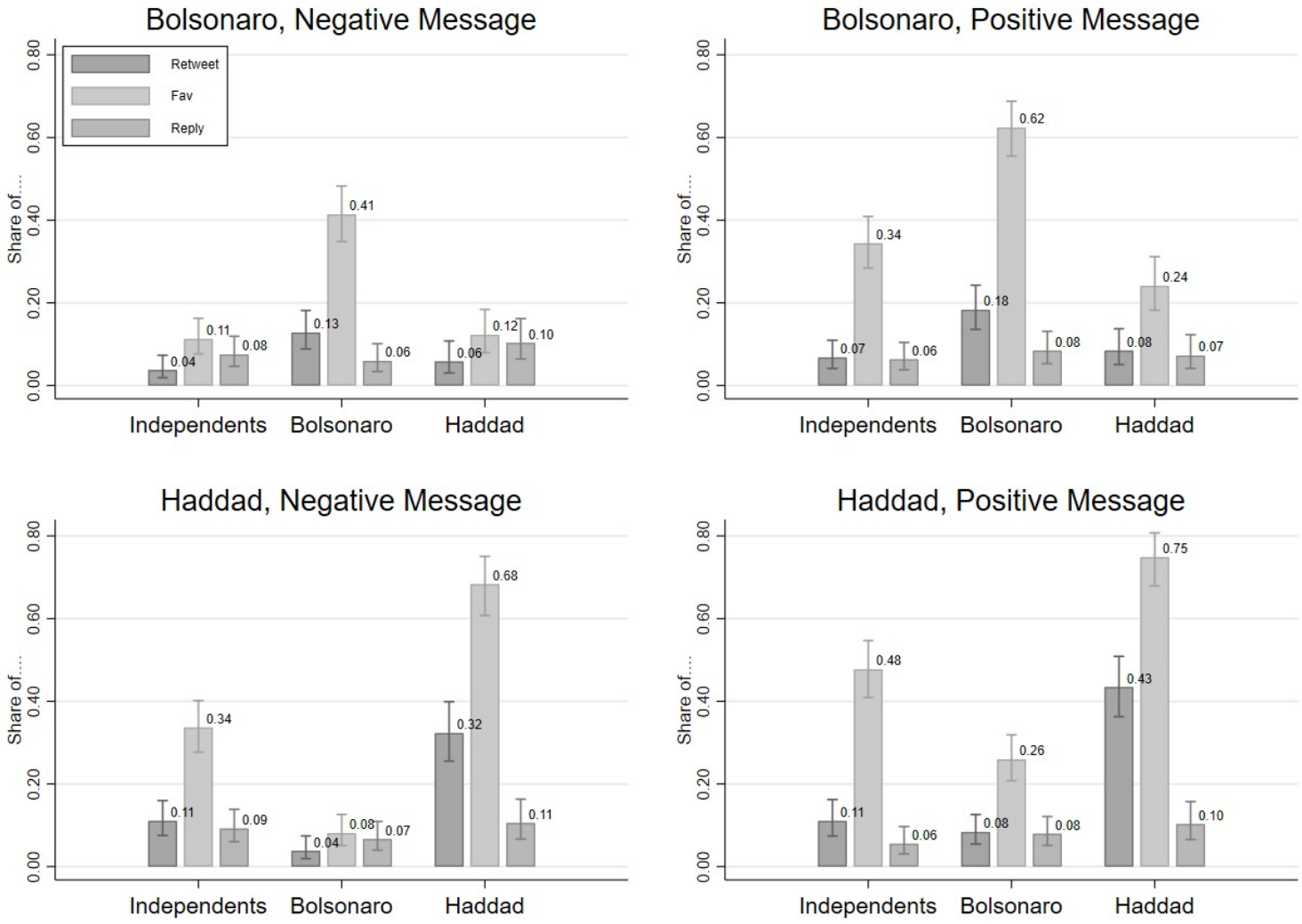



**Figure 5** Favs, Retweets, Replys in response to each of the four treatments.

**Autopsy of Problem 2: did the experiment elicit "anger" for negative out-group messages?**

Results in Figure 5 already hint that something is not quite as expected and that the affective reaction to the treatments may be more nuanced than anticipated. Positive tweets by both Bolsonaro and Haddad collected more shares than negative ones. Further, reply rates for negative messages by out-group respondents were not particularly high. Both issues suggest that positive frames by out-group politicians and negative frames from in-group politicians have a larger presence in the data than what we expected.

