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Analyzing Twitter politics across 26 countries

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Digital soapboxes:

Analyzing Twitter politics
across 26 countries



Livia van Vliet -
Teernstra

Digital soapboxes:

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ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad van doctor

aan de Universiteit van Amsterdam

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PREFACE

This dissertation - Digital soapboxes: Analyzing Twitter politics across 26 countries - was written at the University of Amsterdam by Livia Sophia Teernstra, who published the articles under the name Livia van Vliet. The chapters are comprised of the following collection of articles:

- 1 van Vliet, L., Törnberg, P., & Uitermark, J. (2020). The Twitter parliamentary database: Analyzing Twitter politics across 26 countries. *PloS one*, 15(9), e0237073.
- 2 van Vliet, L., Törnberg, P., & Uitermark, J. (2021). Political Systems and Political Networks: The Structure of Parliamentarians' Retweet Networks in 19 Countries. *International Journal of Communication*, 15(21).
- 3 van Vliet, L., Chueri, J., Törnberg, P., & Uitermark, J. (2023). Political groups over national parties: Measuring the Europeanization of the political arena through MEPs Twitter interactions. *Party Politics*, 13540688231158486.
- 4 van Vliet, L. (2021). Moral expressions in 280 characters or less: An Analysis of Politician tweets following the 2016 Brexit referendum vote. *Frontiers in Big Data*, 4.

In all co-authored articles, Livia van Vliet developed the design, collected and analyzed the data and wrote the majority of the texts. The co-authors contributed to framework development, data analysis and writing of the articles.

The database can be freely downloaded from www.twitterpoliticians.org.

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CHAPTER 1



Introduction

Chapter 1. Introduction

The importance of communication for political life cannot be overstated, as parliamentarians gain and build their careers through public communication with their colleagues and constituents, and through cross-national relationships (Woshinsky, 1995). Political communication is concerned with how political information spreads and influences politics, policy-makers, the news media, and citizens (McNair, 2017). Social media has undeniably added a new dimension to the political conversation, enabling politicians to quickly and easily connect directly to their constituents and target audiences. This new digital arena for political communication provides a fresh angle for examining questions in political science and political communication. Not only has social media constituted a new medium of political communication, but it has also ushered in an explosion of data, leading researchers to shift to computational methods to study the dynamics of political communication (Theocharis & Jungherr, 2021; Windsor, 2021). Twitter is one platform that has emerged as a major data source for researchers, as it can be used to examine how politicians communicate in the public eye. Twitter data also holds promise for advancing the field of comparative politics. We can compare how politicians compete and cooperate within and between different countries, electoral systems and across different levels of government. However, there are fundamental issues with the ways in which Twitter data is collected and used – especially in its sampling, delineation and validation – that need to be addressed prior to realizing this potential. This raises the question: How can we study politics with Twitter data? This thesis develops a database that attempts to address the existing data collection issues and pave the way for a comparative approach to using Twitter data.

This introductory chapter is split into two sections and is structured as follows: The first section begins with introducing Twitter as a platform, and how politicians use the platform. It then looks at how Twitter is most commonly studied in political communication research. The research question and sub-questions are elaborated upon, followed by a discussion of the opportunities and limitations of computational social science. It then

covers what we know thus far on the topics covered in this thesis. The ethical considerations surrounding the publication of Twitter data are discussed, and the contents of the rest of the thesis are outlined. All in all, this thesis develops and demonstrates a computational comparative approach to studying political communication, presented through four separate articles utilizing different aspects of Twitter data to address existing questions in the field.

1.1 Twitter and political communication

Twitter has become a popular element in political campaigns around the world. The posts and interactions of political elites, journalists, and the general public constitute a political communication space. (Jungherr, 2015, p. 69)

Social media has changed the way people communicate, allowing connections across time and space, where people can reach out to those from other cultures, countries and backgrounds. There are different ways that people use social media, and one of the more studied forms is how politicians use it to communicate to their constituents and the media. This section firstly describes Twitter and the ways it is used in political life. It then looks at the ways in which Twitter is used as a research platform in the social sciences, especially in political science and communication.

What is Twitter, and how is it used by politicians?

To better understand what this thesis is about, we must first understand exactly what Twitter is. Twitter is an online micro-blogging platform that was created 15 years ago. Users post ‘tweets’ – messages of 280 characters or less – in the form of a text, photo or video to be shared with other users worldwide. In the first quarter of 2021, the platform boasted 199 million active daily users worldwide (Price, 2022). The U.S. hosts the highest number of Twitter users for a single country, with 21% of U.S. adults using the platform (Omnicores, 2021), although proportionally, Twitter is more popular among Japanese users

(Briggs, 2020). Around 64% of Twitter users are male (although in the U.S., that figure drops to 54%), with around 30% being between the ages of 25 and 34 (Pew Research, 2021). Twitter users are also generally highly educated, with 42% of U.S. Twitter users holding a bachelor's degree (or higher), and 77% of them earning over \$75,000 per year (Pew Research, 2021). This is slightly higher than the national averages of 37.5% holding a bachelor's degree or higher (Duffin, 2021), and a median household income of \$67,521 in 2021 (Shrider et al., 2021). Thus, many Twitter users can be thought of as being high-earning, educated millennials. Additionally, Twitter replicates most of the existing inequalities when it comes to public political exchanges. Thus, politically active Twitter users tend to be males living in urban areas, with solidified ideological preferences (Barberá & Rivero, 2014).

In many countries, the popularity of Twitter among politicians as a one-to-one and one-to-many broadcasting platform is unparalleled. While some do use Facebook and other social media channels (e.g., Enli & Skogerbo, 2013), Twitter remains the most commonly used by politicians across a multitude of countries. This is thought to be due to the sound-bite style communication that it affords (Enli & Skogerbo, 2013; Miller Jr., 2020). In fact, Twitter is an essential platform for political campaigning (Jungherr, 2016). Moreover, politicians can use Twitter to show their allegiances and contentions within their respective parliaments, as well as internationally, and in other levels of politics, such as with local parliamentarians and supranational parliamentarians, e.g., Members of the European Parliament (van Vliet et al., 2020). Clearly, Twitter is a bustling political arena that should be considered as one important medium for politicians to communicate with their constituents. Not only can politicians use Twitter to attract voters, but they can also interact with constituencies and advance issue-based campaigns (Adi, Erickson & Lilleker, 2014). Hence, Twitter plays a prominent role in the way politicians disseminate and promote their political agendas.

How is Twitter used to research politics?

Twitter is the social network *du jour* for social science researchers to examine a broad range of social and political phenomena, such as social movements (e.g., Theocharis et

al., 2015), behavior in natural disasters (e.g., Mihunov et al., 2020), and social issues (e.g., Wonneberger et al., 2021). This popularity of Twitter research may be due to a combination of its popularity among politicians and journalists, and the ease with which researchers can gather data from the platform. Twitter is notably more open to academic research than other social networks such as Facebook and Instagram. This section will briefly outline the main contributions made by political Twitter research, followed by the contribution that this thesis seeks to make.

One important focus of Twitter research uses Twitter data in attempts to predict election results (see Jungherr, 2016 for an overview of campaigning literature), due to its popularity of use by politicians during campaigning periods. Interestingly, those who are more likely to use Twitter are people in opposing parties rather than in governing parties (e.g., Ahmed & Skoric, 2014; Jaidka & Ahmed, 2015; Jungherr, 2014). There are a variety of methodological approaches used to study campaigning behavior, primarily through using content analysis of the Twitter messages posted by parties or candidates (e.g., Evans et al., 2014; Graham, Jackson & Broersma, 2014).

Twitter can also be used to study the structure of interaction between parliamentarians. While content might be one of the most obvious and straightforward ways to study parliamentary allegiances, cooperation with other politicians or political elites on certain topics may not need to be explicitly stated by parliamentarians, and can be indicated in other ways, such as retweeting (posting the same message from their account), mentioning (actively tagging the user in their text), or adding that tweet to a favorites list (Cherepnalkoski et al., 2016). These behaviors are important, as retweets are found to be more predictive of election outcomes than the language used by politicians (Corra & Camargo, 2015). They can also be used to predict coalition formation between parties (e.g., Cherepnalkoski et al., 2016) and political leanings (Conover et al., 2011).

While there is now a sizeable body of research that utilizes Twitter to study politics (Jungherr, 2014), it is rare that researchers study more than one country. This means that the potential of Twitter for comparative research is yet to be realized. Such research could build upon and contribute to the established literature on comparative politics (e.g., Ingelhart & Wezel, 2003; Lijphart, 2012; Norris, 2008), which can be updated through

research on Twitter. Some authors have made steps in this direction (e.g., Bisbee, Larson & Munger, 2020; Stier, Froio & Schünemann, 2021; Rauchfleisch, & Metag, 2016), but studies that used the potential of Twitter for comparative research are sparse (e.g., Barberá, 2015; Ernst et al., 2017). Thus, Twitter data has the potential to offer a lot toward bettering our understanding of political communication, yet it currently remains underutilized. This thesis develops a computational, comparative approach: it uses computational techniques for network and text analysis to compare patterns of political communication across parties and countries.

1.2 Research question

As noted, Twitter can be a terrific source for comparative research in communication patterns, but existing studies are limited to only a few countries (e.g., Barberá, 2015). Therefore, there is an important gap to study a broad range of parliamentarians, beyond what current studies have to offer. Given the current trends and limitations of Twitter research surrounding political communication, this thesis addresses the research question:

How can Twitter data be used as part of a comparative computational approach to studying political communication?

Before we can say something about using Twitter as part of such an approach, it is important to address the current limitations of Twitter research. At present, there are issues surrounding *delineation*, *sampling* and *validation*. Issues with delineation refer to filtering users primarily by hashtags used, which can be problematic and lead to biases in the sample, as people with different political views are likely to use different hashtags even when discussing the same issue (Weber & Garimella, 2013). Following that, sampling issues are further raised through the use of Twitter's streaming interface to query certain keywords or hashtags. At the time of data collection for this thesis, it was found that not all content is gathered without paying for full access, and thus as the number of search parameters increase, the less representative the data becomes (Bruns & Liang, 2012; Joseph et al., 2014; Morstatter et al., 2013). Lastly, validation issues are concerned with

the common lack of contextual information, as Twitter data tends to be difficult to link to other sources (van Vliet et al., 2020).

Thus the following question arises: how can data be best collected to answer the research question? In order to begin answering what Twitter data can contribute to the field of political communication, the limitations with current Twitter research need to be recognized and addressed, to build a foundation for the rest of the thesis. This thesis contributes a systematic way of sampling, delineating and validating a population of parliamentarians on Twitter, through developing a database focusing on sampling parliamentarians from the lower chambers of parliament in 26 countries, as well as the European Union. This is henceforth known as the Twitter Parliamentarian Database (TPD). Details on how the TPD was built and validated are outlined in Article 1, presented as Chapter 2 of this thesis.

To enable a computational comparative approach, it is necessary to collect the data in a way that can be systematically compared across parliaments, and solve existing issues regarding delineation and validation. Hence, after addressing several of the current limitations in Twitter research for political communication, in order to best demonstrate what we can know from Twitter through such systematic data gathering and linking, the rest of the articles examine Twitter data from different angles, primarily retweets, mentions and content. For instance, generally speaking, retweets are signs of endorsements between politicians (Kim & Yoo, 2012; Metaxas et al., 2015). Mentions, on the other hand, are rather indicative of debate, and discussion (Hemsley et al., 2018). Lastly, content is arguably the most important part of Twitter research, as it enables researchers to see the ways in which parliamentarians communicate their views and ideologies with the public in a more casual environment than a parliamentary debate or roll call vote (Lyons & Veenstra, 2019).

The thesis is split into three sub-questions that address the Twitter data from these different angles as examples of how the data can contribute to existing theory. These sub-questions are framed in ongoing debates and questions in political communication:

- 1 Do proportional systems foster more cross-party endorsement among parliamentarians than majoritarian systems do?
- 2 To what extent are Members of the European Parliament oriented toward the European political arena?
- 3 How do British parliamentarians use moral foundations to discuss the Brexit withdrawal agreement on Twitter?

These sub-questions cover different aspects of political communication as well as engage different literatures and showcase different methods. As such, they help answer substantive questions on the role of political systems, multi-level governance and political discourse. They are also pertinent as the political landscape changes and adapts to the use of new media, providing a new platform that positions the parliamentarian with their colleagues and audiences in different ways (Nguyen, 2018). In addition to addressing these substantive issues, the sub-questions also demonstrate the potential of Twitter to conduct different kinds of comparative analysis. Therefore, the sub-questions best showcase the ways in which we can use different aspects of Twitter data (retweets, mentions and text) to contribute to the fields of comparative politics and political communication. The first sub-question uses retweets as a proxy for cross-party endorsement (see Kim & Yoo, 2012). The second sub-question makes use of the sampling of multiple countries, as well as the inclusion of the mention feature, in order to study how frequently Members of the European Parliament (MEPs) communicate with their national parliamentarians. The third question uses the content of tweets in the context of a case study of a political event: Britain's exit from the European Union (Brexit). All in all, the most pertinent features of Twitter are used in this thesis in order to better understand what Twitter data can contribute to some established questions in political communication. It begins with situating the computational comparative approach to political communication on Twitter in the broader, ongoing discussion on how Big Data can be studied within the social sciences.

1.3 Advantages and limitations of a computational science approach

Existing computational research on Twitter data has been dominated by a Computational Social Science approach (CSS). This field uses powerful computational methods in order to make sense of large amounts of data ("Big Data"). Lazer et al. (2009) predicted that computational social sciences will be the most important discipline of the 21st century due to the shift of many aspects of our lives being conducted within the online network, such as communication between friends, using GPS services, purchases, etc. This pervasive use of online tools enables the gathering and analysis of swathes of data about social life. González-Bailón (2013) has summarized the main approaches of computational sciences, and noted that "[i]f there is something that Internet technologies have highlighted like no other technology before [it] is the importance of interdependence and the complexity that interactions add to social dynamics. Big Data can help illuminate that complexity [...] with an impressive level of detail, and promises to yield significant theoretical advances in the study of social change" (p. 148). Therefore, the different type of data that is offered through social networks can reveal interdependent relationships and complex interactions in a level of detail that could never before be studied.

Broadly speaking, there are two main ways of analyzing Twitter data. The first focuses on interactions, and the second focuses on content. Relationships between individuals can also paint an interesting picture of a debate, topic, or political climate. Network analysis provides several techniques to examine relations between individuals on Twitter (Watts, 2001). Traditionally speaking, network analysis has focused on measuring structural boundaries of the network, such as its density, modularity and individual measures of centrality for each node. Text mining, on the other hand, is used to examine the content of tweets. It tends to focus on word frequency distributions, pattern recognition, and classification (Feldman & Sanger, 2007).

While CSS has emerged as one of the fastest growing disciplines in recent years, it has also been subject to substantial criticism. In particular, critics of CSS have argued that it is poorly linked to existing theory within the fields it studies (Hofman et al., 2021; Törnberg

& Törnberg, 2018). In this sense, phenomena are treated as patterns, and there are a lack of links to existing research and theory for further explanatory power. This is clearly the case within Twitter research, which often relies on methods from the physical sciences to interpret social phenomena (Lazer et al., 2020; Waldherr et al., 2015). A key focus of these techniques is to uncover the ‘laws’ which govern nature, modeling, and prediction, or optimize certain social and organizational practices (Lazer, 2009; Lazer et al., 2020). While these implicit goals have yielded impressive results in the physical sciences, they may not be the most appropriate frames to apply when studying social life. Social life occurs in a multi-faceted and complex space, and thus modeling only a sliver of these social interactions may not be sufficient accurate to predict or describe an entire complex phenomenon.

Scholars have therefore argued for developing computational research that is situated in existing research, and that is critical and theory-driven (Jungherr 2016; Törnberg & Uitermark 2021), which mixes computational methods with rich descriptions and reflections on the data (e.g. Lewis et al., 2013; Lindgren, 2020). Comparative political science studies the impact of institutions and political culture through the use of comparative or other empirical methods (Nissen, 1998). These methods can include experiments, comparative historical analysis, case studies, surveys and ethnography (Hall, 2003). Thus, comparative research is a central means through which we can understand how institutions and contexts shape political behavior (Blyth, 2006). When combined with CSS methods, similar cases can be compared with different dependent variables (such as the political system), or different cases can be compared with the same dependent variable (such as across political parties within the same system). Comparative methods and Twitter data are used for the comparative computational approach applied in this thesis. It uses computational methods to identify patterns, alongside comparative and quantitative analyses to better understand and explain the patterns found, drawing on the type of data and approach that is commonly used within political communication.

A hybrid approach to CSS

The implication of using a computational comparative direction would be to steer CSS

away from implicit goals such as identifying the ‘laws’ of social life, and instead focus on wider research strategies which are critical, methodologically pluralist, interpretive and explanatory (Törnberg & Uitermark, 2021). These strategies would thus serve to find qualitative differences and develop explanations of the organization of social life. Qualitative methods do not often use computational algorithms to examine data, but rather involve thick descriptions and interpretations from reading whole datasets. Hence, rather than looking for invariant patterns, it is able to look for variation between cases and over time. To capture and explain qualitative differences, this thesis uses different approaches that combine quantitative and qualitative methods. By way of example, one such approach that combines qualitative and quantitative methods is Visual Network Analysis (VNA) – a newly devised research method that looks at network structures in the context in which they are set (Decuyper, 2020).

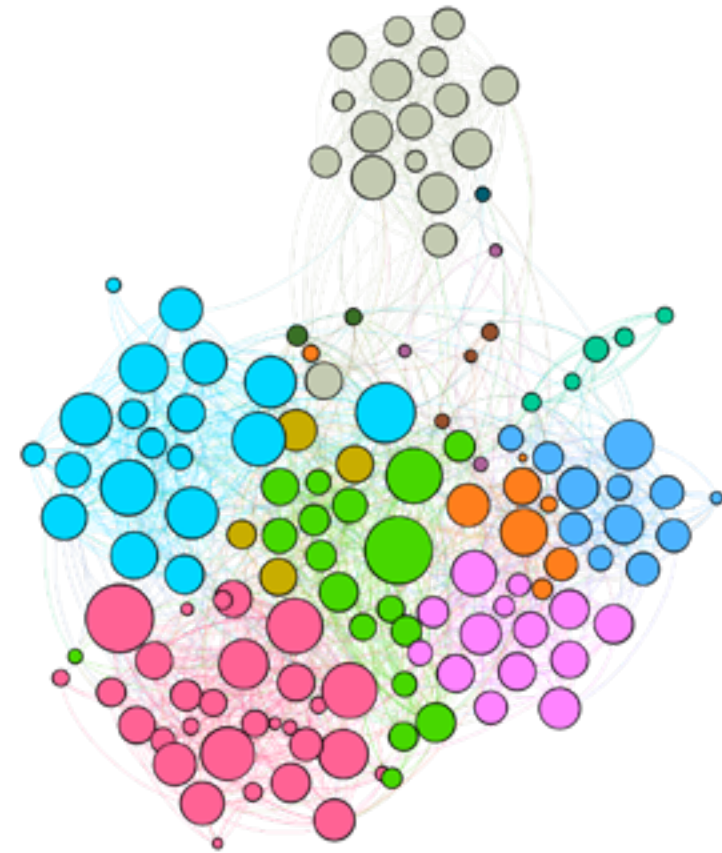


Fig. 1.1: *The Dutch parliamentary network in 2019, where the Partij Voor de Vrijheid (PVV, depicted with gray nodes) is an outlier to the larger parliamentary endorsement network. The PVV is a nationalist, right-wing populist party (Source: the author).*

Depending on the breadth or depth of conclusions that are drawn, results may be immediately obvious without deep prior knowledge. For instance, in a parliamentary endorsement network, you might see that parties may be excluding one or two smaller parties. This can be clearly seen in Fig. 1.1, which shows an overview of the Dutch parliamentary endorsement network, where nodes are colored by their party. The gray party to the top is the far-right Partij voor de Vrijheid, which sits outside of the larger grouping of nodes, which can be identified through VNA. However, VNA does not say anything about how the pattern came to be, which may be a result of the party sending / receiving fewer retweets to and from other parties, or it could be that they are more likely to retweet other party members than those external to the party. While VNA thus helps to see patterns in the data, the meaning and underlying reasons require additional interpretation and research.

