

Lost in re-election: a tale of two Spanish online campaigns

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Abstract. In the last years Spanish politics have transitioned from bipartidism to multipartidism. This change led to an unstable situation which finally evolved to the rare scenario of two general elections in the period of six months. The two elections had a main difference: two important left-wing parties formed a coalition in the second election while they had run separately in the first one. In the second election and after merging, the coalition lost around 1M votes contradicting opinion polls. In this study, we perform community analysis of the retweet networks of the two online campaigns in order to assess whether activity in Twitter reflects the outcome or parts of the outcomes of both elections. The results show that the left-wing parties lost more online supporters than the other parties. Furthermore, an inspection of the Twitter activity of the supporters unveils a decrease in engagement especially marked for the smaller party in the coalition, in line with post-electoral traditional polls.

Keywords: Twitter, Politics, Political Parties, Spanish Elections, Online Campaigning, Political Coalition, Engagement, Political Participation

1 Introduction

As social media are getting a key role in shaping public debate in political contexts, as a kind of new public sphere [6], it is increasingly important to understand their usage during political campaigns. On the one hand, as social media have a strong impact on voters' perceptions and decision making, it is important to understand their dynamics and influence [17], and their usage by politicians [1,21]. On the other hand, social media can be observed as a mirror of trends underlying society [5]. Although translating signals from the online to the offline world is not always straightforward, and previous studies aimed at predicting election results through the analysis of Twitter [20] received many criticisms [7,11,15], it is undoubted that the analysis of social media as emerging political battleground can unveil important aspects of electoral campaigns. Indeed, a growing amount of research is devoted in particular to investigating multiple aspects of the usage of Twitter during elections, as illustrated in the

systematic literature review presented in [14]. In this study, we focus on the Spanish general elections of 2015 and 2016, and we compare activity on Twitter during the two consecutive campaigns to assess whether and how it reflects changes in the engagement of the supporters of different parties.

This case study is of special interest for several reasons. The first one is that the 2015 general elections marked the end of 40 years of Spanish bipartidism. After the country was shaken by the economic crisis of 2008 and by the 15m (or *Indignados*) movement of 2011 with massive protests against the two major parties [22], the elections in December 2015 were held in a very different scenario with respect to all previous elections [18]. The emergence of new political forces and the resulting fragmented parliament with no clear majority led, after six months of negotiation, to new elections in June 2016 [19]. The fact that two elections were celebrated within such a short time interval constitutes another element of interest, which motivates us to analyze and compare the two corresponding online campaigns.

The main parties involved in the elections and having a presence on the whole country (sorted by electoral result) are the following:

- Partido Popular (PP)³ - Traditional conservative party located in the center-right or political right.
- Partido Socialista Obrero Español (PSOE)⁴ - Traditional social-democratic party located in the center-left political spectrum.
- Podemos (Pod)⁵ - Left-wing political party founded in the aftermath of the 15-M Movement protests.
- Ciudadanos (CS)⁶ - Liberal party created in 2005
- Izquierda Unida (IU)⁷ - Traditional left-wing party

It is also important to mention the organizations Compromis (Valencia), En Marea (Galicia) and En Comu Podem (Catalunya), regional confluences that included local bottom-up forces in a coalition with Podemos.

From the results in Table 1, we observe that the participation declines significantly from the first to the second elections, suggesting a decrease in motivation of the electorate. Also, they show that PP increased its votes in 2016; this, combined with the participation drop, led to a significantly higher amount of representatives for the party. In the 2015 election, some of the main left parties were presented in a coalition formed by Podemos, En Comú Podem, Compromís and En Marea. After some negotiations with Podemos, Izquierda Unida declined the offer to join as well the coalition. However in the 2016 election, the two parties agreed and Izquierda Unida joined the coalition of 2015 which was re-named Unidos Podemos. The current Spanish electoral law, which penalizes small forces and gave IU only two representatives in the 2015 Congress after achieving almost

