

# Fake News, Fact Checking, and Partisanship: The Resilience of Rumors in the 2018 Brazilian Elections

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**Frederico Batista Pereira**, University of North Carolina at Charlotte

**Natália S. Bueno**, Emory University

**Felipe Nunes**, Universidade Federal de Minas Gerais

**Nara Pavão**, Universidade Federal de Pernambuco

Studies about fake news in developed democracies suggest that fact checking reduces misinformation. They also identify partisan-motivated reasoning as the driving force behind beliefs in false information and the resistance to corrections. But how effective are corrections in developing democracies? Does the dominant explanation for misinformation hold in settings with different partisan configurations? Drawing on a survey experiment during the 2018 elections in Brazil, we find that fact-checking corrections in Brazil are ineffective at reducing misinformation. They fail even when they are most likely to work: among nonpartisans and when they confirm individuals' political predispositions. Although partisan-motivated reasoning predicts beliefs in false information, it is not the main driving force behind the (in)effectiveness of corrections. This study calls attention to the challenges of curbing political misinformation in developing democracies and urges future research to foster a better understanding of the dynamics of fake news across different contexts.

**F**ake news, understood as false information whose purpose is to generate and reinforce misperceptions of reality, is a growing concern in politics because of its potential to distort public debate and disrupt elections (Lazer et al. 2018). Because the spread of fake news is fast and difficult to prevent, most efforts to combat misinformation in political contexts come in the form of professional fact-checking initiatives. The urge to understand what drives political misinformation and what makes corrections more or less effective has inspired a growing body of research. Studies show that political misperceptions are pervasive but that corrective information is generally effective; that is, corrections increase individuals' likelihood of rejecting a false rumor. These studies also identify partisan-motivated reasoning—the tendency of individuals to interpret information

through the lens of their partisanship (Bolsen, Druckman, and Cook 2014)—as the main predictor of the acceptance of fake news and the resistance to corrections (Berinsky 2017a; Flynn, Nyhan, and Reifler 2017; Nyhan and Reifler 2010).

The theoretical and empirical knowledge we currently have about political misperceptions comes predominantly from research conducted in developed democracies, particularly in the United States (Nieminen and Rapeli 2019; Walter and Murphy 2018). Although the recent epidemic of fake news in large democracies like Brazil, India, and Mexico has raised concerns regarding the particularly negative implications that this phenomenon may have in developing democracies, we still know very little about the dynamics of that misinformation in these settings. How widespread are beliefs in fake news in less established democracies? And how effective are fact-checking

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Frederico Batista Pereira (fbatist1@unc.edu) is an assistant professor in the Department of Political Science and Public Administration at the University of North Carolina at Charlotte, Charlotte, NC 28223. Natália S. Bueno (natalia.bueno@emory.edu) is an assistant professor in the Political Science Department at Emory University, Atlanta, GA 30322. Felipe Nunes (felipnunes@gmail.com) is an assistant professor in the Political Science Department at the Universidade Federal de Minas Gerais, Belo Horizonte, MG 31270-901, Brazil. Nara Pavão (nara.pavao@ufpe.br) is an assistant professor in the Political Science Department at the Universidade Federal de Pernambuco, Recife, PE 50670-901, Brazil.

The studies reported here were submitted to Emory University's and University of North Carolina at Charlotte's institutional review boards (IRBs) and were deemed exempt from IRB review by both research ethics committees. One of the authors (Felipe Nunes) is also the CEO of Quaest Consultoria and Pesquisa, the company that collected the data for the study presented in the article. The study was fully funded by Quaest, and Felipe Nunes did not receive any financial return from it. Replication files are available in the *JOP* Dataverse (<https://dataverse.harvard.edu/dataverse/jop>). The empirical analysis has been successfully replicated by the *JOP* replication analyst. An appendix with supplementary material is available at <https://doi.org/10.1086/719419>.

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corrections in these settings? Does the dominant explanation posed by the literature—partisan-motivated reasoning—explain the persistence of misinformation in Brazil? What are the workings of misinformation in countries with different partisan configurations?

We examine the phenomenon of political misperceptions in the context of the 2018 elections in Brazil, which were particularly plagued by the dissemination of misinformation (Machado et al. 2019; Resende, Melo, Sousa, et al. 2019). This study advances two main goals. First, it begins by empirically assessing whether fact-checking corrections are effective outside of developed democracies. We investigate the extent to which the moderate success of corrective information documented in these settings vanishes when considered in the context of a developing democracy that displays lower levels of education, lower levels of newspaper readership, and lower attention to fact-checking organizations.

Second, we turn our attention to the conditions under which corrective information succeeds or fails to change minds in developing democracies. Studies conducted in established democracies, where partisan attachments are particularly strong and widespread, point to partisan-motivated reasoning as the main driver of political misinformation and also the central explanation for the success or failure of fact-checking corrections. We investigate whether this dominant explanation holds in Brazil, where a different configuration of partisan attitudes exists. Brazil has a fractured party system and lower levels of party identification than most developed nations. Indeed, the partisan attitudes that have formed in Brazil are structured around the country's main political party—the *Partido dos Trabalhadores* (Workers' Party [PT]; Samuels 2006; Samuels and Zucco 2018). The strong aversion to political parties documented in the country has created a large contingent of self-identified nonpartisan voters. This partisan configuration could limit the incidence of partisan-motivated reasoning, thus reducing incentives for misinformation and increasing the power of fact-checking corrections. However, recent studies suggest that a large share of nonpartisan voters in Brazil have antipartisan sentiments toward the PT (Samuels and Zucco 2018) and that this disposition represents an important source of motivated reasoning (Abramowitz and Webster 2018; Maggiotto and Piereson 1977; Medeiros and Noel 2014; Samuels and Zucco 2014). Therefore, we expect partisan- and anti-partisan-motivated reasoning to be a significant driving force behind political misinformation and the effectiveness of fact-checking corrections even in the context of developing democracies with limited partisan attachments.

Our design involves manipulating fact-checking corrections of existing fake news stories about the PT and its main icon, former president Luís Inácio Lula da Silva. The PT is the

political group most targeted by the circulation of false information in Brazil in 2018. We conducted data collection using a face-to-face cross-sectional survey with an embedded experiment on a large representative sample of voters from the state of Minas Gerais—which has the country's second-largest contingent of voters—just a few days before the first round of the national elections in 2018. We assess the prevalence of false beliefs about politics as well as the effectiveness of professional fact-checking corrections to six fake news stories that had large circulations in Brazil.

We find that about a third of our sample accepts the fake news stories used in the study. Most importantly, unlike what has been found in the developed world, follow-up corrective information about the falsity of the fake news fails to change minds during elections in Brazil. We also find that while rumor acceptance is correlated with partisan and antipartisan attitudes, as the dominant explanation for misinformation predicts, corrections fail across the board. Fact-checking corrective information is ineffective even among a large share of self-identified nonpartisan voters and also when fact checking confirms what is suggested by individuals' political identities. Therefore, although partisan- and anti-partisan-motivated reasoning explains individuals' motivations to believe in false information, it does not seem to be the main driving force behind the (in)effectiveness of corrections in Brazil.

