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Congressmen in the age of social network sites: Brazilian representatives and Twitter use by Francisco Paulo Jamil Almeida Marques, Jakson Alves de Aquino, and Edna Miola

Abstract

This paper investigates the factors that influence how members of the Brazilian House of Representatives adopt Twitter as part of their political communication strategy. Our intention is to understand the main variables that lead legislators to invest time and resources in microblogging. This quantitative study examined all of the 457 official congressional accounts registered on Twitter. These accounts were monitored weekly between February 2012 and February 2013. After empirically exploring the data, this work reflects on the results thanks in part to an examination of the literature on the intersection of the Internet and politics. The results indicate correlations between the use of Twitter and attributes like age and occupation of leadership positions.

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1. Congressmen and social network sites

Over the last decade, political agents and institutions have been continuously provoked into considering the possibility of adopting digital media to achieve a greater closeness to citizens. The intention is to make the most of the convenience offered by these media to reinforce the legitimacy of contemporary democratic practices (Blumler and Gurevitch, 2001; Coleman, 2004; Chadwick, 2006; Norton, 2007; Dai and Norton, 2007; Leston-Bandeira, 2012). The expectation is that:

On the one hand, eParticipation will expand citizens' forms of participation from voting to more detailed input on particular policy issues ... [...] On the other side, policy makers will experience new forms of accountability to their constituency that requires them to consider citizen input in more regular intervals than only during election times. (Macintosh, *et al.*, 2009)

More recently, research in the areas relating to the Internet and democracy has shown that in addition to the availability of technical resources, the success of e-participation initiatives is determined by the degree of willingness of institutions and political actors to employ such tools [1] (Gulati, 2004; Salter, 2004; Best and Krueger, 2005; Coleman, 2005; Ward and Lusoli, 2005; Macintosh, *et al.*, 2009; Jaeger and Bertot, 2010; Marques, 2010; Sampaio, *et al.*, 2011; Perna and Braga, 2012).

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Such a point is reinforced in the Brazilian case: a research about the participatory tools found on the Presidency's Web site shows:

an organizational disorder [that] partially reveals an institutional unwillingness to make use of new media to foster governmental political interaction with citizens. There is a lack of clarity regarding the specific tasks of each entity within the bureaucratic structure that manages e-government projects. [...] Additionally, there is a disparity in conditions and funds among institutions to implement solutions in information technology. [...] The most sophisticated Brazilian experiences in information technology refer to digital systems aimed to increase tax collection and fiscal control. (Marques, 2010)

Following this argument, one can say that the use of so-called social network sites (SNSs), such as Facebook or Twitter [2], depends exclusively on a representative's willingness.

It is precisely by opening up the possibility of associating motivation (interacting directly with decision-makers increases the possibility of particular demands being heard) (Verba, *et al.*, 1995; Delli Carpini, 2000), and the discussion of issues that are part of an individual's daily life that SNSs have become an increasingly relevant tool (Hargittai, 2007; Bertot, *et al.*, 2010; Jackson and Lilleker, 2011; Valenzuela, *et al.*, 2012).

It is true that we cannot explain how congressmen and other political actors use social networks without taking into consideration the strategic dimensions tied to the management of public images (Negrine and Lilleker, 2003). In fact, one of the fundamental modifications that mass communication has brought to the political game is exactly the greater prominence that the "image" has had. The personalization of politics is a phenomenon which has increasingly attracted the attention of a large group of academics (Dahlgren and Sparks, 1991; Manin, 1997; Mcnair, 2003; Gomes, 2005; Negrine and Stanyer, 2007; Maarek, 2011; Van Aelst, *et al.*, 2012).

The behavior of congressmen is known to be determined by institutional, political-ideological and individual aspects [3] (naturally, all these dimensions are inserted in specific historical and cultural contexts). The initial premise of the argument outlined in this paper is that the aspects that influence representative's activities in Parliament continue to be relevant in explaining decisions made by politicians regarding their communication strategies.

Having this in mind, one knows that SNSs offer an alternative opportunity for political personalities to feel how their messages are being understood. In addition, the degree of exposure of particular political positions taken by elected politicians increases [4].

The literature allows us to identify a considerable effort in analyzing the use of digital social networks at times of greater engagement of citizens and representatives, such as around elections. This is especially true for Twitter, mainly because data is easily accessible on this network, even to those Internet users not registered on the microblog [5] (Druckman, *et al.*, 2007; Vergeer, *et al.*, 2013, 2011; Gibson and McAllister, 2011; Marques and Sampaio, 2011; Marques, *et al.*, 2011; Gibson, 2012).

In fact, election campaigns have a short-term goal: in some cases, SNSs are progressively abandoned once the candidate has been elected. This is the case for Dilma Rousseff's profile on Twitter: during her campaign for the Brazilian Presidency in 2010, the Workers' Party (PT) candidate used this network regularly; once she took office, the use of this tool ceased completely [6]. However, regular communication between elected representatives and citizens (one that covers mandates, and not elections) demands specific attention from researchers [7].

