Misinformation, political preferences, and cognitive traits: a look at the Brazilian electorate

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To contribute to the expanding literature on misinformation in contexts beyond developed countries, this article seeks answers to questions such as: Who are the individuals more susceptible to misinformation? What determines such a vulnerability? This research employs a sample of Brazilian voters surveyed between May and June 2019, and it concludes that partisan preferences alone do not explain susceptibility to misinformation. The impact of partisanship on proneness to misinformation is moderated by analytical ability, need for cognition, and political knowledge. People with high levels of these attributes tend to be more capable of evaluating information through the lens of their political beliefs. Furthermore, the findings suggest that individuals with the highest trust in professional journalism may be less prone to misinformation.

Keywords: misinformation; partisanship; need for cognition; cognitive reflection text; political knowledge

Introduction[2]

Information disorders are a threat to democracy because they can undermine its foundations. If under normal conditions, the average person cannot evaluate political issues in line with their real interests (Converse, 1964; Gilens, 2001), imagine how distorted these judgments might be when wrong beliefs are predominant. For instance, how bad will people's evaluations of the public policies or institutions typical of the democratic state be if they make them based on misconceptions? People do not think or process information evenly (Chaiken, 1980; Kahneman, 2013). Therefore, in circumstances of viral propagation of inaccurate information, which individuals would be more likely to believe falsehoods? What would determine such a vulnerability?

There is an increasing number of studies on this topic in political science, especially considering the case of the United States. Findings have consistently shown that

partisanship plays a significant role in shaping people's susceptibility to misinformation (Kuklinski et al., 2000; Berinsky, 2017; Min, 2021; Motta, 2021). Nevertheless, a point to be raised is what would the picture be like in a circumstance in which political parties are of little relevance, and the party system is not strongly institutionalized – as is the case in Brazil (Carreirão; Kinzo, 2004; Samuels, 2008; Carreirão, 2014; Samuels; Zucco, 2018)? Much of the partisan effect on the proneness of misinformation is associated with the level of polarization (Zollo et al., 2015), and social media can exacerbate such antagonism (Tucker et al., 2018). However, in ideological terms, there is no empirical confirmation of this kind of polarization in Brazil (Borges; Vidigal, 2018). On the contrary, the evidence suggests an affective polarization (Fuks; Marques, 2023), with Brazilians showing sympathy or aversion toward the Workers' Party (PT – Partido dos Trabalhadores). This is commonly referred to as *petismo versus antipetismo*[3] (Samuels; Zucco, 2018).

At least in the last three decades, the political disputes in Brazil have been all about the PT, supporting or rejecting it. This refusal of the PT can also be taken as what is called negative partisanship in the American case (Abramowitz; Webster, 2018). It is worth mentioning that the level of animosity toward a specific political party likewise impacts attitudes and behaviors (Caruana; McGregor; Stephenson, 2015; Haime; Cantú, 2022).

Specific worldviews can exert a powerful influence on cognition and behavior (Koltko-Rivera, 2004). Still more, endorsing misinformation has a lot to do with previous motivations, especially political ones (Lewandowsky et al., 2012). Thus, from these situational and dispositional environments, this research primarily tests whether partisan preferences (*petismo* and *antipetismo*) determine the susceptibility to misinformation among the Brazilian electorate.

In this framework, one must consider that some cognitive traits reinforce the personal ability to link new data to their political tendencies (Carl, 2015). An example is people with high analytical capacity (Kahan et al., 2017). Another might be the need for cognition because such an attribute is associated with deep thinking (Cacioppo; Petty, 1982). Yet, more strongly linked to political reasoning is the degree of political knowledge (Kam, 2005). People knowledgeable politically are greatly inclined to analyze new information under the lens of their political likings (Taber; Cann; Kucsova, 2009; Miller; Saunders; Farhart, 2016). Do these variables moderate the impact of partisan preferences on vulnerability to misinformation?

Still in the individual's perspective, the level of trust in information sources plays a relevant role in information processing (Nyhan, 2020). With a constant and overwhelming influx of political content on the internet, distinguishing between truth and falsehood requires significant effort. The origin and credibility of information sources heavily influence how people evaluate them. In this environment of limitless information sources, traditional journalism is generally perceived as more trustworthy than other sources (Daniller et al.,

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[3] *Petismo* is the name of the movement in support of the PT. *Antipetismo* is the opposition to *Petismo*, a movement of people who reject everything about the PT.

2017). Consequently, are the individuals who place a high degree of trust in professional journalism less likely to fall prey to misleading information?

This article addresses these issues using a national non-probabilistic sample of the Brazilian electorate surveyed between May and June 2019 (Turgeon et al., 2019). More than eight thousand adults over the age of 18 were recruited, being people from all social strata who had the habit of accessing social media at least once a month – and agreed to participate in the research.

Statistical analyses of these data indicate that partisan preferences (*petismo* and *antipetismo*) in isolation do not explain someone's tendency to be misinformed. However, the effect of partisan preferences on the susceptibility to inaccurate information seems to be moderated by analytical capacity (measured by the Cognitive Reflection Test - CRT), need for cognition (NFC), and the amount of political knowledge (PK). If someone is more analytical, high in NFC, and politically knowledgeable, they will be more prone to evaluate information based on political bias. It suggests that for individuals with such a profile, the political usefulness of content may matter more than its precision. Besides, results indicate that those who rely more on professional journalism can be less inclined to be misinformed.

What is misinformation?

Misinformation can occur due to failures in processing information – when someone processes factual content mistakenly (Marsh et al., 2016) – or because of endorsement of *information disorders*[4] (rumors, fake news, disinformation, mal-information). A misinformed person firmly holds wrong beliefs, acts politically based on them, and resists facts when they contradict their beliefs (Kuklinski et al., 2000). In summary, misinformation arises when individuals accept inaccurate information, leading to the adoption of delusive convictions that can strongly impact their attitudes and behaviors.