To our knowledge, our study is the first of its kind in Latin America and one of the first in developing democracies.<sup>1</sup> As such, the study has the potential to improve our comparative understanding of fact-checking initiatives and of the nature of beliefs in political fake news. Our findings suggests that correcting political misinformation in developing democracies might be more difficult than what was suggested by previous studies. More importantly, we add to existing knowledge about the conditions under which corrections succeed or fail to rectify false beliefs. By finding that partisan-motivated reasoning, either triggered by negative or positive political identities, does not appear to moderate corrections to fake news, we suggest that corrections may be effective under a limited number of settings. Furthermore, if corrections fail even among non-partisans, initiatives aimed at dispelling partisan-motivated reasoning from fact checking, such as creating “nonpartisan” fact checking or relying on sources that agree with voters' partisan bias, are unlikely to make corrections more effective. Future research should look beyond these types of measures to better understand what could make fact checking work.

1. The study by Carey et al. (2020) explores rumors about disease outbreaks in Brazil, which are treated by the literature as nonpolitical rumors. For other studies, see app. A.

The remainder of this article is structured as follows. In the next section, we review the main empirical evidence regarding the effects of fact-checking corrections in reducing beliefs in fake news and present our research question. The ensuing section discusses the main contributions of the literature regarding both the determinants of political misinformation and the conditions under which corrective information is expected to succeed, and it presents our hypotheses. In the following section, we describe the context in which our study was conducted and discuss the dynamics of fake news in the 2018 elections in Brazil. In the subsequent section, we provide details of the study design and the variables used in the empirical analysis. The results section is divided in three parts. The first one answers the research question and presents experimental evidence regarding the effectiveness of corrective information in Brazil. The second and third part shed light on the correlates of political misinformation (hypothesis 1) and on the conditions under which corrections are (in)effective in reducing beliefs in fake news in Brazil (hypothesis 2). After presenting the results of our study, we analyze our findings in light of the existing evidence and discuss how features of our design do not explain the differences we find. The conclusion of the article discusses the implications of our results for the study of misinformation and politics more broadly.

### ARE CORRECTIONS EFFECTIVE AGAINST FAKE NEWS?

Fake news is false information—that is, “distorted signals uncorrelated with the truth” (Allcott and Gentzkow 2017, 212)—whose main purpose is to generate and reinforce misperceptions of reality.<sup>2</sup> Although fake news stories closely follow the shape and form of traditional news media content, they are not produced following the same standard rules and procedures that render accuracy and credibility to information (Lazer et al. 2018). When manifested in politics, fake news assumes two main features: it is both false and politically motivated.

Fake news represents a growing concern in the political realm. Although empirical evidence documenting its effects remains scarce, fake news is often associated with undesirable political outcomes. By promoting misinformation, fake news is thought to make voters “less informed about the costs and benefits of proposed policies and the performance of politicians in office” (Little 2018, 49), which could distort public debate and have disruptive implications for democracy. Although the evidence is mixed, there is a growing concern that the dissemination of fake news may be tied to political polar-

ization and generalized distrust (Tucker et al. 2018). Finally, despite existing evidence showing that political campaigns have limited capacity to persuade voters (Kalla and Brookman 2018), the endorsement of fake news pieces in social media may boost fake news stories’ effects on vote choice (Lazer et al. 2018).

As a result of the potential negative effects of the misinformation phenomenon, considerable academic effort has been made to answer two central questions: first, can false beliefs about politics be corrected in light of new information? Second, what motivates citizens to hold these beliefs and to be immune to corrective information? A review of recent studies conducted in developed democracies indicates that corrective information is effective at reducing rumor acceptance. Furthermore, the findings of these studies seem to converge in stating the importance of motivated reasoning, mainly grounded on individuals’ party identification, as a key driver of misbeliefs and impediment to corrections. But can these insights be generalized to different contexts in which partisan identification is less stable, voters have lower levels of education, and use of fact checking is not widely spread?

We conducted a meta-analysis of experimental studies, published in leading political science journals, that empirically assesses the effectiveness of corrective information in reducing beliefs in fake news about politics. The details and results of the meta-analysis are included in appendix A. The results show that corrections can indeed work against fake news. Based on a random-effects meta-analysis model, the pooled average indicates that fact checking increases the rejection of political misinformation by 0.36 with a confidence interval (CI) ranging from 0.15 to 0.56.

In a broader meta-analysis of attempts to correct beliefs in fake news about politics and other topics such as health, science, marketing, and crime, Walter and Murphy (2018) confirm that corrections indeed reduce misinformation. However, both our and Walter and Murphy’s meta-analyses show that this empirical evidence originates almost exclusively from the United States and Western Europe. For instance, out of 64 studies on corrections to misinformation examined by Walter and Murphy (2018), 45 use data from the United States, 11 from Oceania, 6 from Western Europe, and 2 from Eastern Asia (China). None of them use data from Latin America or Africa.

The fact that most countries studied to date have comparatively higher levels of education, greater access to media, and a longer tradition of fact checking may be of consequence because studies show that political sophistication reduces resistance to corrective information (Fridkin, Kenney, and Wintersieck 2015). Furthermore, although meta-analytic studies suggest corrections are effective, they also qualify these effects as moderate and indicate that fake news about politics

2. We use the terms fake news, rumors, and misinformation interchangeably.

may be particularly difficult to correct (Walter and Murphy 2018). Therefore, we have no strong reason to believe that corrections will work unequivocally across different political contexts. The important question of whether corrective information works is ultimately an empirical one, and given the limited number of settings in which corrective information to fake news was tested, we believe there are reasons to question its efficacy in general.

**Research Question:** Does corrective information make individuals more likely to reject misinformation?

### MOTIVATED REASONING AND PARTISANSHIP

Beyond examining the effectiveness of corrective information, that is, the extent to which corrections increase individuals' likelihood of rejecting false rumors, we also shed light on the conditions under which corrective information is effective and beliefs in misinformation are more or less widespread. Although individuals' political sophistication (Fridkin et al. 2015) as well as levels of dogmatism and disengagement (Berinsky 2011) are associated with misbeliefs, previous studies seem to converge in stating the importance of motivated reasoning. Motivated reasoning—the tendency of individuals to seek out and accept information that is aligned with or confirms their political preferences and to avoid and reject information that contradicts them (Taber and Lodge 2006)—seems to be the main driving force behind beliefs in fake news (Berinsky 2017a, 2017b; Flynn et al. 2017; Nyhan and Reifler 2010; Siddiqui 2020). Partisanship, which is understood as a kind of social identity formed around political parties (Green, Palmquist, and Schickler 2002), is a key source of directional motivated reasoning behind political fake news (Allcott and Gentzkow 2017; Bolsen et al. 2014; Bullock et al. 2015; Flynn et al. 2017). Individuals tend to believe in political fake news when the news piece portrays their preferred political group in a favorable light.

By the same token, individuals will resist information that challenges their existing beliefs. For example, Nyhan and Reifler (2010) show that corrections are not only ineffective at debunking false beliefs, but they can also backfire and reinforce these misbeliefs by increasing individuals' familiarity with false claims. Walter and Murphy (2018) find that proattitudinal corrections (fact checking that corroborates preexisting convictions) are more effective than counterattitudinal ones (fact checking that challenges preexisting beliefs). The centrality of motivated reasoning, mainly grounded on individuals' political affiliation or party identification, is then a key moderator in the process of correcting misbeliefs.