1.4 What do we know about politicians on Twitter?

This section briefly introduces the literature relating to the three sub-questions that arise, regarding the patterns of parliamentary behavior on Twitter. It first discusses what the current debates are surrounding endorsement in proportional representation systems (compared to majoritarian). It then outlines the literature regarding the national orientation of MEPs, as opposed to allegiances with their European political group. Lastly, it briefly discusses moral foundations theory and how it applies in the case of Brexit.

Endorsement in proportional systems

Researchers have long been interested in the relationship between democratic systems and cooperation at the level of political elites (Armingeon, 2002; Lehmbruch, 1974; Lijphart, 2012). According to Stadelmann, Portmann and Eichenberger (2016), democratic systems can either nurture division or cohesion amongst parliamentarians. Arend Lijphart proposed that the type of democracy can affect the political climate (1999), and argued that power-sharing democratic systems such as proportional representation (PR) can lead to a more consensual political culture, since parties need to work together in coalitions (Nordlinger, 1972; Lehmbruch, 1974; Lijphart, 1999; Armingeon, 2002). This is contrasted

with majoritarian systems, which generally consist of two large parties, where one has ruling power, so they do not need to work together (Norris, 2008).

On the flipside, others argue that these PR systems encourage divisions (Cox, 1990; Horowitz, 1992; Reilly, 2001; Reilly & Reynolds, 1999). As PR systems consist of many parties with different ideologies, it can lead to relatively permanent blocks, which can reintroduce political divisions (Cox, 1990; Stadelmann et al., 2016). Moreover, their low barriers of entry can allow fringe parties that oppose mainstream parties to enter the fold (Norris, 2008). As such, it is possible that PR systems could either exhibit signs of cohesion, or division. Thus, this debate is one of the most established in political science. Cooperation can be seen amongst parties through endorsement of other parties, in order to show support for (future) coalition partners. Article 2, presented as Chapter 3 examines retweets across party lines, as well as the broader topology of parliamentary retweet networks in 19 countries. It aims to answer the question: Do proportional systems foster more cross-party endorsement among parliamentarians than majoritarian systems do? This article contributes to political communication and political science through testing the idea that proportional systems are more cohesive.

National orientation of Members of the European Parliament

The Europeanization of political parties has emerged as a hot topic to study in political science, especially focusing on the European Union (e.g. Karabová, D., & Filipec, 2018; Ladrech, 2014; Tomita, 2022). It is critiqued that the European political arena is still incomplete, due to European parliamentarians and voters primarily orienting themselves to national issues and politicians (Mühlböck, 2012). This is not ideal for the European arena, as a national orientation of MEPs could lead to a mismatch between the political arena and policy jurisdiction. There are two ways in which research generally examines the Europeanization of the political arena, through either: 1) the extent to which party manifestos concern themselves with European-level issues (e.g., Gabel & Hix, 2002; Spoon, 2012), or 2) whether MEPs vote in line with their national parties or with their European political group (e.g., Hix, 2002; Mühlböck, 2012).

Political scientists have described the European Parliament (EP) as a second-order political

arena, meaning that voters and candidates orient themselves toward national politics, parties and issues (Reif and Schmitt, 1980; Schmitt, 2005). Although EP elections are transnational, they are organized by national institutions, which pushes the political arena to the national level. Moreover, MEPs are nominated by their national parties for election to the EP, and therefore maintain ties to their national parties, especially if they wish to return to the national arena (Kreppel, 2002). In fact, research shows that MEPs follow the directives of their national parties in case there is a divergence within the European political group (e.g., Coman, 2009; Hix et al., 2007). Moreover, studies on party manifestos show that European parties primarily compete over national issues (Braun and Schmitt, 2020; Hix, 1999), which disconnects politics and policy, as MEPs have little national policy influence. Finally, the performance of candidates are discussed and evaluated on a national level, and therefore MEPs are not evaluated on their performance in the EP (Hobolt and Tilley, 2014).

However, the complexities of capturing the Europeanization of the political arena are met with methodological difficulties, as it is hard to examine the behavior of MEPs in the European arena due to elections, nominations and directives largely being nationally oriented. Article 3, presented as Chapter 4 uses Twitter data to contribute a novel method of measuring the orientation of MEPs through studying their interactions with national parliamentarians in 15 European countries, asking the question: To what extent are Members of the European Parliament oriented towards the European political arena? This article contributes to the debate about the role that MEPs play in national parliaments.

The moral foundations of Brexit

Moral reasoning is said to form the basis of political ideologies and judgments (Graham, Haidt & Noshek, 2009). Political communication scientists often distinguish moral issues from non-moral (or pragmatic) ones (Colombo, 2021). Moral arguments therefore express moral values – judgments about what is right or wrong (Ryan, 2019). These judgments can be expressed through political sentiment that offers a moral conclusion (Feinberg & Willer, 2015). Following the referendum vote in 2016, the issue of Brexit has caused rifts between parties, as they could not agree on the terms for leaving the EU, leading

to the suggestion that there is a clash of worldviews that could potentially be on moral grounds. Both moral and pragmatic arguments surrounded the initial referendum vote, where the ‘remain’ side tended to focus on pragmatic arguments, especially the potential negative economic consequences (Sampson, 2017). The ‘leave’ side, on the other hand, appeared to rely more on moral arguments to win the referendum, such as redirecting EU money toward the national healthcare system (Tzelgov & Dumitrescu, 2018; Smith, 2019).

Most moral research in the political arena relies on Moral Foundations Theory, which posits that there are five moral categories that form the building blocks to moral judgments across cultures (Haidt, 2012). Due to the brief nature of tweets, it may not immediately be apparent that moral classifiers can successfully identify their moral content (as they are traditionally used on longer texts). Article 4, presented as Chapter 5 uses a classifier to label the content of tweets from Labour and the Conservatives to determine if there are indeed moral arguments made regarding Brexit, and if so, whether the arguments differ per party. It asks the question: How do British parliamentarians use moral foundations to discuss the Brexit withdrawal agreement on Twitter? This article contributes to the growing body of literature on the differences in moral arguments used by left- and right-leaning parties and individuals.

1.5 Ethical considerations

This thesis has so far lauded the abundance of data that can be mined from Twitter. However, not all data can (or should) be scraped, analyzed and shared, as there are ethical considerations that come into play. In the United States, users consent to making their data available when they agree to Twitter’s terms and conditions. However, to ethically use this data in research, certain guidelines should be followed. It is largely agreed in Internet research guidelines that users should be anonymized to protect their privacy (Eynon et al., 2016). This is especially pertinent when it comes to polarizing topics and political movements such as #blacklivesmatter, as identification of individuals may lead to their harm. According to the ethical framework for Twitter data developed by Williams, Burnap and Sloan (2017), researchers should make efforts to gain informed consent if

tweets are being quoted verbatim, and that risk assessments should be conducted when publishing tweets verbatim. The first step in a risk assessment is to consider the status of the user (e.g., a company, an individual, or a public servant). It should also be considered whether or not they are vulnerable (e.g., children, or those suffering from illnesses), and whether or not the content is sensitive (e.g., mental health issues, or polarizing topics) (Williams et al., 2017). If so, special steps should be followed in dealing with data from such groups.

Public figures, on the other hand, are not afforded the same ethical considerations when using their data in research. Parliamentarians are noted to be public figures and aim to reach a wide audience, without the expectation of privacy (Williams et al., 2017). Thus, tweets from public figures can be published without consideration. As such, Twitter data of parliamentarians is not protected in the same way as private citizens. This exception is important to consider, especially in Article 4, which uses verbatim tweets to exemplify moral underpinnings in the language used.

1.6 The articles

The rest of this thesis operationalizes the research question regarding what we can know from Twitter data, as well as the patterns that can be seen across nations, parliaments, and parties. It confronts the current limitations of much Twitter research in the first article, and then addresses the research question of how Twitter can be used as part of a comparative, computational approach through the subsequent articles, which examine well-established questions in political communication. These articles are related by their methodological framework, using Twitter data in the framework of CSS to provide different viewpoints to existing questions. Most importantly, they showcase different applications of CSS that would not be possible without a large and comparable dataset from different countries, covering the areas of national communication, multi-level parliamentary communication, and the content of messages surrounding a polarizing political topic. They contribute to the field of political communication and political sociology through adding fresh insights to long-standing debates in the field through the framework of computational social science. The articles specifically cover the following:

- # **Article 1:** *The Twitter parliamentary database: Analyzing Twitter politics across 26 countries* introduces the database and outlines the need for a large, international and comparative dataset. It also demonstrates examples of how retweets, mentions and hashtags within the database can be analyzed, with the focus on what we can know from a rigid sampling of Twitter data.
- # **Article 2:** *Political Systems and Political Networks: The Structure of Parliamentarians' Retweet Networks in 19 Countries* delves into the question of politician cohesion in different electoral systems. It uses retweet data to study the link between political systems and endorsement networks, demonstrating that while proportional systems can be more cohesive, this is not the case for all proportional systems.
- # **Article 3:** *Political groups over national parties: Measuring the Europeanization of the political arena through MEPs' Twitter interactions* tests the notion that Members of the European Parliament are more aligned with their national parties than their political groups. It uses mentions and retweet data to uncover who MEPs interact with the most on Twitter.
- # **Article 4:** *Moral expressions in 280 characters or less: An Analysis of Politician tweets following the 2016 Brexit referendum vote* explores the ways in which parliamentarians use moral foundations to discuss the nuances of the withdrawal agreement from the European Union.

The conclusion section covers overall reflections on the research in the thesis. Firstly, it looks at what was learned in regards to Twitter as a research platform, which led to the creation of the Twitter Parliamentary Database, which is presented and demonstrated in article 1. It then focuses on parliamentary behavior on Twitter, summarizing the questions and insights from articles 2 - 4, giving a broad conclusion to how Twitter data can be used as part of a comparative computational approach.

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CHAPTER 2



The Twitter
parliamentarian
database: Analyzing
Twitter politics
across 26 countries

Chapter 2. The Twitter parliamentary database: Analyzing Twitter politics across 26 countries

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Abstract

This article introduces the Twitter Parliamentary Database (TPD), a multi-source and manually validated database of parliamentarians on Twitter. The TPD includes parliamentarians from all European Free Trade Association countries where over 45% of parliamentarians are on Twitter as well as a selection of English-speaking countries. The database is designed to move beyond the one-off nature of most Twitter-based research and in the direction of systematic and rigorous comparative and transnational analysis. The TPD incorporates, in addition to data collected through Twitter's streaming API and governmental websites, data from the Manifesto Project Database; the Electoral System Design Database; the ParlGov database; and the Chapel Hill Expert Survey. By compiling these different data sources it becomes possible to compare different countries, political parties, political party families, and different kinds of democracies. To illustrate the opportunities for comparative and transnational analysis that the TPD opens up, we ask: What are the differences between countries in parliamentary Twitter interactions? How do political parties differ in their use of hashtags and what is their common ground? What is the structure of interaction between parliamentarians in the transnational debate? Alongside some interesting similarities, we find striking cross-party and particularly cross-national differences in how parliamentarians engage in politics on the social media platform.

Key words: Twitter; elections; europe; political parties; algorithms; social communication; social media; social networks

2.1 Introduction

While many authors have argued that social media data have the potential to revolutionize social science research (Manovich, 2018; Watts, 2007), scholars are just beginning to discover how they can use this new source of data to carefully design social research (Salganik, 2018). To make substantive and rigorous contributions to current debates in the social sciences, further steps need to be taken in terms of developing standards for data collection, preparation and analysis (Cihon & Yasseri, 2016; Salganik, 2018). This is particularly true for Twitter. Since this platform has afforded researchers comparatively broad access, a huge number of studies have drawn on Twitter's data to study a wide range of social processes. While the excitement about the affordances of Twitter is understandable, few studies have begun to address the formidable challenge of systematically collecting valid and representative data (Cihon & Yasseri, 2016; Jungherr & Theocharis, 2017; Tufekci, 2014).

We contribute to this endeavor by presenting a database of parliamentarians on Twitter. The Twitter Parliamentarian Database (TPD) contains all the tweets of members of 27 parliaments (26 national parliaments and the European parliament). The database has been painstakingly and systematically validated to address issues of reliability and validity characteristic of much of the existing research on Twitter politician communication. To address issues of data availability, the TPD incorporates, in addition to data collected through Twitter's streaming API and governmental websites, data from the Manifesto Project Database on the parliamentarians' political parties (Volkens et al., 2019); the Electoral System Design Database on the countries' electoral and legislative systems (IPU I, 2019); the Chapel Hill Expert Survey on party positions on specific issues (Bakker et al., 2015); and the ParlGov database on political parties, elections and cabinets (Döring & Manow, 2012)

In this paper, we carry out a tentative analysis using the data in order to demonstrate the potential of the database. While the TPD allows for a wide range of analyses, we focus our demonstration on comparative and transnational research, as the database fills a considerable research gap in these fields resulting from the lack of large-scale data sources. To illustrate the capacity of the database to answer questions pertaining

to this research, we carry out three illustrative and exploratory studies. (1) We look at parliamentarian's Twitter use across nations, with a focus on coalitions and divisions through who retweets whom, asking: What are the differences between countries in parliamentarian Twitter interactions? (2) We look at differences between how different parties label political issues, asking: how do political parties differ in their use of hashtags and what is their common ground? (3) We study the structure of mentions between parliamentarians internationally, asking:

What is the structure of interaction between parliamentarians in the transnational debate?

We do not here aim for definitive answers, but rather use the analyses to illustrate the affordances of the database in relation to research questions that were previously difficult to address. Through including a variety of analyses we demonstrate the different functionalities and areas of research that the TPD is able to touch upon, especially analyses of communication patterns between and within a large number of countries, as well as the content of the communication. While the affordances of Twitter are the same across all the countries, we find cross-party and particularly cross-national differences in how parliamentarians engage in politics on the social media platform.

2.2 Limitations and possibilities of research on Twitter politics

Limitations

Twitter is not only the social media of choice for politicians, but also the social media data source non plus ultra for social scientific research (Lazer & Radford, 2017). There has been a veritable explosion of research on Twitter in general and Twitter politics in particular (e.g. Enli & Simonsen, 2018; Grant et al., 2010; Keller & Kleinen-von Königslöw, 2018; Lee, 2013; Rauchfleisch & Metag, 2016; Vergeer, 2015). The Web of Knowledge database contained 10,653 articles with "Twitter" as a key word (as per 31st October

2019), with 4,112 papers produced between January 1, 2018—October 31, 2019. The combination of key words “Twitter” and “politics” finds 640 articles, with 279 published in 2018-2019—roughly one article about Twitter and politics every 3 days. Despite this large and growing body of research, there remain a number of fundamental issues with carrying out research on Twitter data, in particular in terms of delineation, sampling, and validation.

It has long been established that the delineation of the population is poorly addressed in many studies examining politics on Twitter (Ruths & Pfeffer, 2014; Tufekci, 2014). Researchers often assume that the relevant population consists of Twitter users who index their tweets with specific hashtags. However, there are some serious issues to consider. One is that Twitter users participating in debates do not necessarily use hashtags associated with a particular issue and Twitter users who do use those hashtags do not always participate in the discussion, raising difficult questions of how to decide whether a message is relevant or merely “noise” (Marres & Moats, 2015). Moreover, we know that Twitter users with different political positions tend to use different hashtags (Weber & Garimella, 2013). While careful curation of hashtags can attenuate these problems, it cannot solve them; when tweets and users are selected through hashtags, the delineation of the population remains arbitrary to a (generally unknown) extent. When the population is arbitrarily defined, all subsequent analyses can provide evocative results at best. There are however notable attempts at tackling this issue, for instance, Bruns et al. (2017) have mapped follower/followee relations to get a more relevant sample of the Australian Twittersphere.

A second issue is associated with the common use of Twitter’s free Streaming API for sampling tweets containing keywords. While research into the Twitter Streaming API is relatively sparse and may not be up-to-date due to constant API changes, the research that has been carried out has had troubling implications for the standard approaches to gathering Twitter data, in particular the use of search word or hashtag queries. For instance, when the free streaming API was compared with paid access to the Firehose API (which reportedly gathers 100% of all tweets), the sample became less representative as the number of parameters requested increased (Bruns & Liang, 2012; Joseph et al., 2014;

Morstatter et al., 2013). The issue here is not just that samples of selected keywords are not representative but that we do not know how samples are drawn and what their biases are. Other methods of sampling have been attempted by researchers through focusing on a core group of individuals, wherein all tweets can be gathered (Rauchfleisch & Metag, 2016). However, no attempts to standardize sampling at the scale of the TPD have yet been made.

A third problem with the way that Twitter data is used in research is linked to the lack of contextual or background information. Twitter data tend to be difficult to connect to other data sources, meaning that little is known on the identities and political leanings of the users. Consequently, validation is difficult. However, contextual information is essential if we want to compare between or within different political groups. In response to this issue, researchers often attempt to infer political viewpoints from behaviors such as a follower or friend network, and hashtag use (Al Zamal et al., 2012; M. D. Conover et al., 2011; Golbeck & Hansen, 2011; Hemphill et al., 2016). For instance, if people use, or are listed as, #tcot (i.e., top conservatives on Twitter), it is assumed that they are conservatives. In this case, such a strategy may result in many false positives, but will also only identify a small subset of conservative users. Also, the political viewpoints garnered through these methods may not be representative of the wide variety of political attitudes that exist, where someone may share conservative beliefs in some points, but not in others (Kam et al., 2007; Preotiuc-Pietro et al., 2017). The issue of misidentifying users’ political leanings is aggravated by the presence of sock puppets, trolls, and bots (e.g. Marres & Moats, 2015). Moreover, inferring political views from behavior brings researchers into a legal and ethical grey zone since Twitter regulations forbid the algorithmic identification of users’ political viewpoints. In response to these challenges, researchers have developed more sophisticated methods (e.g. Barberá, 2015; Pennacchiotti & Popescu, 2011; Preotiuc-Pietro et al., 2017; Sylwester & Purver, 2015) to identify political viewpoints, including linking Twitter data with survey data (Preotiuc-Pietro et al., 2017; Vaccari et al., 2013). In sum, there have been some interesting ways that researchers have tried to circumvent the methodological and technical challenges posed in classifying political viewpoints. We offer a different solution by sampling parliamentarians, wherein party affiliations are known, as well as draw upon

existing databases for supplementary information.