Our objective is to explain which factors influence politicians to invest in these means of communicating with citizens throughout their mandates. In this paper, we discuss individual aspects (such as gender, age, leadership positions, votes received and Twitter account creation date) that influence the use that Brazilian representatives (with a seat in the House of Representatives, Fifty-Fourth Legislature, 2011-2015) make of Twitter [8]. It is important to say that this work highlights a quantitative analysis of the use of Twitter by Brazilian congressmen.

The next sections deal with methodology and empirical analysis applied to the universe of Brazilian representatives, presenting variables investigated, hypotheses formulated and results found. Later in the paper, we discuss the results in light of theories dedicated to understanding the phenomena of Twitter and political communication.

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2. Data

This paper examined politicians with a seat in the Brazilian House of Representatives and their respective Twitter profiles. In order to avoid fake accounts, we checked and confirmed representatives' profiles by using different methods: first, our research team accessed the official Web site of the House and the official Web site of each Member of Parliament. If we were not able to locate official Twitter addresses, we consulted the list of profiles followed by the official account of the House of Representatives on Twitter [9].

After identifying the official accounts of each parliamentarian on the platform, it was verified that in February 2012, 462 of the 513 members of the House were registered on the microblog; 457 of them were still maintaining their Twitter account on February 2013.

2.1. Dependent variables

The analysis of the use of Twitter by congressmen involves three dependent variables: (1) whether the representative had a Twitter account on February 2012; (2) the average number of tweets that the representative posted each week (henceforth referred to as "Tweets per Week" — TPW); and (3) the number of followers the politician had on 28 February 2013.

The collection of user information for the calculus of TPW took place weekly between 23 February 2012 and 28 February 2013. Data collection was always carried out on Thursdays through Twitter API, accessed with the R software (R Core Team, 2012). Twitter servers' limit data transfers to 150 requests of user information per hour; we had to split the list of users in four blocks and then we collected the data with an interval of one hour between each block [10].

Of course, calculating the difference between the number of tweets posted on February 2013 and February 2012 would be simpler than calculating the TPW. However, this simple calculation could be misleading for two reasons: (a) a few parliamentarians closed their accounts and registered others, so the count of their tweets was restarted [11]; (b) in the interval between the weeks, some parliamentarians deleted more tweets than they posted. That means that in both cases we could have negative values for the number of tweets of a week. To reduce distortions in the calculations, these negative values were converted into missing values, and thus not considered in the calculations of the TPW.

The representative's presentation on Twitter is perceived through the difference between the median and mean values of the number of followers and the TPW (Table 1). The distribution of these data is close to a log-normal distribution (that is, relatively to each other, many congressmen are very low users and a few are heavy users). The distortion created by this situation is compensated for in the analyses of the data by using logarithms of the number of followers and the TPWs.

	Minimum	Median	Average	Maximum
Number of followers	2	1,811	7,047	713,538
TPW	0	7.1	22.6	311

2.2. Independent variables

The data used to explain the variability in Twitter usage come from the following sources: (a) the Web site of the House [12]; (b) the Web site of the Superior Electoral Tribunal [13]; and (c) the survey of a sample of the Brazilian population, carried out by the IBGE (Brazilian Institute of Geography and Statistics) [14]. The dependent variables of Twitter use (TPW and number of followers) are analyzed with the independent variables presented in the following subsections.

2.2.1. Gender and age

Some studies on digital political participation point to gender and age gaps (Wilhelm, 2000; Best and Krueger, 2005; Albrecht, 2006). First, in terms of equal opportunities for women in Brazilian politics, it is noteworthy that both the number of women candidates and the number of female elected representatives is proportionally lower than men. Moreover, parliamentary prestige and influence are also distributed unevenly between genders. Research indicates that women with seats in Congress tend to restrict their participation to certain issues, reinforcing their subordinate role in national politics (Miguel and Feitosa, 2009).

Accordingly, our expectation was that the participation of men and women on Twitter would reproduce these patterns of inequality, with a quantitative prevalence of men. This led to the Hypothesis 1: Gender inequalities identified in the Brazilian political scenario are reproduced

when lawmakers use Twitter; therefore, male representatives tweet more and have more followers than women.

Besides the issue of gender, it was expected that the age of congressmen would constitute another important factor influencing Twitter use. Research points out that the ease in operating and monitoring technological innovations in digital media is inversely proportional to the age of its users (Wilhelm, 2000). Thus, the hypothesis regarding the age of parliamentarians predicts a greater number of users and a more intense use of the Internet and its platforms by younger members. Hypothesis 2: The younger the parliamentarians, the more intense their Twitter use.