The evidence that presents motivated reasoning as the dominant explanation for individuals' beliefs in fake news and also for the effectiveness of corrective information comes

almost exclusively from the United States.<sup>3</sup> While we know that levels of partisan identification tend to be lower in younger democracies (Lupu 2015; Mainwaring and Scully 1999; Mainwaring and Torcal 2006), we still lack an understanding of the dynamics that misinformation assumes in these settings.

Brazil has low levels of party identification, especially when compared to most developed democracies, and the great majority of the existing identification is centered around the country's main political party—the PT (Samuels 2006; Samuels and Zucco 2018). Furthermore, the strong aversion to political parties in Brazil has created a large contingent of self-identified nonpartisan voters.<sup>4</sup> While this scenario could limit the partisan acceptance of false rumors, recent studies suggest that the amount of partisan-motivated reasoning in younger democracies like Brazil could be similar to what is found in the United States. Many voters who do not identify with a party are not completely indifferent toward political groups because they develop antipartisan identities, understood as consistent feelings of rejection toward one or more parties in the political system. Samuels and Zucco (2018) show that the proportion of antipartisans is large in the electorates of both young and developed democracies. Because antipartisans have parties as reference points, they engage in motivated reasoning and their antipartisanship shapes their political behaviors and attitudes (Abramowitz and Webster 2018; Samuels and Zucco 2018).

In fact, recent studies that highlight the psychological foundations of negative partisanship (or antipartisanship) suggest that this type of identity may even have unique implications for politics (Abramowitz and Webster 2018; Maggiotto and Piereson 1977; Medeiros and Noel 2014). For instance, Abramowitz and Webster (2016) show that negative partisanship is more likely than positive partisanship to promote loyal voting among partisans. Studies suggest that anger—an emotion directly tied to out-party rejection—reduces individuals' incentives to seek political information (Valentino et al. 2008). Angry individuals are oriented toward action; they display reduced cognitive effort and are more likely to rely on heuristics when processing information (Huddy, Feldman, and Cassese 2007). By increasing reliance on prior predispositions and enhancing motivated reasoning (MacKuen et al. 2010; Marcus, MacKuen, and Neuman 2011), anger is likely to undermine the use of factual information (Valentino et al. 2008, 252). In line with these arguments, Weeks (2015) confirms that anger increases partisan evaluations of misinformation and leads

3. See Siddiqui (2020) for an exception.

4. Data from the 2018 Brazilian Electoral Survey show that only 16% of the voting population in Brazil identifies with a political party. The question used in this survey to measure party identification is as follows: "Do you usually think of yourself as close to any particular party?"

individuals to hold inaccurate beliefs about politics, and Osmundsen et al. (2020) find that negative partisans are more likely than positive partisans to share fake news on Twitter.

Therefore, rather than limiting political misinformation and increasing the probability that fact checking will work against fake news, the large share of self-declared nonpartisan voters in Brazil might be obscuring an important source of partisan-motivated reasoning (Samuels and Zucco 2014). Because of the strength of positive and negative partisan identities in Brazil, we expect false beliefs about politics to be correlated with voters who hold sentiments pro (*petistas*) and against the PT (*antipetistas*). *Petistas* should be more likely to believe in false information when this information portrays the PT in a positive light, while *antipetistas* are more likely to hold false beliefs that are against the PT. Nonpartisans will be the most skeptical of both negative and positive fake news.

**H1.** Partisans and antipartisans are more likely to believe in political rumors than nonpartisans.

A similar dynamic is expected to explain the effectiveness of corrections. The effectiveness of fact-checking corrections refers to the extent to which they make individuals more likely to reject false rumors. Corrections that debunk fake news that favors the PT are more likely to work among *antipetistas* than among *petistas*. Corrections that debunk negative fake news against the PT will be more effective among *petistas* than *antipetistas*. We expect corrections to be particularly effective among nonpartisans.

**H2.** Third-party fact-checking corrections are less likely to increase rumor rejection among partisans and antipartisans in comparison to nonpartisans.

To better understand whether partisan-motivated reasoning shapes the effectiveness of fact-checking corrections, we also include in our study nonpolitical fake news stories that convey a type of information that is less likely to be perceived through partisan lenses. Since corrections of nonpolitical fake news are less likely to be interpreted as politically motivated, if hypothesis 2 is correct, we should expect fact-checking corrections to be more effective in debunking nonpolitical than political fake news. Finally, our experimental design includes fake news pro-PT and anti-PT, as this distinction allows us to examine partisans and antipartisans symmetrically.

## FAKE NEWS IN THE BRAZILIAN 2018 ELECTIONS

Fake news was a central theme during the 2018 elections in Brazil. Studies show that fake news flooded social media applications, such as Facebook and Twitter (Resende, Melo,

Sousa, et al. 2019; Rossini et al. 2021). These studies also reveal that the circulation of fake news pieces in Brazil followed a pattern different from that observed in the 2016 US elections, as the Brazilian news pieces were propagated mainly through WhatsApp, which is used by 120 million people in the country (Machado et al. 2019; Resende, Melo, Reis, et al. 2019). Although precise estimates are difficult to come by, one survey reports that 67% of voters declared receiving fake news through WhatsApp during the election season. Furthermore, extensive research on public WhatsApp political groups argues that 36% of all news characterized as “factual” that circulated in those groups during the 2018 elections was misinformation, 53% was misleading or inconclusive, and about 10% was verified as true (Resende, Melo, Sousa, et al. 2019).

Political figures also noticed the importance of fake news in shaping public (Twitter, Facebook, and other media outlets) and private (WhatsApp, Telegram, and other messaging applications) conversations during the 2018 elections in Brazil. Brazilian Supreme Court justices—targets of fake news themselves—and members of Congress have called for investigations and started official inquiries into the funding and spreading of fake news during the elections. Presidential candidates themselves both shared false information and decried its influence during the election. Jair Bolsonaro, for instance, brought a children’s book to his interview with the main news outlet in the country to falsely accuse his main opponent, who is a former minister of education, of promoting children’s books and educational policies that support homosexuality and precocious interest in sex. The books became popularly known as the “gay kit.”<sup>5</sup>

To convey the extent to which fake news became part of the public debate and an object of interest during the 2018 elections, we present two types of data. They reflect, respectively, private interest (Google searches) and public interest (coverage of fact-checking websites) in fake news. Google search volumes shown in figure 1A indicate that private interest in fake news in Brazil grew over time but peaked in October 2018, when the first and second rounds of voting occurred. Consistent with that rise in interest levels, as shown in figure 1B, we find that searches for the term “gay kit” rose dramatically around Bolsonaro’s aforementioned interview (in August 2018) and in the week when the first round occurred (first week of October 2018).

Beyond private interest in fake news, established news organizations covered fake news during the 2018 elections, particularly during election months from August to October

5. PT’s presidential candidate Fernando Haddad also shared a rumor that a young woman had been branded with a swastika by Bolsonaro supporters.