³ [https://en.wikipedia.org/wiki/United_Left_\(Spain\)](https://en.wikipedia.org/wiki/United_Left_(Spain))

⁴ [https://en.wikipedia.org/wiki/United_Left_\(Spain\)](https://en.wikipedia.org/wiki/United_Left_(Spain))

⁵ [https://en.wikipedia.org/wiki/Podemos_\(Spanish_political_party\)](https://en.wikipedia.org/wiki/Podemos_(Spanish_political_party))

⁶ [https://en.wikipedia.org/wiki/Citizens_\(Spanish_political_party\)](https://en.wikipedia.org/wiki/Citizens_(Spanish_political_party))

⁷ [https://en.wikipedia.org/wiki/United_Left_\(Spain\)](https://en.wikipedia.org/wiki/United_Left_(Spain))

Table 1: Participation, percentage of obtained votes and parliament seats per party for the 2015 and 2016 elections. Pod+ stands for the sum of Podemos, En Comú Podem, En Marea, and Compromis. In 2016 IU is added to this sum as well.

Election	Participation	PP	PSOE	Pod+	IU	CS	Other
2015	69.67%	28.71%	22.01%	20.4%	3.68%	13.94%	11.26%
		123	90	69	2	40	26
2016	66.48%	33.01%	22.63%	20.79%		13.05%	10.52%
		137	85	71		32	25

one million votes, triggered the decision of Izquierda Unida to join the coalition in 2016. The results in Table 1 for these parties are shown separately in 2015 and together in 2016. We can see that, although the sum of representatives is the same in 2016 than in 2015, the amount of votes dropped significantly (around 1 million votes) contradicting several polls⁸

While the electoral results clearly indicate the increase or decrease in votes of each party between the two elections, they do not explicitly indicate voter migration between parties (or between parties and abstentionism), which is left to opinion polls. In the 2015 election there were around one million people who voted Podemos and IU who did not vote Unidos Podemos in 2016. Moreover, the winner party, Partido Popular, increased its votes in 2016, and it can be hypothesized that it received votes of people who have voted for other parties in 2015. Several studies using post and pre-electoral polls tried to determine the voter transfers from one election to the other. The study [16] shows that probably only 73% from UP repeated their vote. Their voters did not vote PSOE, the other left party, they did not go to the schools as 15% of the former voters of Podemos and IU recognize that they did not vote on 26-J. In addition, [10] estimated that coalition managed to retain 74% of Podemos voters (almost four million) but only six out of ten IU (60%, around half a million). This means that there are also differences between where the voters went within the coalition electorate.

To complement opinion polls about voter migration between parties with evidence from social media activity, we formulate the following research question:

- **RQ1:** *Can we observe from Twitter activity a migration of supporters between parties from the first to the second election?*

To answer this question, we will consider the retweet network and perform a community analysis to identify clusters of political parties and characterize their structure following the methodology of [2]. As retweets generally represent endorsement, they have been shown useful in previous literature to detect clusters corresponding to political parties, both in the context of Spain [1,2] and of other countries [8]. We will use the clusters obtained and study the migration of users between clusters. As we know from the electoral results that the parties

⁸ See for example http://datos.cis.es/pdf/Es3141mar_A.pdf

who constituted Unidos Podemos lost more than 1 million voters from the first to the second elections, our hypothesis is that we will observe a drop in the users clustered around the accounts of these parties. We further expect the analysis to indicate which of the parties in the coalition lost most supporters in Twitter, and whether such lost users started supporting other parties.

Several studies have examined the correlation between social media use and political engagement. Holt et al [12] report that both, political social media usage and attention to political news in traditional media, increase political engagement over time, and suggest that frequent social media use among citizens can function as a leveller in terms of motivating political participation. Findings from [3] reveal that a variety of Internet uses are positively related with different forms of political participation, whereas the relationship between most uses of traditional media and participation are weak. Finally, Dimitrova et al [9] demonstrate that there are only weak effects of digital media use on political learning, but that the use of some digital media forms has appreciable effects on political participation.