2.2.2. Leadership position

The behavior of parliamentarians in their attempt to secure and hold positions of power within the House is influenced by many factors, such as the orientations of the parties to which they belong and, of course, certain institutional dynamics that define the hierarchical structure that characterizes the exercise of representation in the Brazilian National Congress. It is considered that holding positions that increase the power of lawmakers also has an impact on how representatives are presented on media (Cook, 1989; Gomes, 2005). The hypothesis tested here states that those who occupy seats on the Legislative Steering Committees of the House or the Commission of Leaders have a particular concern in managing their image on social networks. As a consequence, they tend to develop an effective communication strategy on Twitter. Hypothesis 3: Parliamentarians holding leadership positions and roles in the House use Twitter with greater intensity when compared to those parliamentarians who do not hold such positions.

To evaluate this effect, deputies were classified into those holding party leadership positions (leaders, vice-leaders and members of Legislative Steering Committees) and those parliamentarians who did not occupy such positions in the Chamber.

2.2.3. More than one term served as congressman

On the one hand, we shall consider that experienced congressmen have a stronger connection with their constituencies, something built over time. On the other hand, new congressmen need to consolidate their relationship with their constituencies — and one of the available alternatives is to use as many communication options as possible. Hence, Hypothesis 4 is: representatives elected to the House for the first time use Twitter more intensively.

2.2.4. Party ideology

Following research on the use of the Internet by political parties elsewhere (Cunha, *et al.*, 2003; Hooghe and Marien, 2013; Vergeer, *et al.*, 2013), our Hypothesis (5) regarding this topic is: Representatives of left-wing parties use Twitter more intensively than representatives of right-wing parties. In this paper, we adopt the classification made by Tarouco and Madeira (2012) in surveying the opinion of 47 experts during the 2010 meeting of the Brazilian Political Science Association and classified Brazilian parties according to their position on a left-right ideological scale, attributing a numerical value for the ideology of each political party.

2.2.5. Number of votes

In order to secure the maximum number of votes and win an election, candidates try to reach citizens by using all media channels at hand. Thus, the Hypothesis 6 is: congressmen who received the most votes are heavier users of Twitter. However, while comparing the votes received by Brazilian representatives in the 2010 elections (as noted earlier), we must consider the fact that Brazilian states' population varies greatly, as well as their number of seats in the House of Representatives [15]. In order to avoid distortion, we use the proportion of votes that the candidate received from the number of votes that his or her seat represents, according to the following expression:

$$v_a = \frac{v \cdot s}{S}$$

where v is the number of votes received by the candidate, S is the sum of all votes given for all candidates in the representative's state, and s is the number of seats the state has on the House.

2.2.6. Characteristics of the electorate

To investigate the impact of constituency features on Twitter use by representatives, we also take as explanatory variables: (1) voters'

residence (urban or rural), (2) education (the proportion of residents with higher degree) and (3) average income, taken from the Sample of the 2010 Population Census, at the municipal level [16].

The expectation is that voters residing in urban areas, and who have both higher education levels and incomes, rely on the structural conditions (access to equipment and broadband Internet) and literacy needed to use social networks as tools for interacting with representatives (Norris, 2001). The hypotheses resulting from this reasoning are:

Hypothesis 7a: Representatives elected by constituencies with higher incomes use Twitter more intensely.

Hypothesis 7b: Representatives elected by constituencies with predominantly urban residents use Twitter more intensely.

Hypothesis 7c: Representatives elected by constituencies with higher rates of education use Twitter more intensely.

The methodological strategy adopted in this study for the incorporation of variables related to urbanization and education consisted of calculating the average proportion of the population of the municipalities aged above 16 and less than 80, living in urban areas and who had higher education, weighted by the vote obtained by the congressman in each municipality of the state represented. For each representative, the value of this variable was calculated according to the expression:

$$\frac{\sum_{i=1}^n p_i \cdot v_i}{V}$$

where n is the number of municipalities where the representative has received votes, p_i is the proportion of people with higher education in municipality i , v_i is the number of votes received in municipality i and V is the total number of votes received by the representative.

The calculation of *income* and *residence* was similar, weighing the citizens' average income and the proportion of people living in urban areas by the candidate's polling in each municipality.

Residing in cities greatly facilitates Internet access. Hypothesis 7b assumed that a more urban electorate would coincide with increased use of Twitter by Brazilian parliamentarians.

The last proposition, Hypothesis 7c, is based on the fact that Internet use for communication between citizens and representatives requires the ability of both to understand the language involved in producing content. It is assumed that voters with higher education meet this requirement and have a greater ability to demand that their representatives offer a higher rate of information and interaction.

The use of these three variables runs the risk of committing the so-called "ecological fallacy". For example, a congressman may have obtained votes from predominantly poorer voters in some municipalities with high per capita income, whereas another congressman could obtain votes of richer electors in some poor municipalities. However, the expectation is that, for the data on representatives as a whole, errors will cancel out, so that correlations can be interpreted as representing relevant causal relationships.