Possibilities

If we want to exploit the opportunities for comparative and transnational research into politics that Twitter offers, the issues of delineation, sampling and validation have to be resolved. One way forward, which is the method employed by the database at hand, is to not define populations according to the content of their tweets but to construct a panel of Twitter users whose tweets are collected over time (e.g. Budak & Watts, 2015; Diaz et al., 2016). This approach has been taken in a number of studies that have focused on accounts of the United States' Congress, for which reasonably reliable lists are available on Twitter (see, e.g. Golbeck et al., 2010; Hemphill et al., 2013; Shapiro & Hemphill, 2017). Some researchers have begun to study Twitter parliamentarians outside of the United States but often consider only one or at most two countries (e.g., Del Valle & Bravo, 2018; Khan et al., 2014; Rauchfleisch & Metag, 2016), often in the specific context of election campaigns (Barberá & Rivero, 2015; Ernst et al., 2017; Graham et al., 2016; Kampf et al., 2015; Vergeer, 2015). Thus, while there is considerable research focusing on Twitter use by parliamentarians, to our knowledge, there is no research that includes a large number of countries or that connects to existing databases on parties and parliaments. Hence, the database provides new opportunities for comparative research between multiple countries by making data available that has been gathered over several years from a clearly delineated population.

Focusing on parliamentarians limits the scope of research, but the advantage is that the TPD attempts to resolve several important issues regarding the delineation of the population and sampling in a way that is straightforward, transparent, and verifiable. An additional advantage is that parliamentarians are public figures, which significantly reduces ethical issues regarding privacy protection and increases possibilities to match data obtained from Twitter with data from other sources. In an effort to capitalize on these advantages, the database presented in this article extends earlier work by: including a much greater number of countries; complementing Twitter data with data drawn from other sources; and developing elaborate procedures to maintain data accuracy. The

TPD data enable a broad range of Twitter research (e.g. Conover et al., 2011; Hemphill & Roback, 2014; Kruikemeier, 2014; Ratkiewicz et al., 2011; Vergeer, 2015; Wagner & Gainous, 2013). While previous research focused on a limited number of cases or had to rely on convenience samples (e.g. Barberá, 2015; M. D. Conover et al., 2011; Ratkiewicz et al., 2011), the TPD allows for studying these topics at scale and in comparative and transnational perspective. As such, we present a variety of analyses to demonstrate the different functionalities of the TPD.

Several research domains can be reached by the TPD through linking it to other databases, such as; the Electoral System Design Database (ESDD), the Manifesto Project, the Chapel Hill Expert Survey (CHES) and ParlGov—meaning that the TPD can extend existing comparative work to Twitter, to examine differences in for example the ways parliamentarians express themselves and engage with one another, within nations, within parties as well as transnationally. To illustrate the TPD's potential, we focus on three domains of comparative research as a demonstration of how the database could begin to answer questions in these areas.

We use several methodologies to illustrate the TPD's potential for cross-national and comparative research. First, we can use the TPD to investigate national differences in the way parliamentarians use Twitter. Political science literature has a long-standing tradition of comparing political culture and political debate among various nations (Inglehart, 2015; Kriesi et al., 2008; Lijphart, 2012; Norris, 2008; Statham et al., 2005), showing important differences across countries and different types of electoral and political systems. We use this literature as a way both of showing how the structure of national retweet networks can shed new light on Lijphart's classic ideas on the relationship between democracy types and national political communication (Lijphart, 2012). Second, the TPD allows for comparison of hashtag use between different parties. Twitter provides textual data that captures the way parliamentarians express themselves and frame political issues. Hence, the TPD constitutes a powerful tool for studying subsets of political party discourse. Despite the apparent potential, there has been limited research on content of parliamentarians' tweets, and none that are on a large international scale (Jungherr, 2016). Therefore, the TPD offers the opportunity to contribute to comparative work on discursive conflicts

(Koopmans, 2004; Mueller et al., 2003) that so far had to rely on newspaper data that cover only a very small portion of political claims (Koopmans, 2004). A third domain in which the TPD can be used is transnational communication. Since social media are often regarded as conduits for breaking geographic boundaries (Hänska & Bauchowitz, 2019), there is a need for systematic analysis of communication flows between countries. Since the TPD not only records interactions within but also between countries, it allows for the examination of the prevalence, nature, sources, and topics of international communication networks on Twitter.

Limitations of the TPD

The limitations of exclusively following parliamentarians on Twitter should be acknowledged. First, as mentioned, the focus on parliamentarians limits the scope of the research, since parliamentary tweets only constitute a subset of political discussions on Twitter. This limits usefulness in relation to, for instance, campaigning research, as the TPD only gathers data on parliamentarians who are already in office. It should also be noted that in some cases, parliamentarians may choose not to individually interact with constituents but rather present themselves through the party account. Further, the timeliness of updating the database following elections is largely dependent on the updating of official government websites, which may not occur in some countries until coalitions are formed. In rare cases, this may be several months. While the TPD has a limited scope outside of incumbent parliamentary communication, it may serve as a starting point for questions about other political debates, by using various techniques to expand from parliamentary users to other parts of Twitter.

2.3 Data collection and database design

In selecting countries, we aim to contribute to the large and growing body of comparative and transnational analysis. We included all member states and candidate member states of the European Free Trade Association (EFTA) where over 45% of parliamentarians are on Twitter (van Vliet et al., 2019). In addition, we included a number majority English speaking countries because they allow for the application of English text analysis tools

and have different political systems than most EU and EFTA countries, thus contributing to variation in the dataset. The countries included are Austria, Belgium, France, Denmark, Spain, Finland, Germany, Greece, Italy, Malta, Poland, Netherlands, United Kingdom, Ireland, Sweden, New Zealand, Turkey, United States, Canada, Australia, Iceland, Norway, Switzerland, Luxembourg, Latvia and Slovenia. In addition, the database includes the European Parliament. A full list of the countries and the proportion of their parliamentarians that use Twitter can be found in Table S.2.1.

To identify the parliamentarians in the TPD, we consulted official government websites and retrieved all the identities of incumbent members. From these websites, we also collected the parliamentarians' party affiliations and when available, data on regions and constituencies. When the official government websites did not provide the party information for parliamentarians (as was the case for Germany, France, Finland and Spain), we used Google searches to establish party affiliation. For those websites where English was not available, it was double checked with translation programs that the list we obtained from these websites is the most current and up-to-date list of incumbent members. Identifying parliamentarians on Twitter is occasionally challenging due to e.g. common names and parody accounts, so we followed a protocol to identify and verify Twitter accounts, which involved comparing pictures with those on the government website, examining the number of followers, scrutinizing the lists of followers, and reading the content of the tweets. If the tweets were not in English, they were translated through Google Translate.

Due to the data protection regulation, we only include parliamentarians that are in public service during the time of data collection. Hence, persons who are not currently in parliament but are campaigning to be elected are excluded, as are those who served in one legislative period but were not re-elected in the next. If an account was set to private, it was not included. Inactive accounts, defined as accounts that have not made public tweets after 2014, were also excluded. For the year of 2018, the Twitter Parliamentary Database captured 6,281,684 tweets from 6,437 parliamentarians active on Twitter out of a possible 8,098, meaning that 79.6% of parliamentarians had an active Twitter account.

The tweets of the parliamentarians are collected using Twitter's streaming API, including their mentions, retweets, and hashtags. As mentioned with regards to prior research, the streaming API can encounter certain limitations due to its rate limit, which, when used to follow a certain query (e.g. a popular hashtag that may be used 1,000s of times per second), may be reached much faster than following a certain user, who may only tweet a couple of times per day. Hence, following certain user (in this case, a parliamentarian) results in the streaming API gathering almost all tweets of that user as the amount of tweets per minute rarely exceeds the rate limit imposed by the API.

The database is updated following elections. Therefore there may be several electoral periods for some countries, if they had an election during the time of data collection. For example, if persons A and B are elected in 2015, and there is an election in 2018, where person B is reelected but person A is not, there will be data for person B across both periods, but only for person A until the election in 2018. Data collection for a parliamentarian starts from after they are elected, hence their tweet ids before the election date are not included. The Twitter accounts of members of new parliaments are checked for several months following elections, since we discovered that it takes time for new parliamentarians to find their footing on Twitter, and that some parliamentarians may later create new accounts for their parliamentary service, separate from their personal or campaign accounts. The database includes data from as early as May 2017 for some countries, and has been continually updated since, capturing many interesting political events such as the span of Donald Trump's presidency, the Catalonia referendum, the Brexit debate. The user ids from the database can be used to retrieve older tweets from parliamentarians across the electoral periods where members were collected, or be used to gather further data. Hence, any researcher can use the Twitter ids currently provided in the TPD as a starting point for their own research to update a country of interest following an election.

We conducted cross-validation to confirm the coverage and validity of the collected users and tweets. For user accounts, only limited validation could be carried out, due to the limited availability of databases against which to cross validate. We however compared the TPD ids for members of the US congress against the 115th U.S. Congress Tweet Ids dataset (Littman, 2017), finding that 93% of the ids in the member list matched. The ids

that did not match in either data set were found to be missing accounts that have since been deleted. This could be due to changing accounts during time in office, which can happen as some parliamentarians have campaigning accounts. Moreover, the method of gathering accounts for the 115th U.S. Congress Tweet Ids dataset was different to the TPD, where the former mostly retrieved Twitter accounts from the congress website, which may not differentiate between campaigning and service accounts, rather than manual research which was used for the TPD. To validate the coverage of tweets, we used a random sample of 50 current parliamentarians in the TPD, and retrieved tweets from their timelines occurring between March 1, 2020 and May 1, 2020, using Twitter's REST API. We confirmed that 98% of the tweet ids that were retrieved from the timelines were found in the database. The 2% that were not found are thought to be due to server downtime.

Moreover, the database can be connected to the ESDD, the Manifesto Project, CHES and ParlGov, which enables research questions beyond countries, parliamentarians and their parties. The Manifesto Project, CHES and ParlGov can be used with the TPD in various ways. For instance, the ESDD can be used in combination with Twitter data to determine relationships between electoral systems and online politician communication, where additional variables like electoral size, number of tiers and legislative system are also available (IPU I, 2019). The manifesto project provides "parties' policy positions derived from a content analysis of parties' electoral manifestos." (Volgens et al., 2019, p. 1). ParlGov contains information on parties, elections and cabinets for 37 countries, including all EU and most OECD democracies (Döring & Manow, 2012). The CHES use expert surveys to "estimate party positioning on European integration, ideology and policy issues for national parties in a variety of European countries." (Bakker et al., 2015) Thus, these databases can be used to link differences in online elite political behavior and interaction to variables like party family, political position or offline discourse. In the Appendix (S.2.6) is the Database codebook which gives an in-depth explanation about the variables included, in which tables they can be found, and the relationships between the tables in the database. These relationships can also be seen in Fig 2.1. The latest data can be downloaded from the TPD website: twitterpoliticians.org.

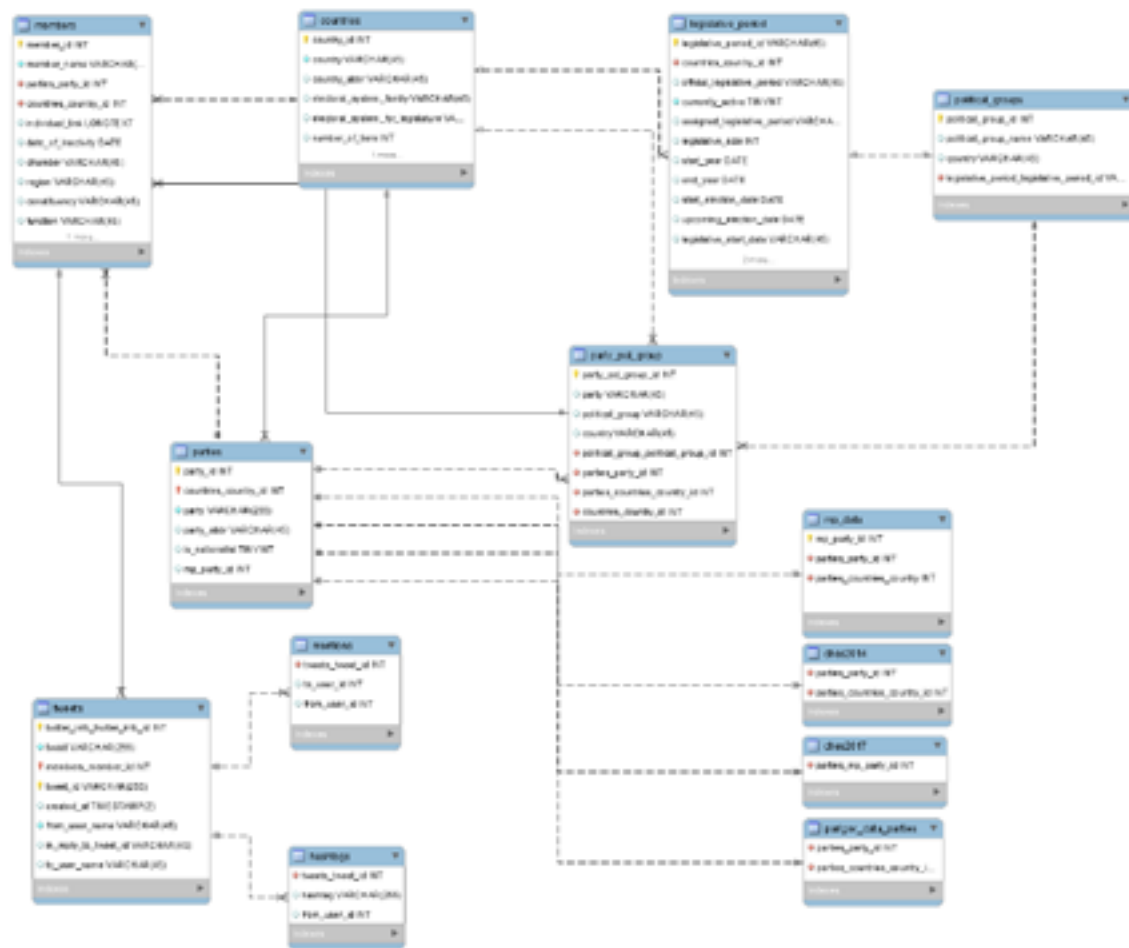


Fig 2.1. Entity relationships in the TPD. Fig 2.1 shows a simplified version of the entity relationships between tables in the database, the foreign keys, and their data types. (Note that not all data columns are included in the diagram for the sake of brevity) (Source: the authors).

2.4 Analyses to demonstrate the Twitter parliamentary database as a research tool

To illustrate the TPD's capacity for comparative research, we use guiding questions to focus our demonstrations, limiting the time frame to the period from 1 January 2018 to 31 December 2018 for congruence.

Comparing countries: How do politicians use Twitter?

We begin by looking at the similarities and differences between countries in terms of Twitter use: What are the differences between countries in parliamentary Twitter interactions? While Twitter offers the same functionalities to parliamentarians everywhere, how those functionalities are used varies significantly between countries. These differences may point to differences in political cooperation across countries. Firstly, the percentage of parliamentarians that actively use Twitter differs. Some countries may have an extremely high active Twitter base (99%, United States) where most parliamentarians tweet almost daily, whereas in other countries, the parliamentarians may have Twitter accounts, but they rarely tweet. However, on average 80% of parliamentarians per country are active on Twitter. The frequency of Twitter use varies across countries. On average, parliamentarians tweet 2.8 times per day, although there is some deviation; parliamentarians in Iceland tweet less than once per day, whereas parliamentarians in Turkey tweet 6 times per day (min = 0.7; max = 6.6; σ = 1.4).

Retweeting and mentioning exclusively between national parliamentarians make up an average of only 21% of total politician Twitter activity (min = 7%, max = 36%), with Poland having the highest proportion of Twitter activity between their parliamentarians, and Iceland with the lowest. Further, as we see in Fig 2.2, while mentions to other parliamentarians tend to be used much more than retweeting, there are stark differences between countries: Icelandic parliamentarians very rarely retweet, while Greek, Turkish and Canadian parliamentarians have more retweets than mentions. Conversely, we see the opposite pattern when looking at retweets and mentions to non-parliamentarians, as parliamentarians retweet more than mention when communicating with those outside of parliament.

