

Online Network Organization of an Emergent Movement-Party

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Introduction

Social media have played an important role in the emergence of a new wave of networked citizen movements in different countries over the last years. In Barcelona, activists from the Spanish 15M (or "indignados") movement devised Barcelona en Comú, an emerging grassroots party that was the most voted candidacy in the 2015 municipal election. While the 15M movement is based on a decentralized paradigm, political parties generally develop oligarchical leadership structures. To investigate such tension between two opposed models, in this study we propose a computational framework to analyze the Twitter communication networks of the parties that ran for this election. A detailed description of the study has been published in [1].

Data collection

To characterize communication patterns of the different parties, we collected data from Twitter in relation to the campaign (May 1 to 26, 2015). We defined a list of accounts representing the main political parties and their leaders, and we collected all messages originated from these accounts, or mentioning them. We then built a network by establishing an edge from user A to user B if user A retweeted at least 3 times a message from user B in the dataset.

Clustering

To identify clusters of users we applied the Louvain algorithm for community detection. To obtain robust results, avoiding dependency on a particular execution of the algorithm, we introduced a method to identify the main clusters of the network in a stable way. We ran $N=100$ executions, we selected the biggest clusters for each execution, and identified each of these cluster through its most central node (according to the PageRank algorithm). Finally, we assigned to each cluster only the nodes appearing in that cluster in at least 95 of the 100 executions. Figure 1 shows the results, in which each color corresponds to one of the main parties, with the exception of the two green clusters, that represent two distinct parts of Barcelona en Comú: the dark green cluster contains the leader and the official party accounts together with many peripheral users, while the light green cluster is composed of activists engaged in the digital communication for the campaign. We call the former *party cluster* (BeC-p) and the second *movement cluster* (BeC-m).



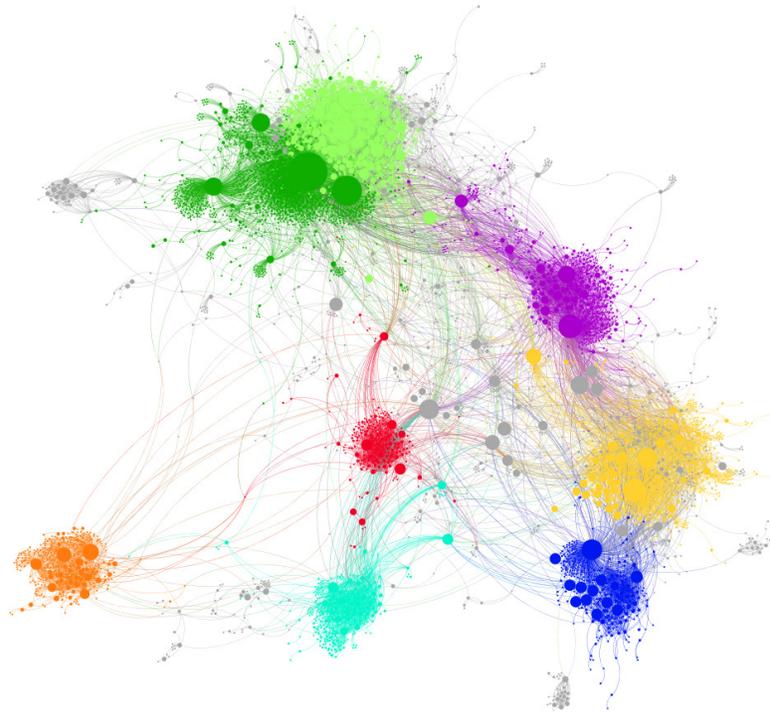


Fig. 1: Network of retweets (giant component). Clusters are represented by color and correspond to political parties: BeC-p (dark green); BeC-m (light green); ERC (yellow); PSC (red); CUP (violet); Cs (orange); CiU (dark blue); PP (cyan). The gray nodes lie outside of these clusters.

Cluster characterization

We characterize the clusters according to three properties: *hierarchical structure* based on the inequality (Gini coefficient) of the in-degree distribution, *small-world phenomenon* based on clustering coefficient and average path length, and *coreness* based on the k-core decomposition. The result show that the party cluster BeC-p is highly centralized like traditional parties. Instead the observed small world phenomenon, low inequality, and rich core of active users of the movement cluster BeC-m point out its decentralized, cohesive and resilient structure. In conclusion, the tension between the decentralization of networked movements and the centralization of political parties results into a movement-party structure, where both paradigms co-exist in two well-defined clusters.

References

1. Aragón, P., Volkovich, Y., Laniado, D., Kaltenbrunner, A.: When a movement becomes a party: Computational assessment of new forms of political organization in social media. In: Tenth International AAAI Conference on Web and Social Media (2016)