From 2015 to 2016, participation dropped significantly showing a general demotivation or tiredness in the electorate. As we know that Twitter activity can be related with the political engagement and there has been a motivation decrease between the two campaigns, the second question of this study is:

- **RQ2:** *Is the demotivation of the electorate reflected in their Twitter activity/engagement?*

We will answer this research question analyzing the volume of activity per user in the two campaigns, and determining if there are notable differences between them. We will look separately at users supporting different parties, with a special attention towards Podemos and IU, the parties that lost more votes.

2 Dataset

The study is based on two different datasets collected from Twitter in relation to the electoral campaigns of the 2015 and 2016 Spanish national elections (collected during December 4-20 2015 and June 10-26 2016 respectively). The data collection was based on party official accounts and party candidate accounts. For each election, we collected all tweets that either: (a) were created by, (b) retweeted or (c) mentioned one of these accounts. The list of all party candidate and official party accounts considered for data collection is detailed in Table A.1 in the supporting information section.

To detect and characterize the online network organization of political parties, we build directed weighted graphs which comprise a set of nodes (users) and a set of edges (retweets between any pair of users). Each edge in the graph indicates that the source user retweeted a message posted by the target user. To exclude anecdotal interactions between users which might not be enough of a signal to infer endorsement and to highlight the structure of the expected clusters, the networks only contain the interactions between any pair of nodes that

occurred at least 3 times: an edge from user A to user B implies that user A has retweeted at least 3 times user B in the dataset. Nodes without edges after this process are removed. The two resulting networks for 2015 and 2016 have the following characteristics presented in Table 2.

Table 2: Retweet network stats for 2015 and 2016: number of retweets for the whole election (# tweets), number of nodes (N) and edges (E) in the network, clustering coefficient (cl) and average path length (l).

Elections of	# tweets	N	E	cl	l
2015	3 196 677	57 575	164 411	0.004	7.18
2016	1 602 528	72 269	168 135	0.0015	6.215

3 Methodology

3.1 N-Louvain method

Many previous studies have relied on the Louvain method [4] because of its high performance in terms of accuracy, and its efficiency. However, the usage of this algorithm for detecting clusters corresponding to political parties raises some issues. Given the algorithm has a random component, every execution may typically produce different partitions for the same network. To obtain robust results, and classify only nodes who reliably fall into a given cluster, we follow the method introduced in [2], based on the idea of executing multiple times the Louvain algorithm, and classifying only nodes that fall most of the times into the same cluster.

To identify each cluster across executions, we improve the previous method by applying the Jaccard index [13] to every pair of clusters c_i and c_j across different executions:

$$J(c_i, c_j) = \frac{|c_i \cap c_j|}{|c_i \cup c_j|}.$$

Thus, clusters across executions are matched if they are the most similar ones. This allows us to assess the proportion of times a node falls within the same cluster. Finally, the method assigns to each cluster all the nodes that appear in that cluster in at least a fraction $(1 - \varepsilon)$ of the partitions created, that is to say, ε represents the sensibility level of the algorithm ($\varepsilon = 0.05$ in this study). This procedure allows to validate the results of the community detection algorithm and to guarantee that all the nodes that are assigned to a cluster do actually belong to it with a given confidence. The remaining nodes, that cannot be assigned in a stable way to any of the main clusters, are left out from all the clusters.

Table 3: Number of nodes (N_{2015} and N_{2016}) and edges (E_{2015} and E_{2016}) for the intra-network of each cluster in the retweet networks of 2015 and 2016.