We can do considerable more to see how voters react to the content of the tweets and test for "anger" as a mediator, because, after we asked respondents if they would share a tweet, we asked them how did the tweet "make them feel." The "angry" response to this question collected $\approx 8\%$ in the positive frames and $\approx 19\%$ in the negative frames. While sharing behavior is higher for positive messages, "angry" responses were indeed higher for the negative tweets. Table 2 presents descriptive evidence using logistic models for the effects of the four frames eliciting "anger" among our respondents. In the overall sample, negative messages from pro-government and anti-government officials induced similar levels of anger and positive messages have no statistically significant effect. However, while negative posts elicit more angry reactions, the effects filtering by the partisan groups are not consistent: among Haddad voters, both in-group and out-group message elicits similar amounts of angry response, while among Bolsonaro voters both out-group negative and positive messages induced "anger".

Results in the Table 2 provide compelling evidence of a disconnect between the content of the frames and the expected emotional response. The evidence confirms that the negative frames increased "angry" responses. However, the difference between the negative and positive tweets

is modest and "anger" was frequent after reading in-group and out-group messages. Therefore, the proposed frames failed to elicit the expected response, $frames \not\rightarrow anger$. While "anger" was shown to have a crucial effect on subjective risk, the effect of the frames was modest.

**Autopsy of Problem 3: Is there a disconnect between "anger" and risk?**

Table 2 estimates the determinants of our dependent variables *perceived health risk, job risk, and government performance.* As covariates we include the four treatments, a variable taking the value of 1 if the respondent indicated that they felt anger after reading the tweet, and a latency variable that measured the time, $log(miliseconds)$, that respondents took to answer the "how did you feel" question. As in the pre-approved plan, we expect automatic and fast responses to be associated with heightened perceptions of risk. What Kahneman (2011) defines as a "System 1" response.

Table 2 shows evidence to rule out problem number 3 in the health equation. Results show, as expected, that "anger" is associated with an increase in the users' perceptions of health risk. The effect of "anger" increases perceptions of subjective health risk among Haddad and independent voters.

Results in Model 1 of Table 2 show that an angry response yield a statistically significant 0.241 increase in perceived risk for the full sample. Model 2 in Table 2 shows that the effect of anger on perceptions of health risk holds when controlling for vote intention, a statistically significant 0.187. Results also show that a lower time to express how they feel is associated with higher perceptions of risk. The effect of time is consistent with a decision that "operates automatically and quickly [...] originating from impressions and feelings"(Kahneman 2011, pp.21).

While results of this autopsy provide compelling evidence of a positive effect of "anger" on perceptions of health risk, validating the mediating mechanism, this is not the case for subjective

job risk. The effect of "anger" on job risk is not statistically significant. We interpret the lack of significance as supporting evidence for Problem 3 being an issue in the job equation. That is, frames that elicit anger are not having the hypothesized effect on perceived job risk. Finally, we do find an effect of the Anger mediator decreasing support for the government's response to the pandemic, as shown in model 5 in table 2. However, the effect shrinks and loses significance when controlling for party vote, which is a consequence of exteme levels of polarization in the support for the government during the pandemic. .

To summarize, the autopsy on key validation checks of our experiment allows us to discard problems in the interpretation of the frames (Problem 1) and shows a disconnect between the frames and our expected emotional responses by respondents (Problem 2). In the case of health and support for the government, our model supports the interpretation that $frames \not\rightarrow anger \rightarrow risk$, instead of the expected $frames \rightarrow anger \rightarrow risk$.

