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Demographic factors influencing the sharing of fake news in Brazil: A multivariate and qualitative study

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This paper presents additional theoretical, qualitative, and empirical evidence to understand the profiles of Brazilian citizens that share political fake news online and their potential motivations. The study introduces exclusive data collection through a national telephone survey, a tailormade focus group, and quantitative multivariate modeling. The qualitative exploration exposed fake news sharing motivations such as social approval, attention attraction, or strong feelings. The empirical results show that income level (especially Brazilian middle class), religious preferences (mostly evangelicals), and online frequency of exposure to fake news are key profile drivers for sharing fake news.

Keywords: Fake news, politics, Brazil, misinformation, behavior, disinformation

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As van der Linden and Roozenbeek (2021) clearly state: fake news is everywhere. According to researchers Tandoc et al. (2018), fake news has rapidly become a catch-all phrase without a fully accepted working definition. As Mooney (2018) clearly presents, "fake news" was rampant during the 2016 presidential elections in the United States and has become a mainstay in headlines and opinion articles ever since, discussed alongside a range of issues, including corporate technology monopolies, the negative impact of social media, the viral spread of conspiracy theories, Russia propaganda, and online privacy. Accusations of spreading fake news have become a daily occurrence worldwide. From former US President Donald Trump accusing journalists and mainstream media of spreading "fake news" about him (Pengelly, 2017) to traditional communication vehicles tracking fake news spread by Mr. Trump and the German party AfD (*Alternative fur Deutschland*) returning to Nazi term *Lügenpresse* (lying press) to describe mainstream media.

Watson (2018) mentions that lexicographers from Merriam Webster identified the term “fake news” as early as the nineteenth century. Meneses (2018) notes that “fake news” does not have the same meaning as “false news.” The author argues that both have similar but never equal meanings. For Meneses (2018), the key difference is the intention with which the falsehood is produced and spread. False news is directly linked with journalistic error, lack of competence, and irresponsibility, while fake news is related to “false information” that is deliberately intended and intentionally misleading (Meneses, 2018). The author also concludes that false news has always existed, different from fake news, which has only gained prominence in the last 20 years. This change in the term’s meaning is the result of technological advancement, digitalization, and social media.

Baptista (2020) defines fake news as a type of online disinformation, with totally or partially false content, created intentionally to deceive and/or manipulate a specific audience, through a format that imitates news or reports, through false information that may or may not be associated with real events, with an opportunistic structure to attract readers' attention and to persuade them to believe in falsehood, aiming at increasing the number of clicks, shares, greater advertising revenue, and ideological gain.

However, there is no academic consensus on fake news. Farkas and Schou (2018) recall that President Donald Trump was the politician, especially during the White House race of 2016, who made the term popular. During this time, Mr. Trump consistently referred to most journalism that criticized him or his campaign as “fake news.” Farkas and Schou (2018) also emphasize that such constant repetition is a well-known propaganda technique. Grinberg et al. (2019) indicate that since the 2016 presidential election, fake news has been mostly used to promote ideologies or to make money in different parts of the world. The term was also catalyzed by the Cambridge Analytica Scandal in the United States, which brought popular awareness to political consultancies and data-driven campaign strategies that operated using social media as both a means of communication and a source of highly specific individual profiling. Estulin (2015) would classify fake news as the modern social engineering of the masses.

Nations around the world have experienced this phenomenon in different ways. While some such as the United States and the European Union have faced high levels of false information circulating on Twitter, other countries, such as Brazil and India, have

witnessed this phenomenon over encrypted messaging apps like WhatsApp and Signal (Bradshaw & Howard, 2019; Howard et al., 2018; Machado et al., 2018.; Marchal, 2018). It is understandable that the patterns of consumption of information are highly dependent on cultural aspects, including which social media platforms are most prominent in each country.

These issues have brought much attention from public opinion, media, and academia. The phenomenon is complex and inspires investigation from several disciplines, including law, sociology, economics, and psychology. Within the scope of this paper, we choose to focus on a specific aspect of misinformation and disinformation in Brazil, particularly measuring patterns of consumption. While certain disciplines differentiate between misinformation and disinformation, given our focus on understanding how the general public interprets "fake news," we will use both terms interchangeably.

This paper aims to understand what are the main profiles of Brazilian individuals who share political fake news, and are fully aware that it is false content. The main goal is to better understand how Brazilian public opinion sees fake news. The study applies an exclusive and primary data collection through a national telephone survey, a focus group, and a quantitative multivariate methodology outlined by Goyanes and Lavin (2018).

Inspired by the study conducted by Goyanes and Lavin (2018), the quantitative study replicated similar research questions focused on Brazil. Furthermore, we try to provide initial insights on the qualitative reasons behind sharing fake news based on the literature on fake news and psychology.

LITERATURE REVIEW

The Brazilian “Fake News” context

Macedo (2018) has concluded that in Brazil, the term “fake news” was popularized in 2018 during a highly disputed presidential election, which also involved the aggressive and often unethical use of online campaigning. “Fake news” involved both disputing hyperpolarized political narratives, as well as hoaxes and flagrantly false information circulated by candidates and supporters to favor or attack specific political parties.

Also, during this time, the then-presidential candidate Jair Messias Bolsonaro used his Facebook and Twitter pages as a platform to mobilize supporters, attack the

opposition, discredit the media and spread disinformation (Londoño, 2019). President Bolsonaro also made use of his social media to promote hyper-partisan websites that served as parallel information systems for his supporters.

This particular electoral context is fundamental for understanding current events in Brazil from a media and political information consumption perspective. President Jair Bolsonaro's strategic use of social media to dispute facts helped catalyze the hyper-polarization of Brazilian society. As information sources have become so intensely divergent, segments of society no longer agree on a baseline of specific facts, creating a social epistemic crisis (Benkler et al., 2018; Kalil et al., 2021). There are numerous legal, social, and political factors allowing for disinformation campaigns nationally.