Cluster	N_{2015}	E_{2015}	N_{2016}	E_{2016}
Podemos	16 114	33 488	9 771	12 818
IU	10 439	22 422	10 314	12 304
PP	8 345	28 677	5 614	11 682
PSOE	7 538	25 119	5 541	10 174
CS	7 200	24 110	5 458	9 501
ECP	1 412	2 925	1 791	2 868

3.2 Cluster changes between networks

To characterize how users change between two consecutive networks, G_1 and G_2 , we consider five possible categories, depending on how a user i that belongs to a cluster in G_1 is related to the clustering in G_2 . Let $c_1(i)$ and $c_2(i)$ denote the cluster to which i belongs in G_1 and G_2 , respectively. There are three main possible scenarios, either the user belongs to the same cluster in both networks, $c_1(i) = c_2(i)$ (**Same cluster**), it belongs to different clusters, $c_1(i) \neq c_2(i)$ (**Other cluster**), or i does not fall robustly in any cluster of G_2 . In the last case, we can still assign a cluster to i depending on whether i retweeted users belonging to the same cluster $c_1(i)$ (we call this category **Associated with same cluster**) or retweeted users belonging to another cluster (**Associated with other cluster**). Finally, if the level of activity of i does not reach the threshold to be included in G_2 (we only include interactions that occur at least three times), we assign i to the category **None**.

4 Results

We start showing some general results about our community discovery analysis for both election campaigns. We then analyze how the found clusters change between the two elections and conclude this section with a quantification of the change in political engagement.

4.1 Community detection

Table 3 shows the clustering results obtained using the N-Louvain method in both networks. For clarity, we only show the largest clusters.

We observe that, out of the four parties that formed the coalition –Podemos, En Comú Podem (ECP), En Marea and Compromís–, only two clusters are identified, the ones corresponding to Podemos and ECP. Whereas En Marea and Compromís are effectively integrated in Podemos, the party of ECP, in contrast, forms a separate cluster. This can be explained due to the different language and the specificities of the debate about Catalan independence, which creates stronger intra-party interaction.

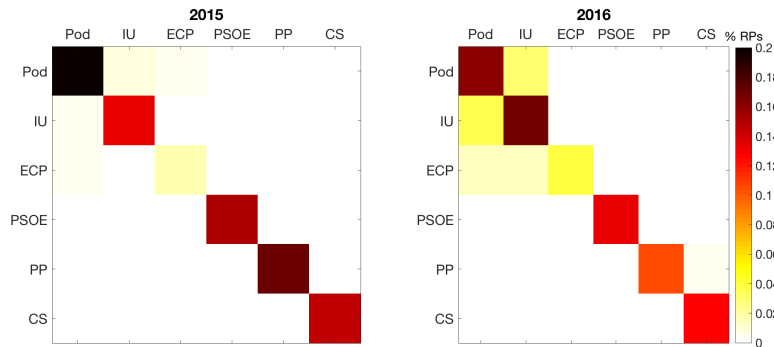


Fig. 1: Normalized weighted adjacency matrices of the 2015 (left) and 2016 (right) retweet networks aggregating nodes by party clusters.

In addition, we also observe that the IU party keeps its own cluster in both elections, despite merging with Podemos in the second elections. The IU cluster is slightly bigger than the one of Podemos in the second election. This is noteworthy, since Podemos had by far a larger amount of votes in the first election, and one might expect the opposite effect in the network.

In general, we can conclude that the formation of the coalition for the 2016 elections *is not captured* by the observed communities, since Podemos, IU and ECP are identified in different clusters. Moreover, there is no simple obvious relation between the size of the identified communities and the electoral results, in terms of votes.

We now analyze the inter-cluster and intra-cluster density of edges. This will provide a measure of how strongly connected are the clusters within the same party and between the different parties in the different campaigns.

Table 3 (second and fourth columns) shows that the amount of intra-cluster edges is smaller in 2016 than in 2015, with a decrease of almost a half, indicating weaker connections in the second elections.

What about the inter-cluster edges? We would expect some of these interactions to increase in the second election, as a consequence of the electoral coalition and of the synergies between the parties. To examine all the interactions between the parties, we consider the interaction matrix A , where A_{ij} is the sum of all retweets that users from cluster i made for the tweets from users of cluster j . Since the clusters have different sizes, we normalize A_{ij} by the sum of all retweets made by the users assigned to cluster i .