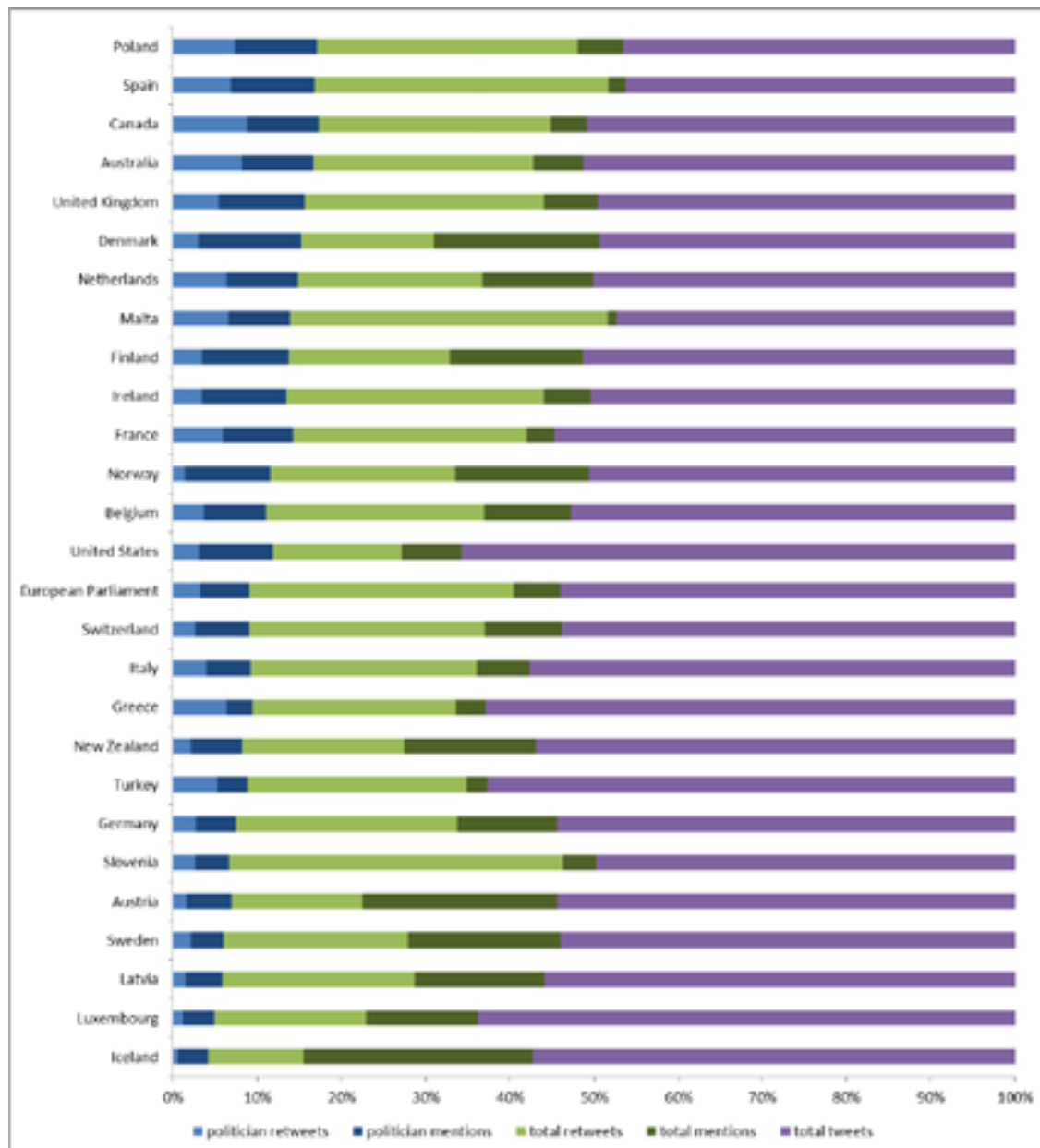


Fig 2.2. Ratio of retweets & mentions. *Retweets and mentions per country as a percentage of total tweets for all countries in the database (Source: the authors).*

The data on retweets and mentions can however be employed in much more powerful ways, providing new data to questions that have long been central to political science. For instance, a large literature in political science focuses on international comparison of politician cooperation, and the relation to aspects of the countries' democratic systems. This literature follows not least from Lijphart's (2012) suggestion that consensus democracies, usually employing proportional representation systems, leads to "kinder, gentler" political cultures than majoritarian systems (see also e.g. Armingeon, 2002; Lehmbruch, 1967; Nordinger, 1972). The authors postulate that the structures of power distribution represented by the democratic system of a country (e.g. majoritarian or consensus) may encourage attitude polarization (and in turn elite conflict), or instead, foster cooperation between politically dissimilar parties (Adam & Horowitz, 1993; Cox, 1990; Lijphart, 2012; Norris, 2008). With this reasoning, it is thought that proportional systems lead to increased cooperation (Lijphart, 2012). Conversely, other scholars argue that due to lower barriers of entry for smaller, single-issue parties, political fragmentation is instead increased in proportional systems (Adam & Horowitz, 1993; Cox, 1990; Reilly, 2001; Reynolds & Reilly, 1999).

Academic work on the coalitions and divisions within parliamentary communication networks has been limited by lack of suitable empirical data. The TPD can thus provide a useful data source for studying the coalitions and divisions among parliamentarians. By viewing retweets as endorsements (c.f. Kim & Yoo, 2012; Metaxas et al., 2015), the patterns of retweeting can be revealing of the political alliances within a country. Retweets can be treated as edges in a network, wherein the structure can reveal coalitions and divisions amongst parliamentarians. Such networks can be analysed in different ways, capturing different aspects of the structure of endorsements within a country. For this demonstration, we focus on the networks with 30 or more parliamentarians, and filter the networks by their giant component. We here aim only for a tentative exploration, leaving an in-depth and rigorous analysis for future research.

A simple but powerful way of operationalizing the level of cohesion within a country is to compare the fraction of retweets made to members of external parties. Countries whose parliamentarians frequently use retweets to endorse members of other parties can be

assumed to have more amicable between-party relations compared to countries whose parties mostly retweet internally. Table S.2.2 documents the electoral system, and the average fraction of external retweets per country. It shows that there are clear differences between countries in terms of the fraction of external retweets. Although these patterns need further exploration, we see that majoritarian (M) systems tend to have a lower fraction of external retweets compared to countries with mixed and proportional representation (PR) systems. PR systems on the other hand, show wide variation in the average fraction of external retweets. Countries with a high fraction of external RTs all employ PR systems.

However, this quantitative approach has certain limitations, as it fails to capture, for instance, divisions involving multiple parties in coalitions or situations in which a fraction of a party is strongly divided from other parties. As there are many forms that divisions can take in these networks, we turn to a more qualitative approach to network analysis: Visual Network Analysis (Decuyper, 2020). This highly flexible approach allows us to categorize the endorsement networks according to their structure, identifying various forms of divisions and alliances within a country.

To look beyond descriptive metrics for examining the differences in parliamentary twitter interactions, for this preliminary demonstration we focus on the networks with 30 or more nodes and filter the networks by their giant component. We plot the networks using the ForceAtlas2 visualization algorithm, which uses a number of properties to structure the networks in such a way that highly connected nodes tend to be closer to each other, and less connected nodes further away from each other (Jacomy et al., 2014). In Fig 2.3, the nodes are colored according to their party.

Using this qualitative method identify four distinct types of political network structures (see Fig 2.3). Type 1 networks show a highly divided structure: there are clear divisions between clusters and very few cross-cutting ties. Type 2 networks show two large clusters that have dense connections amongst themselves and fewer external ties. Type 3 networks show a large, densely connected structure with one or two outlying parties,

which are weakly connected to the others.¹ A clear example of this is the Netherlands, where the outsider is the radical-right party PVV and Germany, where the outsider is the radical-right AfD, which entered parliament in the 2017 election. Lastly, Type 4 structures exhibit one large cluster of dense connections. All the individual retweet networks and their classifications can be found in Fig S.2.5

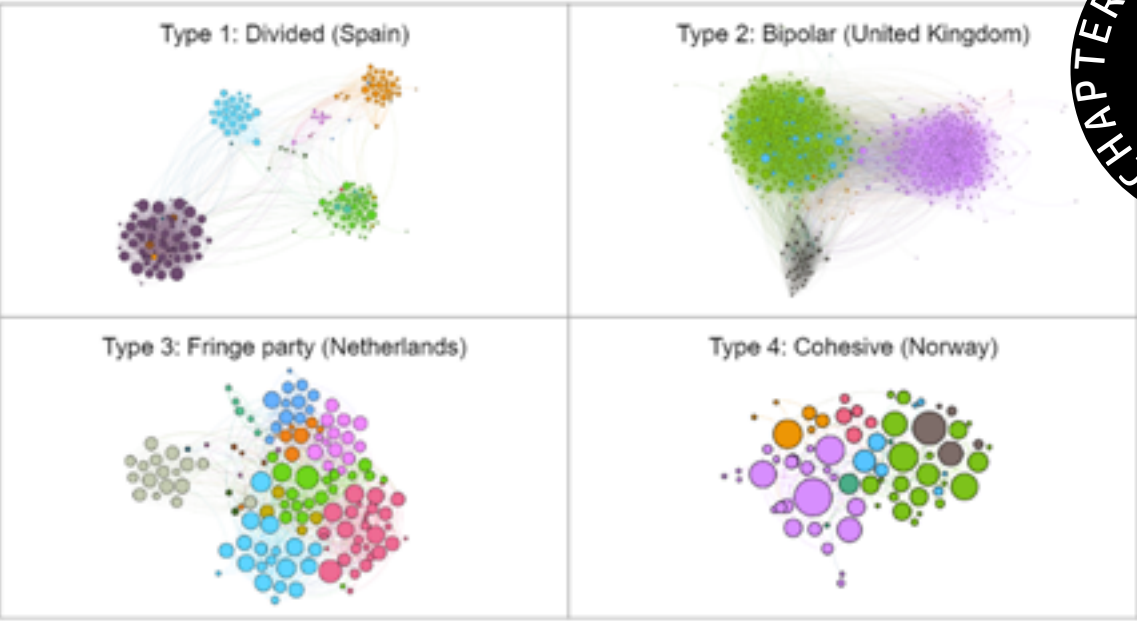


Fig 2.3. Parliamentary retweet network archetypes. Shows the 4 distinct types of retweet networks. Each node represents an individual parliamentarian. The networks are plotted with the ForceAtlas2 visualization algorithm which plots highly connected nodes close to one another, and less connected nodes further away. The nodes are colored by party (Source: the authors).

We can furthermore use additional measures to compare the categories of networks identified using VNA, to demonstrate that the networks are not only visually distinct. S.2.2 Table also reports the modularity, number of clusters, and average clustering coefficient per country to provide measures of clustering within the networks. To confirm

¹ These findings are outlined in more depth in *Chapter 3: Political Systems and Political Networks*, based on the publication: van Vliet, L., Törnberg, P., & Uitermark, J. (2021). Political Systems and Political Networks: The Structure of Parliamentarians’ Retweet Networks in 19 Countries. *International Journal of Communication*, 15(21).

the stability of the modularity measure, we used the `leidenalg` python library to measure each network 1,000 times. We report the average modularity from these runs, as well as the most frequent number of clusters per run. Cluster assignment was based on the most frequent cluster assigned per node across the 1,000 runs. The results indicate that type 1 networks tend to have higher modularity, as well as a greater number of clusters than other networks. Type 3 networks tend to have fewer clusters than the other network types. Type 1 and 2 networks tend to have higher clustering coefficients whereas type 4 networks have lower clustering coefficients. This would indicate that type 1 networks tend to be more divided than types 3 and 4. The fraction of external retweets also shows that parties in type 1 and 2 networks retweet other parties much less than those in types 3 and 4. Additionally we see that most type 3 networks tend to have negative kurtosis of their degree distributions, which implies that members in the network retweet each other to a similar degree, rather than rallying around a few leaders. Finally, we see that type 1 networks tend to have lower normalized eigencentrality scores, implying that nodes are less well-connected within the network.

We also look at the relationship between cluster and party membership through χ^2 and Cramer's V measures, wherein Cramer's V show the strength of that relationship, thereby indicating how 'neatly' the networks cluster based on party: fragmented networks are expected to have a stronger relationship between party-cluster membership, whereas a weak relationship would indicate more overall cohesion in the network. For brevity, we only report the Cramer's V value in S.2.2 Table, as all χ^2 results indicated a significant relationship between party and cluster membership ($p < 0.00$). We see that type 1 networks have much stronger relationships between party and cluster membership than type 4 networks. Therefore, it is clear that type 4 networks generally retweet across party lines.²

All in all, visual analysis and basic network measures can be combined to interpret the

² These findings are outlined in more depth in *Chapter 3: Political Systems and Political Networks*, based on the publication: van Vliet, L., Törnberg, P., & Uitermark, J. (2021). Political Systems and Political Networks: The Structure of Parliamentarians' Retweet Networks in 19 Countries. *International Journal of Communication*, 15(21).

types of network structures that emerge from the data. The measures provided are by no means exhaustive and may differ depending on the research question. Using the information from the ESDD (IPU I, 2019), we can explore differences in parliamentary endorsement not only between countries, but between democratic systems. We see that Type 1 networks show a divided network with little endorsement between parties. Type 2 networks appear bipolar, with two large contending groups, and are the most common category for Majoritarian systems. Lastly, types 3 and 4 are more consensual, due to many cross-cutting endorsements beyond party lines, and are largely comprised of PR systems. These results are tentative and not exhaustive. However, they do illustrate that the database offers opportunities to compare coalitions and divisions between different countries and political systems. While our purpose here is to illustrate the potential of the dataset for studying cross-national differences through exploratory analysis, it also includes data that allows for more formal and quantitative measurement, and points to several fruitful directions for future research.

Comparing language between parties: Examining Hashtags

Textual data from Twitter provides an avenue into seeing how parliamentarians navigate different issues and engage in discursive conflict. Despite this potential, there has been limited research on content of parliamentarians' tweets, and none that has focused on international comparison (Jungherr, 2016). The TPD offers the opportunity to contribute to comparative work on discursive conflicts (Mueller et al., 2003; Torpey, 2006) that so far had to rely on newspaper data that typically do not provide a comprehensive coverage of political claims (Koopmans, 2004) and is time-consuming to collect and process (Koopmans & Statham, 1999). Since the TPD furthermore links to the Manifesto Project, Chapel Hill, and ParlGov databases, it has the information necessary for connecting such textual analysis to a large body of work that compares different political parties and party families (Allen, 2017; Mair & Mudde, 1998; Merz et al., 2016; Volkens et al., 2019). In this section, we explore the possibilities for using the TPD to take a comparative approach to the study of political discourse, focusing on the differences in the use of hashtags between political parties.

The use of labels in political discourse reveals the different ways that opposing political parties discuss the same issues. This is apparent through brief exposure to political debate: while one party may speak of “tax reform,” the other focuses on “tax relief.” Using different labels for the same issue indicates how central labelling is to politics (Lakoff, 2010). The way an issue is labelled influences how we view that issue, what issues we see in the first place and enable us to make sense of what we are reading. Using certain labels over others may lead to exacerbating political divides: when every group identifies and labels its own issues in its own way, it makes conversations across partisan lines more difficult (Scheufele, 2018).

Analyzing labels used on Twitter is made easier by Twitter providing affordances for explicitly labeling tweets, in the form of hashtags. While hashtags serve many purposes, broadly speaking they can be used to index conversations (Fitton et al., 2014), convey a particular point of view (Conover et al., 2011), or for issue positioning and labelling (Conover et al., 2011a; Conover et al., 2011b; Hemphill et al., 2016; Hemphill, Culotta, et al., 2013). Importantly, hashtags aid in building public perceptions of an issue by ensuring maximum visibility, and allow anyone to jump into the conversation (Zappavigna, 2011). In order to demonstrate the database as a tool for comparing issue labelling between parties, we therefore look at hashtags, using the guiding question: how do political parties differ in their use of hashtags and what is their common ground?

To take a first step toward a comparison of how different parties label issues, we develop a simple computational method that captures which hashtags are partisan and which are shared. To study this, we look at the two largest parties in all countries, in terms of the number of active users on Twitter (note that these are not necessarily the parties that have the most seats in parliament). We count each hashtag used by these parliamentarians and then normalize according to the total number of hashtags used by the party. If a hashtag is used by both parties, the overlapping part of the use is seen as the intersection between the parties. As in a Venn diagram, the intersection of the sets are the common hashtags, and the non-intersecting parts are hashtags characteristic of the party. The relative size of the intersection thereby gives a measure of the similarity in hashtag use between the two parties, which corresponds to the Jaccard similarity measure (Niwattanakul et al.,

2013). Since dynamics of discursive conflicts are likely different in multiparty systems, we here focus on the majoritarian systems categorized by the ESDD: the UK, USA, Canada and Australia. The results are shown in Fig 2.4. While the set-based method used here is intuitive and therefore useful for exploratory analysis, a common statistical way of comparing corpora for the most overrepresented words is Log-Likelihood (Boukès & Trilling, 2017). This analysis can be found in S.2.3 Table, and largely matches the results in Fig 2.4.



Fig 2.4. Hashtag use amongst the 2 largest parties. *This figure shows partisan and common hashtags in Australia, the United States, Canada, and the United Kingdom. The middle panel shows the common ground while the side panels show the distinctive hashtags for two largest parties. The size of the middle panel is proportional to the size of the common ground relative to the parties. In the word clouds, the size of words is proportional to the frequency of use as a fraction of total hashtag use (Source: the authors).*

A first striking takeaway from this Fig 2.4 is that the common ground hashtags represent only a small fraction, where the intersection is 15.7% (in the United Kingdom) or less. Most of the hashtags that are equally represented in each party (proportional to the number

of total hashtags used by that party), are usually smaller, less commonly used tags. This indicates that hashtags are largely partisan. Hence, to understand what these fractions mean, we need to look closer at the way hashtags are employed by politicians.

A first thing to note is that the most common intersecting hashtags for Canada and Australia are “cdnpoli” and “auspol” respectively, although they are not used with the same relative frequency by each party. These are general country-level hashtags for marking the nation which the discussion concerns, and are broadly employed for political debate also outside of professional politicians (these hashtags have been broadly studied, e.g. Bruns & Burgess, 2011; Bruns & Liang, 2012; Bruns & Stieglitz, 2012). The UK and the US do not seem to have any corresponding hashtags, which may be due to the US and UK being large enough to be the norm on the platforms, while Canadian parliamentarians need to demarcate that they are speaking of Canadian politics.

We focus here on the US for a deeper look into the ways parties make use of hashtags, and the relation to how political issues are labelled. Looking at Fig 2.4, we see that politicians from both parties address many of the same issues, while using very different labels. The 2018 tax reform is a major talking-point on both sides, but while Republicans refer to it using “taxreform” or “taxcutsandjobsact,” Democrats instead use “goptaxscam”. Interestingly, there is no common ground hashtag to denote the bill. A similar state of affairs can be identified in relation to the 2018 government shutdown, which both parties attempt to attribute to the other party: Democrats refer to it as the “trumpshutdown,” while Republican use “schumersshutdown”. An interesting point of note is that Democrats use the hashtag “trump,” while this is not among the major hashtags for Republicans. Republicans focus on “Venezuela,” as an example of the putative dangers of left-wing politics, while Democrats speak of “climatechange,” an issue that is not featured among top republican talking-points.

The most important intersecting hashtags found in Fig 2.4 include tags which describe arenas of contention rather than specific topics of disagreement, for instance, “scotus,” referring to the Supreme Court, in which a highly contested process of electing new judges played out during 2018. Another example of this is “farmbill”, referring to the primary agricultural and food policy bill of the US government, which is renewed every 5 years

and deals with affairs under the purview of US Department of Agriculture. While there may be disagreements about its contents, the common use hashtag suggests that representatives from both parties at least agree they are discussing the same issue.

Other important intersecting hashtags point to common ground values, to which both parties are happy to profess their support. These include “veterans,” “neverforget,” and “stem”. Similar common ground is found in national emergencies, such as the hurricane striking Puerto Rico. However, even here the language differs somewhat between the parties: Republicans are more likely to refer to the event as “hurricaneirma”, while Democrats speak of its impact on “PuertoRico”. DACA (Deferred Action for Childhood Arrivals)—an Obama-era executive action, now turned Trump-vetoed bill with broad bipartisan support among voters—is an important hashtag in the intersection, but is driven in particular by Democratic politicians, who also employ the related hashtags “dreamact”, “dreamers”, “protectdreamers”. There is, perhaps somewhat tellingly, broad bipartisan use of the hashtag “mepolitics,” denoting a criticism of the country’s polarized political discourse.

As we have demonstrated, we see that politicians use hashtags to express partisan claims. While there is some common ground (for instance when it comes to the importance of caring for veterans), politicians generally use hashtags in outspokenly partisan ways: they use specific hashtags to push different kinds of issues on the agenda or to express a partisan take on the same issue. This case has served to illustrate the range of possible research opened by the TPD in examining language and discourse of politicians on Twitter.

Transnational communication: What is the structure of the transnational mention network?