Furthermore, Brazil has been an important testing ground for fake news campaigns and particularly innovative case in delivering disinformation and propaganda through private messaging platforms, especially WhatsApp (Dos Santos et al., 2019; Marés & Becker, 2018; Machado et al., 2019; Machado & Konopacki, 2018). Private messaging platforms offer an additional difficulty in detecting, measuring, and fighting misinformation because in many cases they operate through peer-to-peer encryption, which makes the content of the conversations inaccessible to third parties, including law enforcers and the service provider itself.

Moura and Michelson (2017) have shown that Brazilians very quickly and widely adopted WhatsApp. The app offered the possibility of sending text messages over a WiFi connection while having a very similar feature to mobile messaging communication. After WhatsApp was acquired by Meta (formerly known as Facebook), all the company's services were offered for free by the main Brazilian mobile telecommunications providers. Through sponsored data agreements with the operators, users had free use of its services, namely Facebook (the service), Instagram, and WhatsApp. These so-called "Zero-Rated" plans are still very common in Brazil and were not properly addressed by Brazil's Net Neutrality rule, established by a Presidential Decree in 2016 (Tribunal de Justiça do Distrito Federal e dos Territórios, 2015; Pereira, 2016).

Added to these regulatory provisions, Brazil had no data protection legislation in place by 2018, which was another determining factor for the success of fake news campaigns (Dos Santos & Varon, 2018). Platforms and political campaigns were able to

take advantage of user data to shape patterns of information consumption. According to Dos Santos et al. (2019) and Machado and Konopacki (2018), the sale of personal data to private companies and political actors catalyzed the uncontrolled use of social media for the dissemination of political content. Thousands of Brazilians had their data sold to campaigns, which then spread fake news through automated WhatsApp accounts and chains of app groups to broadcast their messages. Message transmissions did create a de facto means of broadcasting messages.

As a result, Facebook, which already had global prominence as a social media platform, was used by nearly all the connected Brazilians. In 2021, approximately 152 million Brazilians were connected to the internet (Brazilian Internet Steering Committee, 2021), of which over 90% were on Facebook's social media services and who spent an average of nearly four hours a day on social media, consuming information (GWI, 2021).

Numerous countries discuss legal solutions to hamper misinformation, especially by regulating social media internet service providers. Several countries around the world are faced with these challenges and discussions, including France, Germany, Brazil, Canada, India, Singapore, the United Kingdom, the European Union, and many others (Brant et al., 2021). From these statutes, there seems to be a consensus in legislators' minds that social media platforms should do more to tackle the issues of misinformation. At the same time, there still seems to be a significant demand for academic production to understand how internet users effectively consume information and form political opinions. And why individuals share fake news and who those individuals are.

Why do people share "Fake News?" An initial and exploratory discussion

The literature shows that the search for social approval or ambition to attract attention (Lee & Ma, 2012; Bright, 2016), content with emotional impact (Duffy et al., 2016), party and ideological beliefs (Marwick, 2018), or desire to inform "friends" are some of users' main motivations for sharing news. In addition, there is also a hypothesis of people consciously sharing fake news to create chaos or simply for fun (Vorderer et al., 2004).

Kim (2015) points out that human beings are interested in controversial, surprising, or bizarre subjects, which are the ones that motivate greater sharing by users. Fake news is mostly made up of sensational and controversial headlines, and its emotional language

can contribute to it being widely disseminated (Vosoughi et al., 2018). Content that encourages strong feelings (positive or negative) such as happiness, excitement, or anger is more likely to be shared (Harber & Cohen, 2005).

Another relevant psychological aspect is the "fear of missing out" (FoMO), related to a feeling of anxiety or psychological reaction that motivates users to try to reinforce their popularity in a certain group, seeking approval and the feeling of inclusion. FoMO can make people more vulnerable to sharing and spreading gossip (Talwar et al., 2019). Additionally, Kahan (2013), from a psychological perspective, found that analytical and intuitive thoughts can interfere with the evaluation of false and true information.

Based on the physiological research on fake news previously mentioned, it is possible to initially frame a theoretical approach to the incentives of sharing misinformation, as demonstrated below [following Mas-Colell et al. (1997)]:

$$Ub + Pb > Ic + Oc + RCc\ ,\ f(\pi arr)$$

Ub = marginal utility benefit of engaging in sharing fake news (social inclusion)

Pb = the psychological (self-determination bias and FoMO) benefits of engaging in sharing fake news

Ic = reputational cost of sharing fake news

O1c = the opportunity cost of sharing fake news

RCc = the reputational cost of being shut down by peers or other negative effects. This is a variable function of the probability of being shut down by peers and suffering other negative effects.

Hence, this initial framework presented above summarizes key elements from the revised literature: social approval, inclusion, emotions involved in sharing fake news, and the FoMo (fear of missing out). In summary, and simply, if the value of social inclusion combined with FoMo is greater than the sum of the reputational and opportunity cost, then there is a higher probability of individuals sharing fake news.