In a political setting, misinformation undermines democracy as it impedes citizens from being adequately informed (Pereira; Harris; Bavel, 2018). Still worse, misinformed individuals are unaware of the mistakes made by political leaders (Hochschild*;* Einstein, 2015). It is a personal lapse that is highly likely to spread among the masses and proliferate in environments with a high level of political polarization (Zollo et al., 2015). According to Zollo and co-authors, the more misinformed people are, the more fertile the atmosphere for radical antagonism to run rampant.

An aggravating factor is that misinformation has a continuous effect, regardless of debunking attempts (Lewandowsky*;* Van Der Linden, 2021). Once set in memory, its implications for individual inferences are almost unquenchable, even if there is a provision of truthful information at some point afterward (Johnson*;* Seifert, 1994; Lewandowsky, 2020). Something almost subversive is that misinformed people can make decisions

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[4] For more on this concept, see Lazer et al., 2018; Wardle and Derakhshan, 2018.

contrary to their own interests and are more politically active (Hochschild; Einstein, 2015).

What makes misinformation a much more complex problem is that misinformed people rarely are willing to accept correction (Nyhan; Reifler, 2010). For many, admitting correction is conflated with compromising their identity (Clarke, 2002) and threatens their feeling of belonging (Jost, 2017). Often, accepting correction of an erroneous belief will mean breaking long-term social bonds (Hochschild; Einstein, 2015). There are always specific motivations inducing ratification or refusal of newly received messages (Kunda, 1990). Generally, it is not the truth that matters, but how pieces of information confirm pre-established views (Nickerson, 1998).

In this dynamic, political preferences play a substantial role (Van Bavel; Pereira, 2018). This makes sense because partisanship has to do with affective settings (Greene, 1999); it is a psychological link with some political party (Dalton; Weldon, 2007). Furthermore, having a political side often means submitting thoughts, decisions, and evaluations of the most diverse assortment of contrivances to partisan inclinations (Campbell et al., 1980; Zaller, 1992; Bartels, 2002; Gerber; Huber; Washington, 2010).

As a consequence, if inauthentic information is relevant to political disputes, a partisan person can use it as weaponized or incendiary rhetoric, even if they know the information is false (Hochschild; Einstein, 2015; Lewandowsky, 2020). Individuals favor their own groups in the face of rival causes (Greene, 1999). Partisanship can have damaging outcomes that are challenging to reverse, even with copious amounts of factual information to eventually discredit it (Bartels, 2002). Political preferences reduce the cost of information (Jones; Hudson, 1998), working as a shortcut to facilitate interpretation in a way consistent with prior beliefs.

But the extent to which political parties are relevant can vary considerably from one country to another. In some countries, they are vital; in others, they are irrelevant. In general, parties matter more in developed nations, where party systems are vigorously institutionalized (Mainwaring; Torcal, 2006). There is also a denial orientation, even in countries where identification with a party has been guiding political life. According to Abramowitz and Webster (2018), it is negative partisanship, or, in the American scenario, "individuals line up against one party instead of affiliating with the other" (p.119). This party anti-orientation also can influence citizens' political attitudes (*idem*).

Negative partisanship has been an important variable that politically orients voters in Latin America (Brazil included), and it is a personal characteristic that distinguishes them from nonpartisans (Haime; Cantú, 2022). Brazil, especially, has been a case where political parties have not been prominent for too many people (Carreirão; Kinzo, 2004; Samuels, 2008; Carreirão, 2014). To be sure, the Brazilian party system is not stable, and is not a long-term institution (Fleischer, 2007). Conversely, there is a claim that since the beginning of re-democratization in the 1980s, the political disputes in Brazil have been centered on the approval or rejection of the Workers' Party (Samuels; Zucco, 2018).

Such polarization cannot be classified as ideological, but as an affective[5] antagonism (Fuks*;* Marques, 2023) – at least until 2018, when Jair Bolsonaro ascended as a conservative leader (Borges; Casalecchi; Rennó, 2020). Despite this movement around President Bolsonaro, Borges, Casalecchi and Rennó also point to anti-Workers' Party attitudes, known in Brazil as *antipetismo,* as a foundational component of this new right-wing orientation in Brazil.

Petismo versus *antipetismo* can be a *sui generis* example of this kind of political dispute because *antipetismo* is not a political party but a heterogeneous and emotional phenomenon, in which the common tie is the rejection of anything linked to the PT. And, as discussed, endorsing information disorders also has much to do with affective connections. This is a relevant variable to explain one's susceptibility to misinformation. Therefore, bearing in mind the general importance of the PT for Brazilian political contests and this potential to ignite more emotive disputes, this article tests the following hypothesis: (**H1**) *support or rejection of the PT explains susceptibility to political misinformation*. Depending on how some political issue is attached to the PT, more or less likely to be misinformed a partisan person will be. For instance, it is expected that an *antipetista*[6] is more likely to be misinformed about the Bolsa Família Program (BFP) – an asset of *petismo*. It could be that the feeling of disapproval toward the PT induces a wrong belief about this policy. By contrast, a *petista*[7] is less likely to be misinformed about the BFP.

Of course, people are not homogenous, and many may have better cognitive skills to distinguish false content from factual or empirical truth. There are, for example, people with a greater "need for cognition" (NFC), or "chronic thinkers" (Cacioppo*;* Petty, 1982); such a trait surely shapes the way individuals process information. Someone high in NFC has the intrinsic demand to think more, feels happy with challenges to their mind and prefers to face complex situations with reasoning (Cohen; Stotland; Wolfe, 1955; Suedfeld*;* Tetlock, 2001). According to Cohen and co-authors (*idem*), when there is not enough data to fill the need for in-depth scrutiny, frustration emerges, possibly blocking the effects of NFC.

Partisan individuals' judgments, including their support of or opposition to public policies, can be affected by NFC (Bullock, 2011). Bullock's findings show that a Democrat with a high NFC (compared to one with a low) favors liberal policies more than conservative ones. The reverse is true of Republicans. In terms of public security policies, high NFC is negatively associated with punishment among less authoritarian people, however positively among very authoritarian ones (Tam; Leung; Chiu, 2008).

