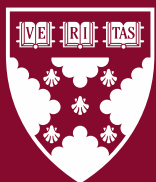


Working Paper 24-022

Words Can Hurt: How Political Communication Can Change the Pace of an Epidemic

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Words Can Hurt: How Political Communication Can Change the Pace of an Epidemic *

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Abstract

While elite-cue effects on public opinion are well-documented, questions remain as to when and why voters use elite cues to inform their opinions and behaviors. Using experimental and observational data from Brazil during the COVID-19 pandemic, we study how leader cues influence decisions about issues of direct personal relevance, such as social distancing. We first document a divergence in mobility and excess-death trends between municipalities with different concentrations of Bolsonaro voters. Second, we provide evidence from two pre-registered survey experiments confirming that these differences are likely explained by Bolsonaro cues polarizing the electorate regarding COVID-19-related issues. We then explore whether voters react to Bolsonaro's cues as a way to make decisions with little cognitive effort (heuristics) or to express group membership (expressive utility). We conclude that while his supporters follow his cues to protect their social-political identity, the drivers of his opponents' reactions are mixed.

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Cues by political elites shape citizens' opinions about a range of political issues (Bullock, 2020). Whether this is good or bad news for the capacity of citizens to hold elected officials accountable is an open question. On the one hand, elite cues can be beneficial for democracy by helping uninformed citizens form self-interested and value consistent opinions on complicated political matters with reduced effort (Lupia et al., 1998). On the other hand, if citizens blindly follow elite cues even at the expense of their policy preferences or government performance, elected officials have little incentive to act in the interest of their constituents (Bakker, Lelkes and Malka, 2020; Groenendyk, 2013; Lodge and Taber, 2013). This question becomes even more relevant when attitudes of personal relevance are at stake.

Policies of personal relevance are those that, once implemented, affect one's income, rights, lifestyle, or privileges directly and immediately (e.g., changes in income taxes). These types of policy are more likely to change voters' evaluations of governments and parties than policies that, albeit consequential for the state of affairs in a country (e.g., tax incentives for international companies), only affect voters' lives indirectly through complex processes (Apsler and Sears, 1968; Boninger, Krosnick and Berent, 1995; Mullinix, 2016; Slothuus and Bisgaard, 2021). When the personal costs and benefits of a policy are immediate and direct, voters have incentives to form accurate evaluations about the extent to which they support that policy and who is to be blamed or praised for it. In these cases, voters are expected to discount political-elite cues when forming their opinions (Groenendyk, 2013).

Two perspectives explain why voters rely on political-elite cues. According to the first perspective (heuristics), when processing information, individuals may rely on cues to reduce effort in decision-making, i.e., as a heuristics mechanism or shortcut. In these situations, the attitudes towards the cue source are used as a simple rule to form an opinion about the subject matter. Voters would tend to use shortcuts when stakes are low. By contrast, when stakes are high, they have incentives to put effort into examining the external and internal consistency of messages. Hence, in these circumstances, political-elite cues tend to be discounted. The second perspective (expressive utility) postulates that citizens may react

to cues as a way to express group membership. Also according to this perspective, political-elite cues should be discounted when voters have personal stakes in the policy. This happens because, when personal stakes are involved, most voters are expected to put more stock on the costs and benefits of a policy rather than on expressing group loyalties (Groenendyk, 2013; Lodge and Taber, 2013; Bakker, Lelkes and Malka, 2020).

Worldwide, policies aimed at containing the COVID-19 pandemic had a direct effect on citizens' lives. Many COVID-19-related policies - for example, shelter-in-place measures, mask mandates, and vaccination requirements to access public spaces - required individual behavioral changes and had a direct impact on personal health risks. One might expect that these policies provided high incentives for individuals to form accurate evaluations by gathering information systematically while putting little stock on political-elite cues. Yet, there is mounting evidence that citizens relied on political-elite cues during the pandemic to form their evaluations. For example, partisanship in the US is a strong predictor of attitudes towards COVID-19 policies, such as vaccine effectiveness (Shana, Goodman and Pepinsky, 2022) and the political leaning of counties was strongly associated with levels of COVID-19 cases and deaths during the COVID-19 pandemic (Gollwitzer et al., 2020). While part of these trends might be explained by partisanship correlates, such as trust in institutions and belief in science (Allcott et al., 2020; Brzezinski et al., 2020), evidence from survey experiments suggests that political-elite cues are also one of the causes of these aggregate patterns in the US and elsewhere (Flores et al., 2022). While elite cue effects are well-documented, open questions remain, such as which types of voters rely on political-elite cues, what are their reasons for doing so, and how contextual features moderate cue effects.

In this paper, we examine how cues from a charismatic leader, Jair Bolsonaro (the President of Brazil during the time of this study), changed behaviors and attitudes during the COVID-19 pandemic in Brazil. In doing so, we build on previous US-focused literature that highlights the importance of individual differences for our understanding of how voters use political-elite cues when forming their opinions (Arceneaux and Vander Wielen, 2017;

Bakker, Lelkes and Malka, 2020; Barber and Pope, 2019). In particular, we focus on individual characteristics likely to make voters more inclined to behave as leader loyalists, i.e., following leader cues at the expense of personal costs and risks. More specifically, we go beyond dividing the public between Bolsonaro supporters and opponents and measure how important Bolsonaro as a political figure is to the social identity of each individual. To distinguish between the heuristics and expressive utility perspectives, we consider how inclined individuals are to commit effort when processing information (Bakker, Lelkes and Malka, 2020). Our analyses rely on a combination of observational and experimental data. We first document a negative correlation between Bolsonaro’s vote shares in the 2018 Presidential election at the municipality level and the prevalence of people engaging in social isolation in the early days of the pandemic. We show that this pattern – absent at the beginning of the pandemic, before Bolsonaro took a clear stance about COVID-19 – intensifies with time as the President becomes increasingly critical of social distancing measures and other non-pharmaceutical interventions (NPIs). Using longitudinal and fine-grained data on cases and excess mortality, we show that reduced social distancing in pro-Bolsonaro municipalities had relevant implications for the spread of COVID-19, implying that many voters incurred high personal costs for following President Bolsonaro’s lead. These effects are even higher for localities with higher levels of Bolsonaro support and higher levels of tertiary-educated people. Moreover, we conduct a series of robustness checks and conclude that these trends were most likely caused by Bolsonaro’s cues.

We then present results from two pre-registered survey experiments (N=2989).¹ In our survey experiments, we randomly assigned Bolsonaro supporters and opponents to a control condition or Bolsonaro cue condition. In both conditions, respondents received a short paragraph about how the scientific community perceives either the potential of a new and unapproved treatment for COVID-19 (experiment 1) or the need for complying with non-

¹We uploaded our pre-analysis plan (PAP) on the Open Science Foundation’s (OSF) website *before* data collection started. An anonymized version of our PAP can be found on this link: https://osf.io/m9wnc/?view_only=2bf90b93064a47bcb81813a3c5362080). We pre-registered the hypotheses and related rationale, data pre-processing, regression specifications, inferential rules, and exploratory analysis.

pharmaceutical interventions (NPIs) to protect oneself against COVID-19 (experiment 2). In the control condition, participants were exposed to the opinion of “a Brazilian politician” about the matter at hand. In the treatment condition, we disclose that this opinion is Bolsonaro’s.² Our results show a polarizing effect of Bolsonaro’s cues, with his supporters and opponents responding in opposite ways to his cues.

Next, we explore heterogeneous effects to understand which voters are more responsive to Bolsonaro’s cues and which mechanisms drive cue effects in this context. First, we find that cue effects tend to be stronger among strong supporters and opponents. Second, to distinguish between the heuristics and expressive utility mechanisms, we follow the approach by [Bakker, Lelkes and Malka \(2020\)](#), who posit that the heuristics mechanism for cue-following implies that cues should have smaller effects for individuals with high propensity to put effort into reasoning. By contrast, the expressive utility mechanism implies that individuals more able to justify opinion change and hence who have high cognitive ability should be the ones for which cue effects are the strongest. Heterogeneous treatment effects that consider participants’ strength of social-political identity and performance in a cognitive resource test (CRT) (all measured pre-treatment) provide evidence that expressive utility drives the reactions of Bolsonaro supporters to his cues, while we find mixed findings for his opponents. We tentatively speculate that in-group cues might be more likely to activate expressive utility mechanisms than out-group cues.

Overall, our contribution to the literature is threefold. First, we provide evidence from both observational-behavioral and experimental-survey data that leader cues polarize attitudes and behaviors, even in one of the most unlikely political scenarios: when the decision at hand is of direct personal relevance and countervailing information abounds ([Groenendyk, 2013](#); [Slothuus and Bisgaard, 2021](#); [Tappin, Berinsky and Rand, 2023](#)). Second, by showing how cue-effects vary in magnitude depending on individual-level characteristics in an understudied context, we inform a growing literature focused mostly on the US and Europe that

²We do not engage in deception as our treatments are based on newspaper articles.

investigates what explains the heterogeneity in elite cue effects and the underlying mechanisms (e.g., [Arceneaux and Vander Wielen, 2017](#); [Bakker, Lelkes and Malka, 2020](#); [Druckman, 2022](#)). Third, we demonstrate that the social-political identity constructed around a new political leader, as opposed to a party, has the potential to influence opinion and behaviors. We are able to uncover this last finding because Jair Bolsonaro, who was relatively unknown before becoming a Presidential candidate in 2018, did not belong to any party during the period we analyze. This finding is particularly relevant to scholars working on contexts where personalism is strong, such as in Latin America, Eastern Europe, and Southeast Asia and increasingly in Western Europe and the US ([Frantz et al., 2021](#)). Moreover, our research contributes to the growing body of literature, primarily focused on the US, that shows that partisanship shapes attitudes and behavior related to health-related decisions (e.g., [Bisbee and Lee, 2021](#)).

Different motives driving political-elite cue effects

While a vast literature establishes that political elites influence public opinion and behaviors, when and for which types of voters such effects are stronger are still open questions. As [Bullock \(2020\)](#) states, the magnitude of the effects of political-elite cue varies significantly in existing studies, ranging from 3% to 43% of the scale on which attitudes or preferences are measured.

We follow a growing body of research that argues that voters have different and, at times, competing motives (e.g., [Groenendyk, 2013](#)). Two models explain what drives voters to consider political-elite cues while forming an opinion. The first model, known as “the dual-processing perspective,” posits that political-elite cues are heuristic devices. According to this model, individuals process information either systematically or by relying on shortcuts (heuristics). When processing information systematically, individuals analyze the internal consistency of a message and compare it with other information they have about the matter. Hence, systematic information processing requires high cognitive effort. Alternatively,

individuals may spare cognitive effort by making a decision based on simple rules, such as how they feel in relation to a cue source, such as a party (Arceneaux and Vander Wielen, 2017; Lupia, 1994; Lupia et al., 1998).