METHODS

As mentioned previously, the main questions of our study were based on the American study of Goyanes and Lavin (2018). Similar to the United States, Brazil is

increasingly facing the impact of fake news in elections, the misuse of social media, and negative social and political effects of misinformation. The overall goal of the original study was to identify the socio-demographic factors and predictors that potentially influence the probability of sharing political fake news through social media and chat platforms. For this purpose, we applied the initial five research questions defined by the authors mentioned above, which follow a stepwise process of adding additional variables to evaluate the change in magnitude and statistical significance of the estimates when including potentially omitted variables in the model. Following the same structure also facilitates comparisons between the results observed in the United States and in Brazil, which will be developed in the Discussion section. The quantitative and qualitative questions we will try to answer are:

1. Why do Brazilian citizens share fake news?
2. How can demographic and personal traits like gender, age, religion, education, political orientation, and socioeconomic class affect the likelihood of sharing political fake news online?
3. What is the effect of observing fake news online at a higher frequency on the probability of sharing fake news?
4. What is the expected effect of having unintentionally shared fake news previously on the likelihood of consciously sharing it?
5. What is the relationship between the likelihood of sharing fake news and the perception of responsibility for addressing the problem of fake news among the population (1), government and politicians (2), and social network platforms (3)?
6. What is the effect of the interaction between political orientation and gender?

For this article, two main sources of data were used. For the qualitative insights, a tailormade focus group was conducted exclusively with eight voluntary participants to gain qualitative and exploratory insights about the cognitive reasons behind sharing political fake news and insights to structure our empirical investigation. The process of building this particular focus group followed three major steps:

1. A target audience was defined: Brazilian eligible voters (over 16 years old) that verbally admit they had shared fake news before;
2. A group of professional focus group recruiters called a random national list of telephones (fixed and landlines) to apply a filter questionnaire (specially designed to identify these target individuals), and;
3. Those respondents that fully qualified to participate, based on the filter survey answers, were invited to join the focus groups.

Additionally, the recruiters managed to balance the gender of the participants (half women/half men). Some elements obtained were later tested in the quantitative research, since we understand the limitations of holding a small group and the lack of statistical representation of the broader Brazilian population.

Boydell et al. (2014) define a focus group as a qualitative research methodology where a moderator conducts an interview with a small group of participants to discuss certain topics and areas of interest defined by the researcher. With an exploratory approach, this technique has been commonly used by academic researchers, as well as private and public institutions for numerous purposes.

In addition, the authors expose that with the increasing use of technology in research methodologies, focus groups have also been conducted in virtual environments, staged on dedicated platforms that allow the moderator to guide the interview, foster discussion and participant engagement, and provide technical support whenever needed. For confidentiality purposes, participants usually sign non-disclosure agreements, and the results are shared with the researcher or contractor in the format of audio recordings and transcripts. Throughout the focus group, the researcher and other invited participants can watch the interview in an observation room, communicating directly with the moderator (Woodyatt et al., 2016). With the precautionary measures to control the spread of COVID-19, the focus group was conducted in a virtual format by a known local research institute named IDEIA (ideiausa.com/en) on May 26, 2021, with Brazilian voters who admit to having shared political fake news online. Demographically, participants represented different regions and socioeconomic backgrounds to gather a more diverse perspective on the reasons behind engaging and spreading political misinformation.

For our quantitative analysis, the study addresses the research questions with the data collected from a quantitative telephone survey (90% mobile and 10% landline phones) of 2,000 Brazilians conducted by the same research institute that conducted the focus group, IDEIA (ideiausa.com/en) with an estimated margin of error of +/- 3 percentage points. The data was collected between July 30 and August 12, 2021. The sampling was a two-step process as Fowler (2002) and Bussab and Morettin (2017) described. It was a random stratified sample of citizens 16 years old or older by gender, age, income, religion, and distribution across the five regions of Brazil. The full survey questionnaire can be found in Appendix A.

Finally, the multivariate model focused on the likelihood of sharing political fake news online as a binary dependent variable to produce an inferential analysis through a binomial logistic regression (logit). This model allows us to test the probability of a dichotomous outcome happening, obtaining as estimates the odds ratio of the variable of interest following the logistic model of $\ln P/(1 - Pi) = \beta Xi$ (Goyanes & Lavin, 2018; Sperandei, 2014). A logit model is a generalized form of a Linear Regression Model, being a good discriminant tool since it limits probabilities within 0 and 1 (0 and 100%), however, it assumes linearity between the dependent variable and the independent variables and can only be used to predict discrete functions (Greene, 2018).

RESULTS

Focus group on "why do people share fake news?" A qualitative perspective

As a summary of the conversation, Table 1 below presents questions and answers (with direct quotes) from the participants about key issues on sharing fake news. As an ethical protocol to preserve identity and privacy, the quotes are anonymous.

From Table 1 and the content of the discussions, we can extract some consistent qualitative information related to the act of sharing political fake news online: social pressure, anger, desire to inform friends, and other psychological motivations.

Interestingly, during the discussions, after acknowledging they had shared fake news with a group of unknown people, participants stressed the ignorance of spreading misinformation intending to inform other people, instead of actively and consciously doing it. Additionally, another factor that called our attention and is to be considered when

analyzing the cognitive reasons for sharing fake news is the personal cost of investigating and fact-checking information users face on social media. Participants suggested that the effort to validate false information online was too high.