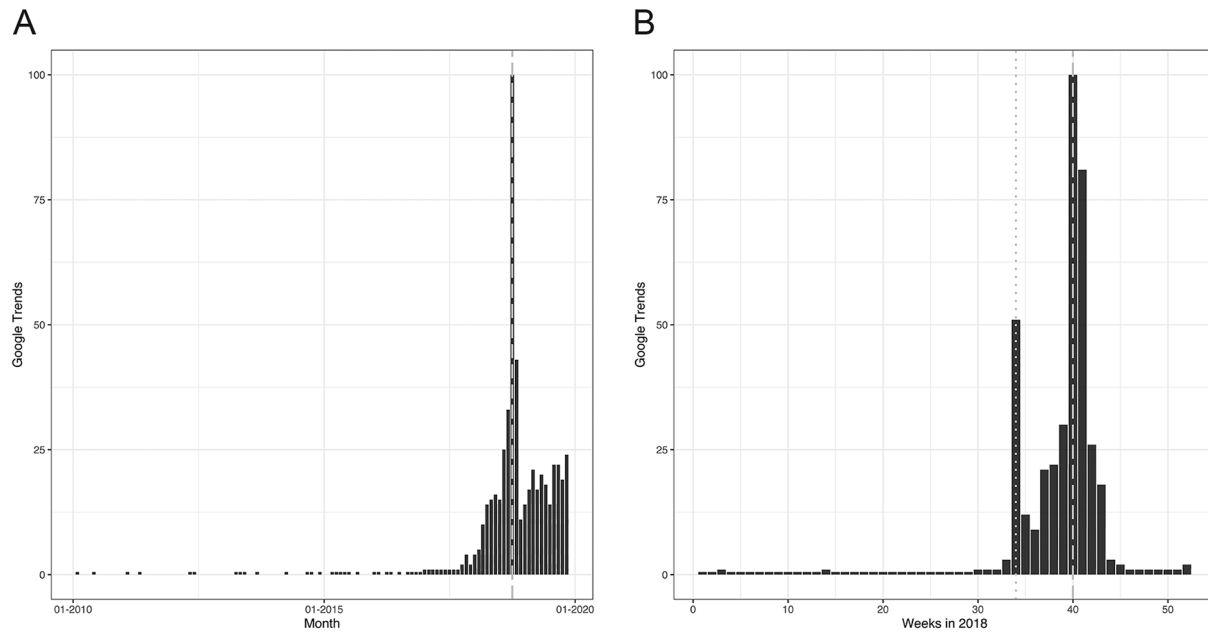


Figure 1. A, Interest in fake news based on Google Trends data (2010–19). Dashed line indicates election month (October) in 2018. B, Interest in “gay kit” based on Google Trends data (2018). Dashed line indicates week of first round (October 7, 2018). Dotted line indicates week of Bolsonaro’s interview with Brazil’s most important television news program (August 28, 2018).

2018 when candidates were campaigning for office. We observe that established news organizations used fact checking extensively against fake news. We draw on a novel web-scraped data set of all main fact-checking agencies in Brazil to show that fact-checking websites verified many more stories and also found many more false stories during the 2018 election months (and the during the COVID-19 pandemic) than in previous years and nonelection years, as figure 2A shows. In terms of political fake stories, figure 2B shows that they peaked during the three months before the election in 2018. As a reference, Allcott and Gentzkow’s (2017) mapping of fake news in the 2016 US elections found 156 election-related news stories categorized as false in the three months before the 2016 US election. Drawing from a single fact-checking agency in Brazil, we found 194 false stories about politics in the three months before the 2018 Brazilian elections.<sup>6</sup> In appendix L we present additional data on the news coverage of fake news that confirm the salience of this issue during the 2018 elections in Brazil.<sup>7</sup>

All in all, this descriptive evidence, along with existing research focused on WhatsApp conducted by other researchers, suggests that false information was an important and notable part of private conversations and public debate during elections in 2018. Yet false rumors are not necessarily new to

Brazilian politics. Numerous rumors and false stories, spread through word of mouth and face-to-face interactions, were reported in previous election cycles (Baker, Ames, and Rennó 2020). The presence and growth of social media and messaging applications, however, changes their public coverage, our ability to detect them, and, possibly, their magnitude and spread in society (229–331).

#### DATA AND RESEARCH DESIGN

We conducted a survey experiment during the campaign season at a moment in which fake news was at the forefront of political discussion.<sup>8</sup> Fielded between October 4 and 6, 2018, in the state of Minas Gerais, Brazil, the study was included at the end of the survey questionnaire conducted on a weekly basis by Quaest Consultoria e Pesquisa about the national- and state-level elections.<sup>9</sup> The study used tablet questionnaires during face-to-face interviews and included 2,236 respondents between the ages of 16 and 75. The sampling procedure used quotas based on age, sex, education, and income according to the proportions in the voting population of the state. The sample was also stratified using all regions of the state of Minas Gerais. Minas Gerais is a southeastern state with the second-largest population, third-largest gross domestic

6. Here we rely on a single agency (<https://www.boatos.org/>) to avoid duplicates, as fake stories may be checked across multiple agencies.

7. See app. L for details on data collection, analysis, selection of the news organizations, and a discussion of measurement error.

8. As indicated in the previous section of the article, fake news was particularly salient during the campaign season and not simply a function of major social mobilization.

9. Our study, conducted in partnership with Quaest, was exploratory, and we did not submit a preanalysis plan.

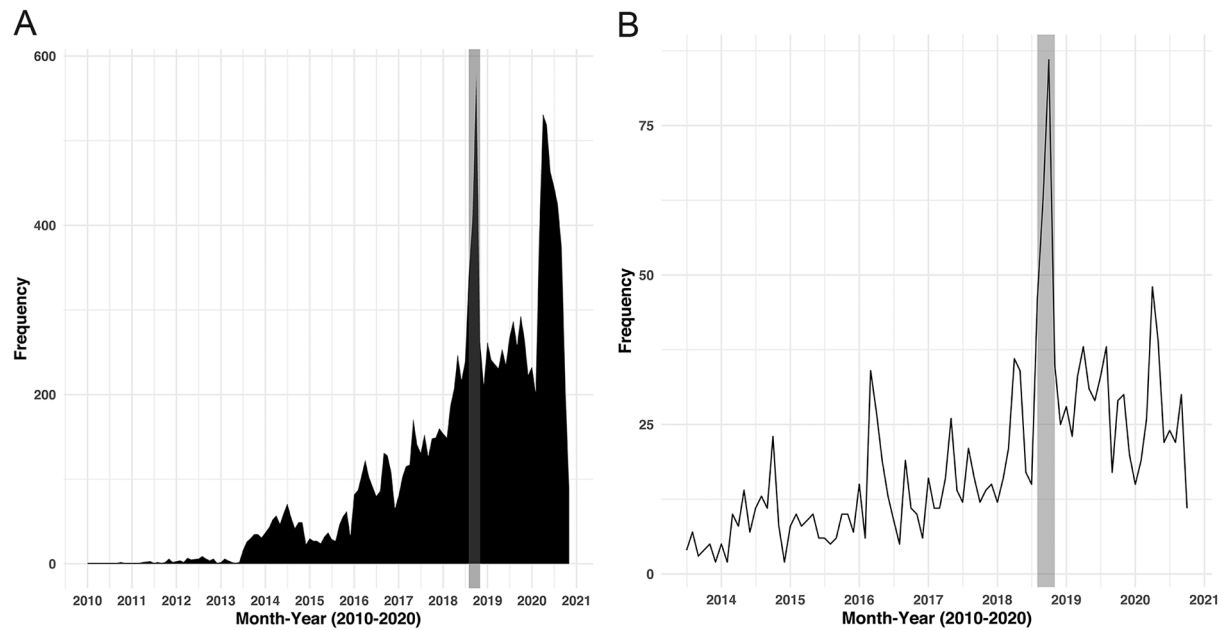


Figure 2. Fact-checking information and fake news in Brazil. Gray bar indicates the four months during the electoral period (August, September, October, and November 2018). A, All fact-checked stories for the fact-checking agencies listed in appendix L. B, Stories categorized as political and false by boatos.org.