2.2.7. Twitter account creation date

In addition to research on the factors that lead politicians to adopt Twitter (Williams and Gulati, 2010), we were interested in seeing if the early adoption of Twitter could predict a greater numbers of posts or followers. There have been a few studies on the influence of time on Twitter use, but we consider that it is important to know if the patterns of use or the potential to attract followers change over time. Our Hypothesis 8 states the following: Representatives whose Twitter accounts are newer (higher values for creation date) post less tweets and have less followers than representatives whose accounts are older.



3. Results

The data show that about 90 percent of the congressmen had registered a user profile on Twitter in February 2012. The use of Twitter varies substantially: there are representatives who have posted a total of more than 44,000 tweets and have more than 700,000 followers. At the other extreme, there are congressmen who have never posted any messages and have very few followers (see [Figure 1](#)).

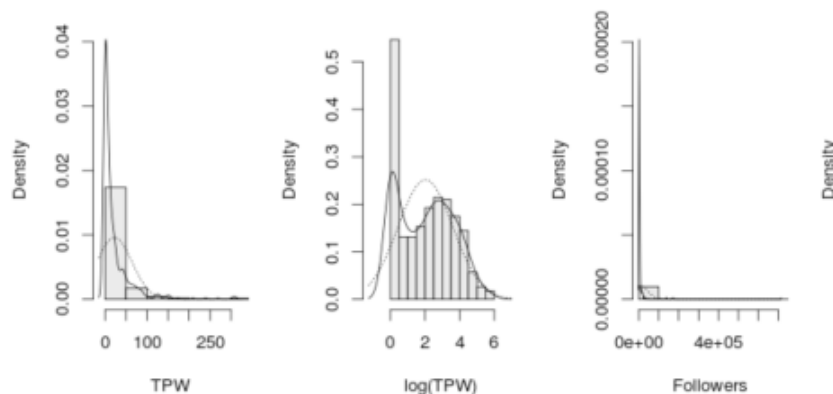


Figure 1: Histograms of absolute and logarithm values of TPW and Number of density and normal curve.

It is noteworthy that there are elected representatives with insignificant numbers of followers and tweets: 83 deputies had a TPW of zero and, among the congressmen with extremely low values, there are 11 individuals whose the logarithm of the number of followers is two standard deviations or more below the mean (they have only 58 followers or less). As can be seen in [Figure 2](#), Twitter usage is irregular but presents a general trend of decline (the correlation between TPW and time is -0.82).

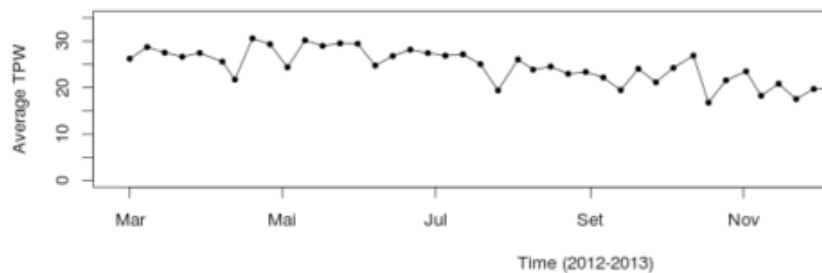


Figure 2: Time series of TPW.

Before analyzing the relationships between the dependent variables and the independent ones, we checked the correlation between TPW and number of followers. Supposing that the popularity of a Member of Parliament on Twitter is related to the production and publication of content, we expected a strong correlation between (1) the number of followers that each representative has, and (2) the volume of tweets he or she posts. As [Figure 3](#) shows, the correlation between the two variables is 0.18 and the correlation between their logarithms is 0.61 [17]. Thus, the correlation is in the expected direction and is reasonably strong when we consider the logarithmic nature of their distributions.