The TPD not only allows for cross-national comparative research but also for research on international and transnational politics, by enabling analysis of how parliamentarians of different countries communicate with one another (Dahlgren, 2005; Farrell, 2012; Papacharissi, 2002). Through facilitating communication and mobilization of opinion across borders (Castells, 2008), social media platforms open up for the possibility of a cross-national dialogue. The TPD allows us to examine systematically and comprehensively

whether parliamentarians are employing the affordances of the platform to engage in transnational debate. To demonstrate, we look at all mentions between politicians in the European Free Trade Association (EFTA). When a parliamentarian uses the Twitter mention functionality, it refers to another Twitter user and notifies the user that they have been tweeted about. Mentions in this case are tweets in which another parliamentarian's Twitter account is signalled with the '@' symbol. This does not include direct retweets, but it does include retweets where additional text has been added. Mentions were chosen over retweets as they are more indicative of a dialogue or debate (rather than an endorsement), as well as to provide illustration of analysis of Twitter's affordances beyond retweets in the TPD. Luxembourg and Slovenia were excluded from the analysis due to their low number of international mentions. Moreover, since we are interested in communication between national parliamentarians, we do not include the European Parliament in this analysis (see Cherepnalkoski et al., 2016; Larsson, 2015; Scherpereel et al., 2017 for studies on the European Parliament). As illustrative questions, we ask; what is the structure of interaction between parliamentarians in the transnational debate?

We begin by examining the network of mentions between individual parliamentarians, filtered by its giant component (see Fig 5). In most countries (with the exception of Ireland and Spain), less than 55% of parliamentarians have mentioned a parliamentarian from another EFTA country. Table S.2.4 contains the proportion of parliamentarians that made external retweets per country. The extent to which the international network is split along national lines is striking: the parliamentarians are organized in clusters that almost perfectly cut along national lines, with only a small number of parliamentarians being located outside their respective national cluster. Moreover, when there are connections between national clusters, they tend to occur between neighboring countries, with nations like Ireland and UK situated next to one other in the network.

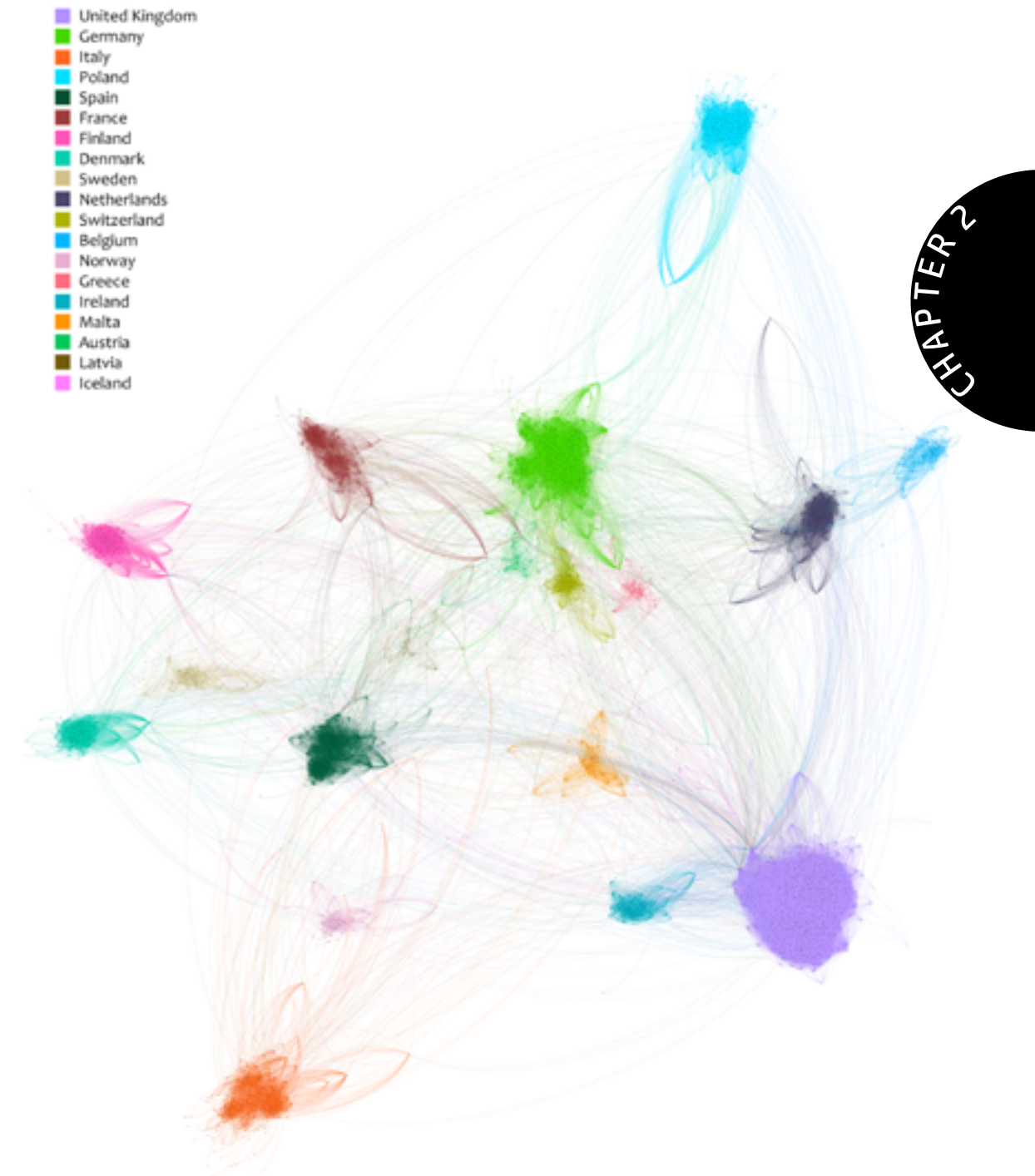


Fig 2.5. International mention network. *This network shows all mentions between parliamentarians in the database. The network is made in Gephi, using the ForceAtlas2 algorithm. Node colors are set according to country (Source: the authors).*

To arrive at a more precise measure for quantifying the level of external communication between countries, we look at the fraction of external tweets, network diameter, average path length and modularity. The modularity indicates the strength of the division of the network. The network diameter measures the longest distance between any two nodes in the network, whereas average path length counts the average graph distance between all pairs of nodes. These measures help to understand the structural connectivity amongst individual national parliamentarians on a European level. Aggregating on country level, we examine centrality with PageRank. The network diameter is 18 and the average path length is 5.8, indicating that there is quite some distance between distant nodes in this network. The network has a modularity of 0.678, suggesting that the network is relatively divisible into separate clusters. All these numbers suggest that parliamentarians communicate mostly with their compatriots, resulting in a very sparse and highly divided international communication network.

Although international communication accounts for a low proportion of the total communication (1.9% of all mentions are directed to a parliamentarian in a different country), in absolute terms it is still substantial cross-national traffic (16,955 total mentions). Looking closer at these mentions gives insight in patterns of communication across EFTA countries. We examine the fraction of external mentions per country, to determine the proportion of mentions that are dedicated to international debate (Domínguez & Hollstein, 2014). When looking at fractions of external mentions, we see in Fig 2.6 that some countries participate minimally in international debate, through a low fraction of incoming and outgoing international mentions. Moreover, we see that the majority of all international mentions are directed towards a small number of countries, namely the United Kingdom and Germany, and to a lesser extent, France. Additionally, we see that there is a large imbalance in outgoing and incoming mentions for some smaller parliaments such as Austria and Iceland. Small countries appear relatively outward facing, as there are simply fewer parliamentarians to mention within these small countries, and more external parliamentarians, resulting in a higher fraction of external mentions. Moreover, it is noted that smaller countries tend to be more globalized than larger countries (Salvatore, 2010).

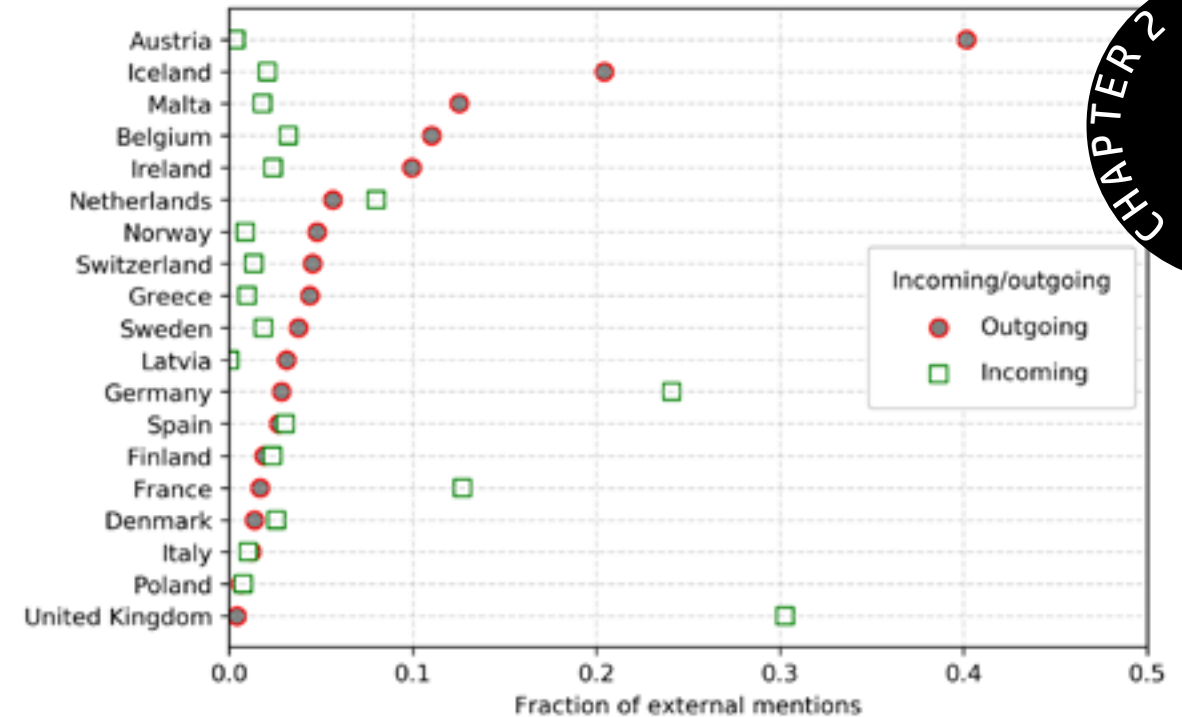


Fig 2.6. Incoming and outgoing mentions. Shows the normalized fraction of outgoing and incoming mentions. The fraction of incoming mentions shows which countries are more central to the debate whereas the outgoing mentions shows how much mention activity per country is directed to international debate (Source: the authors).

To further examine the extent of the transnational debate, Figs 2.7 and 2.9 show that the international debate is uneven, being dominated by Germany and United Kingdom. To check if countries contribute equally to the international debate, we used an independent samples Kruskal-Wallis test. We compared the relationship between normalised cross-border tweets and country. The results indicate that some countries have significantly more external ties than others ($p = 0.000$). This implies that some countries participate more than others in the transnational debate. For a more precise estimate of the relative importance of different countries, we calculate PageRank centrality on the adjacency

In summary, the results of our demonstration suggest that debates among national parliamentarians remain, by and large, contained within national boundaries. The TPD not only makes it possible to study the degree of transnational communication, but also to examine the position of countries, parties, or individual parliamentarians within that debate and the role of different issues. While our exploratory analysis has shown which countries are more central to transnational debates within Europe, the TPD makes it possible to study transnational politics on Twitter at a greater scale and in more detail than data sources have previously allowed for.

2.5 Conclusion

This paper presents a database that responds to the methodological issues regarding delineation, sampling and validation methods commonly used in Twitter research, using a variety of data sources alongside manually validated Twitter information. The opportunities of this database for comparative and transnational research were illustrated through three tentative studies, looking at 1) national differences between parliamentarians' Twitter use, 2) differences between political parties' hashtag use and 3) the structure of transnational debates.

Through our exploratory analyses, we discover similarities in the ways which politicians use Twitter across countries. Overall when communicating with other politicians, they prefer to use mentions rather than retweets. There are also many differences: some countries have a very active, thriving Twitter culture in which all functionalities are used, others refrain from mentioning and retweeting, and yet others may not use the platform much at all. Apart from documenting differences in how Twitter is used, the database can also provide an empirical foundation for research into long-standing questions in political science. To illustrate the database as a tool for studying these questions, we used the structure of retweet networks as a proxy for coalitions and divisions in parliamentary Twitter networks. Using Visual Network Analysis, we could distinguish four different kinds of retweet networks: bipolar, fringe party and cohesive. These structures show whether or not there is a lot of endorsement across party lines, or if the political culture seems more strictly partisan. Indeed, when looking at clustering measures, we see that networks that

appear more divided have a higher clustering coefficient. We find that majoritarian systems have less external retweets and higher clustering coefficients, and most commonly resulted in bipolar structures. On the other hand, proportional systems are the only systems that resulted in cohesive networks. This suggests that there is a correspondence between the nature of political system and patterns of political communication but further investigation is necessary to arrive at robust conclusions.

Comparisons between parties are made through using hashtags as a conduit for issue labelling. We compare countries with majoritarian systems, as they have two large opposing parties that comprise the bulk of the politicians' Twitter activity. We find that there are very few hashtags that are shared between the opposing parties, and, in line with existing literature (Hemphill et al., 2016; Jeffares, 2014; Small, 2011), hashtags are used by politicians for issue positioning. The TPD is able to be used when looking at the content of parliamentary tweets to determine which party used which hashtag, which can help provide a clear identification of partisan and shared tags within a country. This identification can then highlight issues of importance between different parties. Thus, hashtags are an interesting future avenue to study how parties label and discuss issues.

The TPD does not only allow comparisons of countries and parties but also the study of transnational communication. By way of illustration, we studied cross-European parliamentary communication. We found that cross-national mentions constitute only a tiny portion of the total politician Twitter use, which is confirmed by the fraction of external mentions per country. Therefore there is very little international interaction amongst national parliamentarians. Additionally, through PageRank measures we can see that Germany and the United Kingdom take central positions in these debates. Hence, we have demonstrated that the TPD is able to explore the degree in which cross-European communication exists for parliamentarians on Twitter, along with the position of the countries, parties or individual parliamentarians across a number of different issues with more detail than previous studies.

This paper has therefore demonstrated that the TPD is a powerful database for carrying out research on parliamentarians' use of Twitter, in particular for cross-country comparative and transnational research, which has thus far struggled with data availability. All in all, our database addresses some of the current methodological issues with Twitter research and provides a starting point for studying communication, contention and cooperation not only within countries, but also comparatively across borders. As far as we are aware, the TPD is the most comprehensive database of parliamentarians on Twitter that exists, and it is able to provide a framework for more standardized comparative methodology in politician Twitter research.

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CHAPTER 3



Political Systems and
Political Networks:
The Structure of
Parliamentarians'
Retweet Networks in
19 Countries

Chapter 3. Political Systems and Political Networks: The Structure of Parliamentarians' Retweet Networks in 19 Countries

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Abstract

Social scientists have long studied international differences in political culture and communication. An influential strand of theory within political science argues that different types of political systems generate different parliamentary cultures: Systems with proportional representation generate cross-party cohesion, whereas majoritarian systems generate division. To contribute to this long-standing discussion, we study parliamentary retweets across party lines using a database of 2.3 million retweets by 4,018 incumbent parliamentarians across 19 countries during 2018. We find that there is at most a tenuous relationship between democratic systems and cross-party retweeting: Majoritarian systems are not unequivocally more divisive than proportional systems. Moreover, we find important qualitative differences: Countries are not only more or less divisive, but they are cohesive and divisive in different ways. To capture this complexity, we complement our quantitative analysis with Visual Network Analysis to identify four types of network structures: divided, bipolar, fringe party, and cohesive.

Keywords: Twitter; elite political behavior; politicians; political systems; social media; political communication

3.1 Introduction

Political scientists, communication scientists, and political sociologists have long studied international differences in political culture and communication (e.g., Armingeon, 2002; Lehmbruch, 1974; Lijphart, 2012). We focus on a long-standing discussion about the relationship between democratic systems and elite political cooperation. The notion that the type of democracy affects the political climate can be traced back to the work of Arend Lijphart (1999), who argued that systems based on power sharing—such as proportional representation (PR) systems—“have the potential of making an initially adversarial culture less adversarial and more consensual” (p. 307). The idea is that proportional representation systems—varyingly conceptualized as consociational, consensus, or proportional democracies—have a less abrasive political culture and exhibit “kinder, gentler” traits compared with majoritarian systems (Lijphart, 2012, p. 274). It has been extended in work by scholars like Eric Nordlinger (1972), Gerhard Lehmbruch (1974), Klaus Armingeon (2002), and others, and today constitutes one of the most well-known propositions within political science.

A central challenge for this research has been the lack of methods and data to measure and compare political culture and communication (Burgess & Bruns, 2012). Twitter provides terrific resources for such comparative analyses, but existing comparative studies using Twitter data have so far generally been limited to a few countries (e.g., Barberá, 2015). This article speaks to comparative political communication literature (Lijphart, 1999; Norris, 2008) by proposing a comparative, relational approach to examine differences in networks of politicians on Twitter across 19 countries by using retweet data. In the political realm, retweets can generally be seen as endorsements (cf. Calais Guerra, Veloso, Meira, & Almeida, 2011; Conover, Gonçalves, Ratkiewicz, Flammini, & Menczer, 2011; Kim & Yoo, 2012; Metaxas et al., 2015; Wong, Tan, Sen, & Chiang, 2016), which allows them to be used to predict political leanings and preferences with high accuracy (Calais Guerra et al., 2011; Conover et al., 2011; Wong et al., 2016). We hence use retweets to create social networks that reveal the structure of support relations among parliamentarians (Decuyper, 2019).

We ask:

Do proportional systems foster more cross-party endorsement among parliamentarians than majoritarian systems do?

To answer this question, we rely on a mixture of quantitative and qualitative indicators that aid in examining the nature of divisions and alliances among parliamentarians on Twitter. We use a database of parliamentary tweets, which enabled the analysis of 2.3 million retweets between 4,018 incumbent parliamentarians over the entirety of 2018 (van Vliet, Törnberg, & Uitermark, 2020). To study this data, we use a combination of statistical methods, such as the E-I index measure of network homophily (Crossley et al., 2015; Domínguez & Hollstein, 2014) and Visual Network Analysis, a qualitative approach to study the structure of social networks (Decuyper, 2019; Gamper, Schönhuth, & Kronenwett, 2012).