product, and fourth-largest area in the country. For the first round of the presidential election, the state also had voting proportions that closely matched the national votes for the two main candidates in the race.<sup>10</sup>

The study consisted of presenting existing and widespread false rumors to respondents and then experimentally manipulating whether respondents received third-party fact-checking information correcting the rumor or no correction at all. Interviewers were instructed to read all rumors out loud, while showing respondents the tablet screen displaying the rumors, as well as the image that accompanied that rumor on social media.<sup>11</sup> Both the salience of fake news during election season and the widespread use of images make our study well suited to investigate fake news in the context of Brazilian politics.

Respondents were then randomly assigned to one of two experimental conditions. In the first condition, interviewers informed subjects that a fact-checking website specialized in investigating internet rumors had checked the rumor and confirmed that it was false.<sup>12</sup> In the second condition, interviewers gave no corrective information. For respondents in both conditions, we then measured their beliefs about the story

presented in the false rumors. All subjects were debriefed at the end of the study.<sup>13</sup>

The study used a total of six false rumors—four political and two nonpolitical—that had been fact-checked by several agencies in the country. The four political rumors included information about the PT and its politicians. We used multiple pieces of false rumors in the hope that rumor-specific characteristics would not drive our conclusions, even if having multiple rumors (and adjusting for them) implied less precise within-rumor estimates. All rumors were presented including the original images and text from their circulation, according to the fact-checking agencies. Most of the rumors that circulated before and during the electoral period targeted the PT (mostly anti-PT rumors), which validates using the party as the main theme of those rumors.<sup>14</sup> To compare how respondents with positive and negative partisan attitudes toward the PT react to rumors and corrections, we included two false rumors that put the PT in a positive light (pro-PT) and two false rumors that cast a negative light on the PT (anti-PT). The pro-PT rumors stated that “Pope Francis said that Lula’s biggest crime was attempting to fight hunger in the world” and that “a child wipes Lula’s tears on TV.” The anti-PT rumors were that “British magazine elects Lula as the world’s most corrupt

10. See app. C for descriptive statistics.

11. See app. F for the full list of rumors. As the previous section indicated, fake news often traveled through images shared on WhatsApp. WhatsApp allows for text, URLs, audio, video, and image sharing; images are the most shared form of media (about 10% of all messages). See Machado et al. (2019) and Resende, Melo, Sousa, et al. (2019).

12. These were true statements (no deception).

13. Exposing subjects to fake news raises valid and important ethical concerns that we discuss in detail in app. K.

14. Two days before the runoff election, three fact-checking agencies (Lupa, Aos Fatos, and Fato ou Fake) reported checking and correcting 123 false rumors during the campaign. Of those, 104 were against the PT, while 19 were against the opponent Jair Bolsonaro (Macedo 2018).

president” and that “Senator Fátima Bezerra (PT) wants to authorize the use of Wi-Fi internet in Brazilian prisons.” The nonpolitical rumors included false rumors about celebrities that are not directly related to Brazilian politics. They stated that “Messi and other soccer players spend 37,000 euros in one night” and that “actress and model Daniella Cicarelli has six toes.” As we explain in more detail in the following sections, the inclusion of nonpolitical fake news in the study allows us to assess whether fact checking could be effective against beliefs in (nonpolitical) news that were less likely to be associated with partisan-motivated reasoning.<sup>15</sup>

In addition to the statement that a fact-checking agency had found a particular story to be false, our vignette contained a general statement saying that “false rumors like this one are fabricated by people with the intention of distorting facts and disseminating misinformation in social media.” The vignette was read by the interviewer. We relied on a simple strategy of presenting a plain and short fact-checking statement refuting the information displayed in the image.<sup>16</sup>

To measure whether respondents believed the rumors, we followed Berinsky (2011) in directly asking: “Do you believe that [states the rumor in past tense]?” However, we diverged from Berinsky in the operationalization of the dependent variable. The variable differentiated positive (rumor acceptance) from negative (rumor rejection) responses, and we treated “don’t know” (DK) responses as missing. The rates of DK responses in our sample were never higher than the ones in Berinsky (2011), who treats DKs as “failure to reject” a rumor. Additionally, a follow-up question to respondents who initially picked the DK option finds that the majority tends to reject the rumor when further asked about it. Therefore, we followed Thorson (2016) in treating DK responses as indicating ambivalence toward the rumor, and, since DKs were a residual category, we did not consider them in the analyses.<sup>17</sup>

The questionnaire also included pretreatment items that tapped into other factors that were potentially related to the acceptance of false rumors and the effectiveness of corrections.<sup>18</sup> Given the relevance of motivated reasoning and confirmation bias in the acceptance of false rumors, we used items

that measure partisan and antipartisan attitudes in the Brazilian electorate. However, given Brazil’s highly fragmented party system, classifying and identifying partisans in such contexts can be difficult. We followed Samuels and Zucco (2018) in distinguishing partisans (respondents identified with a party), antipartisans (respondents who dislike a party without liking other parties), and nonpartisans (respondents who neither like nor dislike a party). This classification is crucial to unpack a large category of nonpartisans and identify those who dislike a party and behave in ways that reflect such a predisposition (Samuels and Zucco 2018). We measured *petismo* (PT supporters) by selecting those who mention the PT in response to a standard question asking whether respondents like a party. *Antipetistas* are those who do not like a specific party and mention the PT in response to a standard question asking whether respondents dislike a party. *Petistas* comprised 16% of the sample, *antipetistas* comprised 21%, and true nonpartisans comprised 52% of the sample in Minas Gerais. Other partisan groups (other partisans and other antipartisans) comprised approximately 11% of the sample and, for the sake of simplicity, will not be discussed in the analyses that follow.

Other variables included as pretreatment questions were dogmatism, disengagement, political interest, education, and other socioeconomic variables. Dogmatism was measured by one of the items used by Berinsky (2011). The item asked respondents which is better: “to remain undecided” or “to take a stand on an issue even if it’s wrong.” The measure of disengagement also relied on an item from a battery used by Berinsky (2011) that asked the extent to which respondents agreed that “politicians are disconnected from the real world.” We measured political interest using an item asking respondents about how interested they were in politics, with four response options ranging from “very interested” to “not at all interested.” We used standard measures of education, income, and age.