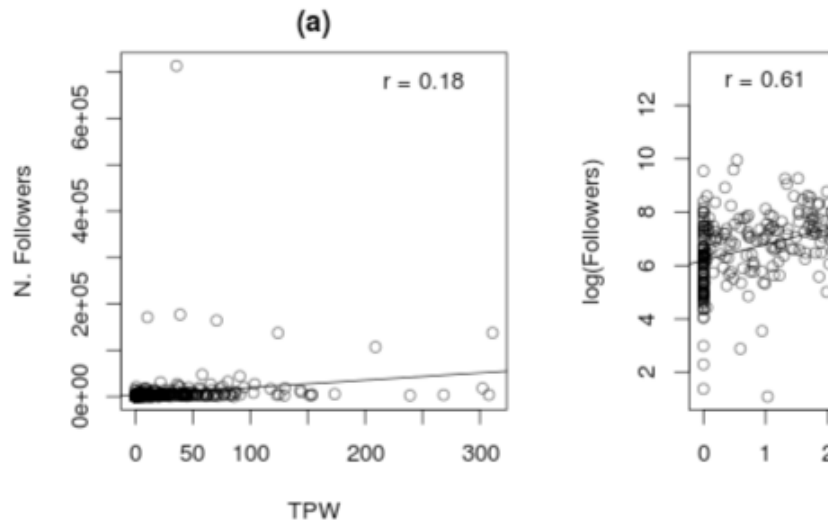


Figure 3: Correlation between number of followers and TP

[Table 2](#) presents three regression models, one for each of our dependent variables and [Figure 4](#) shows diagnostic graphics of residuals (Cook's distance for the logistic regression and quantile-comparison plots for the OLS regressions). The residuals of TPW and Number of Followers regressions have only a few cases outside the confidence interval of 95 percent, as delimited by the dashed curves and we decided to keep all cases in the regression analyses.

The first model is a logistic regression. For the TPW and the number of followers, we used their logarithms. All variables (except *Has Twitter*) were standardized so they have a mean of 0 and a standard deviation of 1, which facilitates the interpretation of results.

Table 2: Summaries of regression analyzes.			
Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.			
	Has Twitter	TPW	Followers
(Intercept)	2.744***		
Gender (Female)	0.190	0.024	-0.002
Age	-0.329	-0.149***	-0.182***
More than one term as deputy (Yes)	0.040	-0.163***	-0.024
Has leadership position (Yes)	0.098	0.111*	0.081*
Constituency average income	-1.408*	-0.514**	-0.215
Constituency with higher education	1.529*	0.511***	0.336**
Constituency living in urban areas	0.661*	0.092	0.068
Party Ideology	-0.624***	-0.222***	-0.144***
Votes	0.210	0.129**	0.255***
Time since Twitter account creation		0.235***	0.500***
<i>N</i>	513	457	457
<i>Adjusted R</i> ²		0.225	0.482
<i>F</i>		14.245	43.423

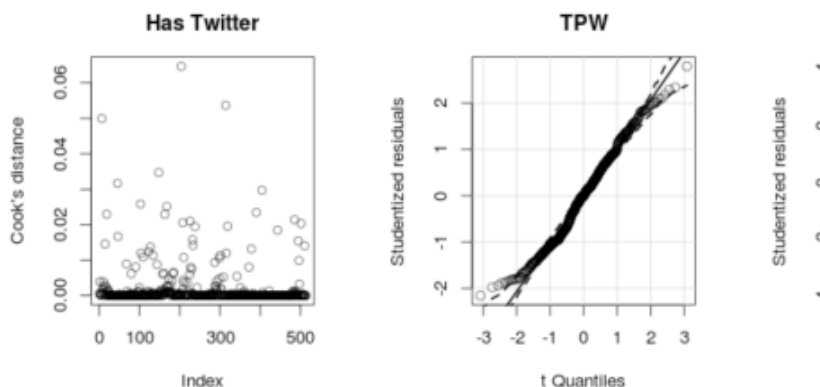


Figure 4: Diagnostic graphics of residuals.

Most of the hypotheses stated in the previous sections are confirmed: the dependent variables are significantly and negatively correlated with right-wing ideology of the representatives' parties and positively correlated with the education level of their constituency. TPW and number of followers are negatively correlated with age of representatives and positively correlated with the age of their Twitter account, number of votes each politician obtained in the 2010 elections, education level of their constituency and leadership positions. The constituency living in urban areas is positively correlated with the dependent variables, but the relationship is significant only to Twitter adoption.

The proportion of the electorate living in urban areas and the gender of the deputy are not statistically significant when controlled by other variables. Having served more than one term as deputy is significant only to TPW — and the correlation is negative.

But the surprise is provided by the average income of the electorate. Although in bivariate analysis the constituency's income is positively correlated with the TPW logarithm (0.10) and the number of followers logarithm (0.21), when controlled by other variables, it is negatively correlated with Twitter use. That is, the higher the voters' income, the lower the chances of a congressman appeal to Twitter intensively.

The time elapsed since Twitter account creation date has the strongest correlation with the number of followers and, confirming our hypothesis, the impact is positive. This variable also is positively correlated with TPW. In other words, parliamentarians who adopt Twitter earlier have more followers and post more messages.



4. Discussion

4.1. Gender and age

Some of the findings described earlier agree with results from other studies on the political use of digital media in Brazil, such as Pereira, *et al.* (2011). They investigated how lawmakers use the virtual tool "Contact a Representative", found on the Web site of the House. In the study by Pereira, *et al.* (2011), male deputies received and answered a higher proportion of messages through "Contact a Representative": "While men answered 2.27 messages on average, women responded to just 0.28 messages" [18]. Furthermore, in the investigation by Pereira and colleagues, "age" showed a positive correlation with the dependent variables (the older the representative, the more the tool is used).