Table 1
Focus group questions and participants' quotes

Questions	Sample Quotes
What are your sources of information about politics in Brazil?	• *"Mostly from **social media,** especially Facebook. And also from TV sometimes"* • *"I do discuss a lot of politics in my **WhatApp** groups. It is not as biased as getting news from TV"* • *"Direct from the web and from **WhatsApp**. All the papers and the Brazilian press have hidden agendas. We can not trust them"* • *"From my own research**: social media, WhatsApp and close friend**s. The press shapes the news and it is hard to follow"*
Do you believe the media publish fake news?	• *"If the press published it is because there is a fact behind it. However, **we know that they manipulate**"* • *"**Absolutely**"* • *"Sometimes it is **hard to believe** what I see on TV. Especially in politics. It is only bad news about certain people"* • *"It should not **but there is a lot of money involved** behind it"*
Do you believe that social media platforms publish fake news?	• *"**Yes**, but we have the power to control what we see"* • *"**Absolutely**, I trust much more content that comes from family, and friends via WhatsApp"* • *"**Fake news is everywhere**, no safe environment"* • *"Usually I think **Facebook has a lot of fake news.** But honestly, I am not a Facebook fan"*
Why do you share fake news?	• *"Sometimes it can really **help win a discussion**. We have corrupt politicians in Brazil"* • *"**Most of my friends do it**"* • *"**Only about politics**. Other topics such as making money, or the pandemic I would never do it"* • *"We never are 100% sure about the news, especially from TV. **If a friend is sharing, I do it as well**"*
Do you regret sharing fake news?	• *"**Yes**, I am getting better at checking my sources"* • *"**I was not fully aware of the consequences** at that time. I just wanted to spread the news"* • *"**Yes**, at the end of the day it just contributes to increased political polarization. Bad"* • *"It is hard to control but sometimes happens. **Not proud about that**"*

Notes. In the table above we have selected four quotes that we found best illustrated the different points of view. Focus group on May 26th, 2021, produced by the authors.

Finally, WhatsApp has been cited as the main platform to share false content, and most participants perceive fake news as a strategy instrumentalized by politicians to convey certain narratives and further polarize Brazilian society. However, more and deeper qualitative study is certainly necessary to validate or invalidate those initial insights.

Who shares fake news? A multivariate approach

For the quantitative model based on the research questions originally delimited by Goyanes and Lavin (2018), the analysis used the dependent variable as the likelihood of an individual consciously sharing political fake news on social media, which is derived from the answer to the following question “Have you ever shared a political news story online that you thought at the time was made up?", which could be "yes," "no," or "unsure." For the purpose of the analysis, the binary dependent variable was coded as 1 for individuals who answered yes, and 0 otherwise.

For our independent variables, we included demographic variables similar to the ones used by Goyanes and Lavin (2018), such as age, gender, and education, with an indicator of whether the respondent has at least completed high school (coded as 1 and 0 otherwise). Instead of income, we used socioeconomic status according to the Criteria of Economic Classification Brazil (CCEB) developed by the Brazilian Association of Research Companies (Abep, 2021). Hence, we created a binary variable for each socioeconomic group derived from the system of five letters from highest to lowest socioeconomic level in descending order (A, B, C, D, and E), which is ranked according to a point system that considers income, education, access to water services, and household possession of durable goods. We then grouped the higher class as "AB," the middle class as "C," and the lower class as "DE," which was the left-out group not included in the model.

Given the importance of religion in Brazilian political preferences, most of all due to the strong support of some evangelical voters associated with Bolsonaro's government, we also included a binary variable indicating whether the respondent was evangelical (coded as 1 and 0 otherwise) (Spyer, 2020). The choice of indexing the binary of religion on evangelicals was based on an evaluation of which religion generated the most significant differences in terms of results. Finally, we included political orientation as three binary variables indicating whether the individual self-identifies as aligned with the political left, center, or right. No political orientation was the left-out group from the model, in which the three variables were coded as 0.

To measure the frequency of observing political fake news online, participants answered the question "How often do you come across news stories online that you think are almost completely made up?", where higher frequency includes individuals who

answered "often" and "sometimes," as opposed to "never," "hardly ever," and "unsure." To measure the unconscious sharing of fake news, respondents were asked "Have you ever shared a political news story online that you later found out was made up?", answering "yes," "no," or "unsure." Finally, to measure the responsibility attributed to each group, participants answered "How much responsibility does each of the following have in trying to prevent made up (fake news) stories from gaining attention," separately for population, government and politicians, and social network (social media and Google), ranging from "no responsibility at all" (1), "not much responsibility" (2), "a fair amount of responsibility" (3), "a great deal of responsibility" (4) (Goyanes & Lavin, 2018).

Overall Survey Results

In the survey with 2,000 Brazilians, the most important demographic characteristics, such as age, gender, income, religion, and geographic region, were distributed according to the Brazilian population as previously mentioned and described by Bussab and Morettin (2017), aiming for a representative sample. Table 2 presents the main survey results. The complete results of the survey can be found in Appendix B.

Table 2 *Survey overall quantitative results*

Question	Alternatives	%
Have you ever shared a political news story online that you thought at the time was made up?	Yes	21
	No	76
	Unsure	3
How often do you come across news stories online that you think are almost completely made up?	Hardly ever / Never	22
	Sometimes / Often	74
	Unsure	4
Do you think the spread of so-called "fake news" is a serious problem?	Yes, very	79
	Yes, quite or fairly	15
	No	5
	Unsure	1
Do you check the news received on social media, the press, or acquaintances?	Always / Occasionally	42
	Rarely	23
	Never	35
Do you trust fact-checking agencies?	Yes	36
	No	40
	Never heard of fact-checking agencies	20
	Unsure	4

Source. Authors' own elaboration based on IDEIA's results from August 2021.

When asked whether respondents have ever shared political fake news online, being defined as the spread of false information, our dependent variable, 21% of Brazilians declared to have done it. Given that the act of spreading fake news can be socially perceived as negative, observing a share of 21% of self-declared participants who have engaged in such activity online is a significant result. In fact, this number is actually expected to underrepresent the true value, most of all due to social desirability bias, in which participants are expected to adjust their answers to what they consider more socially acceptable. This and other types of bias will be further explained in the limitations section together with other challenges of the present study.

Focusing on those who reported having shared fake news, 39% of the participants declared to have never corrected or clarified the information, while the same proportion of individuals declared to not have shared it from the moment they were aware that it was false. Still, 5% declared to have kept sharing information even after being fully aware of its falsehood.