Thus, it is reasonable to think that people who are high in NFC may be the ablest to evaluate information through the lens of their political preferences. From this

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[5] For more on this subject, see Iyengar et. al, 2019.
[6] A nickname given to people identified with the *antipetismo*.
[7] A nickname given to people identified with the *petismo*.

perspective, I outline hypothesis (**H1a**): *the need for cognition will moderate the effect of partisan preferences regarding the vulnerability to misinformation*. For instance, if a person is a petista and high in NFC, she/he might be less likely to be misinformed about the BFP because she/he is more capable to see that policy as an asset of the PT. The opposite can happen for an antipetista who is also high in NFC, exactly because of their expected ability to better link the BFP to the PT government.

Another personal trait frequently studied in information processing is analytical capacity (measured by the Cognitive Reflection Test – CRT). It is an attribute related to decision-making and impulsiveness in the evaluation of information (Thomson*;* Oppenheimer, 2016). Individuals with low CRT scores interpret new messages based mainly on intuition, while those with high scores can perceive information nuances (Frederick, 2005). This cognitive peculiarity, though, reinforces ideological links (Carl, 2015; Kahan et al., 2017). Considering this, I propose the following hypothesis (**H1b**): *analytical capacity similarly will moderate the effect of partisan preferences regarding the vulnerability to misinformation*.

Evidence suggests that political sophistication greatly matters for shaping political opinion (Kam, 2005). Thinking exclusively in terms of misinformation, this variable tends to impact susceptibility to it (Nyhan*;* Reifler, 2010). Consequently, I can presume an additional hypothesis (**H1c**): *political knowledge will moderate the effect of partisan preferences regarding the vulnerability to misinformation*. Politically knowledgeable people also manage to have a greater capacity to evaluate information in harmony with their political predilections (Taber; Cann; Kucsova, 2009).

Accepting or not a piece of information likewise depends on trusting the source. This can be the strength or weakness of the message and affects how much someone will pay attention to any content (Halpern et al., 2019). For this reason, I include trust in professional journalism as a control variable. The idea is to test a research question of whether trust in journalism can prevent individual susceptibility to misinformation. Journalism has been losing credibility, but compared to other sources of information, it tends to be more trustworthy (Daniller et al., 2017).

Data

This article uses an original database (Turgeon et al., 2019) with data about sensitive issues in Brazilian politics. I chose themes that have been highly relevant in the political debates in the last two decades: the direct conditional cash transfer program known as Bolsa Família (BFP), the voting machine system (VM), and the tax burden (TX). These topics were chosen due to the ardent controversies underlying them, mainly the BFP and the VM.

Despite being a public policy already accepted and defended even by opponents of the PT, before its consolidation the BFP was a constant target of lies and misinformation.

An example is the rumor that circulated on social media saying that poor women with kids intentionally were seeking to be impregnated in order to receive more money from the BFP.

The controversy over electronic voting machines does not have the same long history. The issue gained notoriety when then candidate for president Aécio Neves, who faced with defeat in the 2014 presidential race against Dilma Rousseff, challenged the validity of the electoral process and its outcome. Such conspiracy theories about the electoral process gained even greater force in recent years as former president Jair Bolsonaro has similarly cast doubts on Brazilian elections and its technologies.

In the 2018 election, a rumor circulated on social media that the electronic voting machines used at the polls had been manufactured in Venezuela and were rigged to produce an unfavorable result for Bolsonaro. The Superior Electoral Court (TSE, in Portuguese) issued a note refuting this false information (Available at: <https://bit.ly/3imnooX>[8]). Therefore, I believe that such political/emotional connotations and the broad reach of these topics (BFP and voting machines) are good subjects for such analyses. The issue of tax burden is a more neutral matter that I do not expect to be of great consequence to the present work.

Data collection was carried out between May and June 2019. The sample was nationally representative and non-probabilistic, with more than eight thousand Brazilians over the age of 18 recruited as respondents. People from all social strata who used social media at least once a month and agreed to participate in the research were selected. Participants answered questions about their media consumption, political knowledge, political attitudes, party identification, and demographics. Moreover, there were batteries of questions about the CRT and that aimed to measure NFC.

Methodology

To test the hypotheses, I used OLS regression models[9]. The dependent variable is *misinformation*. Specifically, part of the participants (n = 2346) received a correct piece of information regarding the BFP: "*Families that received Bolsa Família benefits had fewer children than average in Brazil between 2003 and 2013*"[10]. A second subset (n = 2267) read factual information about voting machines: "*Various countries other than Brazil use electronic voting systems*"[11]. Finally, the third subset (n = 2279) read the following factual text about the tax burden: "*Compared to the Organization for Economic Cooperation and Development (OECD) member countries, Brazil is the country that charges the least in*

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[8] Accessed on: July 21, 2019.
[9] The descriptive statistics for the variables in the model are in Table A of the Appendix.
[10] Source: "Pesquisa Nacional por Amostra de Domicílios – PNAD – 2015". Available at: <https://bit.ly/3Yzk7bf>. Accessed on: July 10, 2019.
[11] Source: The Brazilian Electoral Court (Tribunal Superior Eleitoral – TSE). Available at: <https://bit.ly/3DW4O31>. Accessed on: July 15, 2019.

taxes"[12].

After reading the factual information, they answered the question: "in your opinion, how likely is this to be true?" The response options were "not likely at all", "not very likely", "somewhat likely", and "very likely". Those who answered "not likely at all" were considered more prone to be misinformed, and those who said "very likely" were considered less inclined. Finally, to facilitate analyses, I added up these answer options and recoded them as a continuous variable, from 0 (informed) to 1 (misinformed).

In other studies about misinformation, especially those in which correction strategies are tested, researchers present false information (often made up for the study) and check the acceptance of correction (Nyhan; Reifler, 2010). My goal is quite different: to evaluate people's knowledge of actual sensitive political issues. That is why I provided only exact information and measured how much people believed in its authenticity. It is a tactic like that used by Kuklinski et al. (2000).