This article fills multiple lacunae in the literature. Firstly, most research into Twitter and politics focuses on how politicians use social media to communicate with journalists (e.g., Dogu & Mat, 2019; Garcia-Perdomo, 2017; Sinha, 2018); there is much less about the use of Twitter for discussion among politicians (Lietz, Wagner, Bleier, & Strohmaier, 2014; Weaver et al., 2018). Thus, we fill a gap in the literature through examining how politicians use social media to engage with one another. Secondly, we develop an approach that allows for the systematic comparison of politician retweet networks among different countries on Twitter—a considerable improvement over current Twitter studies that lack clear standardization in (1) what constitutes “political elite” (e.g., Flores, 2018, p. 312; Weaver et al., 2018, p. 133), (2) measures and analytical techniques (Cihon & Yasseri, 2016; Jungherr, 2016; Zimmer & Proferes, 2014), and (3) sampling methods, whereby snowball sampling is often used, starting with a preselected set of hashtags, followed by selecting profiles based on who used those tags (see Cihon & Yasseri, 2016). We consequently demonstrate standardization in data collection and measurements that does not currently exist to this scale in social media research. Thirdly, digital trace data research has been criticized for being limited to primarily “proof-of-concept” studies, in the sense that they are lacking connection to existing theory (Cihon

& Yasseri, 2016). This article exemplifies how such data can be used to explicitly link to and develop existing theoretical work (e.g., Jungherr, 2015). The key aims of this article are twofold: firstly, to develop a systematic method that allows comparison of Twitter networks across countries, and secondly, to study the differences across political systems and elite cooperation.

In the remainder of this article, we first outline the different types of democratic systems and their hypothesized effects on patterns of cohesion and division among parliamentarians. We then discuss the benefits of using a network analysis approach to studying political communication, ending with a description of network structures we would expect to find based on the different democratic systems. We use a combination of Visual Network Analysis and network measures to identify four archetypical network structures, and discuss the implications of our findings.

3.2 Network Patterns in Politician Retweets

The democratic system is thought to play a key role in either fostering cohesion or driving division among parliamentarians. Some argue that proportional representation (PR) systems produce cooperation (Lijphart, 1999, 2012), while others suggest that PR systems encourage divisions (Cox, 1990; Horowitz, 1992; Reilly, 2001; Reilly & Reynolds, 1999). To begin to answer the research question, we consider the distribution of power in the different types of democracies. We then present how the type of democracy can affect divides or cohesion among politicians. Following that, we consider the placement and role of fringe parties. Lastly, we introduce our approach to studying parliamentarians' networks on Twitter.

Types of Democracies and Cooperation in Politics

Although there are multiple institutional factors determining the power distribution within a democratic system, “electoral rules represent perhaps the most powerful of the instruments which undergird power-sharing arrangements” (Norris, 2008, p. 117). The types of democracies in our data set are PR, mixed PR, and majoritarian. In both

PR and mixed PR systems, there is usually a mix of large and small parties, and ruling governments are likely to be composed of more than one party—either in a coalition or through support agreements (Norris, 2008). Majoritarian systems, on the other hand, are likely to have two large parties, with one of them possessing ruling power.

The democratic system can nurture division or cohesion among political elites (Stadelmann, Portmann, & Eichenberger, 2016). The assumption is that proportional systems foster endorsements across party lines, as parties need to work together in coalitions (Armington, 2002; Lijphart, 1999). Majoritarian systems do not need parties to work together as they are based on a “majority rules” principle, and are thus expected to have less cooperative communication among parliamentarians representing different parties (Norris, 2008, p. 24).

According to scholars following Lijphart, PR systems foster cross-cutting ties through political cleavages, and encourage elite cooperation among distinct groups (Lijphart, 1999). This is because for a functioning government in PR systems, cooperation is necessary to form coalitions or agreements between parties (Lijphart, 2012). This cooperation can be seen in the endorsements of politicians where support is shown across parties, as they may be potential coalition partners for governing power. Other scholars, however, argue that PR systems are prone to division, as these systems tend to have many parties (Horowitz, 1992; Reilly, 2001; Reilly & Reynolds, 1999). The parties may form relatively permanent blocks, which can reintroduce political divisions (Cox, 1990; Stadelmann et al., 2016). More importantly, PR systems generally have low electoral thresholds, allowing access to fringe parties³ that oppose mainstream parties (Norris, 2008). In this understanding, divisions within PR systems are contingent on the composition of parliament and take a different form than in majoritarian systems: They are not between two major parties but among blocks of parties and/or between mainstream parties and fringe parties. Whereas Lijphart and others suggest that PR systems are generally more consensual, in this understanding

3 Related terms include “non-established,” “niche,” “minor,” or “marginal” (Arzheimer, 2010, p. 640). We choose “fringe” since we use network measures to detect their position on the fringes of parliamentarians' network.

it is possible that PR systems can instead exhibit patterns of division. This means that we should not only test whether parliamentarians retweet across party lines but also study the broader topology of their networks. We therefore combine quantitative and qualitative analyses of parliamentarians' networks.

Network Analysis: Taking a Relational Approach to Political Communication

Network analysis techniques have become increasingly popular within social science during recent years, as they provide powerful ways to study the structure of social systems (Gastner & Newman, 2006). Networks model social systems as a set of interconnected nodes and employ mathematical and computational methods to study their structural properties. In this case, we can use network models to visualize and quantify the relationships among parliamentary members with different democratic systems (Decuyper, 2019). Parliamentary cohesion would be governed by centripetal forces, exhibited by many cross-party retweets, bringing the nodes together, whereas division would show a lack thereof, and thus be governed by centrifugal forces that push the nodes apart.

For a long time, a challenge with using social network analysis to study relations among politicians has been the availability of data. This has changed fundamentally with the growth of social media, which are often organized precisely around the notion of social networks. This has particularly been the case when it comes to studying the social interaction among politicians. Previous studies have used voting records of elected politicians (Dal Maso, Pompa, Puliga, Riotta, & Chessa, 2014; Hix & Noury, 2010; Spirling & McLean, 2006; Waugh, Pei, Fowler, Mucha, & Porter, 2009) or their legislative speeches (e.g., Beauchamp, 2011; Lauderdale & Herzog, 2016) to examine politicians' interactions. Through looking at parliamentary Twitter interactions, we are able to see coalitions and divisions that would not be visible based solely on voting records or party affiliation. While there are many single case studies, some recent studies have looked at political Twitter networks from a comparative perspective (e.g., Lietz et al., 2014; Smyrniotis & Ratinaud, 2017; Urman, 2020; Vaccari et al., 2016; Vergeer, 2017; Weaver et al., 2018).

Following these studies, we use Twitter retweet data to compare the extent and structure

of online endorsements among politicians. In these networks, the nodes are politicians, and the ties between them are retweets, with the weight of the ties being determined by the number of retweets. Cooperative patterns will be clearly visible in the network through many ties between the different parties. Retweet networks can be related to political structure, as the structure is reflected through which politicians endorse one another. Cooperative behavior among different political parties is therefore expected to exhibit different network structures than those that lack cooperation or communication among parties.

3.3 Methods

To address the key aims of the article, we developed a systematic method that allows comparison of Twitter networks across countries. We constructed a database that gathers tweets from incumbent parliamentarians in the lower houses of parliament (van Vliet et al., 2020), since this is where open debate, contentions, and coalitions are most likely to be seen.⁴ Hence, the population under study further addresses our second aim of studying elite cooperation across political systems.

The database is freely available (<http://twitterpoliticians.org>). When constructing the database, all the European Free Trade Economic Area countries and all majority English-speaking countries were checked for the number of parliamentarians that were on Twitter. These accounts were manually validated to verify that they were not parody, campaigning, or private accounts, and to make certain that the selected accounts indeed belonged to members of parliament. Those that had more than 45% of their members on Twitter were included in the database, and with at least 50 nodes in the retweet network.⁵ The sample comprises 19 countries in total. Data were gathered through the

⁴ We recognize that in some systems the lower chambers are less involved in the legislative division, but to be able to make relative comparisons between countries, we have chosen the comparisons that made most sense across the board.

⁵ The lack of nodes indicates that the parliamentarians were not using Twitter to retweet other parliamentarians.

Twitter streaming API and collated in a MySQL database. For the type of electoral system, we rely on the classifications from the Electoral System Design Database (International Institute for Democracy and Electoral Assistance, 2019). Several of the selected nations are relatively understudied and provide a mix of democratic systems. A full list of the countries in the study, along with their type of democracy, is shown in Table 3.1.

Table 3.1. *An Overview of Attributes per Country, Including Democratic System, Network Measures, and E-I Index.*

Country	Democratic system	Nodes	Unique edges	Total RTs	E-I
Australia	M	117	1,830	12,825	-0.91
Belgium	PR	102	372	31,455	-0.54
Canada	M	312	8,726	92,448	-0.67
Denmark	PR	121	1,099	1,593	-0.68
Finland	PR	140	1,547	22,950	-0.59
Germany	Mixed PR	405	5,621	60,318	-0.61
Ireland	PR	78	775	32,859	-0.92
Italy	Mixed PR	333	2,692	169,047	-0.47
Malta	PR	51	512	23,12	-0.91
The Netherlands	PR	136	1,585	147,393	-0.72
New Zealand	Mixed PR	87	751	1,917	-0.84
Norway	PR	72	268	2,403	-0.57
Poland	PR	223	4,288	75,276	-0.91
Spain	PR	199	3,286	189,054	-0.78
Sweden	PR	117	438	19,818	-0.34
Switzerland	PR	92	658	7,992	-0.64

Country	Democratic system	Nodes	Unique edges	Total RTs	E-I
Turkey	PR	437	6,763	867,753	-0.80
United States	M	545	20,596	295,110	-0.850
United Kingdom	M	390	4,436	168,966	-0.719

Country	Type	Louvain modularity	Louvain clusters (M)	Average clustering coefficient	Cramer's V
Australia	2	0.595	7	0.399	0.79
Belgium	1	0.775	10	0.398	0.82
Canada	1	0.55	9	0.451	0.83
Denmark	4	0.53	8	0.326	0.64
Finland	3	0.433	7	0.342	0.61
Germany	1, 3	0.508	9	0.352	0.84
Ireland	2	0.54	6	0.5	0.71
Italy	1	0.655	25	0.348	0.72
Malta	2	0.461	5	0.594	1.00
The Netherlands	3	0.623	7	0.396	0.69
New Zealand	2	0.576	5	0.402	0.65
Norway	4	0.587	8	0.212	0.53
Poland	2	0.529	8	0.47	0.61
Spain	1	0.665	7	0.471	0.84
Sweden	2	0.688	10	0.277	0.79

Country	Type	Louvain modularity	Louvain clusters (<i>M</i>)	Average clustering coefficient	Cramer's V
Switzerland	4	0.522	9	0.331	0.50
Turkey	1	0.663	14	0.274	0.95
United States	2	0.484	9	0.328	0.56
United Kingdom	2	0.537	16	0.281	0.79

For our analysis, if a country had an election during 2018, we took the parliamentary period that was the longest sitting. For example, if there was an election on June 16, we used retweets from the previous parliamentary period, rather than the newest.⁶ Overall, our analysis includes a total of 4,018 politicians (max = 545; min = 36; mean = 200) and 2,360,043 retweets between them (max = 867,753; min = 513; mean = 117,473; *SD* = 190,144). This translates to an average of 6,465 retweets per day, or 323 retweets per country per day. Information on the number of retweets per country is shown in Table 3.1. Quote retweets (i.e., those where the sender is adding an additional comment to the original tweet), are not included as retweets, since they are not as certain to be considered endorsements (Garimella, Weber, & De Choudhury, 2016; Molyneux & Mourão, 2019).

⁶ The same method was used in 'Chapter 4: Political groups over national parties' based on the publication van Vliet, L., Chueri, J., Törnberg, P., & Uitermark, J. (2023). Political groups over national parties: Measuring the Europeanization of the political arena through MEPs Twitter interactions. *Party Politics*, 13540688231158486.

Quantifying Cohesion

As we are trying to measure the degree of cohesion in a network, we are most interested in cross-party retweets, which are indicative of cohesion among parties (Metaxas et al., 2015). The more that parliamentarians endorse others from parties that are not their own, the more cohesive the network will be overall. Likewise, if parliamentarians primarily retweet within their parties, this would indicate division. To determine the strength of endorsement that a party has within itself compared with external parties, we use the E-I index (Crossley et al., 2015; Domínguez & Hollstein, 2014). It is defined as follows:

$$E-I = (\text{Number of retweets across party lines} - \text{Number of retweets within party lines}) / (\text{Number of retweets across party lines} + \text{Number of retweets within party lines})$$

It results in a number within $[-1, 1]$ which shows the level of connections that goes across party lines (Domínguez & Hollstein, 2014). An E-I index of -1 would mean that there are only internal retweets, with no retweets to external parties, whereas an E-I of 1 implies that all the retweets are external to the parties. If the E-I index is zero, the politicians are just as likely to retweet other politicians who are independent of their party affiliation. This measure can show the proportion of cross-party retweeting, and the normalized figures can be compared across the parliamentary networks of various sizes.

We use additional measures to compare the networks, including modularity, average clustering coefficient and Cramer's V. The modularity and average clustering coefficient indicate the strength of the division of the network into distinct clusters. We also use Cramer's V to measure the association between cluster and party membership: Divided networks are expected to have a stronger relationship among party-cluster memberships, whereas weak relationships would indicate more overall cohesion in the network.⁷

⁷ We have chosen not to use measures that largely depend on the number of nodes and amount of activity—such as density—as these factors are not equal across all networks and therefore cannot be used comparatively.

Visual Network Analysis

Qualitative approaches to network analysis offer more open, flexible, and descriptive methodologies when compared with the more formalistic methods based on quantitative measures (Gamper et al., 2012). They are therefore useful and complementary to quantitative measures when used together with the E-I index for interpreting network structures. Visual Network Analysis (VNA) is an established method that uses the visualization of a network through an algorithm that positions nodes and edges as a function of the strength of connections (Decuypere, 2019). These algorithms tend to locate strongly connected nodes close together, and weakly connected nodes further apart.

In this study, we employ the force-directed algorithm *ForceAtlas2* (Jacomy, Venturini, Heymann, & Bastian, 2014) for generating the network visualization, which creates a simulation of a physical system to spatialize the network. This physical system implements two physical laws, one centripetal and one centrifugal: Hooke’s law and Coulomb’s law respectively. Coulomb’s law means that the nodes act like particles with equal charge, creating a force of repulsion between the nodes, whereas Hooke’s law attracts connected nodes as if the edges were springs. Over time, these counteracting forces will lead to convergence to an equilibrium state, which in an intuitive way reveals the structure of connections of the network. This allows us to use the visualizations as powerful and flexible ways to analyze the structure of relations within and among parties, as well as the different types of structures that may emerge. The networks were visualized in Gephi.

3.4 Results

We aim to examine whether there is a link between type of democracy and politician retweet behavior. We use the E-I index to look at the ratio of internal to external retweets, which can be seen in Table 3.1, along with a country’s associated electoral system. Figure 3.1 shows a visual overview of the E-I values.

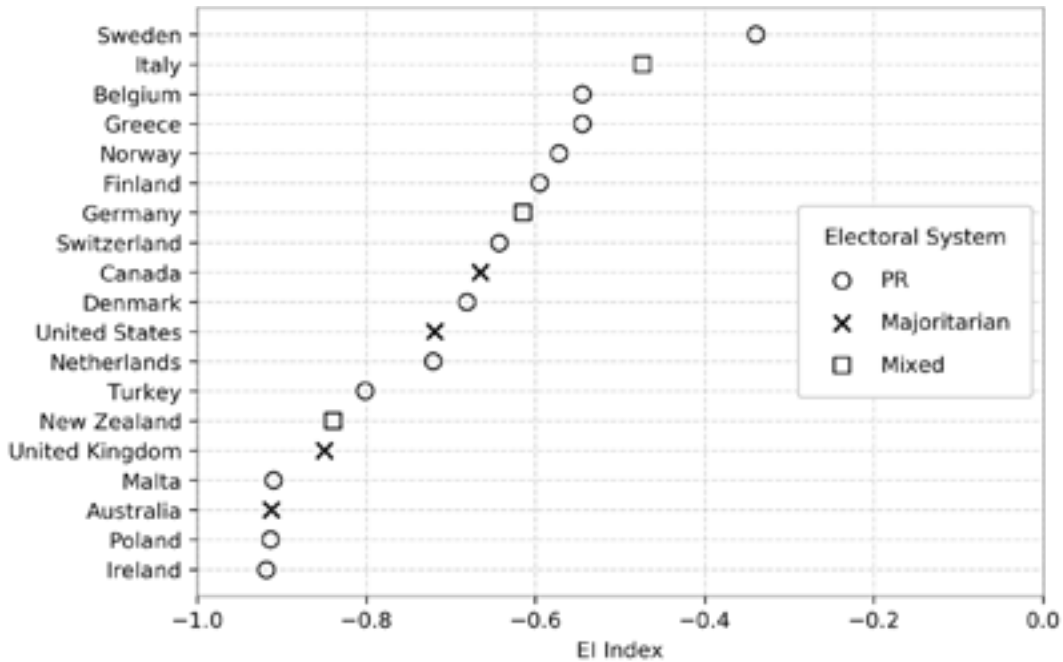


Figure 3.1. Overview of the E-I index of the included countries, categorized according to electoral system (Source: the authors).

The E-I index shows that across all countries, retweets are largely within parties, as all E-I values lie below zero. However, we are most interested in how far below zero these values lie; the closer to -1, the higher the amount of intraparty retweeting. The results tentatively suggest that there is a link between democratic system and cohesion, where majoritarian democracies tend to retweet within parties more. This is shown in their E-I values, which are lower than -0.6. Moreover, we see consensual democracies like Sweden and Belgium with higher E-I values (> -0.6), indicating more external retweets than majoritarian systems. These patterns are not consistent, however, as a number of countries with PR systems have a lower E-I index than some majoritarian countries. In sum, support for the idea that PR systems foster cross-party cooperation is limited. Since the distinction between PR and majoritarian systems do not seem to account for the considerable variation we see between and within the different types of democracies, we turn to the qualitative approach of VNA (Decuypere, 2019).

A Typology of Network Structures

The VNA reveals that the networks display different structural patterns, which capture some interlinked properties of the networks. The nodes represent individual politicians and are sized by in-degree, meaning nodes of highly retweeted politicians will appear larger. As can be seen, there is little variance in the number of retweets received by most politicians, despite some belonging to smaller parties (and would thus be thought to be retweeted less). As revealed by the E-I index, politicians are generally fiercely loyal to their party: They mostly retweet fellow party members. This is clearly seen in Figure 3.2, where the nodes are colored by party membership. However, there are also important variations among the countries, allowing for a comparison between network topologies, which may help cast light on underlying differences in political culture, and ongoing processes of elite conflict and cooperation. Through studying the various forms of structures of the networks, we identified four distinct types of political network structures (see Figure 3.2).