In our research, age was negatively related to Twitter use and the gender of the deputies was not important for predicting their TPW or their number of followers. Naturally, the digital tools analyzed in the two studies are different, which must be the most likely cause of the discrepancy in the use of the online devices. What can be inferred, therefore, is that the representatives differ in their use of digital resources (each one behaves in a unique way, adopting more or less effectively those channels available); in fact, on an individual level, congressmen use each tool in a particular way, emphasizing one or the other.

4.2. Leadership positions

We also studied the impact that holding leadership roles in the House would have on the use of Twitter by representatives. Those members of Parliament who are in a higher position in the hierarchy of the House tend

to make use of Twitter with greater intensity and have a larger number of followers, when compared to the others [19].

There may be two explanations for why Parliament leaders invest more time in the use of Twitter as a communication resource. First, as they have the most institutional power (determining the voting agenda, for example), these actors also have a greater visibility in traditional media, which is reflected in digital social networks. This visibility would make them subject to increased demands by citizens, causing these politicians to publicize their activities and positions. Moreover, lawmakers in positions of leadership are more "popular" in the network than other representatives — the correlation between occupying leadership positions and the number of followers is greater than the correlation between holding office and TPW, although both are positive.

Another possible explanation for the greater use of Twitter by party leaderships may lie in the idea of "permanent campaigning" (Gomes, 2005). These representatives are usually professional politicians, who worry constantly about accumulating capital for the next election. Logically, maintaining a prominent (and positive) public image depends on the exploitation of all communication resources available.

4.3. More than one term served as congressman

When we analyze the use of Twitter according to the number of terms served by each congressman, we see a strong negative correlation between being a veteran representative (with more than one term served) and his TPW. In other words, novice members of Parliament tend to publish more posts.

Possible explanations for this result include (1) a distinction between those representatives who are rising in their careers — and therefore seek to maintain an intense communication with the public — and those members who have already been elected more than once for the office — who concentrate their efforts on their constituencies. Another possibility is that (2) politicians who have a longer career receive greater support from their parties to fill gaps in traditional media — so they tend to use Twitter less. The validity of such assumptions, of course, depends on further investigations.

4.4. Party ideology

We found that left-leaning congressmen tend to tweet more and have more followers than representatives of right-wing parties. These results show that it is possible to identify ideological divisions in the political behavior of representatives — as noted by Limongi (2007) in his study of the Brazilian political system. Our results are consistent with the findings of Cunha, *et al.* [20], that is, leftist parties are likely to give greater relative emphasis to the use of the Internet to communicate with citizens.

Future research could investigate whether this may be related to a greater concern that these congressmen have regarding democratic values — such as participation or accountability (as stated by Cunha, *et al.* about the sites of Southern European parties) — or if it is just a shortcut to improve their public image.

4.5. Number of votes and characteristics of the electorate

The number of votes obtained by representatives is also important in explaining Twitter use. Our research sought to draw a socioeconomic profile (at the municipal level) of the voters responsible for electing each member to the House, in order to understand whether having a constituency with access to the Internet would be important in predicting political behavior on Twitter.

The analysis of three indexes carried out here — (a) *the average municipal income weighted by the municipal vote for a representative*, (b) *the municipal proportion of individuals with higher education weighted by the municipal vote for a representative*, (c) *the municipal proportion in the urban zone weighted by the municipal vote for a representative* — illustrated that access to education is a determinant for a congressman to maintain an updated profile on Twitter and also to attract more followers.

However, income is a variable that cannot be examined in an aggregate manner, as suggested by Pereira, *et al.* (2011) when using the Human Development Index (HDI). In our study, income (when controlled by other variables) has negative correlations with Twitter use by members of Parliament, while *residing in the city and higher education* provide positive correlations. This empirical result contradicted our expectations and needs further investigation to be adequately explained.

It may be noted, however, that the electorate's average income has a strong correlation with the proportion of the electorate with higher education ($r=0.95$). But for the electorate's income to have a positive impact and a statistically significant effect on Twitter use by parliamentarians, it would be necessary to eliminate from the models both the variable indicator of education and the variable indicator of residence in urban areas. More data or more sophisticated methods of analysis are required to explain the negative impact of income.

4.6. Twitter account creation date

According to our results, those parliamentarians who have older accounts on Twitter tend to have a higher TPW and also have more followers. This means that, among the parliamentarians, while the adoption of digital communication tools tend to spread, certain inequalities remain, as predicted by the stratification model of technology diffusion (Norris, 2001). Those congressmen who have adopted Twitter earlier are also more efficient in using the tool, posting and attracting more followers.