According to the survey results, the spread of false information is perceived to be a severe issue by 79% of the population, and a majority share of 74% of the participants declared to come across fake news online on a regular basis (adding up the answers for "often" and "sometimes"). Nonetheless, the habit of fact-checking is clearly not as frequent. While 42% of the participants have declared to check information received either always or most of the time, there are 40% of the population that do not trust fact-checking agencies. In addition, the Brazilian press is considered to be the most responsible in terms of fake news prevention (64%), followed by the government and politicians (62%). Finally, as discussed and anticipated in the focus group, Facebook and WhatsApp are the social media platforms perceived to be the most impacted by fake news (64% and 61% respectively).

An exploratory correlation analysis anticipates relationships between the independent variables that will be addressed by the model analysis. As observed in Table 3, three demographic variables had statistically significant associations with the research variables at a 5% significance level, however, none of them indicates high levels of correlation, which would be values closer to one in terms of absolute value.

First, there is a positive association of socioeconomic status (classes A and B, upper class) with the attribution of public responsibility for fake news prevention, as well as government and politicians' accountability. For evangelical participants, a negative correlation with the attribution of responsibility on the three categories- public, government, and social media is registered. Lastly, respondents with higher levels of education demonstrated a positive association with observing fake news online at a higher frequency, and also with the population's accountability for fake news prevention.

Table 3
Correlation between independent variables (in absolute value ranging from 0 as low correlation and 1 as high correlation)

Variables	Fake News Frequency	Unnoticed Fake News	Resp. Population	Resp. Government	Resp. Social Media
Men	-0.013	0.002	0.036	0.042	0.014
Age	-0.046*	0.014	-0.051*	-0.038	-0.049*
Class AB (upper class)	0.043	0.015	0.083***	0.077***	0.049*
Class C (middle class)	0.036	0.050*	-0.008	-0.003	0.002
Right-wing	0.009	0.018	-0.026	0.002	-0.045*
Political centre	0.034	0.053*	-0.011	-0.013	-0.002
Left-wing	0.054*	0.026	0.051*	0.045*	0.040
Educated	0.064**	0.010	0.061**	0.049*	0.027

* p<0.1, ** p<0.05; *** p<0.01

Note. The table is an excerpt of our larger finding, highlighting the most relevant data. The abbreviations on the line above represent the frequency of participants who: identified fake news (Fake News Frequency); did not identify fake news (Unnoticed Fake News); and believe in the accountability of the population (Resp. Pop), of the government (Resp. Gov), or of the social media platforms and Google (Resp. SM).
Source. Authors' own elaboration based on IDEIA's results from August 2021

To evaluate for multicollinearity, we used the Variance Inflation Factor (VIF) between each regressor to calculate how much the variances of the estimates are potentially inflated due to the correlation with other variables. In this index, smaller values indicate no multicollinearity, and the threshold using a conservative approach is to

aim for results no greater than 5 (Akinwande et al., 2015). Results can be found in Appendix C and no VIF has exceeded such a threshold in our analysis.

Quantitative Outcome

A logistic regression was used to better understand what is behind the sharing of political fake news in Brazil and the demographic characteristics associated with higher chances of sharing political false information online. According to the original study published by Goyanes and Lavin (2018), the analysis includes five models, each introducing additional independent variables following the research questions previously outlined. For the purpose of this analysis, 66 observations were excluded from the model since survey participants declared to not be sure of having shared fake news.

The results of the multivariate analysis can be found in Table 4. Together with the logit coefficients (β = log-odds), we calculated the exponentiated coefficients (exp (β)) to facilitate interpretation. Negative coefficients or exponentiated coefficients smaller than the value of one (1) indicate that such a profile is less likely to share political fake news online than the reference profile (e.g. educated versus non-educated), so the fitted probability is therefore below 50%. In order to keep consistency, only estimates which are statistically significant at a 5% significance level will be interpreted.

The analysis provides information in two different aspects. First, focusing on each model we can interpret how much each independent variable is associated with the change in the expected log-likelihood of an individual sharing political fake news. Second, we can observe the variation of estimates when adding additional variables improving the model's predictive power measured, which is measured using Nagelkerke R^2 and Cox and Snell R^2 to verify the variance in the probability to share political fake news on each model.

In the first model, we began by regressing our dependent variable, the likelihood of sharing political fake news online, only on socio-demographic characteristics. At a 5% significance level, the estimates show a statistically significant association with middle-class individuals (class C), which are 49% more likely to share political fake news (β = 0.40; Exp = 1.49), as well as evangelicals, who are 32% more likely to share false information online (β = 0.28; Exp = 1.32). This suggests that individuals from what is known as the class C in Brazil, as well as evangelical supporters, both have a higher probability of sharing political fake news. Having a political orientation also seems to be

associated with greater chances of sharing fake news. The three options offered to participants- left-wing, political center, and right-wing- were statistically significant as compared to not having a defined political orientation, with centrists presenting an increase of 72% in the odds of sharing fake news (β = 0.54; Exp = 1.72), holding all else constant.