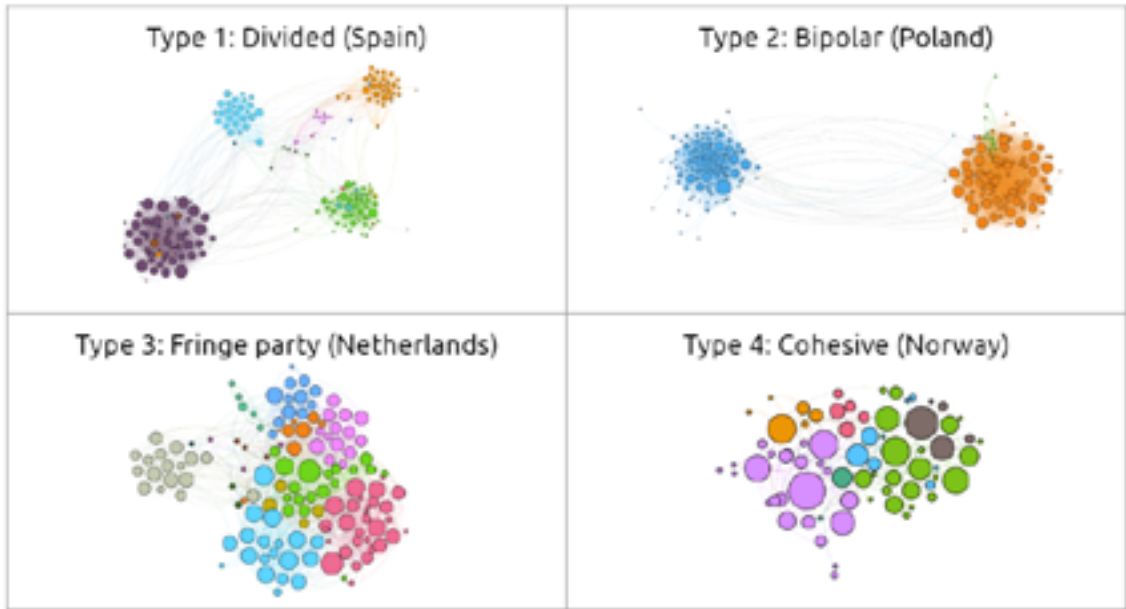


Figure 3.2. The archetypes of the parliamentary retweet networks, which reveal the key differences in endorsement patterns. The nodes are colored by party affiliation (Source: the authors).

Type 1—Divided

Using a visual description to classify the networks, we see that Type 1 networks show a highly divided structure. “Divided,” here, refers to a structure with clear divisions between clusters and very few (if any) cross-cutting ties. Type 2 networks lean toward a bipolar configuration, showing two large clusters that have dense connections among themselves and fewer external ties. Type 3 networks show a large, densely connected cluster with an outlying party that is weakly connected to the other parties. Lastly, Type 4 structures exhibit one large cluster of dense connections, with retweets crossing party lines (van Vliet et al., 2020).

Type 1 networks exhibit few to no ties among parties, with visible distances between them. This indicates that there are far more internal ties within that party, and far fewer with others (see Figure 3.3). For these networks, the nodes that are grouped closely together by the visualization algorithm belong almost exclusively to the same party. It also occurs in some cases that a smaller party is assimilated into the cluster of one larger party, indicating a strong alliance among those parties. We primarily see this occur in Italy.



Figure 3.3. Type 1 networks have a divided structure. The nodes are colored by party affiliation (Source: the authors).

Type 2—Bipolar

Type 2 networks are characterized by two large groups of parties that are at opposing ends of the network (see Figure 3.4). The key difference between bipolar and divided networks is that more than one party can form a large cluster (e.g., Sweden, Australia, Poland, New Zealand), whereas in divided networks the clusters tend to be much smaller and almost exclusively formed by the same party members. These groups of parties tend to be strongly connected to one another, thus forming a multiparty block, but largely lack connections to parties outside their block. Among these, we find two-party systems with weakly linked parties, such as in the United States. These systems are poorly captured by the E-I index, as the parties in the two groups often have many external ties between them. This results in a relatively high E-I index, despite the fact that the network structure reveals potentially strong divisions between blocks of parties.



Figure 3.4. Type 2 networks have a bipolar structure. The nodes are colored by party affiliation (Source: the authors).

A good example is Sweden, which is the country with the highest E-I index. Despite this, the network is clearly split between the left and the right parties, with the radical right party (the Sweden Democrats) forming a separate cluster of nodes, with some connections to the right-wing cluster. In the case of the United Kingdom, there are clearly two major parties

in contention with one another, with the third party (the Scottish National Party) having close ties to Labour. There is a clear separation between Labour and the Conservatives, although there are still many retweets occurring among them. Hence, VNA adds to the analysis and interpretation of the network patterns that goes beyond what is captured with the E-I index.

Type 3—Fringe Parties

Type 3 networks show a large cluster composed of multiple parties relatively close to one another, with one or two parties that are distanced from this larger cluster (see Figure 3.5). This means that the majority of parliamentarians retweet across party lines, with the exception of the outlying party. While these distanced parties do not necessarily match perfectly to the notion of “fringe” parties as used in the literature, they do allow capturing parties that have the relational role of being excluded from a consensus structure. This exclusion can be seen as a relational representation of the concept of “fringe” parties, as it shows how other parties—the “mainstream”—are avoiding connections with the smaller party.



Figure 3.5. Type 3 networks have a fringe party. In such a network, the majority of parties tend to endorse one another, aside from one (or more) smaller, outlying parties. The nodes are colored by party affiliation (Source: the authors).

Fringe parties tend to not retweet other parties, and other parties tend to avoid retweeting them. Generally, fringe parties have high internal density, showing fierce loyalty among party members relative to other parties. This loyalty results in the party being weakly connected to the rest of the network (who are commonly retweeting across party lines), and being located far from the other parties in the network visualizations. In some cases, however, the fringe parties are occasionally using retweets to attempt to form bonds with other parties, but generally finding little reciprocation.

Germany is an example of a mix of network types and has been classified as both divided and with a fringe party. While it is seen as divided due to sparse retweeting between parties, there are some connections between parties with the exception of the far-right AfD party, which sits on the fringe and is not retweeted by a majority of other parties.

Type 4—Cohesive

Type 4 networks show one large, closely connected structure that comprises all the different parties, where parliamentarians retweet so frequently across party lines that visually no clear groupings of parties emerge (see Figure 3.6). As parties in these party systems tend to retweet beyond their lines, there seems to be reciprocal consensus among parliamentarians in that country.

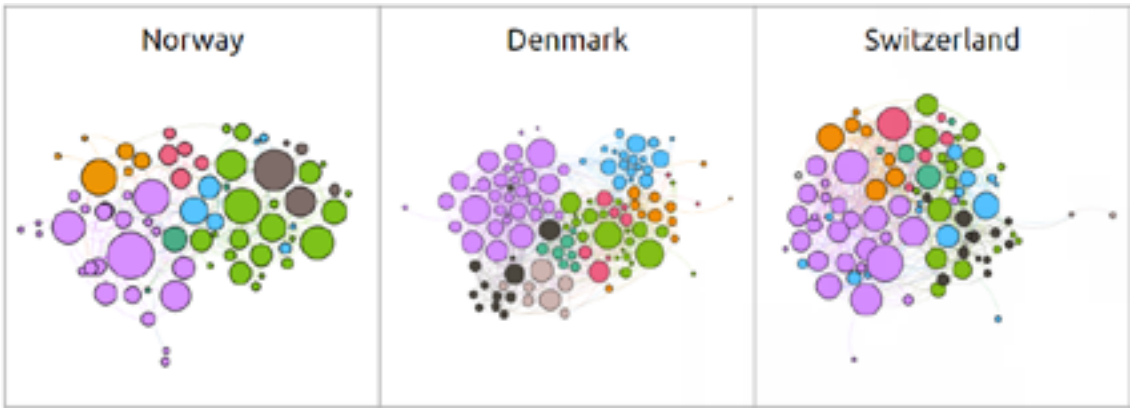


Figure 3.6. Type 4 networks have a cohesive structure, indicating that members of that parliament endorse internally and externally to their party. The nodes are colored by party affiliation (Source: the authors).

Table 3.1 shows the network measures of modularity and average clustering coefficient. We find that Type 1 networks tend to have higher modularity, as well as a greater number of clusters than other network (van Vliet et al., 2020). This indicates a higher division of the network, as the parties tend to cluster with one another, which is in line with the reasoning that proportional systems can cause greater division of a network (Cox, 1990). Type 3 networks, on the other hand, tend to have fewer clusters than the other network types, indicating that there is cohesion in the network, with the exception of the fringe party. This would indicate that to an extent some PR systems are more cohesive than others (Lijphart, 2012). Type 1 and 2 networks tend to have higher clustering coefficients, indicating lack of endorsement between parties, whereas Type 4 networks have lower clustering coefficients, indicating more endorsement across party lines.

We also look at the relationship between party and cluster membership using χ^2 and Cramer's V measures, wherein Cramer's V shows the strength of that relationship, thereby indicating how neatly the networks cluster based on party (van Vliet et al., 2020). For brevity, we only report the Cramer's V value for all significant relationships in Table 3.1. We see that Type 1 networks have much stronger relationships between party and cluster membership than Type 4 networks do. Therefore, it is clear that Type 4 networks retweet more frequently across party lines in comparison with other network types.

The typology uncovers two results in line with Lijphart's (1999) expectations; majoritarian systems tend to retweet members of their own party, and PR systems are the only ones who engage in a lot of cross-party retweets, suggesting that PR systems *can* foster cohesion. However, some results deviate from this, where some PR systems form divided networks, and some historically consensual countries are challenged by fringe parties.

3.5 Analysis and Discussion

Do proportional systems foster more cross-party endorsement among parliamentarians than majoritarian systems? Having presented the findings of the E-I indexes and the network structures, we now revisit the question of how types of democracies relate to patterns of cooperation and division as seen through retweet networks. Looking at the majoritarian systems—Australia, Canada, United Kingdom, and the United States—we see that they are mostly bipolar systems with high negative E-I index values. In relation to Lijphart's (1999) argument, it appears that majoritarian systems tend to have lower E-I values than those with PR systems, meaning that there are fewer cross-party retweets, and therefore less endorsement across party lines. Hence, for the most part, majoritarian systems do have fewer cross-party endorsements than PR systems. The outlying majoritarian country is Canada, which has a relatively high E-I index, implying that it has a fair number of cross-party links, and is also classified as a divided structure. Thus, there is a relationship between democratic system and network structure, although the systems do not neatly categorize into one type of structure per system.

While the results seem to imply that majoritarian systems tend to lean toward more divided political climates, our findings do not completely support the idea that PR systems will necessarily result in frequent cross-cutting endorsements (Lijphart, 2012). We do, however, find that the cohesive networks—Norway, Denmark, and Switzerland—are all associated with PR systems. They have relatively weaker relationships between party and cluster memberships, and lower clustering coefficients. Therefore, there is some evidence to suggest that PR systems lead to more endorsements across parties than majoritarian systems.

On the other hand, PR countries such as Poland, Ireland, and Malta are among those with the lowest E-I and highest average clustering coefficients, implying extremely low cross-party retweeting. This clearly contradicts the notion of PR systems fostering cross-cutting ties. Interestingly, Poland and Malta have two or three parties in their network. Additionally, the suggestion that PR systems are prone to division because of the number of parties (Horowitz, 1992; Reilly, 2001; Reilly & Reynolds, 1999) does not explain some of the networks at the extreme ends of the E-I scale, where Ireland is an exception with

seven parties. This may be due to the change from a two and a half party system in 2011, which caused a rise in support for other, smaller parties (Breen, Courtney, McMenamin, O'Malley, & Rafter, 2019). Hence, while some PR systems appear very divided, they generally have few parties, and may therefore be driven by the same centrifugal forces seen in majoritarian systems, where larger parties tend to retweet only within their party, thus driving the parties apart in the network visualizations.

Conversely, The Netherlands, which appears relatively cohesive, exhibits a relatively low E-I index (-0.72), and a moderately high Cramer's V (0.69). These values indicate that not only is the network less cohesive than it appears but also that the presence of a fringe party may skew the measures due to one or two parties that may be almost exclusively retweeting within their party. Moreover, the apparent exclusion of a fringe party may be bidirectional—where they only retweet among themselves, and simultaneously are not retweeted by other parties. Hence, the fringe party networks that we see are more complex than those that are simply divided or consensual, and can skew measures that would normally indicate increased division when visually we see that the division is only between the “mainstream” and “fringe” parties.

Sweden's network provides an interesting observation for fringe parties that may be in kingmaker roles. Often highlighted as an ideal case of a consensus democracy (Lewin, 1998), Sweden has the highest E-I index of any country (-0.34), but is split between two blocks—the left and the right—with the radical right party acting as a separate fringe cluster. This result shows how block formation may drive PR systems to lose their capacity to support more consensual political climates, as conflict lines emerge among blocks of parties (Norris, 2008). Moreover, in this case we see that the radical right party is put into an influential role, as the larger parties are unlikely to cooperate across block lines (Norris, 1997).

Limitations

We do, however, recognize that while the analysis shows the potential of the presented approach, there are limitations. We recognize nuances in the way that conflicts can be

expressed within and among systems. For instance, lack of retweeting may not indicate conflict between parties, but rather a lack of support. Thus, while we demonstrate that there are important variations in political culture between countries with proportional representation, retweets alone may not adequately capture conflicts between parties.

Moreover, there remains a lack of clarity over whether or not there is indeed a causal connection between the type of democratic system and the patterns of endorsement, as PR systems can result in both fragmented and cohesive network structures. Therefore, it is clear that political cooperation is linked to many more aspects of the electoral system than those we have looked at. The structure of communication may link not only to the type of democracy but also to other factors of the electoral system, such as the electoral threshold, the rules around political campaigns, and the voting list system, but also to the specific histories and political situations of the different countries, which can be subjected to further study.

3.6 Conclusion

We have taken a new spin on an old question within political science: Do proportional systems foster more cross-party endorsement among parliamentarians than majoritarian systems? This article has contributed new data to this question by taking a relational perspective enabled by social network analysis. Using a large Twitter data set of parliamentary tweets from 19 countries, we used the structure of retweet networks to study the endorsement behavior of the parliamentarians. This data allowed us to demonstrate how computational methods may help to contribute to long-standing debates surrounding proportional systems and elite political cooperation, using digital trace data.

We began by analyzing these networks using the E-I index to quantify the number of cross-party retweets. However, this quantitative approach was shown to be limited in identifying political splits, as tight cooperation between a subset of parties in a highly polarized system may be misidentified as a cohesive political climate. This motivated taking a qualitative approach in the form of VNA. Using VNA to study these retweet

networks, we uncovered four distinct types of political network structures. These types may have emerged due to differences in democratic systems, or in elite political culture, where Type 4 networks show an overall more coalescent political culture, and Type 1 and 2 networks may have a more adversarial political culture. Clustering measures support the visual structures found within these networks.

When compared with existing research on politician Twitter networks, these networks bear striking resemblances to previous research, despite being conducted across a different time frame. For instance, research into British parliamentary retweets during the 2016 Brexit referendum vote also shows the same bipolar structure (Weaver et al., 2018). Our structures can also be compared with other parliamentary network research, such as that of the German parliament during campaigning before the entrance of a new party, the AfD (Lietz et al., 2014). Hence, our research updates, and is complementary to, the small but growing body of literature looking exclusively at politician retweet networks.

The approach has furthermore revealed multiple possible avenues for future research. One such avenue is to study the impact of elections in restructuring political networks. Another is to look at how new emerging parties are brought into a political system, depending on the structure of the political system. Do fringe parties tend to become more integrated into the system over time, and what determines the way that this occurs? Future research can also examine interactions and overlaps among parties, through natural language processing of tweets among and within parties in various countries. This can help reveal discussions that either enable cooperation or trigger polarization within various countries.

Overall, we uncovered four distinct types of political network structures that contribute to the comparative political systems literature. In line with the argument that proportional systems result in increased consensus (Lijphart, 1999, 2012; Lijphart & Aitkin, 1994), we find that the only cohesive networks (Type 4) are those with PR electoral systems. This tallies with the expectation that PR systems foster greater endorsement across parties. However, there are also PR systems with divided networks, which shows that PR systems can also result in divided networks due to lack of endorsement between parties. We also

find that it is possible to identify fringe parties through looking at retweet data, as these parties seemingly behave differently to mainstream or more established parties. We find that there is a tenuous relationship between democratic systems and cross-party retweeting: Majoritarian systems are not unequivocally more divisive than proportional systems. Moreover, we find important qualitative differences: Countries are cohesive and divisive in different ways. To conclude, retweet networks among politicians on Twitter constitute only a small part of political life, but arguably offer fascinating insight into patterns of support among political elites, making it possible to use newly available digital data to address long-standing questions in sociology, communication, and political sciences.

3.7 References

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CHAPTER 4



Political groups over
national parties:
Measuring the
Europeanization of the
political arena through
MEPs Twitter interactions

Chapter 4. Political groups over national parties: Measuring the Europeanization of the political arena through MEPs Twitter interactions

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Abstract

The question of the democratic character of the European Union (EU) has been a center-point of decades of political research. This work has brought an important critique, suggesting that the development of the European political arena is still incomplete. European parliamentarians primarily orient themselves to national issues and politicians, implying a problematic mismatch between the political arena and their policy jurisdiction. Research has however been limited by methodological difficulties in capturing the level of Europeanization of the political parties. This paper contributes a novel method for measuring Europeanization by studying interactions between European parliamentarians and national parliamentarians on Twitter for 15 EU countries. Contrary to expectations in the literature, we find substantial Europeanization of the political parties. The level of Europeanization furthermore varies greatly across countries and political groups. This has important implications on the debate on EU's democratic deficit as they suggest that the European political arena is no longer second-order.

Keywords: Twitter, political arena, Europeanization, European Parliament, parliamentary interactions

4.1 Introduction

The European Union (EU) has long been criticized for lacking democratic legitimacy. A cornerstone of this perceived lack of legitimacy has been that the EU does not appear to constitute a complete political electoral arena in its own right (Reif & Schmitt, 1980; Schmitt, 2005). A European political arena would require parties competing for votes on European-level issues, in competition with other European parties, and voters choosing a party based on these positions and past performances on the supra-national level. However, a large strand of research has suggested that voters and candidates are primarily oriented towards national politics, positioning themselves in relation to national allies, competitors and issues (Braun & Schmitt, 2020; Coman, 2009; Hix, 1999; Hix et al., 2007; Hix & Noury, 2009; Hobolt & Tilley, 2014; McElroy & Benoit, 2010; Mühlböck, 2012). The effect of this is a problematic disconnect between politics and policy, as European politicians are elected on the basis of their position on issues over which they have limited influence, while the issues over which they do have influence are left un-debated.

However, there are several reasons to believe the process of Europeanization of political parties has advanced in recent years. First, a number of transnational issues have become salient such as the debt crisis, the refugee crisis, the climate crisis, and the Brexit. Second, a system in which the voters choose the President of the European Commission – the “Spitzenkandidaten” system – was introduced with the hope of increasing public awareness and interest in the EU election (Schmitt et al. 2015). Third, scholars have suggested that the advent of innately transnational digital media, such as Facebook and Twitter, may contribute to the Europeanization of the public sphere, which may in turn enable the Europeanization of the political arena (Bossetta et al., 2017; Hänska and Bauchowitz, 2019).

The question of the Europeanization of political parties has thus been at the center of academic attention in recent years. Research has examined the level of Europeanization of the parties primarily in two ways: 1) by focusing on the extent to which their party manifestos mention European-level issues (Gabel & Hix, 2002; Spoon, 2012; Braun & Schmitt, 2020), and 2) whether the parties tend to vote more in line with their national parties or their European political group (e.g., Hix, 2002; Mühlböck, 2012).