5. Congressmen and Twitter use: Additional comments

The number of followers is a key element in our analysis as one of the factors predicting the degree of influence of a particular user [21]. A high number of followers implies not only that messages are being sent directly to users following a particular politician, but also that the chances of retweeting increases, allowing posts to reach other users who, originally, did not follow the author (Chi and Yang, 2010). Rachel Gibson, referring to Australia, noted:

Here the lesson for parties and candidates would seem to be that Web outreach efforts are best conceived of as resources for a committed base of activists/supporters to go on and spread the word rather than to reach the wider electorate directly. The effect [...] is campaigners 'preaching through', rather than to, the converted. [22]

Thus, it is interesting to note the variety in the amount of congressman's followers. Independently of their party and even of the number of times they post tweets, there are representatives who are successful in amassing a large number of users interested in reading what they write. Many of these congressmen draw attention from their activities in dimensions apart from the world of politics, such as Romario (a former soccer player) and Tiririca (a comedian).

In other words, when analyzing representatives with the highest number of followers, it is clear that the popularity of these users is not always related strictly to their activities in politics. There are congressmen who were already media celebrities before entering politics. Others rely on support in the religious field. This is in line with the findings of Kwak, *et al.*:

There are only 40 users with more than a million followers and all of them are either celebrities (*e.g.*, Ashton Kutcher, Britney Spears) or mass media (*e.g.*, the Ellen DeGeneres Show, CNN Breaking News, the New York Times, the Onion, NPR Politics, TIME). [...] Some of them follow their followers, but most of them do not. [23]

In these cases, different types of capital (Bourdieu, 1986) are triggered, providing specific forms of recognition by other users. In fact, this phenomenon shows that Twitter is not "alone" or isolated from influence of other contemporary information channels.

On the one hand, it is important to note that "the number of followers alone does not reflect the influence a user exerts when the user's tweet is retweeted many times or is simply followed by other influential people: it is not a comprehensive measure" (Kwak, *et al.*, 2010). On the other hand, the number of followers is such an important index for measuring users' influence that many congressmen who decided to run in the 2012 elections [24] changed their user names on Twitter, instead of opening a new account. Changing names follows the strategy of maintaining followers and discourses; creating a second account entails the cost of building up a new group of followers.

In addition, although it has not been our focus to study the content of tweets, we can affirm that the kind of message and relationship that lawmakers seek to establish with their followers also varies a great deal. Some congressmen only use Twitter for political purposes, whereas others use it to share personal information.

For example, Representative Lucio Vieira Lima, from the state of Bahia, tweets about soccer, TV shows or simply jokes with friends and other users, some apparently he does not even know. We believe that his aim is to seem like "any other user", by placing himself at the same level as those with whom he interacts (although this posture is not necessarily devoid of political aspirations). This use of Twitter is in line with the idea pointed out at the beginning of this study regarding the personalization of politics. According to Shaefer, *et al.* [25]: "The politician is no longer presented solely as a policy maker or as a spokesperson but rather as a dedicated parent or a passionate music lover. The politician is portrayed as a private individual". The case of Lima highlights the fact that proximity between representatives and citizens does not always imply improvement in the process of political decision-making.



6. Conclusion

The intention of this paper was to investigate quantitatively the use of Twitter in view of the following questions: a) which Brazilian congressmen have used Twitter as a communication tool? b) Is there any correlation between the use of Twitter by representatives when data on TPW and the number of followers are compared to personal and political variables? c) What other factors could influence a representative to use this platform? Our data revealed that 457 of 513 representatives in the House were registered on Twitter in February 2013.

There was a substantial variety in the use of Twitter when we considered (1) the volume of content published and (2) the number of followers for a given congressman. There are members of the House who published an average of 311 messages per week for the period studied, while there are 89 elected officials who (despite being registered on Twitter) have a TPW of zero. It is important to emphasize, however, that tweeting more posts does not necessarily mean attracting a greater number of voters or followers.

The results show that occupying important positions in the hierarchy of the House is positively associated with a greater number of followers and a higher frequency of messages posted on Twitter. Moreover, younger representatives tend to employ Twitter more regularly and have more followers. There is the same positive correlation with representatives who had higher votes in the 2010 elections and representatives whose constituency has a high number of citizens with college degrees. The variables regarding the proportion of the electorate residing in urban areas (and the gender of the representative as well) were not statistically significant predictors of Twitter use.

Our quantitative analysis offers a set of findings which — if complemented with qualitative research — will bring greater certainty about the impact of Twitter on the formation of a Brazilian representative's public image. Moreover, by considering that there are scripts aimed at increasing the number of followers (or that users can employ tools which allow automatic Twitter updates to be posted), we assume that some of our conclusions could be stronger if we had adopted a qualitative approach to our research.

Finally, one highlights that digital communication tools cannot be perceived as autonomous and independent elements in the activities of agents that are already embedded in politics. This means that digital media operate in parallel with other communication channels. In this sense, we must reflect on an ongoing basis about the connection between digital and non-digital communication environments. 