Undoubtedly, numerous individuals might not be misinformed but, instead, be unfamiliar or unaware of the facts. However, due to the controversies around the BFP and voting machines, especially the former, false information about these subjects has circulated widely. Furthermore, many question or flat-out reject correct information because of party ties or for any number of dispositional and situational reasons (Lewandowsky et al., 2012). These conditions, as discussed, can lead to misinformation. Consequently, I believe that, for the purposes of this work, the strategy adopted here to measure propensity to misinformation is adequate.

I mainly estimate the effect of *partisan preferences* (*petismo* and *antipetismo*) on the chances of a Brazilian voter being misinformed. Nevertheless, I presume that the effect of partisanship on the likelihood of someone being misinformed will vary due to *analytical capacity* (measured by the CRT), the *need for cognition* (NFC), and the degree of *political knowledge* (PK). For this reason, I include interactions between these variables and those partisan inclinations in the models.

Given the specificity of Brazilian politics, I added three variables: *antipartisans* (people who dislike parties); *partisans* (those who identify or affiliate with a party); and *nonpartisans* (individuals who do not have a preferred party). I do not have many expectations regarding these variables.

It is essential to remember that my sample focuses on people who frequently access social media. Thus, among them, it is possible that those who trust more in professional journalism are less likely to be misinformed. To account for this, I also added *trust in professional journalism* as a control variable.

To measure *partisan preferences*, I operationalized some dimensions of partisanship and created a variable with three categories: *antipetismo*, *petismo*, and *other*.

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[12] Source: Organization for Economic Cooperation and Development (OECD). Available at: <https://bit.ly/45t4y7k>. Accessed on: Mar. 2, 2019.

The respondents were asked to express their feelings about some political parties[13] on a 10-point scale of support to those parties, where 0 means "I don't like it at all", 5 "I neither like nor dislike it", and 10 "I like it a lot". Likewise, they indicated their preferred party and the party they would never vote for.

Then, to classify *petismo*, I selected the participants who indicated that the PT was their preferred party, rated it higher than 5, and systematically and consistently ranked it above the others. For *antipetismo*, those respondents who reported that they would never vote for the PT, gave the party a score less than 5, consistently ranked the party below the others, and are not antipartisan. The remaining respondents were classified as *other*. From these restrictions, I got the measurement for *partisan preferences*, coded as *antipetismo* = −1, *other* = 0, and *petismo* = 1.

Concerning the other variables associated with partisan preferences, I considered as *antipartisan* those respondents who stated: "I don't have a preferred political party" and scored all the parties in the ten-point scale equal to 0 (I don't like it at all). On the other hand, I coded as *partisan* those who ranked all the parties above 5 and said that there is no party for which they would never vote. *Nonpartisans* are those who indicated NOT having a party of preference and who ranked all the parties above 5.

The variable *analytical capacity* is an adaptation to the Portuguese of five questions used in the CRT[14]. To operationalize it for the analyses, I added up all the answers and created a continuous range from 0 (intuitive) to 1 (analytical).

To measure the NFC, I have adapted to Portuguese five questions[15] from the battery created by Cacioppo and Petty (1982) to assess how much of a "chronic thinker" a respondent is. For example, if someone likes or does not like to solve complex problems; about the level of pleasure got from thinking; preference for daily or long-term projects; and if someone likes or dislikes having responsibility for handling situations that require lots of thinking. To get a unique measurement, I also added up all the answers and created a continuous range from 0 (low NFC) to 1 (high NFC).

For *political knowledge* (PK), I presented five questions about general political subjects, and participants who answered properly were taken as politically knowledgeable. For example, those who said the *Supremo Tribunal Federal* (Brazilian Supreme Court) is responsible for ensuring the constitutionality of a law. As with the other cases, I created from all the answers a continuous measure varying from 0 (little PK) to 1 (high PK).

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[13] The parties who launched candidates to President in the 2018 electoral races include: Partido dos Trabalhadores (PT), Movimento Democrático Brasileiro (MDB), Partido Social Liberal (PSL), Partido da Social Democracia Brasileira (PSDB), Partido Socialismo e Liberdade (PSOL), and Partido Democrático Trabalhista (PDT), in addition to Democratas (DEM) because it had the presidencies of the Chamber of Deputies (national legislature) and Senate.

[14] **(1)** If you are running in a race and you pass the person in second place, what place will you be in? **(2)** A farmer had 15 sheep and all except for 8 died. How many sheep are still alive? **(3)** Carlos' mother has three children. The first is named April. The second is named May. What is the third named? **(4)** How many cubic meters of dirt are in a hole that is 3 meters deep, 3 meters long, and 3 meters wide? **(5)** A bat and ball cost $1.10 in total. The bat costs $1 more than the ball. How much does the ball cost?

[15] The questions are available in detail in the Appendix.

Regarding the level of trust in journalism, the question was how much the respondents trust the news about politics produced by professional journalists. The answer is a four-item Likert scale that I similarly recoded to form a continuous scale of 0 (never trust) to 1 (trust).

Results

Firstly, the percentages of respondents considered more inclined to misinformation are in Figure 1 (note that the closer to 1 on the scale, the higher the probability of misinformation).

Paying attention to the extreme values in the scale, around 21% of participants tend to be more misinformed about the BFP (n = 2346, M = 0.6, SD = 0.2). Regarding the voting machine system, almost 15% of participants are more likely to be misinformed (n = 2267, M = 0.4, SD = 0.3). Finally, concerning the tax burden, the proportion of people prone to misinformation is much higher: close to 60% (n = 2279, M = 0.8, SD = 0.3). In general, the mean values show a steeper inclination to misinformation about the level of taxes paid by Brazilians and the BFP, respectively. In the case of the voting machines, the distribution shows a minor variance.