**Table 2** Regression Models: Effects of Anger on Risk and Support for the Government

| | Health Risks | | Job Risks | | Support for the Government | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Anger | 0.241*** | 0.187*** | 0.013 | −0.032 | −0.246*** | −0.046 |
| | (0.053) | (0.053) | (0.072) | (0.072) | (0.062) | (0.055) |
| Latency | −0.109*** | −0.101*** | −0.039 | −0.033 | 0.099** | 0.077** |
| | (0.036) | (0.035) | (0.048) | (0.047) | (0.041) | (0.036) |
| Negative Bolsonaro | −0.079 | −0.071 | 0.039 | 0.046 | −0.045 | −0.073 |
| | (0.052) | (0.051) | (0.070) | (0.069) | (0.060) | (0.053) |
| Negative Haddad | −0.045 | −0.035 | −0.069 | −0.060 | 0.108* | 0.074 |
| | (0.051) | (0.051) | (0.069) | (0.069) | (0.060) | (0.052) |
| Positive Haddad | −0.024 | −0.010 | −0.026 | −0.013 | 0.064 | 0.027 |
| | (0.051) | (0.050) | (0.068) | (0.068) | (0.059) | (0.052) |
| Haddad Voters | | 0.026 | | −0.0005 | | −0.331*** |
| | | (0.045) | | (0.061) | | (0.047) |
| Bolsonaro Voters | | −0.316*** | | −0.295*** | | 0.863*** |
| | | (0.042) | | (0.057) | | (0.043) |
| Constant | 3.060*** | 3.142*** | 2.595*** | 2.681*** | 1.868*** | 1.722*** |
| | (0.123) | (0.123) | (0.165) | (0.167) | (0.143) | (0.127) |
| Observations | 2,354 | 2,354 | 2,352 | 2,352 | 2,352 | 2,352 |
| Adjusted $R^2$ | 0.011 | 0.042 | −0.001 | 0.013 | 0.010 | 0.245 |

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

# 8 Concluding Remarks

In a time when social distancing is the primary health response to the COVID-19 pandemic, understanding subjective assessments of health and job risks 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 public discourses by Bolsonaro on perceptions of individual risks, and (3) test for the effect of negative and positive social media frames on perceptions of individual risk.

Our results verify the existence of partisan differences in perceptions of risks; a heightened effect of government speeches on opposition voters perceptions of personal risk; and a bounded partisan identity response to negative social media messages, particularly against pro-government messages denying responsibility for the crisis. Evidence of framing effects from social media messages in our experiment are modest, and mostly null considering our initial hypothesis for the effect of negative content and of crossing-the-isle positive social media message on risk perceptions. However, we find evidence 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. Our experiment provides evidence for citizens' behavioral reactions to different narratives during the first months of the COVID-19 pandemic in Brazil, and suggests polarization was not being received as an effective strategy by

the core supporters of the government.

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. 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 considerably more partisan than that expected from in-group voters. Therefore, at least in Brazil's case during the first months of the pandemic, 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: Survey Information

Our paper presents observational, quasi-experimental, and a framing experiment using novel data from an national on-line survey fielded by Netquest-Vanderbilt. The survey uses probabilistic samples drawn by the LAPOP team in Vanderbilt implemented with the panel of users registered with Netquest. The entire survey and the embedded framing experiment received the approval of the University of Maryland Institutional Board Review 1552091-3.

The survey was carried out from March 23 to May 08, 2020 from a national poll of 2,360 respondents. Completion for the survey took on average 28 minutes. We provide two different incentives for respondents to engage in the survey. Beyond the survey experiment described here, our survey asked a series of questions about trust, policy preferences, social media consumption and standard demographic information. Several of these pre-treatment variables were used and described in different sections for this paper.

Below, we present information about some of the survey variables used throughout the paper. In a later section in this appendix, we describe in detail the treatment conditions, and outcomes variables.

