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Titel:

Who is connected to whom? A twitter-based network analysis of Members of the European Parliament elected in 2019

Autoren:

Stefan Haußner & Christoph Klika

Kurzzusammenfassung

In this article, we aim to contribute to the literature on political communication on social media in the context of the European Union (EU). By analysing Twitter connections of the Members of European Parliament (MEPs) elected to the European Parliament (EP) in 2019, we aim to identify relational patterns of MEPs at the individual and party group level. The results of a social network analysis confirm the assumption that MEPs have stronger connections within political groups.

Schlagworte

Social Network Analysis, European Parliament, Twitter, communication, election campaign

1. Introduction

The advent of social media has changed the landscape of political communication. Interactive platforms like Facebook and Twitter enable politicians and voters to communicate directly with each other. It is therefore not surprising that the role of such platforms in election campaigns has received considerable attention in the academic literature (see Jungherr 2016; Nuernbergk & Conrad 2016). In the 2014 elections to the European Parliament (EP), around one third of all candidates used Twitter in their campaigns (Nulty et al. 2016). Despite some optimism regarding the potential of social media communication to ameliorate the democratic deficit and rising Euroscepticism, empirical evidence suggests that communication between politicians and voters is deficient in terms of quantity and quality (Umit 2017). If anything, social media seems to be dominated by Eurosceptic voices reinforcing existing gaps between political elites and voters with regard to perceptions and preferences on European integration. The democratic potential of social media notwithstanding, platforms like Twitter can be seen as means of communication among elites (Larsson 2015; Spierings et al. 2019). Hence, the underlying assumption of this article is that social media used by politicians, at least for the time being, is a case of elite communication. In this article, we aim to contribute to the study of communication networks among Members of the European Parliament (MEPs) by analysing the current EP elected in 2019.[1] To this end, we perform Social Network Analysis (SNA) to answer the broadly defined research question of how MEPs are connected on Twitter. The basic premise of SNA is that "social life is created primarily and most importantly by relations and the patterns formed by these relations" (Marin & Wellman 2011, p. 11). Although parties are less dominant in the EP than at the national level, by analysing connections between MEPs on Twitter, we are able to gauge, at the structural level, the coherence of political groups and identify, at the individual level, influential MEPs (Del Valle & Borge Bravo 2018; Svensson & Larsson 2016). In line with the relational premise of SNA, answering this research question is a relevant contribution to the literature at the intersection of political communication and European studies.

Identifying connections and patters of relations in the EP is an important research agenda with regard to so-called permanent campaigning (Larsson 2015). Since social media enables MEPs to communicate directly with voters, we can expect voter mobilisation on various European issues in the current EP even after the 2019 elections. Twitter communication can be explained by various individual and (party) group factors (see Umit 2017). Analysing connections between MEPs at individual and group level, enables developing and testing additional explanations based on the relational premise of SNA. Moreover, the results of SNA and related communication can be correlated with voting behaviour (Cherepnalkoski et al. 2016). Hence a broadly defined research question of how MEPs are connected on Twitter is part of a wider research agenda social media, political communication and legislative behaviour. In this article, we take a first step by analysing the connections of MEPs in the current EP.

2. Conceptualisation and research design

In general, a network can be defined as a set of members of the network (so-called nodes) and the connections between these nodes (Marin & Wellman 2011; Nooy et al. 2011). The focus of SNA rests less on the attributes of nodes but rather the relational aspects of nodal connections. The so-called dyad is the smallest structure in a network consisting of the relation between two nodes. Reciprocity indicates the kind of dyad: no tie between nodes, single tie or ties in both directions. It can be assumed that the degree of reciprocity is an indicator of the degree of cohesion within groups and that reciprocal ties are more stable (Marin & Wellman 2011).

1 We thank Arne Moormann for his support by collecting and updating data on the MEP's Twitter accounts. We are furthermore grateful for valuable comments received on the first draft during the authors' conference accompanying this edited volume. The usual disclaimer applies.

The level of analysis, then, is two-fold, the structure of the network itself as well as the analysis of individual nodes and their connections within the network. With a view to answer our research question, we apply standard concepts of SNA to analyse the EP at the structural level as well as the connections of single MEPs at the individual level. In particular, we apply the following concepts: density, transitivity, assortativity and reciprocity at the structural level as well as in-/out-degree and eigenvector centrality at the individual level.