## RESULTS

### Do corrections work in Brazil?

What debunks a rumor in the Brazilian electoral context? In this section, we test whether third-party fact-checking corrections increase rumor rejection among the public. To better understand what is behind the effectiveness of third-party fact-checking corrections, we include the results for both political and nonpolitical rumors. The comparison between political and nonpolitical fake news serves the purpose of assessing whether the effectiveness of fact-checking corrections is a function of perceived political biases. Fact-checking corrections are more likely to be perceived as politically motivated when they relate to political rather than nonpolitical fake news. Therefore, finding that fact-checking corrections

15. An expanded version of this design was used in a study conducted in May 2018. The study included a total of 11 rumors and other types of corrective information. However, because of evidence of failed randomization, we treated the data as a pilot study that informed the design of the October 2018 study.

16. The vignette is in app. E.

17. We also included branching strategies to further assess belief among DK respondents, as well as the strength of belief among all respondents. The measure of strength of belief did not yield consistent results, while the measure that attempts to reduce DKs produces results similar to those presented in the article.

18. See app. E for our questionnaire.



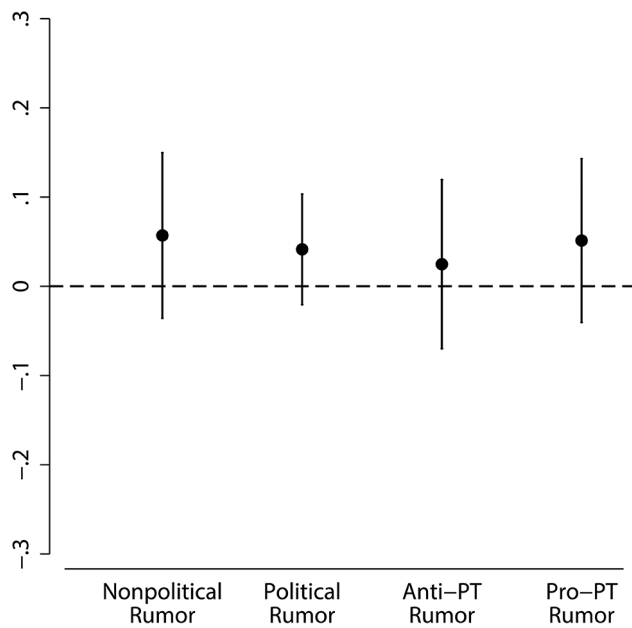


Figure 3. Marginal effect of fact-checking corrections by type of rumor, October 2018.

are more effective against the latter type of false information, which is politically neutral, would suggest that perceived political biases in fact checking undermine their effectiveness.

We present results from linear probability models with robust standard errors estimating the effects of corrections on rumor rejection. All models include pretreatment covariates that are typically predictive of belief in fake news: disengagement, partisanship, age, sex, education, and interest in politics and rumor fixed effects.<sup>19</sup>

Figure 3 examines whether third-party fact checking increases rumor rejection in the Brazilian context. The figure shows estimates of the effect of fact-checking corrections separated by type of rumor (nonpolitical and political; anti-PT and pro-PT) for all respondents combined. As the results show, fact-checking corrections do not increase the rejection of misinformation—for either nonpolitical or political rumors. The null results are consistent after removing each specific rumor from the analyses, as well as excluding the rumors that were most and least accepted by subjects.<sup>20</sup> The null results are also consistent after testing statistical significance with Bonferroni corrections, as expected, since those tend to produce more conservative results.<sup>21</sup>

19. See app. G for balance tests. These tests suggest that randomization was successful. Appendix I shows that models for unconditional effects models (without controls or rumor fixed effects or both) present results very similar to models including pretreatment covariates.

20. See app. I for model estimates.

21. The results for the tests using Bonferroni corrections are available in the replication codes.

### What drives beliefs in rumors?

Before examining whether party-driven attitudes undermine the effectiveness of fact-checking corrections in Brazil, we assess the extent to which individuals accept false rumors in the Brazilian context. Figure 4 shows the rates of belief for the three types of rumors included in the experiment: nonpolitical, pro-PT (political), and anti-PT (political). The estimates are predicted probabilities from a probit model without controls, and they are separated for the full sample and the control group (with subjects who did not receive corrective information). The estimates are not statistically different from models that include pretreatment covariates (partisanship, dogmatism, disengagement, college education, political interest, income, sex, and age).

Overall, a majority of respondents do not believe in fake news. Furthermore, there is sizable variability in the extent to which subjects believe in fake news—belief in false rumors ranges from 18% to 57% depending on the rumor.<sup>22</sup> Respondents are more likely to believe in nonpolitical rumors than in political rumors. These rates do not include DK responses (about 13% of responses treated as missing), which denotes that overall rates of rumor acceptance are even lower than the ones presented in figure 4.

Studies show that rumor acceptance is driven by partisan-motivated reasoning, which refers to the tendency of individuals to process new information with the underlying motivation of confirming their existing partisan biases. Hypothesis 1 states that partisanship should be a key driver of rumor acceptance in politics. Figure 5 assesses this hypothesis and shows the determinants of acceptance of the three types of rumors (nonpolitical, anti-PT, pro-PT) among respondents in our sample. Figures 5A and 5B show the results for nonpolitical and political (anti- and pro-PT combined) rumors, while figures 5C and 5D present the results for political rumors (anti- and pro-PT rumors separated). We include our indicators of partisanship (*petismo*) and antipartisanship (*antipetismo*) with nonpartisans as the baseline category to assess the role of partisan- and anti-partisan-motivated reasoning in rumor holding.<sup>23</sup> We also include measures of dogmatism, disengagement, political interest, and an indicator of college education, as well as income, sex, and age as controls. The figure shows the maximum change in the probability of accepting a rumor using probit models.<sup>24</sup>

22. See app. D for rates of belief for specific rumors.

23. The analyses of the article exclude the small group of other partisans and other antipartisans, those not associated with PT, for the sake of simplicity. The results do not change substantially with the inclusion of those respondents.

24. See the tables in app. H for results.

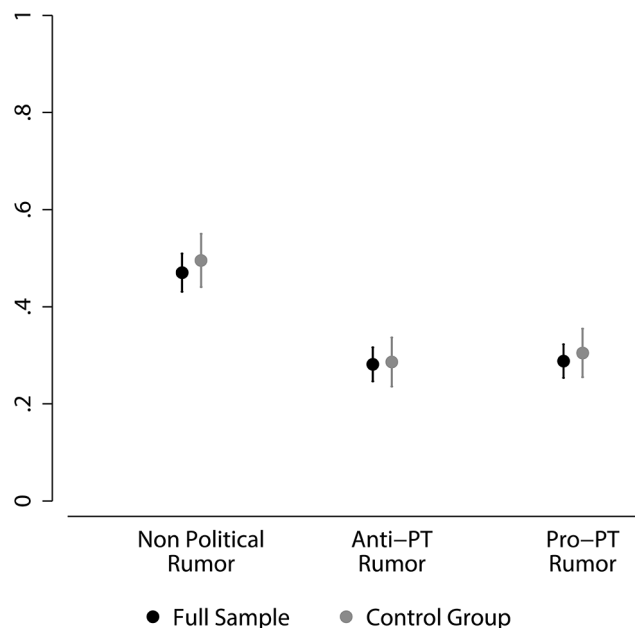


Figure 4. Rates of belief by type of fake news, October 2018

The results in figure 5 show that partisanship is consistently associated with rumor acceptance, as proposed by hypothesis 1. Regarding nonpolitical rumors, partisanship and anti-partisanship are not systematically associated with rumor acceptance, as expected. No other variable is clearly associated with nonpolitical rumor acceptance. For pro-PT and anti-PT rumors combined, *petistas* and *antipetistas* are more likely than nonpartisans to accept false information. Notably, and corroborating hypothesis 1, figures 5C and 5D show that *petistas* are more likely than *antipetistas* and nonpartisans to believe that a positive rumor about the PT is true, while *antipetistas* are more likely than *petistas* and nonpartisans to believe that a negative rumor about the PT is true. The remaining variables included in the models do not show consistent relationships with rumor acceptance, with only college degree and age having a negative relationship with belief in positive false information about the PT.