Figure 1
Percentage of Misinformation among the Respondents
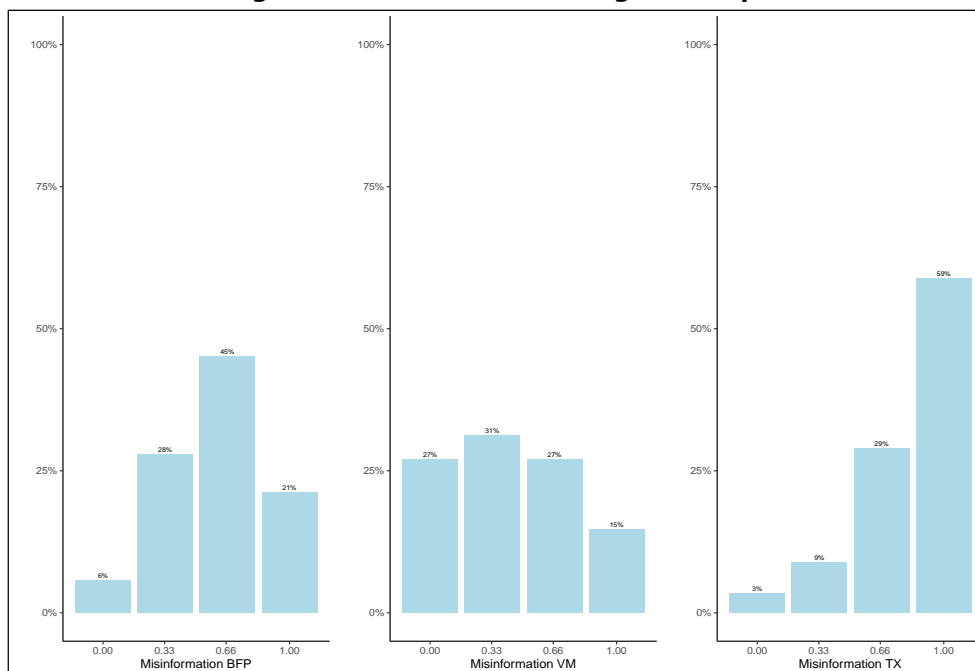
Source: Self-elaboration. Dataset prepared for this project (Turgeon et al., 2019).

The BFP is a public policy that is already a key part of Brazilian politics and a constant target of political vitriol, and the subject of heated debates and clashes. The controversy over electronic voting machines, however, does not have a history as extensive as the BFP. As mentioned, it emerged when the candidate for president in 2014, Aécio Neves, cast doubt on the election results. More recently, the rumors gained intensity when former president Jair Bolsonaro started to similarly speculate or conjecture that election results were unreliable and, allegedly, even rigged.

Concerning taxes, less rigor might be necessary to interpret the high percentage of propensity to misinformation. Taxation is a labyrinthine subject in Brazil, and even more complicated when compared to another country. It is difficult for most citizens to know the actual tax burden in their own country let alone assess or compare taxation in Brazil and other countries. Furthermore – except for those identified as the richest or wealthiest – few people are interested in this issue (Alm; Mcclelland; Schulze, 1992). The vast majority are more likely to be entirely uninformed and not simply misinformed.

Obviously, it is possible to criticize the measure of misinformation used here. However, when considering the trend pointed out by these results, the possibility that so many people are likely to be misinformed about substantial matters of Brazilian politics is a very concerning sign. So, it is necessary to advance in understanding the peculiarities of such a predisposition to misinformation.

In this sense, in terms of proclivity to misinformation, the expectation is that *petistas* will be less inclined to be misinformed about the BFP compared to *antipetistas* (as the program is one of the most notable and celebrated achievements of the PT's governance). The same result is expected for the voting machine coefficients (the PT has won many elections with this system and never doubted its reliability). Likewise, I believe that the effect of these partisan preferences regarding the chances of someone being or not being misinformed will be reinforced by the NFC, CRT, and PK. In isolation, I expect that those people who trust professional journalism the most will be less susceptible to misinformation than those who do not trust it.

Table 1 shows the results for the OLS regressions. The model for the BFP suggests that respondents who identify as *petista* are more likely to be misinformed compared to their *antipetista* peers. This is completely against what would be expected in terms of partisan preferences. As the BFP is an asset to the PT, if identification with *petismo* or *antipetismo* (without considering other factors) had any effect on the susceptibility to misinformation regarding that policy, the inclination should be in the opposite direction. Of course, sympathy with the PT does not mean that someone will be informed about policies linked to *petismo*, and there is a risk that my measure for *petismo* had not captured well how *petista* a person is. On the other side, considering the heterogeneous character of *antipetismo*, many *antipetistas* can be informed about the BFP. It is not possible to comment on the other models because of the lack of statistical significance.

Table 1
OLS regression models for susceptibility to misinformation

	Dependent variables		
	Misinformation BFP	**Misinformation VM**	**Misinformation TX**
Petismo	0.086**	-0.027	0.041
	(0.033)	(0.039)	(0.033)
Antipartisan	0.057***	0.045	0.006
	(0.022)	(0.028)	(0.022)
Partisan	-0.011	-0.037**	-0.013
	(0.015)	(0.018)	(0.014)
Non-Partisan	-0.004	0.060***	0.035**
	(0.015)	(0.018)	(0.014)
Analytical Capacity (CRT)	-0.041	0.076**	0.027
	(0.026)	(0.033)	(0.026)
Need for Cognition (NFC)	-0.078**	-0.044	-0.001
	(0.033)	(0.040)	(0.033)
Political Knowledge (PK)	0.002	0.185***	0.051**
	(0.021)	(0.027)	(0.022)
Trust in Journalism	-0.059**	-0.101***	-0.063***
	(0.023)	(0.029)	(0.023)
Petismo: CRT	-0.075*	0.057	-0.002
	(0.039)	(0.048)	(0.037)
Petismo: NFC	-0.097**	-0.040	-0.086*
	(0.047)	(0.055)	(0.047)
Petismo: PK	-0.060**	0.012	0.038
	(0.030)	(0.039)	(0.031)
Constant	0.694***	0.359***	0.789***
	(0.028)	(0.034)	(0.027)
N	2,210	2,134	2,122
R^2	0.025	0.055	0.012
		*p<0.1 **p<0.05 ***p<0.01	

Source: Self-elaboration. Dataset prepared for this project (Turgeon et al., 2019).