Figure 1 shows this interaction matrix A for both election campaigns. As expected, both matrices are diagonally dominant, since the vast majority of retweets were made between users from the same cluster in both elections, being in 2015 this behavior more pronounced than in 2016. Comparing the parties involved in the coalition, we clearly observe that their interactions are increased in 2016, as the (yellow) off-diagonal elements indicate. Interestingly, the interac-

tion between ECP and the other members of the coalition is not symmetric. This fact may be explained again by linguistic reasons, since ECP users retweet both messages in Spanish and Catalan, but most users in the Podemos and IU clusters only speak Spanish and therefore do not retweet ECP messages in Catalan language.

We conclude that, despite the coalition is not captured at the clustering level (parties within the coalition do not merge into a single cluster), *it is captured* at the level of the interactions between clusters, that increase remarkably in 2016.

4.2 Cluster dynamics between the two elections (RQ1)

We now analyze how the clusters change between campaigns. Table 4 shows some general indicators. For each party cluster, we report its size in 2015 and 2016, the number of users which are present in the cluster in 2015 but not in 2016 (*lost* column) with the corresponding percentage in parenthesis, the number of users which are present in the cluster in 2016 but were not in 2015 (*new*), and the *balance*, or difference between new and lost users. The bottom row shows the quantities for Unidos Podemos (UP), which corresponds to the sum of the parties involved in the 2016 coalition. Although the coalition did not exist in 2015, we use it as a reference in our analysis.

We observe that all but a single cluster (ECP) shrink in the second campaign (negative balance), indicating a significant decrease in activity and suggesting an overall decrease in motivation. Indeed, the total number of labeled users decreases significantly from 56 56 in 2015 to 44 820 in 2016.

Another important observation is that all clusters loose more than half of the users they had in 2015. The cluster that loses less users is PSOE (62%) and the cluster that loses most users is Podemos (nearly 80%). This illustrates the high variability between the users assigned to the clusters in the two campaigns. More precisely, each cluster has a core of no more than 38% of users that are kept in the subsequent elections, while the largest majority of users is lost.

Table 4: Main clusters per party. In columns: cluster sizes in 2015 and 2016, # of users present in the cluster in 2015 but not in 2016 (*lost*) and the corresponding percentage, # of users present in the cluster in 2016 but not in 2015 (*new*), difference (*balance*) between new and lost users. Last line (UP) is the sum of ECP, Podemos and IU

Cluster	size 2015	size 2016	<i>lost</i>	<i>new</i>	<i>balance</i>
CS	7 200	5 458	4 771 (66.3%)	3 029	-1 742
PP	8 345	5 613	5 446 (65.3%)	2 714	-2 732
PSOE	7 538	5 541	4 674 (62.0%)	2 677	-1 997
ECP	1 412	1 791	930 (65.9%)	1 309	379
Podemos	16 113	9 771	12 806 (79.5%)	6 464	-6 342
IU	10 439	10 313	7 792 (74.6%)	7 666	-126
UP	27 964	21 875	19 448 (69.6%)	13 359	-6 089