**Table 3** Survey Questions - Demographic Information

| Variable | Wording | Responses |
|---|---|---|
| Age | What is your age | Binned (From 18-25 up to more than 66) |
| Gender | What is your gender? | Male/Female |
| Education | What education level have you achieved? | Graduate Studies) |
| Employment | During last week, did you work or study at least one hour, in some paid activity? | Yes/no |
| Income | magine a staircase with 10 steps. In the first step, people with lower income are located, and in step 10, people with higher income are located. Where would you be located? | 0-10 |
| Income Assistance | During last month, did you or a member of your household received | Nominal with government programs |

**Table 4** Survey Questions -Political Attributes and Behavioral Responses to the Treatment

| Variable | Wording | Responses |
|---|---|---|
| Likely to Vote (First Round) | Which candidate would you support if the presidential election "were to take place next week" ? | All presidential candidates from 2018 |
| Likely to Vote (Runoff) | Which candidate would you support if the runoff presidential election "were to take place next week" ? | Jair Bolsonaro, Fernando Haddad, Null |
| Positive Partisanship | Which party do you like the most? | List of Political Parties in Brazil |
| Negative Partisanship | Which party do you dislike more ? | List of Political Parties in Brazil |
| Ideological Placement | Imagine a scale that goes from "very conservative" to "very progressive", were would you place yourself? | 0-10 |
| Emotions to the Treatment | Thinking about the tweet we just showed you, do you feel | Angry, Happy, Disgusted, Optimistic, Stressed, Sad, Fearful, Indifferent |
| Reactions to the Treatment | Thinking about the tweet we showed you. Would you? | Fav, Retweet, Reply, Ignore |

To guarantee that our randomization procedure worked properly, we present below demographic information for our respondents across the four treatment conditions of our framing experiment. 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 5** 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 deeper partisan divisions on risk perceptions and government assessment. We first replicate figure 1 in the 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 the 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 assessing 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 6 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. In the main paper, we do not explore 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.

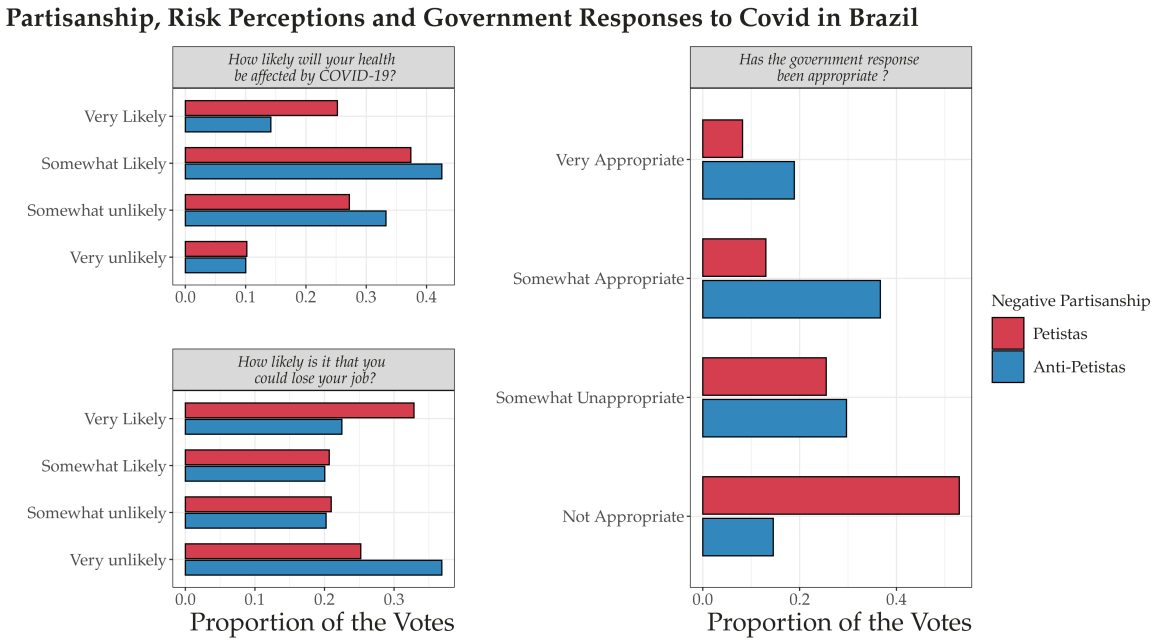



**Figure 6** Survey assessments conditional on Negative Partisanship of the quality of the Government response, perceptions of personal health risk, and perceptions of personal job security, March 23 through May 4, 2020.