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Notes

1. Such as Macintosh and Whyte (2008, p. 17), this paper "... uses a working definition of eParticipation as the use of ICTs to support information provision and 'top-down' engagement, *i.e.*, government-led initiatives, or 'ground-up' efforts to empower citizens, civil society organisations and other democratically constituted groups to gain the support of their elected representatives".
2. According to boyd and Ellison (2007, p. 2), SNSs are: "... Web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system".
3. The Brazilian political system has been described as a "coalition presidentialism". Although a multi-party system which adopts proportional representation with an open list usually predicts a breakdown of interests in Congress, many studies which investigate parliamentary behavior indicate that cohesion and compensation mechanisms prevail in Congress. The traditional dominance of the executive branch in Brazil explains much of this phenomenon (Cheibub, *et al.*, 2009; Limongi, 2007).
4. According to boyd (2008, p. 120), "... social network sites are a type of networked public with four properties that are not typically present in face-to-face public life: persistence, searchability, replicability, and invisible audiences. These properties fundamentally alter social dynamics, complicating the ways in which people interact".
5. According to Druckman, *et al.* (2007), there are a series of factors that explain the motives why some candidates tend to adopt communication channels, including, (a) the availability of financial resources, (b) the party which the candidate belongs to, (c) gender, and (d) if the candidate is or not standing for reelection.
6. In 2010, Dilma Rousseff defeated José Serra in the second round with 56 percent of the votes. She was elected for a four-year term. In that same year, new members of the National Congress were elected to two chambers: the House of Representatives (with 513 members elected for a four-year term) and the Senate (81 members elected for an eight-year term).
7. In order to secure an overview on how Brazilian political actors use SNSs, please see Marques, *et al.* (2013).
8. Since 2012, Facebook is the most accessed social network site in Brazil. Until the end of 2012, Twitter was the second most popular SNS in the country (<http://www.abc.com.br/tecnologia/2012/09/saiba-quais-sao-as-cinco-redes-sociais-mais-acessadas-do-brasil>, accessed 1 September 2012). There is no study able to provide a consistent comparison on the presence of Brazilian political representatives both in Twitter and Facebook, but we do believe that Twitter maintains its strength in the country: data collected in this research showed that 3,178,727 users followed Brazilian congressmen in Twitter in February 2013. Moreover, the importance of Twitter is confirmed when Facebook mimics it by adopting tools such as "follow", "hashtags" and trending topics.
9. <http://twitter.com/CamaraDeputados>. accessed 15 August 2013.
10. We used the function `getUser()` from `twitter` (an R package). This function only gets little information about the user, including the current number of tweets posted and the number of followers, so the information is never truncated due to heavy traffic. The data and R scripts to replicate the paper results are available at <http://www.lepem.ufc.br/dados/CongrTwitter>.
11. Twitter allows users to change their account name, maintaining the history of posts and the list of followers (and we monitored all the changes in the profiles during the period of data collection).
12. <http://www2.camara.gov.br/deputados/pesquisa>, accessed 15 August 2012.
13. <http://www.tse.jus.br/eleicoes/eleicoes-anteriores/eleicoes-2010/estatisticas>, accessed 6 August 2012.
14. ftp.ibge.gov.br/Censos/Censo_Demografico_2010/Resultados_Gerais_da_Amostr; accessed 6 August 2012.
15. In the Brazilian House of Representatives, the seats per state are distributed according to population. The resulting proportionality is limited to a minimum of eight and a maximum of 70 congressmen per state. The state of São Paulo has 39,9 million inhabitants and 70 representatives. The state of Tocantins counts on 1.3 million inhabitants and eight MPs.
16. The sample has information on 20,635,472 individuals from 5,565 municipalities.
17. All correlation coefficients in this paper are Pearson's *r*.

[18.](#) Pereira, *et al.*, 2011, p. 19.

[19.](#) Although this study's intention has not been to check the relationship established between different media platforms, it is plausible that the larger number of followers certain congressmen have may be due to the visibility that media gives to those who occupy positions of leadership.

[20.](#) Cunha, *et al.*, 2003, p. 83.

[21.](#) According to Cha, *et al.* (2010, p. 6), "Many factors — social, political, and economical — affect popularity and influence of individuals and organizations. In online social media, such dynamics is facilitated by easy entry of competition. It only costs 140 characters to generate a tweet for any user. Likewise, it will be challenging for influentials to maintain their status when many emerging local opinion leaders and evangelists enter the arena."

[22.](#) Gibson, 2012, p. 6.

[23.](#) Kwak, *et al.*, 2010, pp. 2–3.

[24.](#) In the 2012 Brazilian elections, 138 million voters had the opportunity to choose mayors and city councilors for 5,568 municipalities in the country. All of them were elected to four-year terms.

[25.](#) Van Aelst, *et al.*, 2012, p. 206.

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