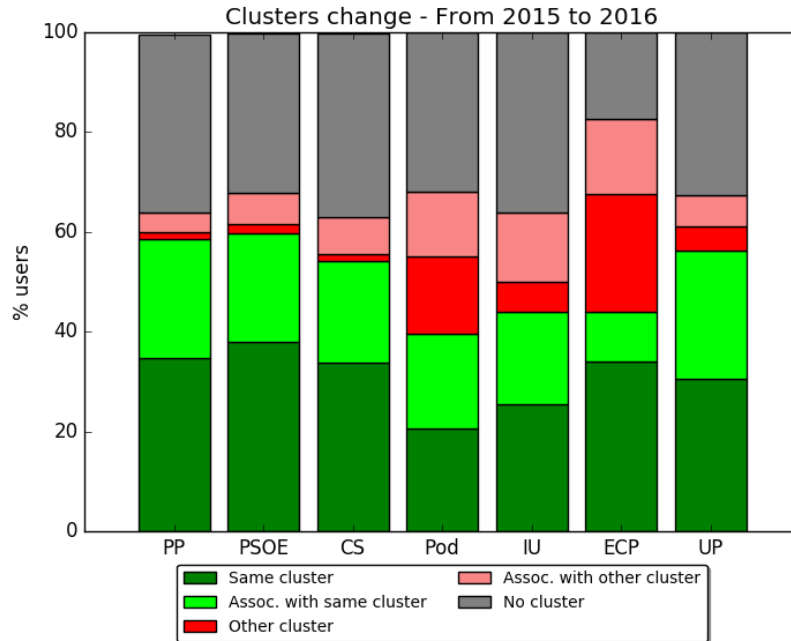


Fig. 2: Proportion of users from each cluster in 2015 who: remain in the same cluster in 2016 (*same cluster*); retweet mostly users from the same cluster in 2016 (*associated with same cluster*); lie in another cluster in 2016 (*other cluster*); retweet mostly users from another cluster in 2016 (*associated with other cluster*); are not associated to any cluster in 2016 (*no cluster*).

The only cluster with positive balances is ECP, with 379 more supporters in 2016. In contrast, Podemos has the highest negative balance among all clusters, loosing 6 324 users. Notice that IU, although being the cluster apparently more stable (with the smallest absolute balance), it is actually the second one that lost more members. This is explained by the fact that IU formed coalition in the second election and, in spite of loosing many users, many new ones joined from other clusters.

Looking at the joint cluster Unidos Podemos (UP), we see that it suffers the highest loss compared to the other parties not in the coalition (69.6% of UP vs 62%–65% of the others). This means that not all the users migrate within the parties of the coalition. Since losing a user from the community does not necessarily mean that the user stopped being a political supporter, we now focus our analysis on the lost users of each cluster.

To understand how users migrate between clusters in the two networks, we apply the methodology described in Subsection 3.2. Figure 2 shows the distribution of the different categories of users for each party cluster in 2015, providing

a more detailed view of the (*lost*) users in Table 4. Note that the values in that column correspond to the regions in the figure that not coloured in dark-green.

We analyze first the distributions of PP, PSOE and CS. They follow a similar pattern with around 35% of users remaining in the same cluster and around 25% of users associated with the same cluster. Therefore, for these three clusters in 2015, despite losing the majority of users according to our clustering criteria, we can say that approximately 60% of their users do not change their support in 2016. The remaining 40% (approximately) is composed mainly of users who do not have a cluster assigned in 2016 and by a small percentage of users who migrated to other parties, either falling in the corresponding cluster or just being associated with it. Notice that the latter is very unlikely.

Regarding the clusters corresponding to UP, we observe that Podemos is has the smallest number of stable supporters (dark/light green) and that ECP is the one with the smallest proportion of users who do not fall in any cluster in 2016 (gray). The latter observation indicates that ECP users keep a high activity in the 2016 campaign.

It is interesting to mention that, when viewed independently, Podemos, IU and ECP have a smaller proportion of users that stay in the same cluster or are associated to same cluster (dark and light green in Figure 2) than the other parties do. However, when considered all together in UP, the proportion increases and becomes comparable to the other parties. This fact suggests that migrations occur mostly within the clusters of the UP coalition parties.

This is confirmed in Figure 3, which shows the flow of clustered users between campaigns for the users clustered in both elections (either in the **same cluster** or in an **other cluster**). It is noticeable that most of these users fall in the same party in both elections, indicating a strong political association. Clearly, Podemos is the cluster that suffers more changes, with a considerable amount of users that mostly migrate to IU and, to a lesser extent, to ECP. We do not see the same behavior in IU.

The following conclusions are extracted from the entire analysis on cluster changes: Although the large variability observed initially in the compositions of the clusters, when one considers the *associated* class, there does not seem to be a high amount of migrations between clusters, with exceptions within Unidos Podemos. It seems that users who actively participate in online campaigns on Twitter are usually very positioned towards one party and only retweet from other parties very sporadically. In general, users that retweet the messages of a party tend to either keep supporting the same party, or stop participating actively in the campaign.