The second model, known as the “expressive utility” perspective, contends that when individuals reason about a problem, they have two main motives in mind: an accuracy motive and a directional one. In this perspective, cue-following is driven by directional motives. While accuracy motives prompt people to reach accurate conclusions, directional motives lead individuals to reach conclusions consistent with their identity or prior beliefs (Lodge and Taber, 2013). As reasoning to reach a specific conclusion (e.g., to agree with a leader) requires producing consistent arguments and reasons to discount inconsistent ones, cue following in this perspective implies a great deal of effort (Groenendyk, 2013; Lodge and Taber, 2013).

According to both perspectives, individuals more attached to a political party or leader are more susceptible to political-elite cues. In the heuristics perspective, support and attachment to a political party or leader is a function of agreement with policy positions and performance (Downs, 1957; Fiorina, 1981). As a consequence, when an individual is confronted with new issues, political-elite cues work as a shortcut for individuals to achieve value-consistent opinions with little effort, and this is the case, especially for strong partisans, who are closer to the party’s position, to begin with (Lupia, 1994). Alternatively, the expressive utility perspective understands cue-following as a way to comply with group norms and protect a social identity, including a political identity, which can be centered on a party or leader. Thus, individuals who strongly identify with a political group have a higher susceptibility to political-elite cues (Lodge and Taber, 2013; Bakker, Lelkes and Malka, 2020).

Another individual characteristic that plays an essential role in both perspectives is the extent to which individuals are inclined to put effort into reasoning (i.e., their level of “cognitive resources”). The heuristics perspective implies that cue-receptivity will be higher

among individuals with limited cognitive resources and who are, therefore, less inclined to process information systematically. By contrast, the expressive utility perspective entails that cue-receptivity is a function of motivation to follow a cue (in this case, the strength of political identity) and the capacity to rationalize and justify opinion change, which is higher for individuals with higher cognitive resources (Bakker, Lelkes and Malka, 2020). Therefore, a comparison of cue effects among individuals with similar levels of party attachment and different inclinations to put effort into reasoning has been used to distinguish between individuals who use cues as heuristic devices and those who use cues to protect their political identity. To date, both perspectives seem to explain cue following, but under which conditions each of them better explain the effects of political-elite cues on opinions and behaviors is an unsettled debate (Arceneaux and Vander Wielen, 2017; Bakker, Lelkes and Malka, 2020; Bullock, 2020).

Furthermore, both the heuristics and the expressive utility perspectives posit that contextual features should affect the magnitude of cue effects. For example, when citizens reason about issues of personal relevance, such as whether to practice social distancing or get a COVID-19 vaccine shot, political-elite cues should be less powerful. According to the heuristics perspective, citizens will be more inclined to put effort into processing information when the stakes are high and direct. In turn, the expressive utility perspective predicts that when deciding on these types of issues, voters have fewer incentives to agree with a party or leader to protect their political identities and more incentives to reach an accurate decision that maximizes their material gains (Mullinix, 2016). Nevertheless, political-elite cues have an effect even in cases in which issues are of clear personal relevance, such as in the case of policies that affect individuals' salary and rights (Slothuus and Bisgaard, 2021) and compliance with COVID-19 policy and recommendations (Flores et al., 2022).

Political-elite cues in Brazil

The importance of understanding how new political identities formed around a single political leader shape opinions and behavior in new and fluid party systems is twofold. First, there is a theoretical reason. Studies on the effects of cues on public opinion and behavior focus on long-standing party systems, where existing theories posit that: (a) party brands are well established and hence serve as useful heuristic devices or; (b) psychological attachments to parties, which are assumed to form in early life through a long process of socialization, had enough time to be formed (Green, Palmquist and Schickler, 2002). More broadly, these ideas underline the importance of time and party system stability for the functioning of democracies (Converse, 1969). Yet, studies on new and fluid party systems provide evidence that cues can also affect opinions and behaviors in these contexts (e.g., Samuels and Zucco Jr, 2014; Conroy-Krutz, Moehler and Aguilar, 2016; Brader et al., 2020). However, evidence on whether heuristics or expressive utility drive cue effects in these contexts is, to the best of our knowledge, nonexistent.

Second, there is a normative reason. Rhodes-Purdy and Madrid (2020) argue that personalism (i.e., the dominance of a president over a weakly organized ruling party) undermines horizontal accountability – i.e., the checks and balances between institutions and branches of power – through a series of mechanisms, for example, the reduced power of other party leaders to constrain presidential attempts to bypass the legislature, courts, and subvert the rule of law. Thus, personalism is detrimental to democracy because it undermines horizontal accountability. But, if, as we argue, a new social identity organized around the figure of a single political leader also affects opinions and behaviors, then the detrimental effects of personalism on democracy also pass through vertical accountability, i.e., the capacity of citizens to hold representatives accountable.

Two main factors make Brazil under Jair Bolsonaro’s leadership a good case to understand how a new political identity formed around a single political leader can shape public opinion and behavior. First, Brazil is a young democracy whose party system is relatively new as

well as highly unstable and fractionalized (Zucco and Power, 2021). Moreover, the open-list system for legislative elections weakens party labels and enhances the importance of individual politicians (Samuels, 2003). These factors make it hard for voters to identify what each party stands for. Moreover, when social cleavages map into partisanship, party attachments tend to be stronger and more stable (Lipset and Rokkan, 1967; Campbell et al., 1980). However, historically in Brazil, this has not been the case (Mainwaring and Scully, 1995). Yet party cues still shape attitudes of partisans and anti-partisans in Brazil, especially if the source of the cue is one of the two most competitive parties in presidential elections since re-democratization: the Worker’s Party (*Partido dos Trabalhadores*, PT) and the Brazilian Social Democracy Party (*Partido da Social Democracia Brasileira*, PSDB) (Samuels and Zucco Jr, 2014; Samuels and Zucco, 2018).

Second, Bolsonaro’s election in 2018 represented a destabilization of an already fluid party system and also an intensification of personalism in the country. Before the 2018 electoral campaign, Bolsonaro had a fringe status (Hunter and Power, 2019). He was neither a member of the PT nor of the PSDB. Instead, he ran under the label of a small party that he had joined for the purpose of running for President in 2018: the Social Liberal Party (*Partido Social Liberal*, PSL). Eleven months into his first year in the presidency, Bolsonaro exited this party and only joined another one in December 2021 in anticipation of the 2022 Presidential election.³ Therefore, Bolsonaro’s rise to power exemplifies how social identities can be quickly organized around the figure of a single politician. Furthermore, by the time the first COVID-19 case was identified on February 26th, 2020, Bolsonaro was not a member of any party. This fact allows us to confidently interpret our results as the effect of his cues alone and not as a combined effect of leader and party cues.

³In Brazil, candidates must be registered into a party to run any type of election.

The COVID-19 pandemic in Brazil – Context and stylized facts

In Brazil, the first COVID-19 case was identified on February 26th, 2020, in São Paulo city. At the beginning of the health crisis, President Bolsonaro sent mixed signals about the risks associated with COVID-19. On March 10th, he said that the “destruction potential” of COVID-19 was being overestimated. Two days later, he declared that the Brazilian health system had limited capacity to treat patients and that the government was paying attention to and monitoring the evolution of COVID-19 in the country. At that time, about four hundred people had tested positive in the country (Folha de São Paulo, 2021).

On March 15th, pro-government organized street demonstrations took place in about two hundred and fifty municipalities in Brazil. In a move that became very salient thanks to broad media coverage, President Bolsonaro joined the protests in Brasília, the country’s capital, to meet, greet and shake hands with demonstrators. On this day, the President himself was supposed to be self-isolating since he had been exposed to staff members who had tested positive for COVID-19 (Marshall, 2020). After March 15th, President Bolsonaro decidedly shifted his attitude towards COVID-19, and his discourse became consistently dismissive towards social distancing measures and mask-wearing. On March 20th, he criticized governors for closing businesses on the grounds that doing so would be detrimental to the economy (Militão, 2020). On March 24th, the President issued an official statement urging governors to re-open businesses, arguing that Brazil should implement a “vertical quarantine” (*i.e.*, one in which only those in at-risk groups should self-isolate). Moreover, he also made national headlines stating that for most of the population, COVID-19 would be no more than “just a sniffle” (Economist, 2020).

Part of the President’s attitudes came from his claims that alternative drugs, not endorsed by the scientific community, could effectively treat COVID-19. The drugs most famously supported by the President were chloroquine and hydroxychloroquine. For instance, the President widely advertised his own use of hydroxychloroquine when he was diagnosed with COVID-19 in early July. He also stated several times that people could live and work

normally and, if they were infected, an “early treatment” composed of a cocktail of drugs that includes hydroxychloroquine, azithromycin, ivermectin, and nitazoxanide, would prevent them from the risk of worsening their condition due to the disease (Brito and Darlington, 2021). Other drugs not so widely advertised but also mentioned by the President were proxalutamide (Gomes and Martins, 2021) and a nasal spray called EXO-CD24 (Lodoño, Casado and Rasgon, 2021), none of them supported by scientific studies.

Some studies have shown evidence of how President Bolsonaro’s stance regarding COVID-19 influenced individual compliance with non-pharmaceutical interventions (NPIs) (e.g. Ajzenman, Cavalcanti and Da Mata, 2020; Calvo and Ventura, 2021). Using a variety of datasets, we show next some stylized facts that complement in two ways the patterns documented in previous studies. First, we provide evidence that Bolsonaro’s cues have actual implications for the spread of COVID-19 in the country. Second, we uncover the importance of heterogeneity at the municipality level in explaining such effects. Finally, in our main analysis we leverage individual-level survey data to show that Bolsonaro polarized attitudes towards COVID-19. Before concluding, we also explore the underlying psychological mechanisms.

Support for Bolsonaro and trends in COVID-19

We investigate whether COVID-19 trends followed different patterns in municipalities with a higher concentration of Bolsonaro supporters (henceforth *pro-Bolsonaro municipalities*) compared with municipalities with a lower concentration of such supporters (henceforth *against-Bolsonaro municipalities*). We use the 2018 Presidential election results to measure support for President Bolsonaro in a given municipality. We measure support at the municipality level as a binary variable that equals one if the then-candidate Jair Bolsonaro received the majority of valid votes in the first round;⁴ and zero otherwise.

We start our analysis by testing whether social distancing patterns differ between pro- and

⁴Results from the first round are preferable compared to the ones from the second round because in multi-party systems (such as in Brazil), individuals tend to vote more sincerely in first rounds than in runoffs (Fujiwara et al., 2011).

against-Bolsonaro municipalities using the Community Mobility Reports released by Google. These reports are created with anonymized data from users’ mobile devices aggregated at the municipality level. These data contain six measures of social distancing, namely visits to retail and recreation, grocery and pharmacy, parks, public transportation, and workplaces, as well as staying in one’s residential area. As the data is anonymized, Google does not make it available if the number of users is below a certain threshold. Missing data are particularly frequent for smaller municipalities during the weekends and for certain types of places that do not have many users.⁵ Keeping these shortcomings in mind, we focus on the two variables that register the least missing data: visits to workplaces and staying in one’s residential area during weekdays.⁶ Google calculates these measures as deviations from their daily median value from the five weeks between January 3rd and February 6th, 2020, and reported such deviations in percentage points.