Table 4

Logistic Regression (logit) identifying the likelihood of sharing political fake news online according to demographic factors (independent variables)

Variables	Model 1		Model 2		Model 3		Model 4		Model 5	
	β	Exp(β)	β	Exp(β)	β	Exp(β)	β	Exp(β)	β	Exp(β)
Men	-0.14	0.87	-0.13	0.87	-0.14	0.87	-0.14	0.87	0.13	1.14
Age	0.01	1.01	0.01	1.01	0.01	1.01	0.01	1.01	0.01	1.01
Class AB (upper class)	0.23	1.26	0.18	1.20	0.03	1.03	0.03	1,03	0.02	1.02
Class C (middle class)	0.40**	1.49	0.36**	1.43	0.19	1.21	0.19	1.20	0.18	1.20
Right-wing	0.36**	1.44	0.34**	1.41	0.29*	1.34	0.29*	1.33	0.38	1.46
Political Centre	0.54***	1.72	0.50***	1.65	0.34	1.40	0.34	1.41	0.50	1.65
Left-wing	0.35**	1.41	0.31**	1.36	0.24	1.27	0.24	1.27	0.51**	1.67
Educated	0.05	1.05	0.03	1.03	0.07	1.08	0.08	1.08	0.08	1.08
Evangelical	0.28**	1.32	0.28**	1.32	0.34**	1.40	0.35**	1.42	0.34**	1.40
Fake News Frequency			0.60***	1.83	0.34**	1.40	0.33**	1.39	0.34**	1.40
Unnoticed Fake News					2.08***	8.00	2.08***	7.96	2.08***	7.98
Responsibility Pop.							-0.16	0.85	-0.16	0.85
Responsibility Gov.							0.23	1.26	0.23	1.26
Responsibility Social Media							0.06	1.07	0.06	1.06
Men * Right-wing									-0.26	0.77
Men * Political Centre									-0.37	0.69
Men * Left-wing									-0.72**	0.49
Constant	-2.06**	0.13	-2.50***	0.08	-2.90***	0.05	-3.02***	0.05	-3.11***	0.04
Observations	1,934		1,934		1,934		1,934		1,934	
Nagelkerke R2	0.02		0.04		0.25		0.25		0.25	
Cox and Snell R2	0.01		0.02		0.16		0.16		0.16	
Log Likelihood	-987.36		-977.97		-832.60		-831.70		-829.27	

Source. Authors' own elaboration based on IDEIA's results from August 2021.

The frequency with which citizens observe false information online, including the answers "often" and "sometimes," suggests that Brazilians who observe fake news online at a higher frequency are more likely to have shared political fake news (β = 0.60; Exp = 1.83). Additionally, having unintentionally shared fake news was the best predictor of whether an individual has consciously shared political fake news online. This new variable expressively increased the model's predictive power, with a Nagelkerke R^2 of 24.7% and a

Cox and Snell R^2 of 15.9%. Brazilians who have shared false information, only finding out later they were made up, are 88.9% more likely to share false political information deliberately (ß = 2.08; Exp = 8.00), holding all else equal. When introducing this variable, only the estimate for right-wing political orientation remained statistically significant, with right-wing voters facing an increase of 34% in the odds of sharing political fake news when compared to Brazilians without any declared political preference (ß = 0.29; Exp = 1.34).

Finally, investigating the interaction between political orientation and gender does not affect the model's predictive power or the previously highlighted variables, but it does generate an additional result. In the fifth model, by including the interaction between men and political orientation, we can see that left-wing Brazilian females are expected to face an increase of 67% in the odds of sharing political fake news online when compared to women without defined political preferences (ß = 0.51; Exp = 1.67). However, the effect is reversed for men. With a negative logit coefficient, left-wing men are expected to be less likely to share political fake news than women without political orientation (ß = -0.72; Exp = 0.49), with a probability smaller than 50%. Throughout the five models, demographic variables such as gender, age, class AB, and education were not statistically significant at any point, and neither were the variables of attribution of responsibility for preventing the spread of fake news.

DISCUSSION

From the quantitative analysis above, we observed that the profiles that are most likely to share political fake news online were evangelicals, middle-class individuals (class C), citizens who have a defined political orientation, those who observe fake news online at a higher frequency, and those who had inadvertently shared fake news in the past. When compared to the original results from Goyanes and Lavin (2018), we can see important differences and similarities.

In the American study, gender (women specifically) and income were both statistically significant variables in all models and negatively associated with the likelihood of sharing fake news. Therefore, women were expected to have a lower probability of sharing fake news, and the higher the income of an individual, the lower the

chances of fake news sharing. In our study, gender was not a strong predictor of such behavior, and the individuals from the middle class were indeed more likely to share fake news, potentially indicating some similarity between the two countries. However, the variable used in the original study was a continuous variable of earnings, while we used the socio-economic class since it is the standard used by the research market in Brazil (ABEP) and we understand it to be a more complete variable since it includes multiple other elements as well as income.

Age is a peculiar case. Although the magnitude of the estimates in all models is extremely similar (a ß around 0.01), our results were not statistically significant at a 5% significance level as the original results were. A similar pattern was observed with the responsibility attributed to the population in terms of preventing fake news stories from gaining attention, where both estimates were negative with a difference of only 0.03, however, our results were not statistically significant at a 5% significance level. Interestingly, while in our study having previously shared fake news inadvertently increased the probability of sharing fake news, in the original study, the effect was the opposite. Those individuals in the United States are less likely to share political fake news online.

By comparing the quantitative results, our study contributes to the understanding that individuals behave differently and have different perspectives and preferences in various contexts, although there can still be some similarities. The case of Brazil has the difference of adding the variable of religion, focused on evangelical supporters, since they constitute an important political group that has grown in size and influence in the past decades (Spyer, 2020). Moreover, it highlights the importance of combating and preventing the spread of fake news, since individuals who have shared fake news inadvertently are more likely to do so again even when doubting the veracity of the information, as well as those who observe such type of news at a higher frequency. Going further, the case of fake news in Brazil is also critical since 58% of the population has declared to never or rarely check the accuracy of news received, with 40% not trusting fact-checking agencies.