Unidos Podemos is the entity that loses more support from the first to the second election, as Table 4 and Figures 2 and 3 show. The total balance between the two elections is negative and stronger than for the rest of the parties. However, when analyzing the nature of the cluster in 2016 and its changes in relation to 2015, this negative balance is not as high as expected in relation to the other parties from the electoral results and it does not seem to reflect the

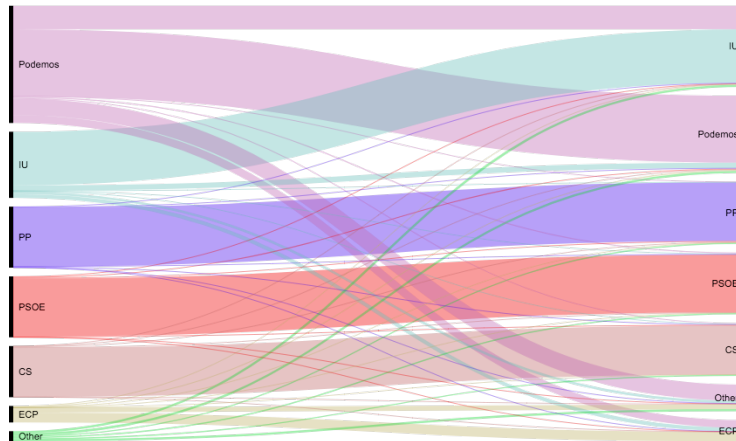


Fig. 3: Match of cluster users: amount of users from a 2015 cluster (left) in the 2016 clusters (right).

general demotivation which was interpreted from the electoral results.

In Unidos Podemos, we have seen a strong migration of supporters from Podemos to IU which did not happen in the opposite direction. The Spanish electoral law that favours bigger parties may have had an influence, pushing citizens closer to IU to vote and campaign for the bigger party Podemos in 2015.

4.3 Political engagement (RQ2)

Activity in Twitter can be an indicator of the political engagement of the population. To characterize the activity of users in each cluster and in each election, we calculate the cumulative distribution function, or probability $P(X \leq x)$ that a user X retweets less than or x times, for those users that were present in both campaigns.

Results are displayed for PP, PSOE, CS and Podemos in Figure 4a. The solid curves lie above the dashed ones, indicating a decrease of activity in all parties. These results confirm that political engagement decreased, perhaps due to the user fatigue after a long period of political activity.

To analyze the engagement within the different parties that form the UP coalition, we break down the coalition UP and show in Figure 4b the cumulative distribution functions for each UP cluster individually. First, we observe that all curves show a similar profile in 2015. However, in 2016 the picture changes. We observe that IU has much less activity than Podemos. Since our analysis includes the strongest supporters of the party only, a decrease of their activity suggests that those users might have been unhappy with coalition and were demotivated during the second election. This result is in agreement with previous literature [19] and with the post-electoral study from Metroscopia [10] which

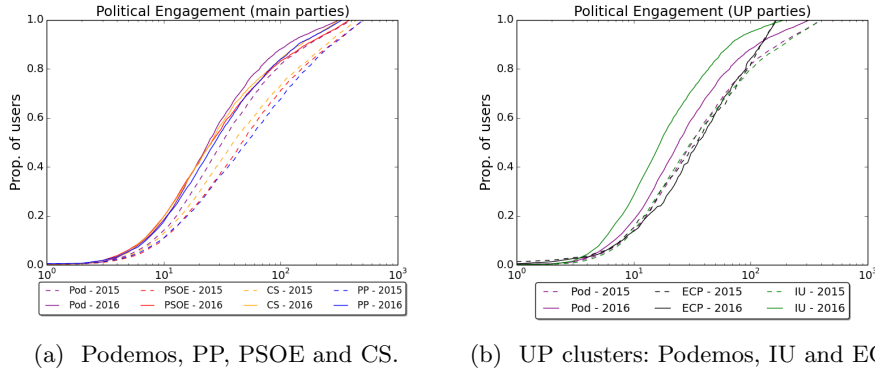


Fig. 4: Cumulative distribution of the number of tweets per users who fall in the same party cluster in 2015 (dashed) and 2016 (continuous). **(a)** The four major parties have all less active users in the 2016 campaign. **(b)** For parties in the UP coalition, a noticeable larger drop of activity of IU users, while ECP users maintained their level of activity.