Figure 1 presents the results of regressions comparing differences in mobility trends in pro- and against-Bolsonaro municipalities using the day of the demonstrations (*i.e.* March 15th) as our benchmark. The idea behind this strategy is that pro-Bolsonaro municipalities respond to the President’s cues differently than anti-Bolsonaro municipalities. To make sure municipalities are comparable, we control for municipality fixed effects and for interactions between time trends and number of cases at the municipality-level on March 14th (one day before our benchmark), their population densities, and state fixed effects. We run dynamic regressions and cluster the standard errors of our estimations by municipality level to account for autocorrelation across time and by commuting zone by time to account for spatial correlation among municipalities.⁷

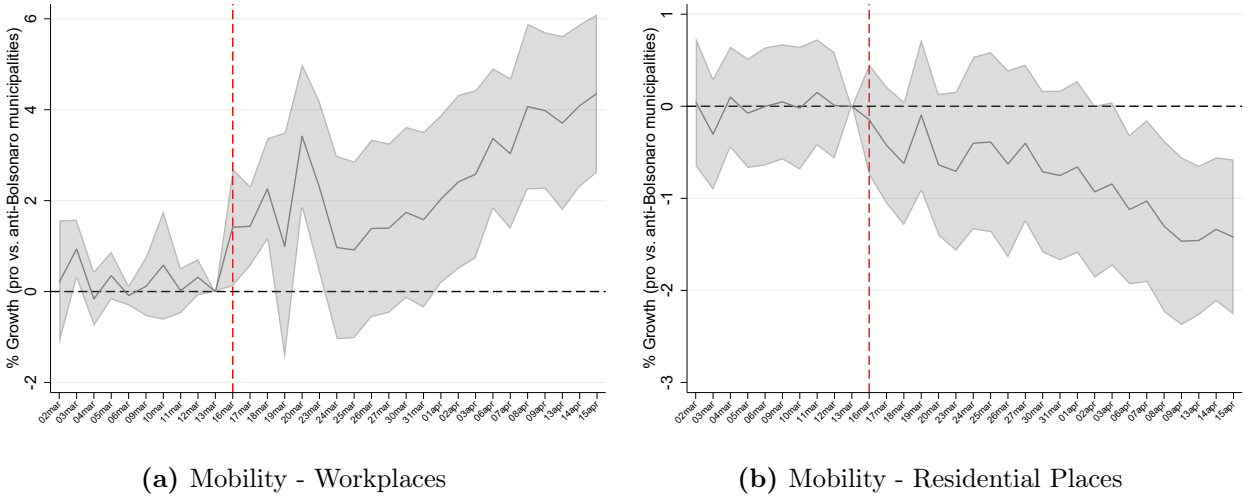
⁵For more details about these issues, see [Google \(2022\)](#).

⁶We ignore municipalities with missing data. Missing data in this context signals fewer users. Using the municipalities with missing data would, therefore, severely bias our results. Our final balanced panel for these specific measures comprises 415 municipalities. Results – not shown – from a balanced panel in all the Google Community Mobility Reports variables, with 215 municipalities, align with the results here.

⁷More specifically, we run the following specification

$$y_{i,s,t} = \alpha_i + X_i' \beta_t + \sum_{k=-15}^{31} \delta_k \times I(\text{Pro-Bolsonaro}_i) \times I(\text{Post-March } 15_k) + \epsilon_{i,s,t}$$

Figure 1: Disproportional Changes in Mobility



Notes: (i) Data source: Google Community Mobility Reports (ii) Reported 95% confidence intervals are based on standard-errors clustered at municipality level and commuting zone x Time FE level; (iii) Dashed line indicates the demonstrations on March 15. (iv) Regression controls for time interactions with population density, number of cases before the demonstrations, and fixed-effects for state-date. (v) The first week of March is the baseline value in this specification; (vi) Estimations based on a sample of 415 municipalities.

The results show a decrease in social isolation in pro-Bolsonaro municipalities right after the demonstrations measured by visits to the workplace (see Panel (a) in Figure 1) compared to the same trends in municipalities with relatively fewer Bolsonaro supporters. These findings suggest that the effect of the President’s cues on social isolation is observed immediately after the demonstrations. The effect persists until at least one month after the event when the mobility in pro-Bolsonaro municipalities is about 4% higher compared to against-Bolsonaro municipalities. When we look at the effects on individuals staying in their residential places (see Panel (b) in Figure 1), we observe that the trends between Pro-Bolsonaro and against-Bolsonaro municipalities started to diverge and stayed less at home right after the day of the demonstrations. However, these effects only became statistically significant on April 2nd.

We then exploit two different indicators of the pace of COVID-19 diffusion in Brazil using information from all the municipalities which had at least one case of COVID-19 before April

where $y_{i,s,t}$ is the measure of mobility in municipality i , in state s , on day t , $I(Pro-Bolsonaro_i)$ is a binary variable indicating municipalities with higher support for the president, and $I(Post-March 15_k)$ is a binary variable indicating the k^{th} day after the demonstrations. We look at a window of fifteen days before and a month after March 15th.

15th, summing up to 4,887 municipalities (out of a total of 5,568 municipalities). Our first variable is the number of COVID-19 cases from daily reports of the State Health Secretariats. To address concerns of underreporting in the number of cases due to insufficient testing, we also use data on excess mortality due to flu-like illness by date and the municipality of residence. We analyze the *excess* mortality to capture the “exceptional” number of deaths that occurs in a specific time interval compared to a reference point. Excess mortality is a common measure in epidemiology studies and has been frequently used to compare the impact of COVID-19 on subnational regions (e.g., Zhou et al., 2021).⁸ To compute excess mortality at the municipality level, we use data come from the Influenza Epidemiological Surveillance Information System (*Sistema de Informação de Vigilância Epidemiológica da Gripe*), which is managed by the Brazilian Secretariat of Health Surveillance (*InfoGripe*). The only difference between the specification used in this exercise and the one in the estimations shown in Figure 1 is that, instead of controlling for state fixed effects, we control for commuting zones fixed effects.⁹ Moreover, to deal with the high occurrence of zeros in our data, we use the inverse hyperbolic sine transformation in our dependent variables.¹⁰

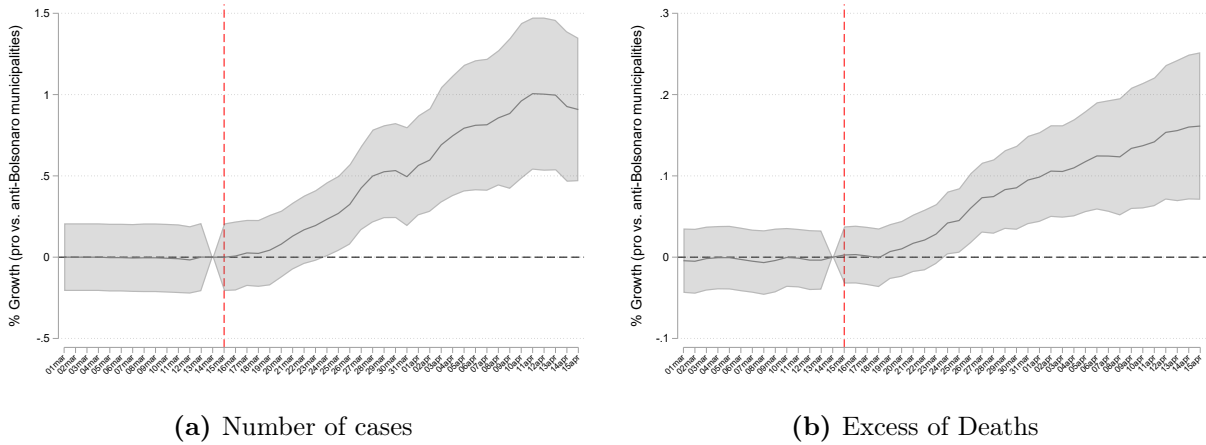
Figure 2 presents the results for the variables related to COVID-19 spread. It shows that pro- and against-Bolsonaro municipalities have the same incidence of COVID-19 before the demonstrations, but these numbers start to diverge a few days after the demonstrations. More precisely, the trends of COVID-19 cases and deaths in pro- and against-Bolsonaro municipalities become statistically different at a 95% confidence level on March 23rd and 24th, respectively. One month after the demonstrations, the number of cases in pro-Bolsonaro municipalities was about 10% larger than in against-Bolsonaro municipalities, while the excess deaths were about 15% higher. In Table A2 in Appendix A, we provide several robustness

⁸Based on previous literature, we define excess mortality as the difference between the cumulative number of deaths in a municipality m between January 1, 2020, and day t , and the average cumulative death in municipality m between January 1 and day t of the five previous years (*i.e.*, 2015 to 2019). Formally, let t denote the day of the year: $\text{Excess mortality}_{m,t,2020} = \sum_{i=Jan1,2020}^t \text{deaths}_{m,i} - \frac{1}{5} \sum_{y=2015}^{2019} \sum_{i=Jan1,y}^t \text{deaths}_{m,i}$.

⁹Since we now have more observations, we can disaggregate even more such spatial controls. Controlling for commuting zones also absorbs the effect of NPIs implemented by governors.

¹⁰The inverse hyperbolic sine transformation is defined as $\ln(x + \sqrt{1 + x^2})$ and is a standard transformation in the literature in cases when there are many zeros and negative values (see Bellemare and Wichman, 2020).

Figure 2: Disproportional COVID-19 spread on Pro-Bolsonaro municipalities

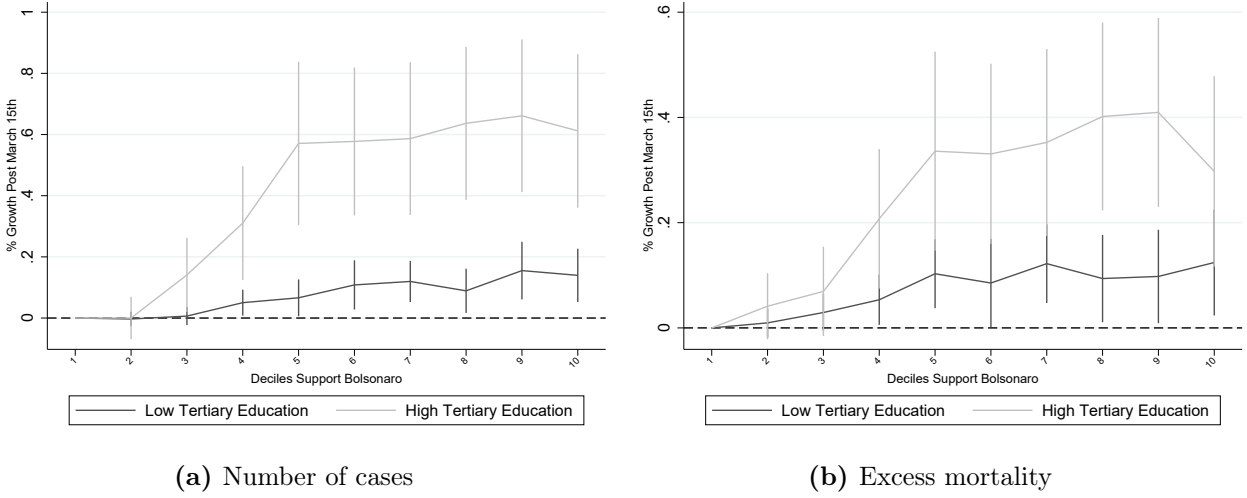


Notes: (i) Reported 95% confidence intervals are based on standard-errors clustered at municipality level and commuting zone x Time FE level; (ii) Dashed line indicates the demonstrations on March 15. (iii) Regression controls for time interactions with population density, number of cases before the demonstrations, and fixed-effects for commuting zone-date and municipality; (iv) Estimations based on a sample of 4,887 municipalities.

checks supporting the idea that these results are not driven by differences in municipality characteristics and that these differences are also not a result of the agglomerations caused by the demonstrations. Moreover, we also show in Table A3 that the results are robust to estimations either controlling for the occurrence of demonstrations on March 15 in the municipality or excluding municipalities where demonstrations took place that day. This shows evidence that gathering during the demonstrations does not explain our results.