2.1 Structural level

At the most basic level, density is an essential concept of every network. It can be defined as the number of relations expressed as the proportion of the possible number of relations (Nooy et al. 2005, p. 319). Hence, density is an expression of how many relations are actually established in a network. The fact that possible relations are sometimes not established is important for the concept of transitivity. While the dyad is the smallest structure in the network, the triad, i.e. three nodes, is the basis for transitivity. In a transitive triad, each node is connected, i.e. every node in the triad has all possible relations established (Nooy et al. 2005, p. 324). Similar to density, the transitivity index expresses the proportion of actual transitive triads. Measuring transitivity is essential for the analysis of cliques and clusters within the network.

The analysis of cliques is essential because of homophily or assortativity. These concepts express the assumption that similar people interact more with each other than with dissimilar people (Nooy et al. 2005, p. 320). The assortativity index is calculated based on the nodes' degree but also on *external* characteristics like group and country affiliation. Since structural level concepts as indicators regarding the EP itself are of limited conceptual value, we also apply these concepts at the level of political groups. As mentioned above, connections within and between groups is an important aspect of the research question and we expect that MEPs from the same political group have stronger ties.

2.2 Individual level

As regards the relations of single nodes, the concept of degree is essential (Nooy et al. 2005, p. 321). In the connections of nodes, one can distinguish between incoming connections, i.e. Twitter followers, and outgoing connections, i.e. to follow someone on Twitter. The incoming connections are referred to as indegree, whereas the outgoing connections are referred to as outdegree. The indicator of betweenness centrality is an expression of the proportion of all shortest paths between nodes that include this node (Nooy et al. 2005, p. 318). In other words, it expresses the degree to which one node is located between other nodes. This indicator is essential for the analysis because it is assumed that individual nodes have a high level of influence due to their centrality in the network. In a similar vein, the indicator of eigenvector centrality measures the degree to which a node is connected to other important nodes (Scott & Carrington 2011, p. 427). It has to be noted that the number of relations is not per se important but rather whether these relations connect the node with other important nodes. At the individual level, we assume that influential MEPs occupy central positions within the network and therefore have high degrees and eigenvector centrality values.

In terms of methods, we use Exponential Random Graph Models (ERGM) to examine, whether the MEP-Twitter-network forms weak or strong ties compared to other networks or which political groups have the strongest inter-group-ties. An ERGM is a statistical simulation of the network structure and properties (Hunter et al. 2008). ERGMs can be used to test inferential hypotheses. A certain number of networks are simulated and compared with the own network. Thereby, certain structural properties of the network of interest can be included in the simulation (Luke 2015, p. 163) In our example we build 1000 networks with the same number of nodes and the same density of connections as the MEP network. We assume that the Twitter-network will reflect the political landscape of the European Parliament, already at this early stage. Party leaders or other important players (rapporteurs, committee chairs) will have a high propensity to be very central in the network.

The study is based on a self-constructed dataset containing all Twitter accounts of MEPs elected to the EP in the 2019 elections. The dataset includes about 621 accounts. The Twitter data does not always show which party or which country the person belongs to. We have therefore added this information from the official EP website. The Twitter data was read and evaluated in the statistical programming language R, in particular with the packages rtweet (Kearney 2018), igraph (Csardi & Tamas Nepusz 2006) and visNetwork (Almende et al. 2019). The code and the data set are made publicly available.[2] The network was created on 12 October 2019.

3. Results

In general, we see that on Twitter, MEPs connect in line with political groups (see Figure 1). The political groups are clearly separated from each other in the network graph.[3] The network as a whole divides itself relatively well along the ideological left-right scheme. Only the newly

2 The material can be found in a GitHub-repository and is under a CC-BY-NC license. You can also find there the possibility to download: https://github.com/haosifan/network_ep19.

3 Due to the black-white printing of this book, the illustration of network graphs is rather complicated. You can find another version of the graph online, which is coloured in the colours of the political groups in the European Parliament: https://github.com/haosifan/network_ep19/blob/master/gfx/graph_coloured.JPG.

founded ID (black circle) does not fit in with this left-right-dimension and is positioned a little further outside at the bottom-left part of the graph. Political groups are also separated relatively well graphically, as can be seen from the fairly good spatial separation of grey and black symbols. The biggest overlap is between the Greens and the leftists, social democrats and liberals closely together on the political spectrum. In the left part of the graph there is a well-defined group of grey diamonds, which stand out from the rest of the point cloud. All these MEPs belong to the Brexit party, which has not joined any political group in the EP and has many connections with each other, but much less with MEPs of other groups.