**Table 6** 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

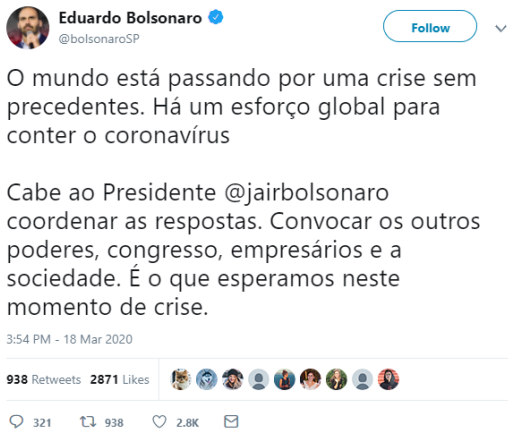
## Section C: Tweets for the Treatment Conditions

Table 7 presents the treatment conditions in English. Figure 7 presents the images, as the respondents read in Portuguese, of the tweets used in each of the treatment conditions.

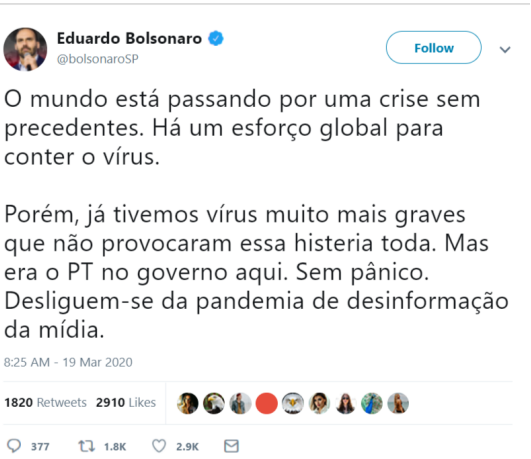
**Table 7** Treatment Conditions

| | Positive Tweet | Negative Tweet |
|---|---|---|
| Eduardo Bolsonaro | The world is currently living an unprecedented crisis. Countries 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 rally together to fight against Coronavirus. However, we have seen other diseases before, some way more dangerous than Coronavirus, that did not lead to all this hysteria. Only that it was the PT's government at that time. No panic. Switch off from the pandemic of misinformation from the media |
| Fernando Haddad | The world is currently living an unprecedented crisis. Countries 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 rally together to fight against Coronavirus. President @jairbolsonaro is delayed in answering. He is only concerned about attacking his opponents and take part in protests that put in risk the Brazilian people. |

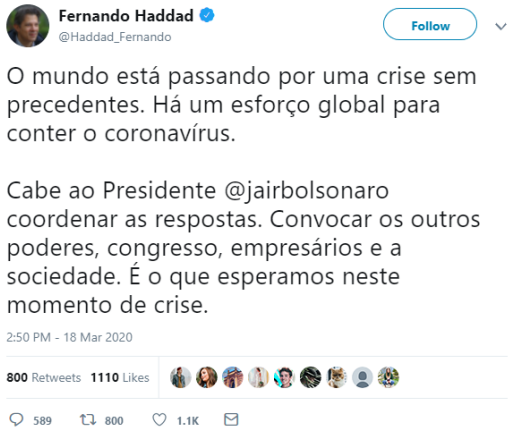
**Figure 7** Tweets for the Treatment Conditions



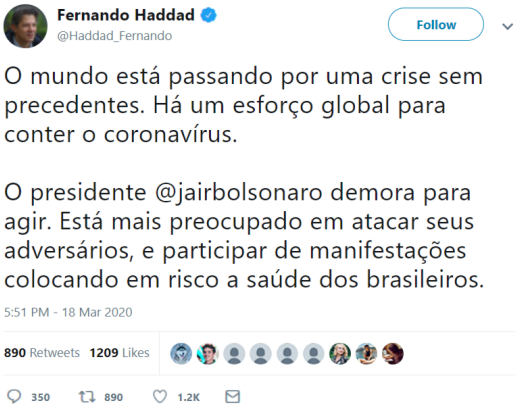

a) Eduardo Bolsonaro x Positive Tweet (T1)




b) Eduardo Bolsonaro x Negative Tweet (T2)




a) Fernando Haddad x Positive Tweet (T3)




b) Fernando Haddad x Negative Tweet (T4)