We finally perform some exercises to highlight the importance of municipality heterogeneity on the effects that we observe in the previous results. In Figure 3, we provide evidence of which municipalities were most responsive to Bolsonaro’s influence. We divide the vote share for Bolsonaro in 2018 into deciles and compare municipalities in each decile with municipalities in the first decile before and after March 15th. We also divide our sample into municipalities above and below the median share of voters with tertiary education in the country. As we can see in Figure 3, the results grow larger with the share of votes for Bolsonaro in a municipality. Moreover, this trend is much more accentuated for municipalities with high tertiary education. If we assume that municipalities with a higher share of

Figure 3: Heterogeneous results of COVID-19 spread



Notes: (i) Reported 95% confidence intervals are based on standard errors clustered at municipality level and commuting zone \times Time FE level; (ii) Each point indicates the coefficient of a regression comparing municipalities with the indicated decile of share of votes for Bolsonaro compared with municipalities in the first decile, before and after March 15th. (iii) Low (High) tertiary education are municipalities below (above) the median of tertiary education in the country (iv) Regression controls for time interactions with population density, number of cases before the demonstrations, and high (low) tertiary education level dummies, as well as fixed-effects for commuting zone-date and municipality; (v) Estimations based on a sample of 4,887 municipalities.

Bolsonaro voters and with a higher concentration of population with tertiary education are the ones where voters also have stronger Pro-Bolsonaro social-political identity and higher cognitive resources, then such stylized results are consistent with the expressive utility perspective, according to which voters with a high social-political identity use their cognitive resources to rationalize and justify a change in opinion following a leader's cues (Bakker, Lelkes and Malka, 2020). We further analyze this pattern in the next section, where we turn to our experimental evidence.

Altogether, these patterns provide evidence that municipalities with more and fewer supporters of the President started to behave differently in terms of social distancing after the demonstrations and that such a behavioral shift led to different trends in the spread of COVID-19 in these municipalities. However, two main questions emerge when one examines these results. First, is the divergence between pro- and against-Bolsonaro municipalities due to a reaction of Bolsonaro supporters in a cue-consistent way or due to a backlash among

his opponents? Second, if both Bolsonaro supporters and opponents reacted to his cues, what were the mechanisms that led to the reaction of each group? Even though the patterns in Figure 3 suggest a possible mechanism, our individual-level data are better suited to investigate this question for two reasons. The first reason is that aggregate patterns do not allow us to know whether more educated people with higher social-political identity are actually the ones responding more strongly to the cue. The other reason is that our survey allows us to directly measure individual’s propensity to reason effortfully rather than relying on a proxy, such as education. In the next section, we exploit survey experiments that allow us to understand who reacts to Bolsonaro’s cues and to disentangle the mechanisms behind such reactions.

Bolsonaro’s cues: Evidence from survey experiments

To understand whether Bolsonaro’s cues influence both his supporters and opponents regarding their attitudes towards COVID-19 and the mechanisms through which such an influence operates, we conduct two survey experiments following the standard design used in the party cue literature (e.g., Bakker, Lelkes and Malka, 2020; Samuels and Zucco Jr, 2014; Slothuus and Bisgaard, 2021). Both of our experiments are embedded in the same online survey with a sample (N=2,992) that is approximately representative of the Brazilian population in terms of State of residence, gender, and age.¹¹ The data collection was carried out by NetQuest, a market research company, in September 2021. Ahead of data collection, we received IRB approval and pre-registered the hypotheses, pre-treatment questions, experimental manipulations, outcome variables, inferential rules, power analysis, data pre-processing, and regression equations.¹² When discussing the analyses and results, we note when and how our analyses were pre-registered. Furthermore, in Appendix B.4, we report the results of tests that were pre-registered and were not included in the main text.

¹¹Descriptive statistics containing the distribution of respondents along socio-demographic variables can be found in Appendix B.3.

¹²See link for PAP in footnote 1.

Experimental design and measures

Our experiments are divided into three main parts: (1) pre-treatment questions followed by an attention check; (2) two experimental manipulations followed by the relevant outcomes separated by a filler and; (3) post-survey information on how to prevent COVID-19 infection retrieved from official sources, such as the World Health Organization (WHO). Besides collecting information on the age, gender, race, State of residence, education, and religion of the respondents, we also ask batteries of questions on the following topics (specific item wording is available in Appendix B.1):

Social-Political identity and its strength. Bankert, Huddy and Rosema (2017) developed a measure of partisan identity for multi-party systems based on social identity theory (Green, Palmquist and Schickler, 2002; Huddy, 2013). The measure from Bankert, Huddy and Rosema (2017) has three main advantages. First, it is more predictive of reported partisan behavior than single-item measures. Second, it allows for measuring different levels of partisan attachment, which is important because, as the authors show, strong identifiers behave differently from weak identifiers. Third, their measure produces consistent properties in different national contexts.¹³ In this study, we adapt their four-item partisan identity scale to measure attachment to a political leader instead of a party. Another innovation of our adaptations is to measure attachment to an out-group identity, specifically identity to the group of Bolsonaro opponents (i.e., “*Anti-bolsonaristas*”). To construct such a measure, we first ask whether respondents identify as Bolsonaro supporters (“*Bolsonaristas*”) or opponents. If participants select “neither,” we ask a follow-up question on whether they feel definitively or perhaps closer to one of these two groups. Following previous research (e.g., Bakker, Lelkes and Malka, 2020), we exclude participants who do not identify or lean towards any of these two groups. We then proceed by collecting data on the strength of social-political identity by asking four questions adapted from Bankert, Huddy and Rosema

¹³In their study, Bankert, Huddy and Rosema (2017) test the validity of their measure in the Netherlands, Sweden, and the U.K.

(2017). We adapt the items for each group (Bolsonaro supporters and opponents, respectively), as follows: (i) “When people criticize [Bolsonarista] [Anti-Bolsonaristas], it feels like a personal insult”; (ii) I have a lot in common with other [Bolsonaristas] [Anti-Bolsonaristas]; (iii) When I meet someone who [supporters] [opposes] Bolsonaro, I feel connected with this person; (iv) When people [praise] [condemn] Bolsonaro, it makes me feel good. Responses are given on a 4-point Likert scale. As pre-registered, we then proceed by creating an index averaging the four items for Bolsonaro supporters ($\alpha=0.80$, mean = 0.53, std. = 0.23) and opponents ($\alpha=0.73$, mean = 0.57, std. = 0.24).

Cognitive resources. We use four items from the cognitive resource test battery developed by Thomson and Oppenheimer (2016).¹⁴ We measure cognitive resources as the percentage of correct answers (mean = 0.47, std. = 0.25).

After responding to the pre-treatment questions and passing an attention check, respondents are assigned to two source cue experiments separated by a filler.¹⁵ To avoid contamination across experiments, the order of the experiments was randomized. For the same reason, we opted for assigning respondents to the same condition in both experiments (e.g., respondents assigned to the control condition in one experiment are also assigned to the control condition in the other experiment).

In the first experiment, we provide the information that scientists warn that the results of trials testing the efficiency of the nasal spray EXO-CD24 as a treatment for COVID-19 are unreliable. Respondents then read that either “some Brazilian politicians are” (control condition) or “President Bolsonaro is” (treatment condition) very optimistic about this new experimental treatment. Our outcome is an index constructed from a battery of questions on attitudes toward the nasal spray as a treatment for COVID-19 ($\alpha = 0.89$, mean = -0.00, std = 0.94).

In the second experiment, we provide information that scientists recommend that individuals keep complying with non-pharmaceutical interventions (NPIs), such as mask-wearing

¹⁴We had to adapt one question for the Brazilian context. We discuss this in Appendix B.1.

¹⁵See Appendix B.1 for details about the filler exercise.

and social distancing, to avoid exposition to COVID-19. Respondents then read that a campaign to encourage compliance with such measures was approved thanks to either “some Brazilian politicians” (control condition) or “President Bolsonaro” (treatment condition). We build our outcome measure as an index based on a battery of questions on attitudes toward COVID-19 prevention measures ($\alpha = 0.88$, mean = -0.00, std. = 0.96). The full text we use in the treatment and control conditions as well outcome questions can be found in Appendix [B.2](#).

Results

Table [1](#) presents the treatment effect of the experiments for the sample of Bolsonaro supporters and opponents separately. Before we move to the discussion of the treatment effects, it is important to note two details in the table. First, Table [1](#) reports the mean of the dependent variable for Bolsonaro opponents and supporters in each experiment. Comparing the means in Columns (1) and (2), we note that, on average, Bolsonaro supporters are more favorable towards the nasal spray when compared to Bolsonaro opponents. This is true even if we consider only the control group, in which the mean support for the nasal spray is -0.220 (std. dev. 0.880) for opponents and 0.450 (std. dev. 0.886) for supporters. While we cannot know for sure what explains such difference, we speculate that probably, by the time we fielded our experiment, some of Bolsonaro opponents and, to a higher degree, his supporters had already heard about Bolsonaro’s opinion about the nasal spray. Indeed, news about Bolsonaro’s declaration about this drug was circulating in February 2021, approximately six months before we fielded our experiment (e.g., [Rocha, 2021](#)).