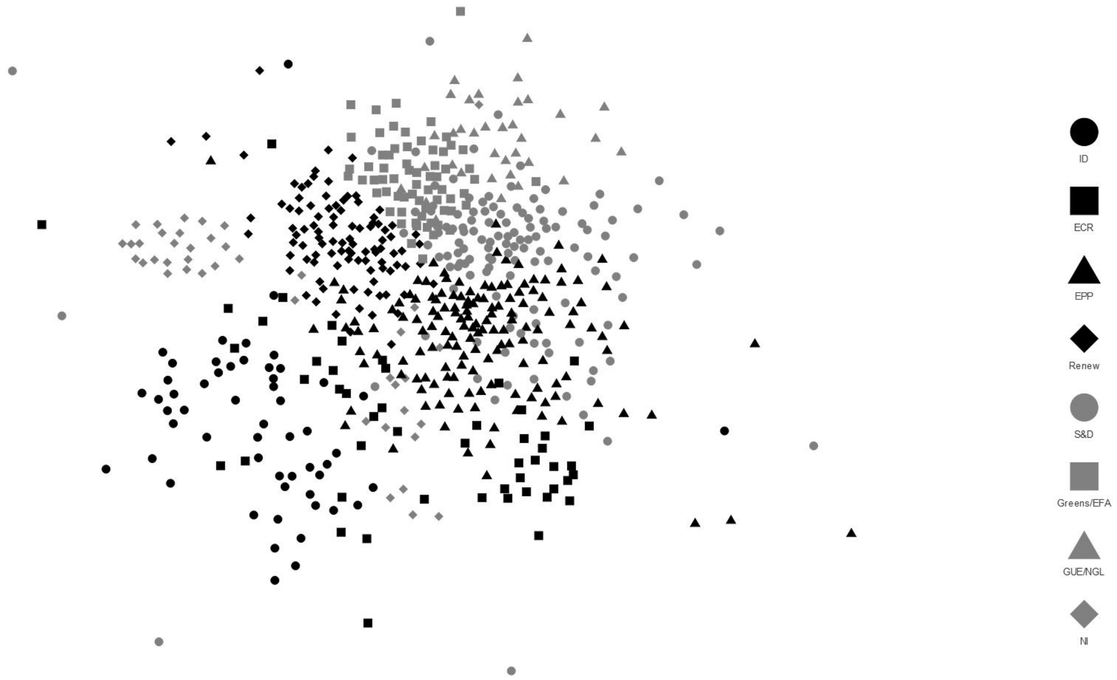

Figure 1: Network structure of the Twitter-network of MEPs

Source: Own calculation and illustration

Table 1 lists the characteristic values of the entire network. Of all possible connections between twittering MEPs, only about five percent are present while each MEP reaches another in its online social network via 2-3 other nodes (2,49). The transitivity value means that with a more than a quarter of the nodes (30,1 percent), two neighbours of the node are also connected. Interesting are the values of homophily (assortativity), based on degree of the MEPs, group affiliation and country of origin. The slightly negative homophily value means that strongly cross-linked MEPs do not necessarily follow other strongly cross-linked MEPs in the network. The clearly positive homophily value based on group affiliation, on the other hand, reflects well what is already evident in the graph. Even in an online environment, MEPs tend to form a network with politically close associates rather than beyond political groups. The homophily value based on country of origin lies in between. Therefore, it is most important for MEPs to follow their political allies, then MEPs from the same country and least important is the position in the social network. The reciprocity value shows that about half of all MEPs (49,4) also follow back when they get followed.

Table 1: Key characteristics of the network

Edge density (*100)	4,93
average path length	2,49
transitivity (*100)	30,1
homophily (based on degree)	-0,09
homophily (based on group affiliation)	0,56
homophily (based on country)	0,32
reciprocity (*100)	51,5

Source: Own calculation

Since some of these results do not say much without a comparison value, we use Exponential Random Graph Models (ERGM). We simulated 1000 networks with the same number of nodes and the same density as in our MEP network. For each of the 1000 networks, the characteristic values are also calculated and compared with our existing network. The results are shown in Figure 2.