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

This section provides some robustness checks for the effects of the Bolsonaro's national pronouncement on March 24 discussed in the paper. Our results' main inferential threat comes from the chance that our measures might capture random fluctuations over time of respondents' risk perceptions. Therefore, to increase the robustness of our findings we examine the extant to which our point estimates differ from changes in our dependent variable over time. We perform

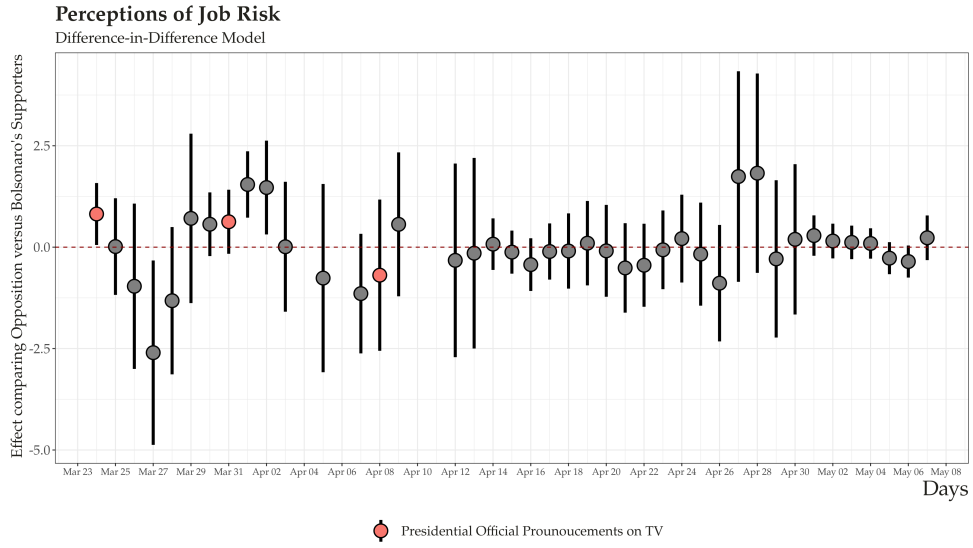
a set of placebo checks to analyze this possibility.

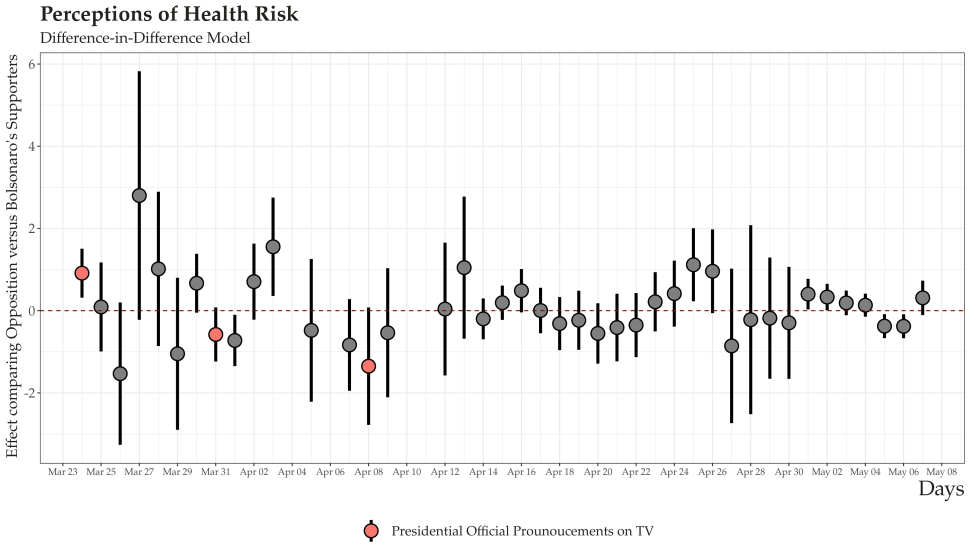
We estimate the same model, as in section four of the paper, but using as a placebo for the treatment effect each other day after March 24. In other words, we simulate as if Bolsonaro speech had happened in all the remaining 45 days we have in our sample. As in the main paper, we estimate the models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

