



# Mapping the online communication patterns of political conversations



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## HIGHLIGHTS

- The political conversation is constrained by both ideology and language.
- Politicians, the main characters; Traditional media, still the main source of information.
- The political communication is still driven by a minority.
- There is a relation between the political alignment of users and the language in which they tweet.

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## ABSTRACT

The structure of the social networks in which individuals are embedded influences their political choices and therefore their voting behavior. Nowadays, social media represent a new channel for individuals to communicate, what together with the availability of the data, makes it possible to analyze the online social network resulting from political conversations. Here, by taking advantage of the recently developed techniques to analyze complex systems, we map the communication patterns resulting from Spanish political conversations. We identify the different existing communities, building networks of communities, and finding that users cluster themselves in politically homogeneous networks. We found that while most of the collective attention was monopolized by politicians, traditional media accounts were still the preferred sources from which to propagate information. Finally, we propose methods to analyze the use of different languages, finding a clear trend from sympathizers of several political parties to overuse or infra-use each language. We conclude that, on the light of a social media analysis perspective, the political conversation is constrained by both ideology and language.

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## 1. Introduction

Opinions are not formed in a social vacuum, but on a social network where those around us affect what we think. A classic topic in political science is how social interactions shape individuals political views, and whether the social network in which they are enmeshed has an influence on their voting behavior [1–4]. In fact, back more than 60 years ago, Lazarsfeld et al. [5] pointed out in “The People’s Choice” that the impact social contacts have on voting decision is bigger than that from mass media or politicians. This resulted on the Two-step flow of communication [6–8]. According to this theory, ideas flow from mass media (or politicians in an electoral context) to opinion leaders, and from them to the population. More

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recently, studies have shown that political participation is affected by the social environment; as friends, family members, or co-workers exhibit similar behavior [9,1,10]. The explanation for this influence is a prevalent theme of research. Burt [11], distinguished between contagion by cohesion and contagion by equivalence. According to the first one, people's political preferences are directly influenced by their social network. This theory sees social influence as a result of intimacy within primary social grouping, and is referred in literature as direct political influence, political assimilation, or socialization [1,12,13]. Alternatively contagion by equivalence proposes a structural equivalence model to explain this influence, where people base their behavior on what they observe from others that occupy a similar position to them [14–16].

In this paper, we intend to explore the structure of the online social networks in which individuals are embedded when discussing politics. This is an increasingly relevant topic since online social networks and social media platforms, such as Twitter, are the latest new medium being exploited by politicians for decisive competitive advantage. Thus, today's culture is changing, Internet and social media represent a new channel through which information and ideas can quickly flow [17], bringing people a wider (and cheaper) variety of information. Today's new culture sees value in sharing information, and relies on collective wisdom [18]; just take Wikipedia [19] as an example. Social media fit perfectly this new context as they are about listening and being heard, about sharing information with those you trust, and about having a variety of sources of information at hand from where to choose. So, nowadays, when trying to understand the opinion formation process of individuals, we have to take into account not only their face to face relations or the propaganda coming from traditional mass media, but also the online communications that are increasingly taking place through social media platforms such as Twitter. In fact, recent research has brought evidence to show that political mobilizations in an online social network can influence real world voting behavior [20]. Moreover, the availability of the data represents a big opportunity to study social phenomena, such as politics [21,22], viral marketing [23], information diffusion [24], or social influence [25].

The target of this paper is to map the communication patterns behind the political conversations taking place on social media to uncover possible constraints in the online political discussion, and to answer questions such as: Do really social media platforms represent a channel through which more voices can be heard and encourage political discussion? To this end we have analyzed the mention and retweet networks within the framework of complex networks [26,27] and performed a community structure [28] analysis to understand how users of social media have grouped themselves around the different ideologies. We discuss the different role played by politicians and traditional mass media, when propagating news, or capturing the collective attention. Next, we identified the language in which each tweet was posted and explored to which extent the diversity of languages limits the communication among the different sides. Furthermore, we propose a method to determine the proximity between the different languages and political alignments. Finally, we discuss the major implications of our results.

## 2. System & methods

### 2.1. Twitter

The number of users engaged to online social networks or social media is rapidly growing all around the globe. More specifically in Spain the percentage of population using online social networks has reached over 49% of the population [29].

Twitter is one of the most popular social media platforms and its main feature consists in allowing people to post and exchange text messages limited by 140 characters. This platform features several interaction mechanisms to facilitate communication among users. The first of these interaction mechanisms is the ability of people to follow and be followed by the rest of users. This is a passive mechanism that allows users to receive the messages written by their followees at real time. The Twitter followers network is a directed graph where non reciprocal relations are admitted and it states the social substratum through which information will flow. Although having a large number of followers increases the visibility of the tweets posted by users, it not necessarily makes them influential [30].

Another important mechanism to interact is the message retransmission or retweet. This mechanism allows individual messages to propagate and travel throughout the network [31], and also, it serves as a way for people to endorse their point of view over specific subjects [32]. In addition to this, another relevant way for direct interaction is the mention mechanism. By mentioning someone's username in the message text, people is able to send directed messages to the mentioned user's inbox. This mechanism is often used to establish conversations between users, through the exchange of messages, or just to refer somebody in the messages text [33]. At last, all messages on Twitter, may be identified using keywords called hashtags [34]. This mechanism generates the trending topics, and people use it to discuss and exchange ideas without the necessity of having any explicit relation.

### 2.2. Dataset

Our datasets are constructed from public access messages posted on Twitter regarding political conversations. The first dataset, labeled 20N, relates to the last 20th of November 2011 Spanish general elections. The second one, labeled as 25N, regards the last Catalan elections that took place on the 25th of November of 2012. We downloaded all the tweets using the Twitter API interface and searching for a specific keyword that identified each conversation. Regarding the general elections we downloaded all the messages that included the keyword 20N posted in a three week period including the official electoral

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