CONCLUSION

As demonstrated in the survey results, fake news is considered a serious issue by 79% of Brazilians, and 21% of the population claims to have shared it. Different cultures and countries might yield different cognitive behaviors for sharing fake news, as well as different associations between demographic variables and the likelihood of spreading political false information online. In the study conducted by Goyanes and Lavin (2018), gender and age were relevant characteristics for explaining the outcome variable in the United States, different than what we observed in the case of Brazil. Inadvertently sharing fake news was negatively correlated with the dependent variable, cases in which people were less likely to share political fake news online. On the other hand, in both countries income was negatively associated with the probability of sharing fake news, as well as the positive correlation between the frequency of which citizens observe fake news online and the chances of sharing political fake news.

Furthermore, part of the literature available shows that motivations behind sharing fake news have more numerous similarities cross border. Linden and Roozenbeek (2021) present different ways to combat the spread of fake news: adapting technology (machine learning and artificial intelligence) to identify fake news, improving professional fact-checking entities, emphasizing publishers' reputation on social media publications, and creating tutorial education through the whole education system. Given such a unique context, a better understanding of conditions, profiles, and reasons behind fake news is critical to building the solutions to face this increasing social global issue. This paper aims to include another element of these complex and ongoing demands of understanding different aspects of fake news.

CONSTRAINTS AND FUTURE RESEARCH

The present article faces several challenges, starting with the research topic itself. Despite fake news being a common practice nowadays and a trending concern in elections and politics around the world, its use as a technique of exerting power through information asymmetry dates back to even before the printing press (Burkhardt, 2017). Nevertheless, the understanding of its concept and use is still being assimilated by the mass society. In Brazil, there is an additional barrier to interpretation since the term is

commonly heard in English, without being properly translated. To avoid misleading respondents and biasing results, the survey questionnaire did not mention the specific term "fake news," referring to it instead as "news stories online that you thought at the time were made up," an aspect that might influence the precision of the information being collected.

In terms of the qualitative analysis and results, an anticipated limitation is the use of focus groups as a research methodology, most of all when organizing a single group with only eight participants. We are aware that insights extracted from focus groups cannot be generalized and that the common practice is to conduct at least three groups on a particular topic. Ideally, additional focus groups would be necessary to obtain more comprehensive qualitative research on the narratives around fake news and sources of information prior to the quantitative research that followed. In addition, even the conclusion from the quantitative analysis is limited to the context of Brazil, facing a problem of external validity as observed in the difference of results when compared to the initial US results.

Regarding the quantitative analysis, as reliable as the data obtained through the quantitative telephone survey is, following all the research standards and aiming to be as representative of the Brazilian population as it can be, self-declared responses impose additional limitations on findings. According to Bogner and Landrock (2016), survey responses might suffer from different types of biases, such as acquiescence when respondents tend to agree with statements, moderacy response bias when respondents choose categories in the middle or moderate responses regardless of the prompt, and extreme response bias when they tend to choose extreme options.

Most importantly, related to the research topic and dependent variable—likelihood of sharing political fake news online, answers might also be affected by a socially desirable responding behavior, also known as social desirability bias, in which respondents tailor their answers to what is socially expected or in a way to be positively viewed by others (Bogner & Landrock, 2016). This is particularly important when respondents self-report whether they have ever shared political fake news online since the numbers reported might be underestimating the true share of people who have ever shared fake news, consciously or not. However, it is reasonable to expect that this bias does not make our

analysis unfeasible, since the adjustment in language to ask the question, without explicitly mentioning "fake news," helps minimize the negative perception associated with it and reduces the likelihood of participants adjusting answers to what would be socially acceptable. Hence, it is possible to still draw conclusions and identify statistically significant demographic and other individual traits related to the self-reported information on sharing political fake news.

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Online Connections

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Appendix A

National Survey Questionnaire
July 30th and August 12th, 2021

QF.A. You live in the city of _____?
QF.1. What is your gender?
1. Masculine
2. Feminine

QF.2. What is your age?
1. 16-24
2. 25-34
3. 35-44
4. 45-59
5. 60 or older

Political Orientation
Q.01. How would you define your current political orientation? (Single answer)
1. Left/Center-Left
2. Center
3. Right/Center-Right
4. I no longer have a defined political orientation
5. I never had a political orientation
99. Unsure

Fake News
Q.02. Have you ever shared a political news story online that you thought at the time was made up? (Single Answer)
1. Yes
2. No
99. Unsure

Q.03. How often do you come across news stories online that you think are almost completely made up? (Single Answer)
1. Never
2. Hardly ever
3. Sometimes
4. Often
99. Unsure

Q.04. Have you ever shared a political news story online that you later found out was made up? (Single Answer)
1. Yes
2. No
99. Unsure

Q.05. [DID ANSWER YES] What was your reaction when you found out that the information shared was not true? If it happened more than once, select the option that was most frequent (Single Answer)

1. I sent a message warning that the information was not true along with the correct information
2. I just sent a message warning that the information was not true
3. I didn't send a warning, but I also didn't share the same information anymore
4. I kept sharing the information

99. Unsure

Q.06. How much responsibility does each of the following have in trying to prevent made up (fake news) stories from gaining attention." (Single Answer per category)

	A great deal of responsibility	A fair amount of responsibility	Not much responsibility	No responsibility at all	Unsure
Members of the public	1	2	3	4	99
Government (Federal, State, Municipal)	1	2	3	4	99
Politicians	1	2	3	4	99
Media/Press	1	2	3	4	99
Social networking sites (Facebook, Twitter, and search sites like Google)	1	2	3	4	99

Q.07. Do you think the spread of so-called "fake news" is a serious problem? (Single Answer)

1. Yes, very
2. Yes, quite
3. Yes, fairly
4. No

99. Unsure

Q.08. From which source are you MOST concerned about receiving fake news? (Single Answer)
1. Government, politicians, or political parties in my country
2. Government, politicians, or political parties from other countries (international)
3. People in general
4. Activists or groups of activists
5. Journalists or the press
6. Friends and family
7. Influencers/Celebrities
8. Scientists
9. I am not worried about it