Individuals who hold an antipartisan stance, expressing a lack of affinity for any political party, are more prone to misinformation concerning the BFP compared to those who are not antipartisans. Considering Fuks, Ribeiro, and Borba's (2020) theorization, antipartisanship in Brazil has intensities, and part of the phenomenon has to do with the level of tolerance of the PT. It is possible that for those who are most intolerant, some political subjects intrinsically associated with *petismo* (or the PT's platform) might fall on deaf ears, which may be the case of the BFP. It is counterintuitive or contradictory to expect antipartisans who are highly intolerant of the PT to admit the accuracy or truthfulness of a piece of information considered an asset to *petismo* (future research would do well to contemplate this). Regarding the models for VM and TX, there is no statistical significance.

The coefficients for partisan respondents are statistically significant only in the model for VM and show that they tend to be less inclined to misinformation. As the great majority of the political parties do not cast doubt on the electoral system, this result is not a surprise. So, if someone is a partisan, it is more likely that they will not be misinformed

on this matter because they might have greater trust in and access to state institutions.

Non-partisans are more likely than their partisan peers to be misinformed about the voting machine system and taxation. Maybe not having a preferred political party makes someone less knowledgeable on such themes. Normally, parties are an important shortcut for processing political issues. It is possible that the electoral system and taxes are not relevant subjects for someone who does not identify with any party. Concerning the BFP, the coefficient is not statistically significant.

Keeping the rest constant, results from the VM model indicate that individuals with the highest CRT scores are more likely to be misinformed. Analytical individuals are best equipped to evaluate political issues through the lens of their preexisting beliefs, which tends to impact how they interpret political content. As for the other regressions, I cannot make any claims, as the effects were not statistically significant.

In relation to the need for cognition, note that the results indicate that people with more NFC are less likely to be misinformed about the BFP. As there is a lot of information available about the BFP, this element may fill the chronic thinkers' need to think more; thus, they may be significantly more likely to be informed about this issue. In the other models, no statistical significance was observed.

Finally, more political knowledge tends to increase the perspective of misinformation related to VM and TX. As discussed, PK is a strong variable for political thinking. This individual attribute therefore influences information processing. Perhaps accuracy is not the most important feature when politically knowledgeable people are evaluating a piece of information. It is possible that they consider how useful the content is for their political disputes. For the BFP model, the tendency is the same but lacks statistical significance.

Conversely, for all the models and keeping all other things constant, relying more on professional journalism implies a lower chance of misinformation. One can expect it really happens because, as mentioned, when compared to other sources of information, traditional journalism is considered more trustworthy.

Concerning the interactions, in the regression referring to BFP, keeping all the other things constant, as the CRT, NFC, and PK scores increase, respectively, the expectation of misinformation for participants identified with *petismo* decreases compared to those with *antipetismo* who are also high in those attributes. None of the other models achieves statistical significance.

In the case of the BFP, then, the coefficients suggest that the effect of these partisan preferences on susceptibility to misinformation is moderated by analytical abilities, the need for cognition, and political sophistication. These individual characteristics worked as if they were bringing things back to normality. After all, on average, it is more expected for *antipetistas* to espouse misinformation and misguided beliefs about the BFP than for a *petista*, because it is a public policy significantly associated with the PT. On its own, the effect of these partisan preferences was not in this direction.

Nevertheless, to improve the interpretation of interactions and increase the certainty of the results, I calculated conditional slopes[16] for the BFP and VM models[17]. In doing so, I tested the effect of partisan preferences (petismo and antipetismo) on the propensity to misinformation by setting CRT, NFC, and PK at the mean and at -1 and 1 standard deviation from the mean.

When CRT is 1 standard deviation below the mean (0.33), its impact on the effect of partisan preferences regarding misinformation about the BFP is not statistically significant. Contrarily, when setting CRT on the mean, the *petistas* are less likely to be misinformed than their *antipetista* peers (Est. = -0.03, S.E = 0.01, t val. = -3.4, p = 0.00). The same happens at 1 standard deviation (SD) above the mean (Est. = -0.05, S.E = 0.01, t val. = -3.7, p = 0.00).

Doing this operation for NFC, at 1 SD below the mean (0.65), is not statistically significant. When NFC scores are on the mean, *petistas* are less inclined to misinformation about the BFP than their counterparts (Est. = -0.03, S.E = 0.01, t val. = -3.4, p = 0.00). There is also such a moderation when setting the NFC scores at 1 SD above the mean (Est. = -0.04, S.E = 0.01, t val. = -3.6, p = 0.00).

Towards the variable PK, this tendency repeats. The effect is statistically significant only when the PK is set on the mean (0.49) and 1 SD above it, respectively (Est. = -0.03, S.E = 0.01, t val. = -3.4, p = 0.00; Est. = -0.05, S.E = 0.01, t val. = -3.9, p = 0.00). In other words, *petistas* with high scores of PK tend to be less prone to misinformation about the BF program than *antipetistas* with similar profile.

Consequently, there is evidence to support the hypotheses that the effect of partisan preferences (*petismo* and *antipetismo*) on the susceptibility to misinformation about the BFP is moderated by analytical capacity (CRT), NFC, and PK. It is naturally expected that the Workers' Party's (PT) partisans will be less likely to be misinformed about the BFP than *antipetistas*. However, this is only the case when *petistas* with the highest scores of CRT, NFC, and PK are compared with *antipetistas* who have the same profile.