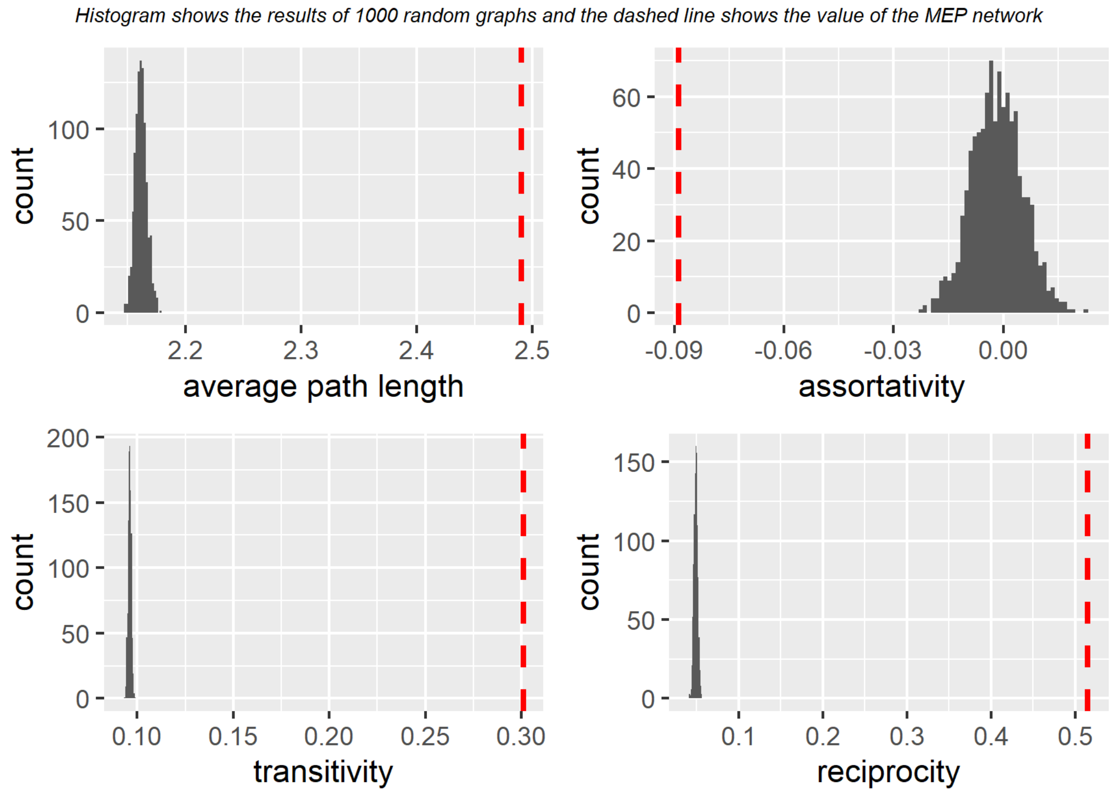

Figure 2: Graphical representation of ERGM-models

Source: Own calculation and illustration

We see that the values of the MEP network (dashed line) always differ significantly from those of the 1000 simulated networks. The MEP network has a significantly high average path length, low degree assortativity (homophily), high transitivity and high reciprocity. MEPs in the environment of a social online network therefore react more frequently than average with a follower if they are followed themselves. In addition, it is much more likely in the MEP network that the *friends* of a MEP follow each other. Since the connections in the simulated networks are randomly distributed, these networks automatically produce an assortativity (homophily) of about zero. Although the MEP network shows a significant deviation, the value remains only slightly negative. Despite the relatively good networking, the average path length required from one MEP to another remains relatively high compared to other networks, underlining once again the strong orientation at political groups.

3.1 Subgroup analysis

The results broken down by individual groups can be found in Table 2. In this respect, it is noticeable that the highest density values are found among the Greens, the Left and the Renew. In addition, the non-attached consisting mainly of two parties (Brexit and M5S), also have high density values. The two large groups EPP and S&D, on the other hand, have the lowest density.

Table 2: Network characteristics in political groups of the European Parliament

groupname	edge density	assortativity	reciprocity
ID	0,186	-0,197	0,665
ECR	0,164	0,243	0,675
EPP	0,155	-0,221	0,542
Renew	0,277	-0,255	0,592
S&D	0,155	-0,113	0,604
Greens/EFA	0,381	-0,197	0,62
GUE/NGL	0,357	-0,23	0,607
NI	0,377	0,66	0,871

Source: Own calculation

The assortativity or homophily value here refers to the degree of knots.[4] If the value is strongly positive, MEPs with a high degree would follow each other within a group frequently, while MEPs with less networked nodes would follow each other less frequently. Positive values are only observable at the group of the ECR and the non-attached MEPs. All other groups have negative values. Members of these groups are followed by many that differ greatly in their degree. Membership in the political group is the more important argument here to follow each other instead of the *importance* in the social network Twitter. In case of the ECR and NI leadership structures in the social network matter more.

The index of reciprocity indicates whether MEPs also follow each other and not only MEP A follows MEP B but not the other way. High values would mean that lots of connections are mutual. The following MEP is also followed back again. Not surprisingly, the *non-group* of the NI occupies a leading position, since it is dominated only by two national parties. Next come the two political groups at the far-right of the political spectrum ECR and ID, which also have relatively high reciprocity values. All other groups are at roughly the same level, between 55 and 60 percent of reciprocal connections.