Second, Columns (3) and (4) in Table [1](#) show that Bolsonaro opponents and supporters had very different views on NPIs, with supporters being much more inclined to engage with these practices than opponents. Once more, this pattern is also verified in the control group, where our index of support for NPIs averages 0.307 (std. dev. 0.546) among supporters and -0.508 (std. dev. 1.310) among opponents. We again speculate that this difference is driven

Table 1: Effects of Bolsonaro’s cues on Bolsonaro opponents and supporters

| | Support for nasal spray | | Support for NPIs | |
|-----------------|-------------------------|----------------------|-----------------------|----------------------|
| | (1) Anti-Bolsonaro | (2) Pro-Bolsonaro | (3) Anti-Bolsonaro | (4) Pro-Bolsonaro |
| Bolsonaro’s Cue | -0.202*** (0.041) | 0.023 (0.050) | 0.000 (0.026) | 0.142** (0.069) |
| N | 1752 | 1240 | 1750 | 1239 |
| Mean Dep. Var. | -0.325 | 0.458 | 0.306 | -0.431 |
| R ² | 0.064 | 0.054 | 0.041 | 0.096 |

Note: (i) Estimations include the following covariates: gender, race, religion, State of residence and age. (ii) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

by the fact that, by the time we fielded our experiment, most opponents and supporters were already aware of the President’s position on NPIs. This is the reason why we opted for a treatment in which Bolsonaro’s message on NPIs is different from the information that was most widely available, i.e., that he advised against them and did not practice them himself. It is important to highlight that the information that Bolsonaro personally approved a government campaign with the aim of educating people about the importance of complying with NPIs during COVID-19 outbreaks is truthful and based on news reports (CNN, 2021). The shortcoming of not engaging in deception in our experiments is that many of the subjects in our study might already have crystallized opinions about the topics that are at the center of our experiments. Therefore, our results can be interpreted as a lower bound of Bolsonaro’s cue effects. Moreover, engaging in deception, especially when issues that are of personal relevance are at stake, is ethically problematic.

As pre-registered, we test Bolsonaro’s cue effects among supporters and opponents using OLS regressions where we have as the dependent variable indices measuring support for the nasal spray (first experiment) and NPIs (second experiment), a dummy equals one if the respondent was assigned to the treatment condition and a series of covariates to increase precision (i.e., gender, race, religion, State of residence and age). We observe that while Bolsonaro’s cue does not change his supporters’ attitudes for the nasal spray, it does impact his opponents’. More specifically, Column (1) in Table 1 shows that Bolsonaro’s cue

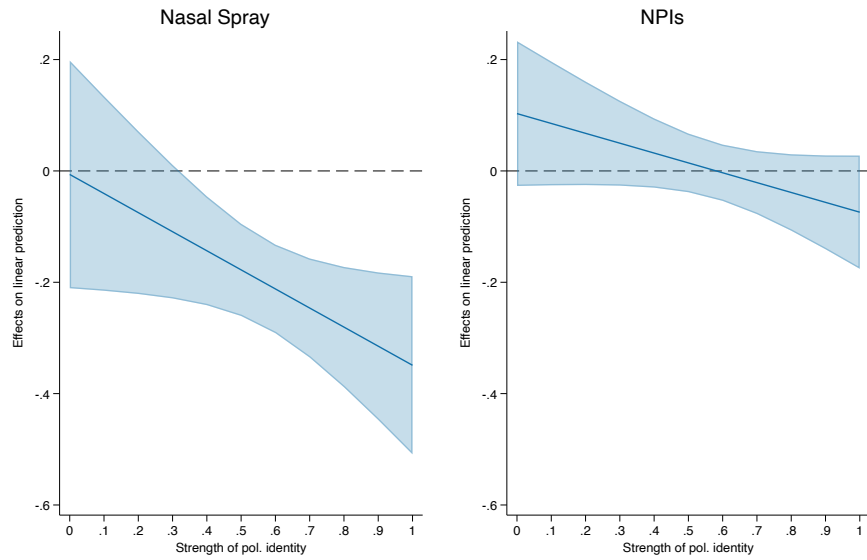
decreases his opponents' approval of the nasal spray by 0.20 standard deviations. In terms of magnitude, this result is similar as the effect of PT cues on anti-partisans documented by [Samuels and Zucco \(2018\)](#). These authors find that, on average, PT cues decrease support for a policy among PT opponents (anti-partisans) by 0.14 standard deviations.

When we look at the effect of Bolsonaro's cues on support for NPIs (such as mask-wearing and social distancing), we observe different patterns. In this case, Bolsonaro's positive cue about such measures improves related attitudes among his supporters but does not change the position of his opponents. In particular, Column (4) in [Table 1](#) shows that Bolsonaro's cue increases his supporters' approval for NPIs by 0.14 standard deviations. The magnitude of this effect is also of comparable size as the effects of PT cues on PT supporters (partisans) estimated by [Samuels and Zucco \(2018\)](#), which was, on average, 0.21.

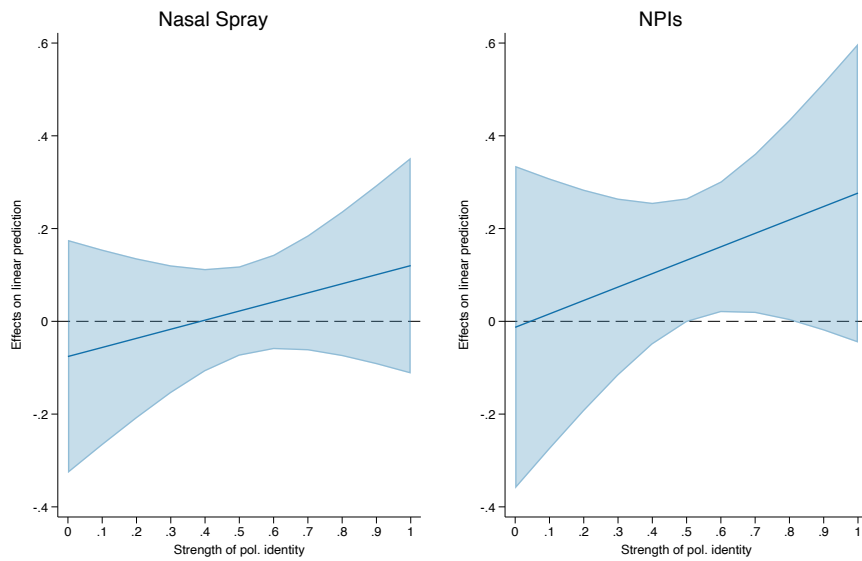
Overall, we find support for our pre-registered hypothesis that Bolsonaro supporters react in a cue-consistent fashion, while his opponents respond in a cue-inconsistent way. This finding is in line with previous work showing that both in- and out-group cues shape voters' opinion in Brazil ([Samuels and Zucco Jr, 2014](#); [Samuels and Zucco, 2018](#)) and elsewhere (e.g., [Nicholson, 2012](#)). However, different from their study, which focuses on party cues, we show this pattern is also verified in the case of leader cues. We also find null effects for our sample of Bolsonaro opponents in experiment one (nasal spray) and supporters in experiment two (NPIs).

We proceed by examining the heterogeneity behind such average effects. We start by testing our pre-registered hypothesis, which states that, in line with both heuristics and expressive utility perspectives, the effect of Bolsonaro's cues should be more prominent for individuals with higher social-political identity. Panel (a) in [Figure 4](#) shows the results among Bolsonaro opponents in both experiments. The negative slope in both figures suggests that the negative effect of Bolsonaro's cues among opponents becomes stronger the more intense respondents' anti-Bolsonaro identity gets. While this pattern is evident in the case of the nasal spray experiment (left of Panel (a)), the same cannot be said for the social

Figure 4: Cue Effects Conditional on Levels of Social-Political Identity



(a) Anti-Bolsonaro



(b) Pro-Bolsonaro

Note: these figures show the marginal effects of treatment by level of social-political identity. The specification includes the following covariates: gender, age, race, education, religion, State of residence.

distancing experiment, where the marginal effects do not reach conventional levels of statistical significance. Panel (b) in Figure 4 displays the results for Bolsonaro supporters. We observe a positive slope in both the nasal spray (left figure) and the social distancing (right figure) experiments. These patterns suggest that the more respondents identify as Bolsonaro supporters, the more likely they are to follow his cues. However, these results must be interpreted cautiously as the marginal effects in both graphs often do not reach conventional levels of statistical significance. In Table B4 in Appendix B.4, we show the marginal effects of Bolsonaro cues among opponents and supporters with high and low social-political identity (defined as below and above the median of social-political identity). The patterns presented with the binary version of our moderator are consistent with the ones presented in figure 4. Overall, our results provide supportive evidence for our hypothesis that higher social-political identity magnifies cue effects among both in- and out-groups.

To understand whether heuristics or expressive utility drive our results, we perform a triple interaction between Bolsonaro’s cues, individual social-political identity, and individual cognitive resources. As discussed above, both the heuristics and the expressive utility perspectives posit that social-political identity enhances cue effects. However, they differ as to the role of cognitive resources. According to the heuristics perspective, individuals with limited cognitive resources – and hence less inclined to process information systematically – are more responsive to leader cues than those with high cognitive resources. By contrast, the expressive utility perspective implies that individuals with a strong political identity and high cognitive resources are better equipped to rationalize opinion change and are hence more responsive to leaders’ cues. Following Bakker, Lelkes and Malka (2020), we distinguish heuristics from expressive utility mechanisms by comparing Bolsonaro’s cue effects on individuals with low and high cognitive resources across levels of social-political identity. Given that the two perspectives have different predictions, we pre-registered this analysis as exploratory.

Table 2 shows the marginal effects of Bolsonaro’s cues conditional on social-political

identity and cognitive resources. For ease of interpretation, we define our cognitive resources and social-political identity variables as dummy variables, which equals one if the respondent scored above the median in the relevant variable. Panel (b) shows that, for Bolsonaro supporters, the cue effects are concentrated on individuals with high cognitive capacity and high political identity in both experiments. For Bolsonaro opponents (Panel (a)), the results are less clear on how these factors moderate Bolsonaro’s cue effects. We provide more evidence in Figures 5 and 6, where political-social identity is defined as a continuous variable.

Table 2: Marginal Effects of Bolsonaro’s Cues Conditional on Social-Political Identity and Cognitive Resources (Dummies)

| | (1) Nasal spray | (2) NPIs |
|---|----------------------|--------------------|
| <i>Panel a: Bolsonaro opponents</i> | | |
| Low cog. resources, Low Pol. id., Cue | -0.144** (0.060) | 0.020 (0.038) |
| Low cog. resources, High Pol. id., Cue | -0.310*** (0.070) | -0.027 (0.044) |
| High cog. resources, Low Pol. id., Cue | -0.200* (0.114) | 0.087 (0.073) |
| High cog. resources, High Pol. id., Cue | -0.144 (0.142) | -0.100 (0.090) |
| N | 1752 | 1750 |
| Mean Dep. Var. | -0.325 | 0.306 |
| R ² | 0.088 | 0.051 |
| <i>Panel b: Bolsonaro supporters</i> | | |
| Low cog. resources, Low Pol. id., Cue | -0.019 (0.076) | 0.085 (0.106) |
| Low cog. resources, High Pol. id., Cue | -0.010 (0.079) | 0.163 (0.110) |
| High cog. resources, Low Pol. id., Cue | -0.001 (0.145) | 0.054 (0.201) |
| High cog. resources, High Pol. id., Cue | 0.397** (0.176) | 0.548** (0.244) |
| N | 1240 | 1239 |
| Mean Dep. Var. | 0.458 | -0.431 |
| R ² | 0.098 | 0.116 |

Note: (i) Estimations include the following covariates: gender, race, religion, State of residence, age; (ii) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 5 presents the results for Bolsonaro supporters. Both in the nasal spray (Panel (a)) and non-pharmaceutical intervention experiment (Panel (b)), we observe that among individuals with low cognitive resources (figures on the left-hand side in both panels), the treatment effect is indistinguishable from zero across all levels of social-political identity. Furthermore, point estimates are basically unchanged across all levels of social-political identity, suggesting that, for individuals with low cognitive capacity, social-political identity does not moderate cue responsiveness. Among Bolsonaro supporters with high cognitive resources (right figure), we observe a different pattern: in both experiments, as social-political identity increases, so do the point estimates. Furthermore, for high levels of social-political identity, the cue effects are clearly positive and statistically significant. Overall, these results are consistent with the expressive utility perspective, which posits that individuals with high inclination to put effort into reasoning are more affected by political-elite cues.