reported that the UP coalition retained only three out of four Podemos voters (74%) and only six out of ten IU voters (60%). Moreover, ECP shows the opposite effect compared to the rest of parties (it actually increases its activity in the second elections), also in agreement with the electoral results in Catalonia, where Unidos Podemos lost fewer voters from 2015 to 2016.

From these results, we can conclude that our proposed methodology of using the clusters and measuring the activity distribution satisfactorily captures the observed behaviour with respect to engagement observed in the election.

5 Discussion

We have presented a methodology to analyze online Twitter campaigns based on several steps. First, we have used a robust community discovery method and matched automatically the user clusters across multiple executions of the Louvain method using the Jaccard coefficient. Second, we have proposed a characterization of the cluster composition dynamics in consecutive elections to reflect changes in party inclinations. Finally, we have analyzed political engagement by means of the Twitter activity distributions in the different clusters. Our proposed methodology can be seen as an improvement on similar approaches proposed recently for the analysis of online Twitter campaigns [2].

We have applied this methodology on social network data extracted from campaign related user re-tweeting activity during the 2015 and 2016 Spanish National elections. We find that the parties which joined in a coalition after the 2015 elections kept their separate online structures and did not form a unique online cluster. However, the interactions between the clusters in the coalition grew suggesting that their supporters got closer in the second elections.

The analysis of user migration between party clusters (RQ1) reveals that several users have transitioned within the coalition. The results expose an important transfer of users associated to Podemos in the 2015 election to the cluster of Izquierda Unida in 2016. Those users might have been supporting the bigger party in the first election as a matter of utility when it came to getting representatives while actually feeling closer to the smaller party.

The results also show a smaller proportion of users who remain in the UP clusters in 2016 compared to other parties, which may reflect the demotivation of its electorate, although this signal is weak compared to the large decrease in votes for UP.

Previous research has indicated how Twitter activity may be thought as an indicator of the political engagement of the users [3,9,12]. Our study has also analyzed whether there is a relation between the motivation of the electorate and activity on Twitter (RQ2). Despite our analysis shows a lower activity in 2016 than in 2015 for all mayor parties, in line with the participation fall, the results follow a very similar pattern for all parties although the electoral results were different for all of them. Moreover, the decrease in activity is not significantly higher for the users in the UP clusters, which lost the highest amount of votes. However our analysis revealed differences within the UP clusters, showing a much larger decay in activity for IU supporters. This may indicate that users strongly associated to IU were less appealed by the coalition, in agreement with existing studies [19,10].

A Supporting Information

Table A.1: Twitter accounts of the selected political parties and candidates which were used to retrieve the datasets.

Party	Party account	Candidate account
PP	@PPopular	@marianorajoy
PSOE	@PSOE	@sanchezcastejon
Podemos	@ahorapodemos	@Pablo_Iglesias_
IU	@iunida	@agarzon
C's	@CiudadanosCs	@Albert_Rivera
En Comú Podem	@EnComu_Podem	@XavierDomenechs
Compromís	@compromis	@joanbaldovi
Equo	@Equo	@juralde
Marea-Anova-EU	@En_Marea	@tone_corunha
ERC-CATSI	@Esquerra_ERC	@gabrielrufian
DL	@ConvergenciaCAT	@franceschoms
EAJ-PNV	@eajpnv	@MikelLegarda
Bildu	@ehbildu	@ikerurbinal
CCa-PNC	@gnacionalista	@PabloRodriguezV

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