Q.09. Do you check the news received on social media, the press, or acquaintances? (Single Answer)
1. Yes, always
2. Yes, occasionally
3. Yes, rarely
4. Never

Q.10. Do you trust fact-checking agencies? (Single Answer)
1. Yes
2. No
3. Never heard of fact-checking agencies
99. Unsure

Q.11. Do you share the news received by social media, the press, or people you know? (Single Answer)
1. Yes, always
2. Yes, occasionally
3. Yes, rarely
4. Never

Demographics
QF.3.: What is the highest degree or level of education you have completed? (Spontaneous and single answer)
1. No education
2. Elementary School
3. Middle School
4. High School
5. Higher Education

QF.4: How would you describe yourself in terms of race? (Spontaneous and single answer)
1. White
2. Black
3. Pardo (brown)
4. Yellow

5. Indigenous
98. Other

QF.5.: Please specify your religion. (Single answer)
1. Catholic
2. Protestant / Evangelical
3. Spiritist / Kardecist
4. Umbanda / Candomblé / African Cults
5. Buddhist / Shinto
6. Atheist
7. No defined religion / I have my own spirituality
8. Other
9. None

QF.6.: Finally, adding your income with the income of all the people who live in your house, that is, adding salaries, pensions, informal jobs, etc., of all residents, which of the following ranges best represents the total household income per month approximately? (Single answer)
1. Up to R$ 600
2. Between R$ 600,01 and R$ 1.200,00
3. Between R$ 1.201,01 and R$1.800,00
4. Between R$ 1.800,01 and R$ 3.600,00
5. Between R$ 3.600,01 and R$ 7.200,00
6. Between R$ 7.200,01 and R$ 12.000,00
7. More than R$ 12.000,00
95. No income
96. Unsure
97. No answer

Appendix B

Survey Results

Table 5. *Demographic data*

Question	Alternatives	%
What is your gender?	Masculine	47
	Feminine	53
What is your age?	16-29	23
	30-39	23
	40-49	19
	50 or older	35
How would you define your current political orientation?	Left/Center-Left	23
	Center	10
	Right/Center-Right	22
	I no longer have a defined	10
	I never had a political	32
	Unsure	4
What is the highest degree or level of education you have completed?	No education	11
	Middle School	31
	High School	42
	Higher Education	17
How would you describe yourself in terms of race?	White	43
	Black / Pardo (brown)	56
	Yellow	1
	Indigenous / Other	0
Please specify your religion.	Catholic	50
	Evangelical	31
	Other religion	8
	No religion	12
Socioeconomic Class	A/B	31
	C	46
	D/E	20
	Unsure / Undefined	3
Region	North	8
	Northeast	27
	Southeast	43
	South	15
	Center-West	8

Source. Authors' own elaboration based on IDEIA's results from August 2021.

Table 6.
Quantitative results

Question	Alternatives	%
Have you ever shared a political news story online that you thought at the time was made up?	Yes	21
	No	76
	Unsure	3
How often do you come across news stories online that you think are almost completely made up?	Hardly ever / Never	22
	Sometimes / Often	74
	Unsure	4
Have you ever shared a political news story online that you later found out was made up?	Yes	25
	No	72
	Unsure	3
[DID ANSWER YES] What was your reaction when you found out that the information shared was not true?	I sent a message warning that the information was not true along with the correct information	24
	I just sent a message warning that the information was not true	29
	I didn't send a warning, but I also didn't share the same information anymore	39
	I kept sharing the information	5
	Unsure	3
Do you think the spread of so-called "fake news" is a serious problem?	Yes, very	79
	Yes, quite or fairly	15
	No	5
	Unsure	1
From which source are you MOST concerned about receiving fake news?	Government, politicians, or political parties in my country	31
	Government, politicians, or political parties from other countries (international)	2
	People in general	21
	Activists or groups of activists	4
	Journalists or the press	14
	Friends and family	11
	Influencers/Celebrities	1
	Scientists	5
	I am not worried about it	11

Question	Alternatives	%
Do you check the news received on social media, the press, or acquaintances?	Always / Occasionally	42
	Rarely	23
	Never	35
Do you trust fact-checking agencies?	Yes	36
	No	40
	Never heard of fact-checking agencies	20
	Unsure	4
Do you share the news received by social media, the press, or people you know?	Always / Occasionally	16
	Rarely	32
	Never	49
	Unsure	3

How much responsibility does each of the following have in trying to prevent made up (fake news) stories from gaining attention."

	A great deal of responsibility	A fair amount of responsibility	Not much responsibility	No responsibility at all	Unsure
Population	54	21	13	9	3
Government (Federal, State, Municipal)	62	14	12	9	3
Politicians	62	12	13	10	3
Media/Press	64	14	13	7	2
Social networking sites (Facebook, Twitter, and search sites like Google)	56	18	14	8	4

Source. Authors' own elaboration based on IDEIA's results from August 2021

Appendix C

Variance Inflation Factor (VIF)

Table 7.

Variance Inflation Factor (VIF) per variable and model

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Men	1.068	1.072	1.069	1.072	2.542
Age	1.059	1.061	1.06	1.064	1.076
Class AB (upper class)	2.123	2.133	2.126	2.133	2.139
Class C (middle class)	1.933	1.945	1.924	1.925	1.931
Right-wing	1.281	1.285	1.269	1.277	2.855
Political Centre	1.171	1.174	1.164	1.166	2.794
Left-wing	1.229	1.233	1.229	1.229	1.933
Educated	1.209	1.214	1.225	1.226	1.229
Evangelical	1.055	1.054	1.056	1.083	1.088

Source. Authors' own elaboration based on IDEIA's results from August 2021.