Figure 8 presents the results. We color red the treatment results presented in the main paper and 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 on March 24 is hardly a random variation from respondents updating their risk assessment over time. For the Job perceptions, only the other two point-estimates, 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.

Finally, we use randomization inference to asses covariates balance between our survey respondents before and after March 24 (Gerber and Green, 2012; Coppock, 2019). Figure 9 plots a histogram of the observed F-statistic, and the null distribution of F-statistics calculated through randomization inference, and using a linear probability model regressing the treatment assignment (answering the survey between March 24-25, after Bolsonaro's speech) on a set of demographic and political information collected during the survey (age, gender, occupation, education, income, ideology, positive and negative partisanship, and voting choices). As in the main models, we limit the analysis to respondents who answered two days before (control), and

**Figure 8** Placebo Checks for the Effects of Bolsonaro Speech on March 24.

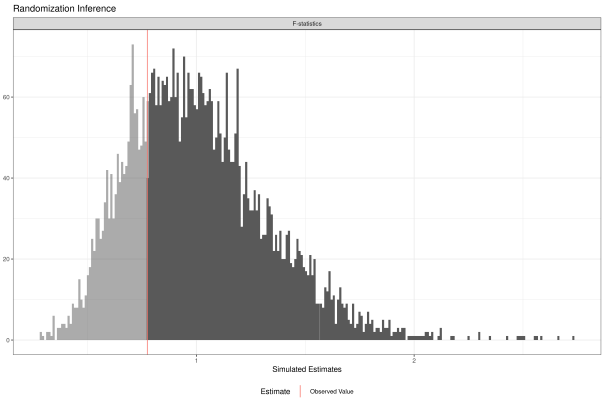


two days after (treatment) Bolsonaro's speech.

Randomization inference provides a strategy to calculate p-values for hypothesis test using randomization techniques. The null hypothesis for our robustness check is that a set of socio-demographics and political covariates do not explain if the respondents answered to the survey before or after March 24. The results are presented on figure 9. The distribution of F-statistics indicates that the null hypothesis (covariates have no effect on treatment assignment) cannot be rejected. Approximately 75% (P-value=0.75) of the simulated F-statistics were larger than the observed F-statistic in the true model. The vertical red line on both graphs denotes the observed F-statistic, while shaded regions denote simulated estimates more extreme than the one observed. I used 5.000 simulations under the the null hypothesis, implied by random assignment, that no covariates is correlated with answering the survey before or after March 24.

**Figure 9** Randomization Inference for Covariate Balance Before and After Bolsonaro's Speech.




## Section F: Effect of Frames on "Anger"

**Table 8** Regression Models: Effects of the four-frame treatments on "angry" response.

| | All Sample | Bolsonaro Voters | Haddad Voters |
|---|---|---|---|
| | (1) | (2) | (3) |
| Constant | 1.090*** | 1.020*** | 1.169*** |
| | (0.014) | (0.019) | (0.032) |
| Negative Bolsonaro | 0.091*** | 0.044 | 0.154*** |
| | (0.020) | (0.027) | (0.045) |
| Negative Haddad | 0.106*** | 0.161*** | 0.117*** |
| | (0.020) | (0.027) | (0.045) |
| Positive Haddad | −0.007 | 0.060** | −0.049 |
| | (0.020) | (0.026) | (0.044) |
| Observations | 2,362 | 855 | 658 |
| Adjusted $R^2$ | 0.021 | 0.039 | 0.036 |
| *Note:* | *p<0.1; **p<0.05; ***p<0.01 | | |

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