Now, I calculate the conditional slopes for the interactions of the VM model. When the CRT scores are set at 1 SD below the mean (0.32), the *petistas* are less likely to be misinformed than the *antipetistas* (Est. = -0.05, S.E = 0.01, t val. = -3.4, p = 0.00). If they are set on the mean, the tendency is similar (Est. = -0.04, S.E = 0.01, t val. = -3.3, p = 0.00). However, when setting the CRT score at 1 SD above the mean, there is no statistical significance (Est. = -0.02, S.E = -0.02, t val. = -1.3, p = 0.36). This suggests that it is not possible to say that this effect is not distinguishable from zero, although the inclination is in the expected direction. Thus, I cannot accept with certainty that high analytical capacity shapes the effect of *petismo* and *antipetismo* on the likelihood an individual is misinformed or holds misguided beliefs about the voting machine system and

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[16] Long JA (2020). jtools: Analysis and Presentation of Social Scientific Data. R package version 2.1.0, <URL: https://cran.r-project.org/package=jtools>. Accessed on: Jan. 10, 2021.

[17] As taxation (tax burden) is a hard subject to the majority, I did not do the procedure for the TX model.

unfounded accusations of fraud.

Setting the NFC scores at 1 SD below the mean (0.65), there is no statistical significance (Est. = -0.02, S.E = 0.02, t val. = -1.34, p = 0.18). In the mean, *petistas* are less likely to be misinformed than *antipetistas* (Est. = -0.03, S.E = 0.01, t val. = -2.45, p = 0.01). The same happens at 1 SD above it (Est. = -0.04, S.E = 0.01, t val. = -2.34, p = 0.02). Therefore, it is possible to say that the need for cognition moderates the effect of *petismo* and *antipetismo* on the tendency to misinformation about the voting machines. *Petistas* high in NFC are less inclined to be misinformed than *antipetistas* also high in NFC.

For political knowledge, when the slope is set at -1 SD, *petistas* are less likely to be misinformed about the voting machine system than *antipetistas* (Est. = -0.03, S.E = 0.02, t val. = -2.01, p = 0.04). The same trend occurs in the mean (Est. = -0.03, S.E = 0.01, t val. = -2.45, p = 0.01); however, despite developing in the expected direction, it is not statistically significant at 1 SD above (Est. = -0.03, S.E = 0.02, t val. = -1.58, p = 0.18). In conclusion, the evidence suggests that *petistas* who have average political knowledge are less likely to be misinformed about the VM than *antipetistas* with the same profile. At 1 standard deviation above the mean, the estimate is not statistically significant, which impedes us to have certainty of the effect.

Discussion

The results reported in this article reveal a considerable propensity for misinformation among Brazilian voters concerning the BFP, voting machine system, and tax burden. However, differently from hypothesized, partisan preferences in isolation do not explain such a vulnerability. Purely being identified with the *petismo* or *antipetismo* does not imply a higher or lower probability of someone being misinformed on those politically sensitive subjects. In contrast, the findings suggest that the effect of partisan preference (*petismo* and *antipetismo*) on the susceptibility to misinformation is moderated by the degree of analytical capacity, the need for cognition, and political sophistication.

In general, for the great majority of people, being misinformed has nothing exclusively to do with liking or disliking the PT. In other words, among people who have identify or are sympathetic to the PT or those who reject it, only those who are similarly highly analytical, chronic thinkers, or politically knowledgeable seem to evaluate information as expected to someone who has those partisan preferences.

These findings reinforce the claim that the historical political polarization around the PT is not ideological for the mass public but might be an emotional antagonism. If ideological presuppositions structured information processing in a systematic way, one should expect that someone identified as *petista* would not to be misinformed about the BFP and the voting machines. The opposite would be expected for *antipetistas*. But this does not happen in isolation.

Theories about vulnerability to information disorders predict that the rhetoric

implicit in various political disputes dictates information usefulness. The most important consideration is not the accuracy of a piece of information, but how "good" it might be in the daily political contests. It is expected that political preferences matter to the political content processing. If it worked for the Brazilian political setting, it would not be strategic for an *antipetista* to endorse and for a *petista* to reject the authenticity of precise information concerning the BFP. In this hypothesis, there would be a contradiction in terms of political pragmatism.

In a more specific approach, there is no evidence that only partisan preferences (*petismo*) or negative partisanship (*antipetismo*) affect the susceptibility to misinformation among Brazilians. It does not work as it does in the United States, where political rivalries between the Democrats and Republicans usually impact the tendency to be misinformed (Clemm von Hohenberg, 2023). New research on this should test if the effect of partisan preferences is different for someone who merely likes a party and for those who are affiliated and engaged in partisan activities.

Hence, a more encompassing contribution of this article lies in its presentation of evidence, which proposes that, even within an environment of affective polarization, merely aligning with a specific side of this antagonism is insufficient to account for Brazilians' susceptibility to misinformation. Only partisans displaying elevated scores in crucial cognitive traits, coupled with political sophistication, demonstrate a propensity to interpret information through a partisan perspective. This framework should be taken into consideration in future studies.

Another contribution is related to possible strategies to face the problem. For all the regression models, keeping everything else constant, the coefficients suggested that people who have greater trust for professional journalism are less likely to be misinformed. It is an encouraging picture as a mechanism to curb misinformation. It is promising once it points to a filter when processing information. In a moment where many people access information on the Internet, maybe some strategy to face misconceptions is to highlight that the newsgathering process was carried out in a professional way. Of course, depending on the level of polarization, many might reject the source credibility, even if it is an established and trustworthy news company.

Despite the theoretical and empirical plausibility of these results, there are some limitations to this study. For instance, the themes addressed (especially the BFP and voting machines) are closely related to PT's terms in the Presidency of the Republic. Moreover, they are lively subjects in recent political clashes involving the PT as a central focus. Such a setting may have impeded verifying the Brazilian electorate's susceptibility to political misinformation.

Another weakness, as discussed earlier, is the measure of misinformation itself. There are, in truth, many false stories concerning the Bolsa Família and the voting machines circulating within Brazil. Many people can receive those fabrications as if they were correct information and become misinformed. However, it could also be that there is

no misinformation, but only ignorance about the topics. Also, as postulated, politically motivated reasoning interferes in the processing of information. As a way to correct this deficiency, to get some filter, it could be possible to design an experiment capable of measuring in advance the respondents' attitudes regarding the political objects under analysis.

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Appendix

Table A presents the descriptive statistics of the variables used to analyze the determinants of susceptibility to misinformation. In it, the minimum and maximum values, average, standard deviation, and the number of respondents per variable are broken down.