Figure 6 shows the analogous results for Bolsonaro opponents. In the case of the nasal spray experiment (Panel (a)), we observe that social-political identity moderates cue effects among Bolsonaro opponents with low cognitive capacity (left figure). Specifically, the higher the social-political identity, the more negative Bolsonaro's cue effects on support for the nasal spray. Among Bolsonaro supporters with high cognitive capacity (right figure), the coefficients are very imprecisely estimated and generally statistically indistinguishable from zero irrespective of the strength of social-political identity. Moving to the experiment on NPIs, we observe a different pattern. Individuals with low cognitive resources do not seem to respond to Bolsonaro's cues, irrespective of their level of social-political identity (left figure). When we look at opponents with high cognitive resources (right figure), we observe that, although point estimates are generally not statistically different from zero at the 95% confidence level, there is some suggestive evidence that social-political identity moderates cue effects. Specifically, point estimates are positive for low levels of social-political identity and negative for high levels. Therefore, results for Bolsonaro opponents are more mixed. While heuristics seem to be at play in the nasal spray experiment, our results for the NPIs

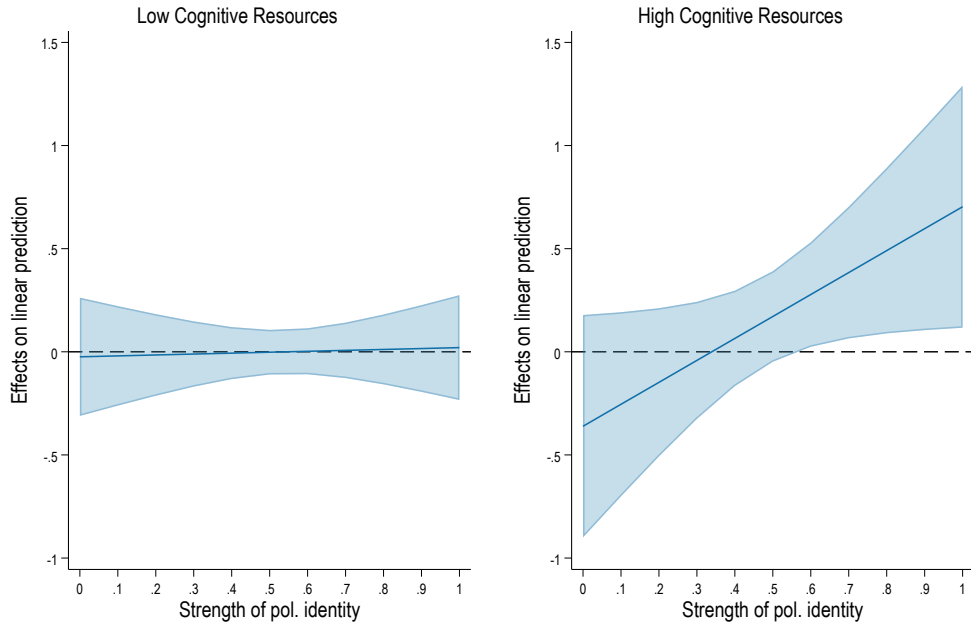
experiment are more in line with the expressive utility perspective.

We speculate such mixed results might be explained by two factors. First, the fact that we find evidence for the expressive utility perspective across both experiments among Bolsonaro supporters but not among his opponents suggests that in- and out-group cues may work differently. The expressive utility perspective posits that leader cues drive individuals to change their opinions in order to comply with group norms and protect their social-political identity. If in-group cues are more informative of group norms than out-group cues, then we should expect that expressive utility is more often at play when individuals are responding to in-group than to out-group cues. Second, familiarity with the topic might explain the propensity to rely on shortcuts to form an opinion. The heuristics perspective posits that individuals try to spare cognitive resources when forming an opinion about a topic by relying on simple rules, such as whether they like a cue source. When we fielded our experiments, six months had passed since the media covered Bolsonaro's statement about the nasal spray. Beyond this specific event, the nasal spray was not a topic frequently covered by the media. Therefore, it is plausible that many respondents did not have crystallized opinions about the topic. By contrast, when we fielded our experiment in September 2021 (about a year and a half after the first COVID-19 case was identified in Brazil), the vast majority of people had received information from multiple sources about NPIs and had actively engaged with them by, for example, wearing masks and working remotely. Hence, opinions about NPIs were plausibly very crystallized at the time. Hence, familiarity with the topic might explain why we find some evidence for the heuristics mechanism in the nasal spray experiment but none in the NPIs experiment. Future research could further investigate under which conditions cue effects are driven by heuristics or expressive utility.

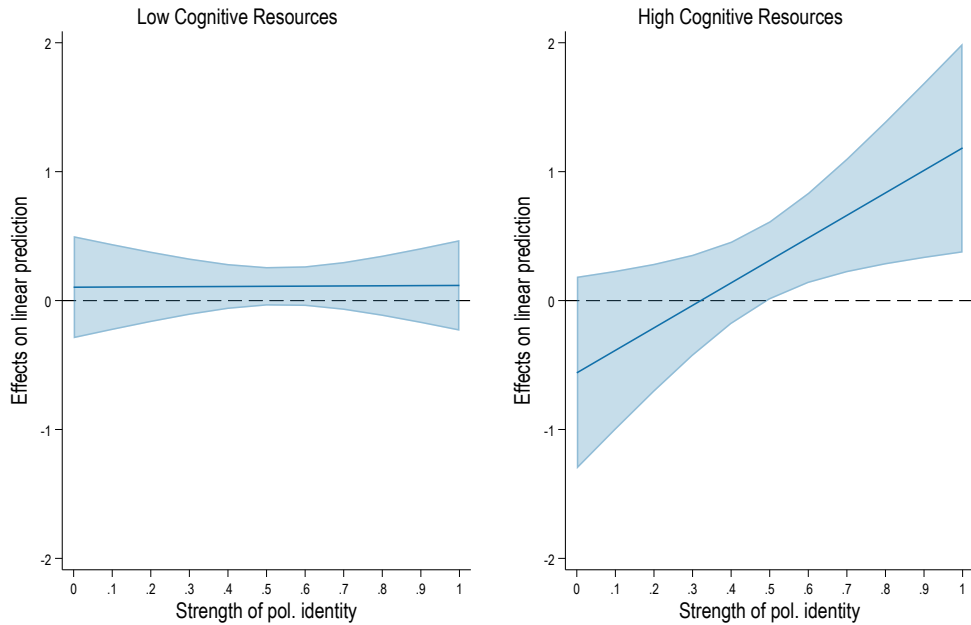
Discussion

With this study, we contribute to our knowledge of how and why citizens react to political-elite cues when personal matters are at stake. Overall, our analysis provides a hard test

Figure 5: Bolsonaro Supporters, Cue Effects Conditional on Different Levels of Social-Political Identity and Cognitive Resources



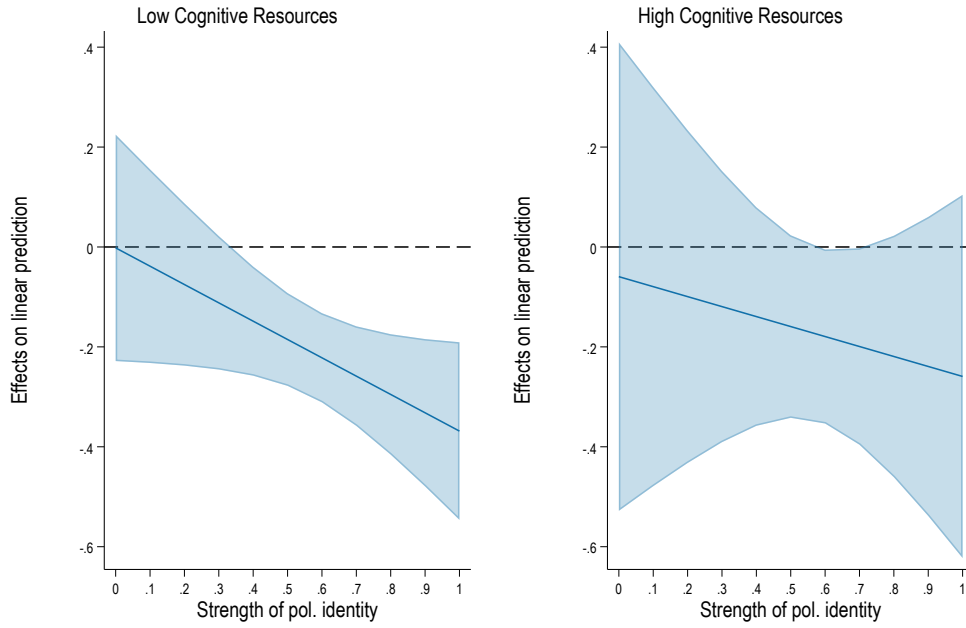
(a) Nasal Spray Experiment



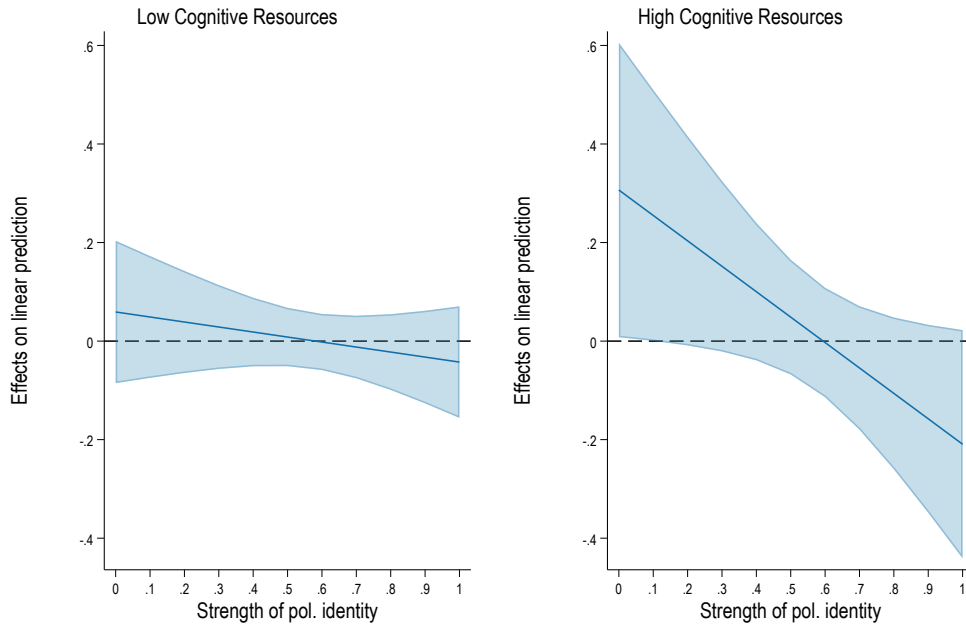
(b) Non-Pharmaceutical Interventions (NPIs) Experiment

Note: These figures show the marginal effects of treatment by level of social-political identity. The specification includes the following covariates: gender, age, race, education, religion, State of residence.