### Corrections and (anti)partisan attitudes

To test hypothesis 2, we rely on a nonexperimental comparison between treatment effects for partisan and nonpartisan respondents—a conditional average treatment effect. It is possible that other factors associated with partisanship, rather than partisanship itself, are driving any differences we might find. The comparison between political and nonpolitical fake news helps us interpret whether partisan attitudes are driving the effectiveness of third-party fact-checking corrections. If we find that partisanship changes fact-checking effectiveness for political but not for nonpolitical fake news, we could in-

terpret it as suggestive evidence that partisanship, and not unobserved covariates, is driving this relationship.

Figure 6 shows whether the effectiveness of corrective information on political and nonpolitical rumors depends on partisan and antipartisan attitudes, according to hypothesis 2. The panels show the marginal effects of fact-checking corrections by type of rumor and by group (nonpartisans, *antipetistas*, and *petistas*).

Overall, corrections seem to be ineffective across the board. The results are statistically null both with and without using Bonferroni corrections for multiple comparisons. Regarding nonpolitical rumors, corrections are unsuccessful against fake news among all groups. The results for political rumors (aggregated) are the only results suggestive of the patterns expected in hypothesis 2. Nonpartisans seem more receptive of corrective information than partisans and antipartisans for political rumors in general. However, the interaction coefficients are not statistically significant in the regression model ( $p < .05$ ). A similar pattern holds for positive rumors, while correction effects are null for negative rumors. In sum, hypothesis 2 is not supported.<sup>25</sup>

### DISCUSSION

One of the central findings of this study is that corrections do not dissuade Brazilian voters from believing in false information. Even corrections that confirm subjects' partisan attitudes are disregarded in our study. Our estimate is notably smaller than the pooled estimate from previous studies (the difference is also statistically significant,  $p < .05$ ).<sup>26</sup>

The features of our design do not explain the ineffectiveness of corrections. First, the sample size in our study (2,236) is larger than the average sample size of studies included in our meta-analysis (1,672).<sup>27</sup> Second, although the literature on the effectiveness of fact checking suggests features of corrections can maximize the chances of rumor rejection (Nieminen and Rapeli 2019), another meta-analysis of 20 studies that use fact checking to dispel misinformation finds that there “was no significant effect of message length on the efficacy of fact checking” (Walter et al. 2019, 16) and that lexical complexity (a series of indicators of the complexity of the text) reduces the impact of corrections. Visual aids (logos) do not tend to make messages more effective (Walter et al. 2019, 17). All in all, simpler corrective messages were, in fact, more effective or at

25. Under certain specifications (with split samples instead of interactions), three of the 12 estimates are statistically significant.

26. See fig. A6.

27. We estimate sample size for the studies in the meta-analysis by adding the number of observations in the treatment arms for each estimate included in the meta-analysis.

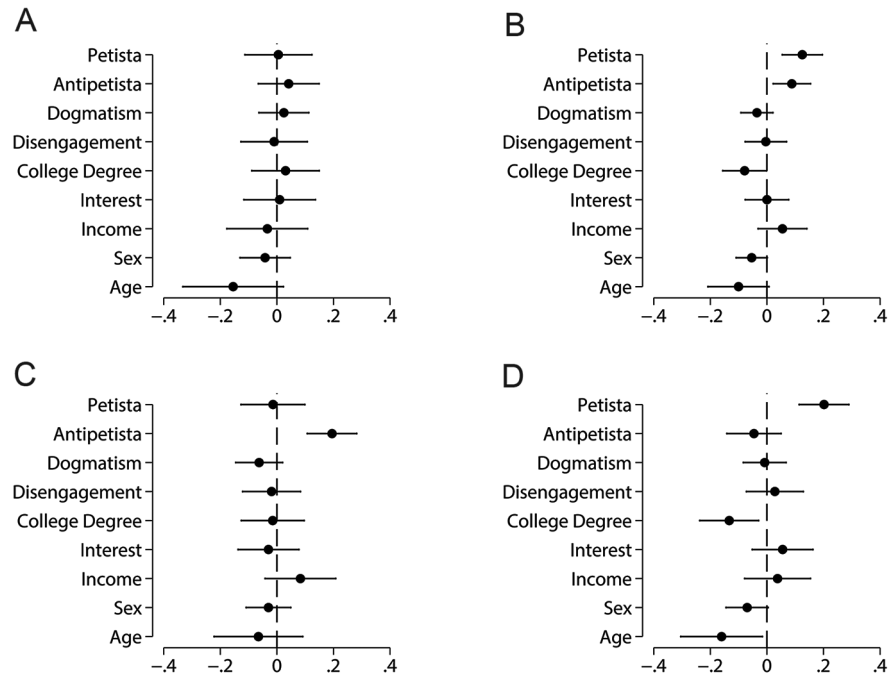


Figure 5. Correlates of belief by type of rumor (maximum change in probability of belief), October 2018: A, nonpolitical rumors; B, political rumors; C, anti-PT rumors; D, pro-PT rumors.

least as effective as more complex corrections. Finally, while Young et al. (2018) find that corrections in the form of videos can be more effective than other forms of corrections, the literature discussed earlier relies primarily on text corrections

(Tucker et al. 2018). Moreover, the combination of text and image was the most common type of media content spread on social media during the 2018 elections in Brazil (Machado et al. 2019). Because we conduct a face-to-face survey in which the

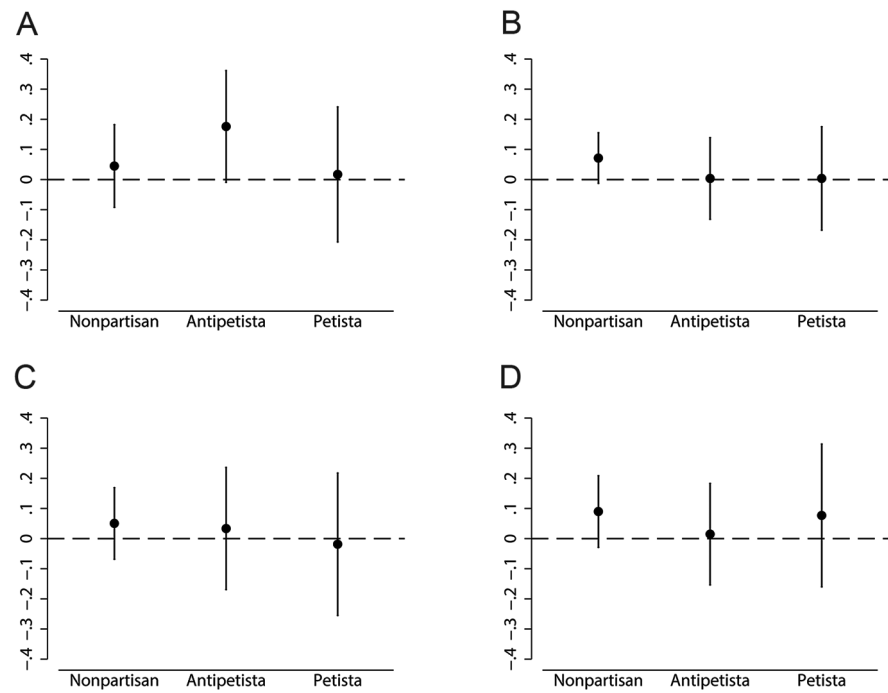


Figure 6. Marginal effect of fact-checking corrections by type of rumor and partisanship, October 2018: A, nonpolitical rumors; B, political rumors; C, anti-PT rumors; D, pro-PT rumors.