Table A
Variables used in the regression models

	Descriptive Statistics				
	Min.	**Max.**	**Mean**	**SD**	**N**
Antipetismo	0	1	0.290	0.453	7902
Petismo	0	1	0.170	0.376	7912
Antipartisan	0	1	0.087	0.281	7979
Partisan	0	1	0.308	0.461	7988
Non-Partisan	0	1	0.157	0.364	7965
Misinformation BFP	0	1	0.606	0.276	2346
Misinformation VM	0	1	0.432	0.340	2267
Misinformation TX	0	1	0.810	0.264	2279
Cognitive Reflection Test	0	1	0.322	0.228	7735
Need for Cognition	0	1	0.645	0.183	8032
Political Knowledge	0	1	0.484	0.279	8031
Trust in Journalism	0	1	0.498	0.254	8040

Source: Self-elaboration. Dataset prepared for this project (2019).

Questions for measuring the Need for Cognition (NFC)

(NFC-1) We would now like to discuss some characteristics that are primarily related to personality. Please respond to the following questions. Some people prefer to solve simple problems instead of complex ones. Other people prefer to solve complex problems instead of simple ones. What is your preference?
>(1) I always prefer simple problems.
>(2) Frequently prefer simple problems.
>(3) Slightly prefer simple problems.
>(4) No preference.
>(5) I slightly prefer complex problems.
>(6) Frequently prefer complex problems.
>(7) Always prefer complex problems.

(NFC-2) How much pleasure do you derive from thinking?
>(1) None
>(2) A little
>(3) A moderate amount

(4) A lot
(5) A great deal

(NFC-3) Some people prefer to think about small, daily projects. Other people prefer to think about big, long-term projects. What is your preference?

(1) I always prefer small, daily projects.
(2) Frequently prefer small, daily projects.
(3) Slightly prefer small daily projects.
(4) No preference.
(5) I slightly prefer big, long-term projects.
(6) Frequently prefer big, long-term projects.
(7) Always prefer big, long-term projects.

(NFC-4) How much do you like or dislike being responsible for handling situations that require lots of thinking?

(1) Dislike a lot
(2) Dislike
(3) Dislike a little
(4) Neither like nor dislike
(5) Like a little
(6) Like
(7) Like a lot

(NFC-5) After finishing a task that requires a lot of mental effort, do you feel more relieved than satisfied, or more satisfied than relieved?

(1) Much more relieved than satisfied.
(2) More relieved than satisfied.
(3) Slightly more relieved than satisfied.
(4) Relief and satisfaction to the same degree.
(5) Slightly more satisfied than relieved.
(6) More satisfied than relieved.
(7) Much more satisfied than relieved.

CARLOS OLIVEIRA

Resumo

Misinformação, preferências políticas e traços cognitivos: um olhar sobre o eleitorado brasileiro

Com objetivo de expandir a crescente literatura sobre misinformação para um contexto diferente dos países desenvolvidos, este artigo busca respostas para perguntas como: que tipo de pessoas são mais suscetíveis à misinformação? O que determinaria tal vulnerabilidade? Esta pesquisa usa uma amostra de eleitores brasileiros, ouvidos entre maio e junho de 2019, e constata que as preferências partidárias isoladamente não explicam a suscetibilidade à misinformação. O efeito das preferências partidárias sobre a propensão à misinformação é moderado pela capacidade analítica, necessidade de cognição e conhecimento político. Pessoas com altos níveis desses atributos tendem a ser mais capazes de avaliar uma informação através das lentes de suas crenças políticas. Os achados também sugerem que as pessoas que mais confiam no jornalismo profissional podem ser menos propensas à misinformação.

Palavras-chave: misinformação; partidarismo; necessidade de cognição; teste de reflexão cognitiva; conhecimento político

Resumen

Desinformación, preferencias políticas y rasgos cognitivos: una mirada al electorado brasileño

Con el objetivo de ampliar la creciente literatura sobre desinformación a un contexto diferente al de los países desarrollados, este artículo busca respuestas a preguntas como: ¿qué tipo de personas son más susceptibles a la desinformación? ¿Qué determinaría tal vulnerabilidad? Esta investigación utiliza una muestra de votantes brasileños entrevistados entre mayo y junio de 2019, y encuentra que las preferencias de partido por sí solas no explican la susceptibilidad a la desinformación. El efecto de las preferencias partidarias sobre la propensión a la desinformación está moderado por la capacidad analítica, la necesidad de cognición y el conocimiento político. Las personas con altos niveles de estos atributos tienden a ser más capaces de evaluar la información a través de la lente de sus creencias políticas. Los hallazgos también sugieren que las personas que más confían en el periodismo profesional pueden ser menos propensas a la desinformación.

Palabras clave: desinformación; partidismo; necesidad de cognición; prueba de reflexión cognitiva; conocimiento político

Résumé

Désinformation, préférences politiques et traits cognitifs : un regard sur l'électorat brésilien

Dans le but d'étendre la littérature croissante sur la désinformation à un contexte différent de celui des pays développés, cet article cherche des réponses à des questions telles que : quel type de personnes est le plus susceptible à la désinformation ? Qu'est-ce qui déterminerait une telle vulnérabilité ? Cette recherche utilise un échantillon d'électeurs brésiliens, interrogés entre mai et juin 2019, et constate que les préférences partisanes n'expliquent pas à elles seules la sensibilité à la désinformation. L'effet des préférences partisanes sur la propension à la désinformation est modéré par la capacité d'analyse, le besoin de cognition et de connaissances politiques. Les personnes ayant des niveaux élevés de ces attributs ont tendance à être mieux à même d'évaluer les informations à travers le prisme de leurs convictions politiques. Les résultats suggèrent également que les personnes qui font le plus confiance au journalisme professionnel peuvent être moins sujettes à la désinformation.

Mots-clés : désinformation ; partisanerie ; besoin de cognition ; test de réflexion cognitive ; connaissance politique