In summary, there is a slight tendency that more extreme groups have a stronger internal bond than parties in the middle of the political spectrum. The two largest groups, S&D and EPP, tend

4 In contrast to some external values like age or gender of the MEP.

to have below-average internal networks, but have many connections across groups and therefore appear centrally in the overall network. Of course, it is all the more difficult for political groups with many members to establish a *group identity* on Twitter.

3.2 Importance of individual MEPs

At the individual level, especially the in-degree-calculation identifies influential MEPs like the former and recent Presidents of the EP Jerzy Buzek, Antonio Tajani and David-Maria Sassoli as well as Spitzenkandidaten of the 2014 and 2019 elections like Manfred Weber, Guy Verhofstadt, Ska Keller and Bas Eickhout. However, there are also less well-known names with no leading positions in the current European institutions or in previous legislative periods. For example, Karlo Ressler, a young MEP from Croatia, has no top-job in the EU, but is the leader of the youth organisation of the EPP. Likewise, Brando Benifei (S&D, Italy) or Martina Dlabajová (Renew, Czechia) have more central positions on Twitter than their actual political clout might suggest.[5] . Interestingly, in contrast to the other values, which also list less well-known MEPs, the list of Top10 with high eigenvector centrality contains only more prominent members (see Table 3). These are MEPs that have many connections on Twitter themselves but are also mostly connected to those that also have many connections: Multipliers, so to speak, who in turn have connections to other multipliers. Although Sophia in't Veld stands out from the group of (former or vice) group leaders, presidents or ex-Commissioners, she is also a long-standing MEP in her third period.

Table 3: Top 10 MEPs regarding the eigenvector centrality

eigen centrality	name	twitter handle	group	country
1,00	Guy VERHOFSTADT	guyverhofstadt	Renew	Belgium
0,76	Manfred WEBER	ManfredWeber	EPP	Germany
0,65	Ska KELLER	SkaKeller	Greens/EFA	Germany
0,58	Antonio TAJANI	Antonio_Tajani	EPP	Italy
0,55	Andrus ANSIP	Ansip_EU	Renew	Estonia
0,54	Sophia in 't VELD	SophieintVeld	Renew	Netherlands
0,50	Dacian CIOLOS	CiolosDacian	Renew	Romania

5 Martina Dlabajová is, however, deputy chairman of the influential Budgetary Control Committee.

0,47	Corina CREȚU	CorinaCretuEU	S&D	Romania
0,46	Terry REINTKE	TerryReintke	Greens/EFA	Germany
0,46	Jerzy BUZEK	JerzyBuzek	EPP	Poland

Source: Own calculation

4. Discussion and Conclusion

The results show that, in general, MEPs connect on Twitter in line with political groups. The relations between MEPs in political groups form cliques within the network. This is demonstrated through the generally low values in terms of degree homophily. It is evident from the results that MEPs do not tend to follow presumably important individuals, but rather MEPs from the same political group. This is an indicator of politicisation and polarisation in the EP. These results are in line with studies of (sub-)national parliaments demonstrating the so-called echo chamber effect of individuals communicating preferably with like-minded individuals (Del Valle & Borge Bravo 2018). This is an indicator of politicisation and polarisation that is highly relevant with regard to the legislative decision making in the EP in the coming years. As mentioned in the introduction, explaining communication patterns by MEPs through SNA will be possible as additional data will be available in the coming legislative period.

At the level of political groups, we find interesting differences. Political groups further to the left/right on the political spectrum show higher values of density, whereas the two centrist groups show lower values. Hence, it appears that the centrist ideology of the two biggest groups, S&D and EPP, is reflected in their density of relations.[6] As mentioned above, the size of these groups or individual attributes of MEPs might explain this pattern.

At the individual level, among the MEPs with the most connections, we find both influential and less influential politicians. Here the results are somewhat ambiguous. While formally influential MEPs can be expected to occupy central positions, we also identified a number of MEPs with high values regarding their connections. However, the analysis of eigenvector centrality reveals that only prominent and formally influential politicians have high values. This indicator is essential because it reflects a strong multiplier position in the network.

Hence, we conclude that a central position in the network is not a sufficient condition for influence in the EP, but only in connection with high eigenvector centrality (Borge Bravo & Esteve Del Valle 2017). It is safe to assume that these MEPs will likely play an important role

6 Depending on the on-going developments regarding Brexit, the group of non-aligned MEPs is an interesting case given that connections in this groups are dense particularly within the Brexit party.

in the EP in the years to come due to their formal influence and their position within the network, where they are connected to other formerly influential MEPs. The various indicators at the individual and group level are an important first step to further analyses of MEPs' communication and voting behaviour in the legislative period of the 2019 EP.

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