interviewer conveyed a simple corrective message directly to the subject, there is no reason to believe that our correction is a priori weaker than corrections used in other studies.

Furthermore, we do not believe that the absence of published studies documenting ineffective corrections is a consequence of publication bias. Although null results are often unpublished, which could overestimate the effects found in the meta-analysis, we find no systematic evidence of publication bias. We formally examine this possibility in figure A3 using a *p*-curve, and we find weak to no evidence of *p*-hacking and publication bias (no clustering around .05; Simonsohn, Nelson, and Simmons 2014). Instead, the *p*-curve is right-skewed, as one would expect when these are true effects. We also conducted a systematic search of unpublished manuscripts, and we found two studies that fit our criteria. Both studies suggest that corrections are effective in reducing belief in misinformation.<sup>28</sup>

Therefore, the evidence documenting the ineffectiveness of corrections in Brazil systematically differs from the findings of the existing literature. Reassuringly, our results are consistent with the recent study by Carey et al. (2020) on rumors about disease outbreak in Brazil, suggesting that our findings are not a fluke.

What then explains the ineffectiveness of third-party fact-checking corrections against fake news in the Brazilian electoral context? Our findings point to the limitation of the dominant explanation based on (anti)partisan-motivated reasoning. While motivated reasoning is the main driving force behind the beliefs in fake news, it is not associated with the effectiveness of fact-checking corrections in Brazil. We systematically examine whether the effectiveness of fact-checking corrections varies by dogmatism, disengagement, education, political interest, age, and sex—factors identified in previous research as influencing subjects' receptiveness to corrective information. However, the analyses included in appendix J show neither substantive nor significant results, suggesting that the effectiveness of fact-checking corrections does not depend on any of these factors.

Unlike most studies included in the meta-analysis, our study takes place just a few days before Election Day. Since elections tend to increase the strength of group identities and partisan attitudes (Huddy, Mson, and Aaroe 2015), it is possible that these factors reduced the power of corrections. However, results from our meta-analysis, presented in figure A4, suggest that the overall treatment effect of studies conducted during elections (pooled estimate of 0.37, CI [0.23,0.51]) was larger than those found in our study.<sup>29</sup>

28. See app. A for tests of publication bias. Walter et al. (2019) find evidence of publication bias in fact-checking studies.

29. Walter and Murphy (2018) find that the corrective effects of fact checking are smaller during elections but not null.

Therefore, the proximity of elections does not appear to completely explain our findings regarding the ineffectiveness of fact-checking corrections.

Another possible explanation for these null findings could be a lack of trust in the media and in fact-checking agencies. Brazil's highly politicized online environment may have undermined the credibility of fact-checking agencies, thus motivating individuals to disregard counterattitudinal corrections to political fake news (Shin and Thorson 2017). Moreover, previous research seems to have underestimated the extent to which citizens in developing democracies—particularly those who identify as nonpartisans—are capable of taking sides and behaving like partisans during elections (Baker and Rennó 2019; Cornejo 2019). Partisan leaners, defined in the literature as voters who admit having a party preference or sympathy after initially self-identifying as independents (Petrocik 2009), engage in the same kind of motivated information processing as partisans during elections. Their presence among self-declared partisans could account for this group's increased resistance to corrections. To explore this possibility, we conduct some additional analyses (see app. J) and separate partisan leaners (those who did not self-identify with the PT but declared having either positive or negative feelings toward the party) from true nonpartisans (those who do not self-identify with the PT and declared being neutral in the feeling thermometer question). Even though the effect of corrections is statistically different from 0 among true nonpartisans for positive and political (positive and negative combined) rumors, those estimates are not different from 0 in comparison to the other partisan groups and also not statistically different from 0 for nonpolitical and negative rumors, which suggests that the effect of fact-checking corrections among true nonpartisans is null or weak, at best.

It is also possible that younger and less developed democracies have different online environments and lower levels of media literacy, which could reduce the power of corrections. Social influence may be another important pathway that renders beliefs in false information more resistant: an endorsement of false information that is implicit when someone shares information via WhatsApp or Facebook may be powerful in influencing behavior. It is also possible that corrective information, coupled with social ties via endorsements and discussion, may prove more effective in debunking false beliefs (Baker et al. 2020). Unfortunately, we do not have the appropriate data to test these explanations and to provide a clear answer to the lack of effectiveness of fact-checking corrections to fake news in Brazil. Future research should test these arguments empirically and foster a better understanding of the dynamics of political misinformation across contexts.

## CONCLUSION

Unlike the overall combined estimate from previous studies, fact-checking corrections are notably weak in Brazil, as they appear to fail even when they are most likely to succeed, that is, when correcting information that confirms subjects' political preferences and among nonpartisans. Corrections fail or are weak across the board, and they are unable to change either beliefs in pro-PT and anti-PT fake news or misbeliefs unrelated to politics.

In terms of the correlates of beliefs in political fake news in the Brazilian context, we find that misinformation thrives among partisans, which confirms the findings from previous studies on political misinformation and fake news. Despite the low levels of partisan attachment and the strong aversion to political parties observed in Brazil, we find that positive and negative partisan identities are the main determinant of rumor acceptance, with *petistas* being the most likely to believe positive rumors and *antipetistas* being the most likely to believe negative rumors about the PT and former president Lula. This dynamic suggests that although partisan- and anti-partisan-motivated reasoning is an important driving force of misinformation in Brazil, this type of reasoning does not explain variation in the effectiveness of fact-checking corrections.

Furthermore, we fail to find evidence that the effectiveness of fact-checking corrections depends on factors such as dogmatism, disengagement, and political interest or on socioeconomic and demographic characteristics. It is possible that, under certain circumstances, fact-checking corrections could have larger effects among a larger group of voters even during the peak of the electoral period. For example, endorsements and unlikely sources may make corrective information more effective (Berinsky 2017a). However, endorsements and unlikely sources may not be easily available in competitive and polarized elections, during which we tend to observe a surge in fake news (Machado et al. 2019; Resende, Melo, Sousa, et al. 2019). Our findings also raise the possibility that factors related to the media environment and patterns of news consumption may influence the effectiveness of corrective information. We hope that future studies address these questions.

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