Figure 6: Bolsonaro Opponents, Cue Effects Conditional on Different Levels of Social-Political Identity and Cognitive Resources



(a) Nasal Spray Experiment



(b) Non-Pharmaceutical Interventions (NPIs) Experiment

Note: These figures show the marginal effects of treatment by level of social-political identity. The specification includes the following covariates: gender, age, race, education, religion, State of residence.

of the expressive utility perspective for cue-taking in an understudied context. Specifically, we show that even when we should expect directional motives to weigh little (e.g., Groenendyk, 2013), political-elite cues can lead citizens to rationalize opinion change in order to defend their identity. Contrary to early theories of political-elite cues (Converse, 1969), we provide evidence that a recently-formed social-political identity around a single politician can be a powerful influence over opinions and behaviors. This finding indicates that strong attachment to political leaders and parties may hinder citizens' capacity to make politicians responsive and accountable. This fact is even more concerning in contexts such as the one we study. In contrast to the cases on which the literature tends to focus (i.e., the United States and Western Europe), Latin American countries, such as Brazil, have weak institutional constraints on strong, personalistic presidents (Mainwaring and Scully, 1995; Samuels, 2003). In times of high affective polarization, the democratic dilemma might be less about whether citizens can learn what they need to know (Lupia et al., 1998) and more about whether they can put their material self-interest before their attachments to political leaders and parties.

While most of the literature on political-elite cues, including the work analyzing COVID-19-related behaviors, relies either on survey data on attitudes (e.g., Slothuus and Bisgaard, 2021; Bakker, Lelkes and Malka, 2020) or aggregate data on behavior (e.g., Bisbee and Lee, 2021), we combine administrative, mobility, and survey data. This approach allows to overcome the limitations of each type of data. Specifically, while aggregate data can measure the consequences of individuals' behavior, the shortcoming of inferring individual behavior from aggregate data is to commit the ecological fallacy. On the other hand, survey data overcomes the ecological fallacy, but such data measure attitudes instead of behaviors. While no single type of data is perfect, by analyzing several types of data from different sources, we can be more confident about our main results and provide suggestive evidence of the underlying mechanisms.

The limitations of our analysis leave open questions for future research. First, our examination of the cognitive processes underlying cue-taking relies on heterogeneous treatment

effects by the level of social-political identity and cognitive resources, but these variables are not experimentally manipulated. Future research should address this concern by directly manipulating these variables (this point was also made by [Bakker, Lelkes and Malka, 2020](#)). Second, previous research applies different measures of cognitive resources. Some examples are factual knowledge about politics, the need for cognition, and performance on cognitive resource tests. However, it is unclear whether these variables measure the same concept ([Bullock, 2020](#)). Future work should investigate this question. Finally, our results suggest that in- and out-group cues may activate different psychological processes. Future work should investigate under which conditions different political-elite cues activate heuristics or expressive utility mechanisms.

Competing interests: the author(s) declare none.

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Online Appendix

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A Additional results for observational data analyses

Table A1: Descriptive Statistics for pro- and anti-Bolsonaro municipalities

| | (1) | (2) | (3) | (4) |
|---|-----------|---------------|----------------|-----------------|
| | All | Pro-Bolsonaro | Anti-Bolsonaro | Diff. ((3)-(2)) |
| Pro-Bolsonaro | 0.53 | 1.00 | 0.00 | |
| Demonstrations | 0.05 | 0.08 | 0.01 | -0.07*** |
| Confirmed COVID-19 cases (March 1) | 0.00 | 0.00 | 0.00 | -0.00 |
| Excess death (March 1) | 0.02 | 0.04 | 0.01 | -0.03*** |
| Population (2018) | 41,124.37 | 55,806.42 | 24,749.45 | -31,056.98*** |
| Pop. density (pop./km ²) (2018) | 133.67 | 202.62 | 56.79 | -145.82*** |
| Share of people over 60 y.o. (2010) | 0.12 | 0.13 | 0.11 | -0.01*** |
| Share of illiterate (2010) | 0.16 | 0.09 | 0.24 | 0.15*** |
| Share of women (2010) | 0.50 | 0.50 | 0.50 | -0.00 |
| GDP/capita (2015) | 19.97 | 27.56 | 11.49 | -16.07*** |
| N | 4,887 | 2,571 | 2,307 | |

Figure A1: Geographical distribution of COVID-19 cases and vote shares for Bolsonaro at the first round of the 2018 Presidential Election

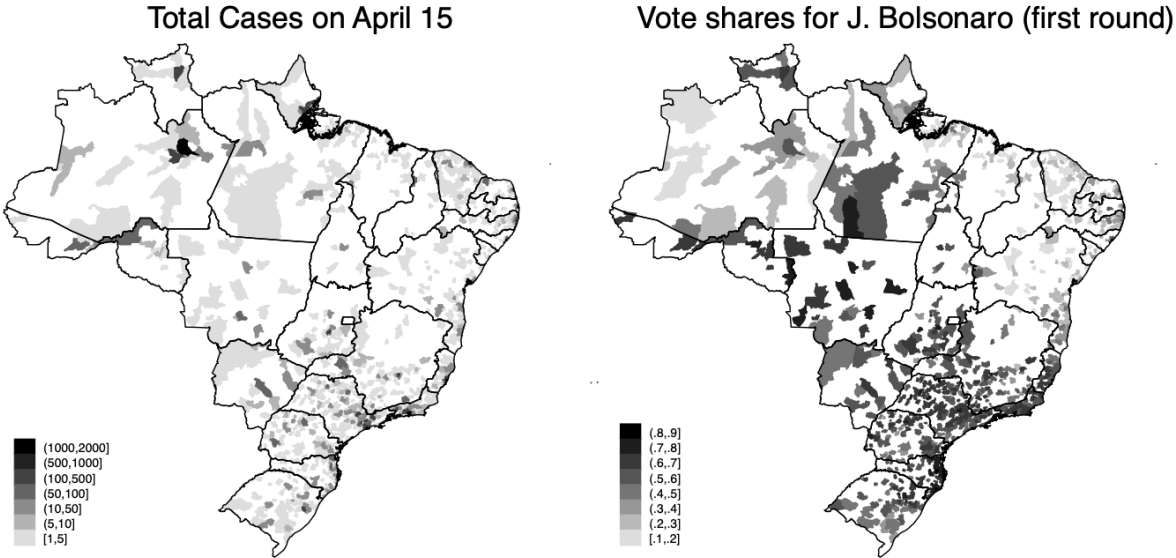


Table A2: Controlling for non-linear trends in variables related to Covid-19

| | (1) | (2) | (3) | (4) | (5) |
|--|---------------------------|----------|----------|----------|----------|
| | Number of confirmed cases | | | | |
| Post March 15 × Pro-Bolsonaro | 0.117*** | 0.162*** | 0.126*** | 0.061*** | 0.107*** |
| | (0.024) | (0.025) | (0.024) | (0.023) | (0.024) |
| | Excess death | | | | |
| Post March 15 × Pro-Bolsonaro | 0.039** | 0.082*** | 0.055*** | 0.026 | 0.046** |
| | (0.018) | (0.019) | (0.019) | (0.018) | (0.019) |
| Observations | 224,342 | 224,342 | 224,342 | 224,342 | 224,342 |
| Municipality FE | ✓ | ✓ | ✓ | ✓ | ✓ |
| Commuting zone x Time FE | ✓ | ✓ | ✓ | ✓ | ✓ |
| Pre-demo number of cases x Time FE | ✓ | ✓ | ✓ | ✓ | ✓ |
| Population Density x Time FE | ✓ | ✓ | ✓ | ✓ | ✓ |
| Population x Time FE | ✓ | | | | |
| Share of people over 60 y.o. X Time FE | | ✓ | | | |
| Share of women x Time FE | | | ✓ | | |
| Adult literacy rate x Time FE | | | | ✓ | |
| GDP/capita x Time FE | | | | | ✓ |

Notes: (i) Standard errors clustered at municipality level and commuting zone x Time FE level; (ii) * p<0.10, ** p<0.05, *** p<0.01; (iii) Each dependent variable in this table is the Inverse Hyperbolic Sine Transformation of the original variable.

Table A3: Controlling for local demonstrations on March 15 and restricting the sample to municipalities without demonstrations

| | Confirmed cases | | Excess death | |
|------------------------------------|---------------------|---------------------|---------------------|---------------------|
| | (1) | (2) | (3) | (4) |
| Post March 15 × Pro-Bolsonaro | 0.123*** (0.022) | 0.092*** (0.018) | 0.059*** (0.018) | 0.046*** (0.016) |
| Observations | 224,342 | 213,486 | 224,342 | 213,486 |
| R Squared | 0.72 | 0.61 | 0.75 | 0.71 |
| Municipality FE | ✓ | ✓ | ✓ | ✓ |
| Commuting zone x Time FE | ✓ | ✓ | ✓ | ✓ |
| Pre-demo number of cases x Time FE | ✓ | ✓ | ✓ | ✓ |
| Population Density x Time FE | ✓ | ✓ | ✓ | ✓ |
| Demonstration x Time FE | ✓ | | ✓ | |
| Municipalities with Demonstration | ✓ | | ✓ | |

Notes: (i) Standard errors clustered at municipality level and commuting zone x Time FE level; (ii) * p<0.10, * p<0.05, ** p<0.01; (iii) Each dependent variable in this table is the Inverse Hyperbolic Sine Transformation of the original variable.

B Additional material for survey experiments

B.1 Pre-treatment questions

Strength of social-political identity: based on the reported political identity of respondents, we ask: (1) “when people criticize [*Bolsonaristas*] [*anti-Bolsonaristas*], it feels like a personal insult”, (2) “I have a lot in common with other [*Bolsonaristas*] [*anti-Bolsonaristas*]”, (3) “When I meet someone who [supports] [opposes] Bolsonaro, I feel connected with this person”, (4) “When people [praise] [condemn] Bolsonaro, it makes me feel good.” Responses are recorded in a four-point scale ranging from “completely agree” to “completely disagree”.

Cognitive resources test: (1) If you're running a race and you pass the person in second place, what place are you in? [intuitive answer: first; correct answer: second]; (2) Emilia's father has three daughters. The first two are named Margarida and Rosa. What is the third daughter's name? [intuitive answer: Violeta; correct answer: Emilia]; (3) a bat and a ball cost R\$1.10 in total. The bat costs a dollar more than the ball. How much does the ball cost? [intuitive answer: 10 cents; correct answer: 5 cents]; (4) A man buys a pig for R\$60, sells it for R\$70, buys it back for R\$80, and sells it finally for R\$90. How much has he made? [intuitive answer: R\$10 ; correct answer: R\$20]

Item 2 is adapted from the original question "Emily's father has three daughters. The first two are named April and May. What is the third daughter's name? (intuitive answer: June; correct answer: Emily)". We could not use the original question because in Brazil it is not common to name children after months.

Attention check Before running the experiment, we ask the following attention check (adapted from [Campello and Zucco Jr, 2018](#)): "Some people read newspapers or watch the news frequently. Others do not read newspapers or watch the news. That's the way it is everywhere, but we just want to make sure you're reading the questions until the end. Ignore the following question, select the "other value" option and write the number 5 in the space provided next to that option. Please indicate how often do you read newspapers or watch the news?". Those who did not follow the text's instructions are screened out of the survey.¹⁶

Filler Spend 30 seconds writing as many words as you can that start with the letter "A."

[Text box]

¹⁶We accept respondents that selected "other" and wrote in the dedicated text box any string containing: "5", "cinco" (five), "CINCO" (FIVE) or "Cinco" (Five).

B.2 Treatments and outcomes

The first experiment is about an unapproved experimental treatment for COVID-19: the EXO-CD24 nasal spray. More specifically, respondents are asked to read the following text:

EXPERIMENT 1: Nasal Spray

A preliminary study investigated the effectiveness of the EXO-CD24 nasal spray, previously used to treat cancer, in treating patients with severe forms of COVID-19. This study shows that out of 35 patients hospitalized with COVID-19 who were treated with the spray, 31 improved their health and were able to return home about four days after starting the treatment. Scientists caution that this preliminary study is unreliable due to the small number of participants and the lack of randomized, double-blind trials.

[Some Brazilian politicians are] [President Jair Bolsonaro is] very optimistic about using the EXO-CD24 nasal spray to treat COVID-19. [One of them] [President Jair Bolsonaro] said that the spray was 100% effective in curing severe cases of COVID-19 and that it appears to be a miraculous product.

At the end of this vignette, we ask an attention check where we ask respondents to indicate whether the following statement is true or false: “a study analyzing the effectiveness of the EXO-CD24 nasal spray to treat COVID-19 was carried out.”

To test whether Bolsonaro’s cues have an impact in this setting, we present the following statements and provide a seven-point Likert-type scale to assess respondents level of agreement:

1. The EXO-CD24 Nasal Spray seems an excellent treatment option for COVID-19.
2. The national health surveillance agency (ANVISA) must authorize the experimental use of the EXO-CD24 nasal spray to treat COVID-19.

3. If a friend or relative were hospitalized with severe COVID-19, I would very much like him or her to be treated with EXO-CD24 nasal spray.
4. I would be willing to participate in a potential scientific study carried out in Brazil as part of the approval process for the EXO-CD24 nasal spray for COVID-19 treatment.

The second setting is a campaign to encourage social distancing and mask use in Brazil.

Respondents are asked to read the following text:

EXPERIMENT 2: Campaign about non-pharmaceutical interventions (NPIs)

Scientists say that in the current COVID-19 situation in Brazil, it is very important to wash your hands with soap and water or use alcohol gel, avoid gatherings, keep a safe distance from other people and wear a mask even if you are fully vaccinated.

Last month, a campaign to inform the population about how to be protected against COVID-19 was launched. This campaign was launched thanks to the approval of [some Brazilian politicians] [President Jair Bolsonaro] in response to a new highly contagious variant of COVID-19. The first message in this campaign states:

“Even though more and more people are getting their vaccines against COVID-19, it is very important that we continue to take care of each other. Therefore, always wash your hands with soap and water or use alcohol gel, avoid gatherings, keep a safe distance from other people and wear a mask”.

At the end of this text, we perform an attention check where we ask respondents a factual question about the text they just read. This is a true or false question about the following statement: "Last month, a campaign was launched to inform the public about the importance of sanitizing hands, avoiding crowding, and wearing a mask." The outcome questions of this experiment are as follows (responses are provided in a seven-point Likert-type scale on level of agreement):

On a scale where 1 represents "strongly disagree" and 7 "strongly agree", to what extent do you agree with the carrying out of the campaign described in the text?

1. Wearing a mask helps to prevent the spread of COVID-19.
2. Hand sanitizing helps to prevent the spread of COVID-19.
3. Keeping a safe distance from one another helps to prevent the spread of COVID-19.
4. I will wear a mask whenever I leave home.
5. I will sanitize my hand whenever I can.
6. I will keep a safe distance from other people whenever I can.
7. I will leave home only when necessary.
8. I will not join social events.

B.3 Descriptive statistics

Table B1: Support for Heterogeneous Treatment Effects Analyses: Cognitive Capacity and Strength of Political Identity

| | Bolsonaro opponents | | Bolsonaro Supporters | |
|--|----------------------------|------------------|-----------------------------|------------------|
| | <i>Control</i> | <i>Treatment</i> | <i>Control</i> | <i>Treatment</i> |
| <i>Low cog. resources, Low Pol. id</i> | 402 | 387 | 268 | 248 |
| <i>Low cog. resources, High Pol. id</i> | 305 | 298 | 232 | 248 |
| <i>High cog. resources, Low Pol. id</i> | 98 | 122 | 70 | 79 |
| <i>High cog. resources, High Pol. id</i> | 72 | 69 | 45 | 54 |

Table B2: Support for Heterogeneous Treatment Effects Analyses: Trust in Science

| | Bolsonaro's opponents | | Bolsonaro's Supporters | |
|------------------------------|------------------------------|------------------|-------------------------------|------------------|
| | <i>Control</i> | <i>Treatment</i> | <i>Control</i> | <i>Treatment</i> |
| <i>Low trust in science</i> | 382 | 366 | 404 | 421 |
| <i>High trust in science</i> | 495 | 510 | 211 | 208 |

Table B3: Descriptive statistics for cue and control conditions

| | All | Cue | Control | Diff. |
|---|-------|-------|---------|---------|
| Gender: Woman | 0.47 | 0.47 | 0.47 | -0.00 |
| Race: White | 0.58 | 0.58 | 0.59 | 0.01 |
| Education: more than high school | 0.76 | 0.75 | 0.77 | 0.01 |
| Age: 40 or more | 0.46 | 0.47 | 0.45 | -0.01 |
| Bolsonaro supporter | 0.42 | 0.42 | 0.41 | -0.01 |
| Political knowledge | 0.85 | 0.85 | 0.85 | -0.00 |
| Cognitive resources | 0.47 | 0.47 | 0.47 | -0.00 |
| Trust in scientists | 0.75 | 0.75 | 0.75 | -0.00 |
| General support for Bolsonaro | -0.01 | 0.00 | -0.02 | -0.02 |
| Political index strength (Bolsonaro opponents) | 0.58 | 0.57 | 0.58 | 0.01 |
| Political index strength (Bolsonaro supporters) | 0.52 | 0.52 | 0.52 | -0.00 |
| Support for nasal spray | -0.00 | -0.05 | 0.05 | 0.11*** |
| Support for NPIs measures | -0.00 | 0.03 | -0.03 | -0.06 |
| N | 2,997 | 1,505 | 1,492 | |

B.4 Other pre-registered analyses

Table B4: Heterogeneous effects by Strength of Social-Political Identity

| | Support for nasal spray | | Support for NPIs | |
|------------------------------|-------------------------|-------------------|-------------------|--------------------|
| | (1) | (2) | (3) | (4) |
| | Anti-Bolsonaro | Pro-Bolsonaro | Anti-Bolsonaro | Pro-Bolsonaro |
| High political identity, Cue | -0.153*** (0.053) | -0.014 (0.067) | 0.031 (0.034) | 0.082 (0.093) |
| High political identity, Cue | -0.273*** (0.063) | 0.052 (0.072) | -0.040 (0.040) | 0.224** (0.100) |
| N | 1753 | 1241 | 1751 | 1240 |
| Mean Dep. Var. | -0.325 | 0.458 | 0.306 | -0.431 |
| R2 | 0.080 | 0.093 | 0.048 | 0.113 |

Note: (i) Estimations include controls for gender, race, religion, State of residence and age;(ii) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B5: Heterogeneous effects by Trust in Science

| | Support for nasal spray | | Support for NPIs | |
|----------------------------|-------------------------|-------------------|---------------------|--------------------|
| | (1) | (2) | (3) | (4) |
| | Anti-Bolsonaro | Pro-Bolsonaro | Anti-Bolsonaro | Pro-Bolsonaro |
| Low trust in science, Cue | -0.208*** (0.056) | 0.052 (0.067) | 0.082** (0.035) | 0.227** (0.089) |
| High trust in science, Cue | -0.194*** (0.060) | -0.015 (0.076) | -0.094** (0.037) | 0.023 (0.101) |
| N | 1753 | 1241 | 1751 | 1240 |
| Mean Dep. Var. | -0.325 | 0.458 | 0.306 | -0.431 |
| R2 | 0.063 | 0.054 | 0.055 | 0.153 |

Note: (i) Estimations include controls for gender, race, religion, State of residence and age; (ii) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B6: Heterogeneous effects by Political Knowledge

| | Support for nasal spray | | Support for NPIs | |
|-------------------------------|-------------------------|------------------|-------------------|--------------------|
| | (1) | (2) | (3) | (4) |
| | Anti-Bolsonaro | Pro-Bolsonaro | Anti-Bolsonaro | Pro-Bolsonaro |
| Low political knowledge, Cue | -0.214*** (0.058) | 0.042 (0.074) | -0.000 (0.037) | 0.048 (0.100) |
| High political knowledge, Cue | -0.181*** (0.057) | 0.011 (0.069) | 0.001 (0.036) | 0.197** (0.093) |
| N | 1753 | 1241 | 1751 | 1240 |
| Mean Dep. Var. | -0.325 | 0.458 | 0.306 | -0.431 |
| R2 | 0.068 | 0.053 | 0.039 | 0.120 |

Note: (i) Estimations include controls for gender, race, religion, State of residence and age; (ii) *

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

Table B7: Heterogeneous effects by Cognitive Resources

| | Support for nasal spray | | Support for NPIs | |
|-------------------------------|-------------------------|-------------------|------------------|------------------|
| | (1) | (2) | (3) | (4) |
| | Anti-Bolsonaro | Pro-Bolsonaro | Anti-Bolsonaro | Pro-Bolsonaro |
| Low cognitive resources, Cue | -0.214*** (0.046) | -0.007 (0.056) | 0.001 (0.029) | 0.113 (0.077) |
| High cognitive resources, Cue | -0.148* (0.090) | 0.148 (0.114) | 0.004 (0.057) | 0.257 (0.157) |
| N | 1753 | 1241 | 1751 | 1240 |
| Mean Dep. Var. | -0.325 | 0.458 | 0.306 | -0.431 |
| R2 | 0.063 | 0.053 | 0.040 | 0.096 |

Note: (i) Estimations include controls for gender, race, religion, State of residence and age; (ii) *

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