In this paper, we contribute to the research on the Europeanization of the political arena by analyzing the level of Europeanization of political parties through an alternative approach. While previous studies on MEPs use of Twitter have focused on Twitter as a form of public sphere, we use the interactions of the MEPs to provide a relational view into what they see as their primary political arena. Existing studies focus either on the presence of a European public sphere, or on parties' political positions – but rarely on the intersection between the two. The intersection is arguably where the political arena is most directly expressed, that is, in the way that politicians engage with one another within the public sphere (de Vreese et al., 2006). This paper fills this important research lacuna by examining the interactions of European parliamentarians on Twitter. Parliamentary interactions can be used to ascertain whom parliamentarians engage with on similar issues, – whom they see as their allies and whom they view as their competitors (Esteve Del Valle et al., 2021; van Vliet et al., 2020). These interactions form relational structures at the intersection of parliamentary communication and campaigning, providing an invaluable resource for examining within which political arena the parliamentarians see themselves as being primarily situated. While Twitter is only one of the arenas in which parliamentarians may interact, it constitutes a lens to the everyday relations and engagements of MEPs and as such provides an additional and thus far understudied dimension to the larger debate on Europeanization.

Our relational perspective on the formation of a political arena allows for systematic comparison between electoral levels by creating indicators for the level of Europeanization of political parties. As politicians often use social media in a deliberate way, such as for signaling their constituents (i.e., Jungherr 2016), studying the emphasis of MEP interactions functions as a powerful way of capturing politicians' orientation – whether their focus lies more on the national or European political arena. Crucially, this method also enables comparison of the level of Europeanization across parties and across political groups. This is an important addition, as there are significant differences between countries and political groups in terms of the perceived legitimacy of the EU, and the centrality of European politics (Schmidt, 2015).

In this paper, we present two indicators that capture MEPs' primary political arena. The

first indicator measures whether members are more likely to endorse (through retweets) members of their European level political group or their national party. The second indicator measures whether MEPs are more likely to engage with debate (through retweets and mentions) on the European level or with politicians within their national parliament. We compute these indicators for political groups and countries to capture cross-country and cross-group variations. We apply this method on a database of tweets over 17 months, across 15 countries in the European Union. Using these indicators, we ask:

To what extent are MEPs oriented towards the European political arena?

4.2 The nature of EU politics

Since its founding, the EU has been the subject of critique regarding its democratic character. This critique primarily stems from two issues. First, unlike politics at the national level, the European Parliament does not have control over the executive body; the parliament cannot hire and fire the members of the European Commission, and policies adopted at the European level thus do not reflect a program chosen by the European people (Follesdal & Hix, 2006; Mair & Thomassen, 2010). Defenders of the institution however argue that a representative mandate is not a precondition for democratic legitimacy. For instance, it is argued that the institution should be legitimized by its performance (Beetham & Lord, 1998), and politicized via the national states (Schimmelfennig et al., 2015). Second, the European Parliament (EP) is intended to represent the European people, but appears to fail in doing so, as manifested by the lack of citizen interest in EU politics (Franklin & Hobolt, 2011). While the 2019 EP election saw an increase in the voter turn-out, the historical average is below 50% (Marquart et al., 2020). The lack of voter engagement with EU politics suggests that the process of Europeanization of political parties and the electorate is, at best, incomplete.

The academic literature has described the EP as a second-order election (herein referred to as the second-order hypothesis), suggesting that voters and candidates are primarily oriented towards national politics, positioning themselves in relation to national parties

and issues (Reif & Schmitt, 1980; Schmitt, 2005). While the EP elections are transnational, they are in many ways organized by national institutions, which pushes the electoral dispute onto the national level, spearheaded by two institutional areas of concern. First, theoretical work has suggested that a transnational public sphere is an essential prerequisite for the formation of a European political arena, as they help create a demos, enable debate and bring European-level issues to the public attention (Habermas, 2012; Koopmans & Erbe, 2004; Statham & Trenz, 2015). According to empirical research, however, broadcast media in Europe are largely organized along national lines, meaning that the associated public discourse is similarly nationally oriented (for an overview, see Bärenreuter et al., 2009; Brüggemann & Kleinen-von Königslöw, 2007; de Vreese, 2017; de Vreese et al., 2006). This means that the associated public discourse tends to be bound by national borders, limiting the possibilities for transnational debate. The weak development of transnational public sphere is seen as a key hindrance in the formation of a European political arena (Habermas, 2012; Koopmans & Erbe, 2004; Statham & Trenz, 2015). Second, since MEPs are nominated by their national party for election to the European Parliament, they must sustain their ties to their national parties if they want to be re-elected or return to their national arena. However, their European parliament group can control a range of benefits such as group positions, chairmanships and speaking time (Kreppel, 2002). These areas of concern have been a focus of research examining the institutional dimensions of Europeanization of political parties, which finds that over time, political groups build stronger institutional frameworks. The strengthening of these frameworks may create pressures on MEPs to conform to their transnational political group, rather than their national party (Dietz, 2000). These factors are thus competing when the MEP choose between showing their allegiance with their national party or with their EP political group (Hix et al., 2007).

The second-order hypothesis has received significant empirical support through various approaches to assessing the presence of a European political arena. Studies on party manifestos have shown that European parties compete primarily over national issues, as the manifestos focus on policies adopted at the national level (Braun & Schmitt, 2020; Hix, 1999). This creates a problematic disconnect between politics and policy, as the MEPs

are elected on the basis of issues over which they have limited policy influence, while the issues that do have influence over are subject to limited debate. This risks creating the image of the EP as an undemocratic and redundant institution, as voters' choice and the effect of this choice are decoupled. For the EP to be considered a more democratic institution, parties would compete for votes on European level issues, and voters choose parties based on these issue positions (Jurado & Navarrete, 2021).

Engagement with questions regarding European integration in national politics tends to be dominated by the debate among Eurosceptic left and right-wing political parties and radical right social movements (de Vries, 2007; De Vries & Edwards, 2009; Hooghe & Marks, 2009; Hutter & Kriesi, 2019; Kriesi, 2009; Steenbergen & Scott, 2004). Those Eurosceptic groups tend to be more nationally oriented than their pro-EU counterparts, as their politicization of the European integration is often based on national rather than transnational concerns (Brack, 2018). Hence, the ideology of the political group may be a crucial component when examining who MEPs consider to be their political arena. Additionally, voters learn about European candidates from parties' performance and communication at the national level, thus EPs are not held accountable for their performance on the European parliament (Hobolt & Tilley, 2014). This national-oriented evaluation may impact the coherence and coordination of parties at the European level. While parties choose their political group on the basis of policy congruence (Hix & Noury, 2009; McElroy & Benoit, 2010), studies show that MEPs follow national directives in case of a divergence between the national and the transnational party (Coman, 2009; Hix et al., 2007; Mühlböck, 2012; Rasmussen, 2008).

This conclusion is further supported by research within political communication, which shows that despite an increase in visibility of EU election coverage in mass media over time, this ascent is not followed by an increase in the Europeanization of news, as EU elections coverage is mainly focused on national actors (Boomgaarden et al., 2013). Therefore, MEPs are reported and judged by media and constituents on a national, rather than European level. In short, current empirical research supports the second-order hypothesis. However, there are reasons to believe Europeanization of the political arena has progressed in recent years. First, a number of transnational issues have risen on the

political agenda as a result of crises such as the debt crisis, the refugee crisis, the climate crisis, and the Brexit crisis. This has made the EU more salient in national political debates, with mainstream parties from the left and right promoting pro-European discourse (Hutter & Kriesi, 2019). Second, a system in which the voters are able to choose the President of the European Commission – the “Spitzenkandidaten” system – was introduced with the hope of increasing public awareness and interest in the EU election (Schmitt et al. 2015). Third, scholars have theorized that the emergence of digital media – such as Facebook and Twitter – as a central arena for political debate, may contribute to the Europeanization of the public sphere as they are inherently transnational in scope (Bossetta et al., 2017; Froio & Ganesh, 2019; Hänska & Bauchowitz, 2019). Such a “European Twittersphere” (Hänska & Bauchowitz, 2019) could provide the foundation for a European political arena, by enabling voters to learn about and debate European-wide issues, as well as the parties' positions, in order to make an informed voting decision (Koopmans & Statham, 2010).

Recent empirical research has focused on whether political debates within the public sphere are indeed transnational in scope. The findings have thus far been ambiguous. Some recent studies provide empirical support for the notion that these media are relatively cross-national in nature, indicating that they may contribute to growing Europeanization of the public sphere (Bossetta et al., 2017; Hänska & Bauchowitz, 2019). Others conclude that political debates on Twitter are still predominantly national. Fazekas et al (2021) find that MEP candidates on Twitter showed limited engagement with the public on European issues in the 2014 EU campaign, and when examining the audiences of far-right parties and movements on Twitter, Froio & Ganesh (2019) show that only a small set of issues actually draw a transnational audience. Critics have furthermore argued that only a small fraction of constituents are active in political debates on these platforms, implying that the platforms give a poorly representative view of the overall public sphere (see e.g., Stier et al., 2020).

We contribute to the research on the Europeanization of the political arena by analyzing the level of Europeanization of political parties through a novel lens. Instead of viewing Twitter as a form of public sphere, we use interactions between MEPs as a relational lens to examine what they view as their primary political arena – hence focusing on the consolidation of the political arena, rather than the Europeanization of political debate. The methods employed to examine the level of Europeanization of the political parties have so far examined party manifestos and media reporting, yet studies of quotidian interactions of MEPs on social media platforms are lacking, despite the fact that social media like Twitter have become the go-to tool for politicians and the media elite (see e.g., Hänska & Bauchowitz, 2019; Hemsley et al., 2018; Jungherr, 2016). We thus propose to examine interactions of MEPs on Twitter to gauge whether they are more oriented to the national or to the European political arena in their everyday political communication.

Twitter provides affordances for politicians to engage with one another in debate, by *mentioning* or *retweeting* each other. These actions are made publicly, and thus represent a way for politicians to enact and signal allegiances and conflicts, in relation to both issue positions and other politicians (Esteve Del Valle et al., 2021; van Vliet et al., 2021). Consequently, politicians use Twitter to position themselves in their political space. We can thus think of retweets and mentions as one way in which politicians navigate the boundaries of what constitutes their political arena (e.g., Cherepnalkoski et al., 2016; Conover et al., 2011; Esteve Del Valle et al., 2021; van Vliet et al., 2020). Interactions of retweets and mentions can therefore function as powerful means of identifying what MEPs view as their primary political arena, by indicating with whom they align themselves, and whom they view as their opposition. Our approach is hence similar to Stier et al (2020), who also look at the Twitter interactions of MEPs to examine the level of transnational communication in electoral campaigns – finding that MEPs communicate chiefly with fellow nationals. However, Stier et al (2020) focus on communication between MEPs, and thus examines only the level of cross-national communication *within* the transnational political arena, rather than comparing the centrality of the national and the European political arenas – and their results hence do not directly speak to the level of Europeanization of political parties. For instance, if an MEP predominantly mentions and retweets members of their national parliament, this implies that they are debating with domestic opposition and

showing allegiance to their domestic party, i.e., that they are treating domestic politics as their primary political arena. Conversely, if an MEP predominately debates with other MEPs, and shows allegiance to their EP political group, this implies that they are operating primarily within the transnational political arena.

We furthermore argue that the interaction of MEPs on Twitter furthermore speaks to how MEPs think of their voters as engaging with European politics. If MEPs understand voters as being engaged with and voting on EU politics on primarily the European level, then MEPs would be incentivized to act, discuss and campaign primarily on this level, implying that the MEPs would make use of Twitter to campaign and engage in the European political arena. If, however, the MEPs believe that voters are engaging with European politics through national politics, as the second-order hypothesis suggests, then the MEPs should primarily engage and position themselves in relation to national politics.

While analysis of Twitter data provides a powerful way of examining what parliamentarians view as their political arena, studies on the Twitter interactions of MEPs are relatively sparse, and are mainly related to election campaigning (e.g., Fazekas et al., 2021; Meganck et al., 2019; Stier et al., 2020) and public outreach (e.g., Daniel et al., 2019). Existing studies thus leave unanswered whether MEPs are interacting primarily with the national or European political arena in their everyday political communication on Twitter. We draw two hypotheses from the literature discussed, capturing two aspects of the political arena. First, the literature suggests that MEPs will primarily be situated within their national party, as MEPs are tied in various ways institutionally to their national party. For instance, they are nominated by their national party for (re)election to the European Parliament. This suggests that the primary focus of MEPs would be to emphasize allegiance to their national party over their EP political group.

H1: MEPs show more allegiance with their national party than their EU political group.

Second, the literature suggests that MEPs prefer to debate over national politics than European issues, wherein they engage with the opposition and mark their position. This is due to being judged and mentioned in the media on a national level.

H2: The debate arena primarily remains the national one, with MEPs interacting more with national parliamentarians than fellow MEPs.

4.3 Method and data

We use a large pre-existing database of tweets from incumbent parliamentarians from the European Parliament and national parliaments – the Twitter Parliamentarian Database (van Vliet et al., 2020). We capture the level of Europeanization of political parties by comparing the level of interaction between MEPs, with interactions between MEPs and NPs. In bicameral systems, we focus on politicians in the lower houses of parliament, to enable cross-country comparison. For our analysis, we selected countries that are members of the European Union, and excluded those where less than 45% of parliamentarians had a Twitter account, in order to focus on countries whose parliamentarians significantly rely on the platform for communication.

We choose the date range from January 1, 2018 until May 26, 2019 – from the beginning of the database’s data collection to the end of the parliamentary period. We choose to focus on one parliamentary period (the 8th official period), as there may be changes in members, relationships, parties, political groups and so forth if more than one parliamentary period is included. For the same reason, if a country had an election in 2018 or 2019, we took the parliamentary period that was the longest sitting. For example, if there was a national election on January 16, 2019, we use the previous parliamentary period, rather than the newest. If there was a national election during the period of the EP, we also removed the corresponding MEP tweets from the excluded period of the national parliament. As such, we are controlling for elections, as these periods may instigate different ways of using Twitter by parliamentarians (Jungherr, 2016). As we are focusing on a limited period, our results should be understood as a snapshot of the level of Europeanization.

The data we are concerned with are the retweets and mentions (combined referred to as interactions) between NPs and MEPs. It should be noted that the Twitter API treats replies and quote-retweets as mentions, which are thus included in the data as mentions. We filtered the data for interactions from MEPs from Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Malta, Netherlands, Poland, Slovenia, Spain, Sweden, and United Kingdom (N = 15). This includes 489 MEPs, with 298,015 interactions between themselves and 1,621 national parliamentarians. This translates to an average of 585 interactions per day, or 1.2 interactions per MEP per day. A full table with the number of MEPs and NPs per country can be found in Table S.4.1 in the Appendix.

The literature on Twitter suggests that retweets tend to function as endorsements (Kim & Yoo, 2012; Metaxas et al., 2015), thus capturing what individuals and parties the parliamentarians show most allegiance to (van Vliet et al., 2021). Mentions can be suggestive of positive or negative interaction, but are indicative of discussion amongst parliamentarians at different levels (c.f., Hemsley et al., 2018; Sanders & Van Den Bosch, 2013). While the data used provide relational information, we do not employ the data through a standard social network analysis lens, as we are here focusing on comparing the amount of engagement between two different types of nodes. This means that common social network analysis measures, such as density, homophily, or eigenvector centrality, are inappropriate to employ for this analysis. Instead, we develop custom measures. We thus employ these to formulate two indicators that operationalize our hypotheses.

(1) Indicator 1: Europeanization of party allegiance

This indicator measures how strongly an MEP shows allegiance to their EU political group as compared to their national party. This indicator is defined by comparing the number of retweets from an MEP to their EU *political group*, with the number of retweets to parliamentarians from their *national party*. Rather than using fractions, we normalize⁸ the fractions to a value between 1 and -1, where positive values indicate a primarily European orientation of allegiance, and negative values primarily national allegiance (similar to the

⁸ We use that $2(a/(a+b)) - 1 = 2a/(a+b) - (a+b)/(a+b) = (2a - a - b)/(a+b) = (a-b)/(a+b)$.

E-I index, see Crossley et al., 2017) and is defined as follows:

$$\text{Allegiance} = \frac{\text{Retweets to parliamentary group} - \text{retweets to national party}}{\text{Retweets to parliamentary group} + \text{retweets to national party}}$$

(2) Indicator 2: Europeanization of political debate

The second indicator captures the extent to which MEPs are engaging in transnational and national debate. [This indicator compares the number of interactions between an MEP and their EP colleagues and the number of interactions with colleagues from their national parliament. The shows what the MEPs are treating as their arena of political debate. We again normalize this value to go between -1 and 1, with positive values indicating a primarily European political debate arena, and negative values a primarily national political arena. It is therefore defined as:

$$\text{Debate} = \frac{\text{MEP to MEP interaction} - \text{MEP to NP interaction}}{\text{MEP to MEP interaction} + \text{MEP to NP interaction}}$$

It should be noted that while the propensity to use Twitter varies across individuals, countries and contexts, the indicators are not sensitive to such variations, as they will equally affect the numerators and denominators. These indicators are measured on the overall level, that is, including all parliamentarians in the database, but we also calculate separate indicators for each country and political group, to examine variation between these. To ensure that the values of the indicators are not the result of limited data, we furthermore verify the significance of these indicators by using a one-sample binomial test. We treat each interaction as a Bernoulli trial, and verify that the resulting outcome is different from a Bernoulli probability of 0.5, which corresponds to the indicators being equal to zero. This provides a means of examining that the result is indeed significantly different from equal levels of European and national interaction.

4.4 Results

Before we discuss results for our two indicators, we first provide a visual overview of the structure of interaction among MEPs, seen in Figure 4.1. As the figure shows, the majority of interactions from MEPs target other MEPs of the same political group. While all political groups appear to have this propensity, it is more pronounced for S&D, ALDE and EFA, and less so in the other groups. Although we might expect that MEPs of smaller political groups are less likely to engage with their fellow group members (simply because there are fewer of them), this does not seem to be the case – the small ALDE and ENF engage as much with fellow political group MEPs as members of the larger S&D group. Interestingly, we see that when interacting with national parliamentarians, the proportion of interactions towards the same national party is roughly the same as interactions with those from other parties.

We now turn to look at indicator 1. A positive value implies that the MEPs primarily show allegiance toward their European political group, while a negative value implies predominately national allegiance. Following H1, we expect the indicator to be negative. We find that **indicator 1 = 0.42**. This implies that MEPs tend to predominately endorse their political groups than national parties. Thus, in general MEPs are more European in their endorsements, showing less party allegiance to national parties.

Turning to indicator 2, a positive value implies that the MEPs predominately debate in the European political arena, while a negative value implies predominately national debate. Following H2, we expect the indicator to be negative. We find that **indicator 2 = 0.37**. This implies that MEPs are generally more likely to interact with other MEPs than with their national parliament, hinting at Europeanization of the political arena.

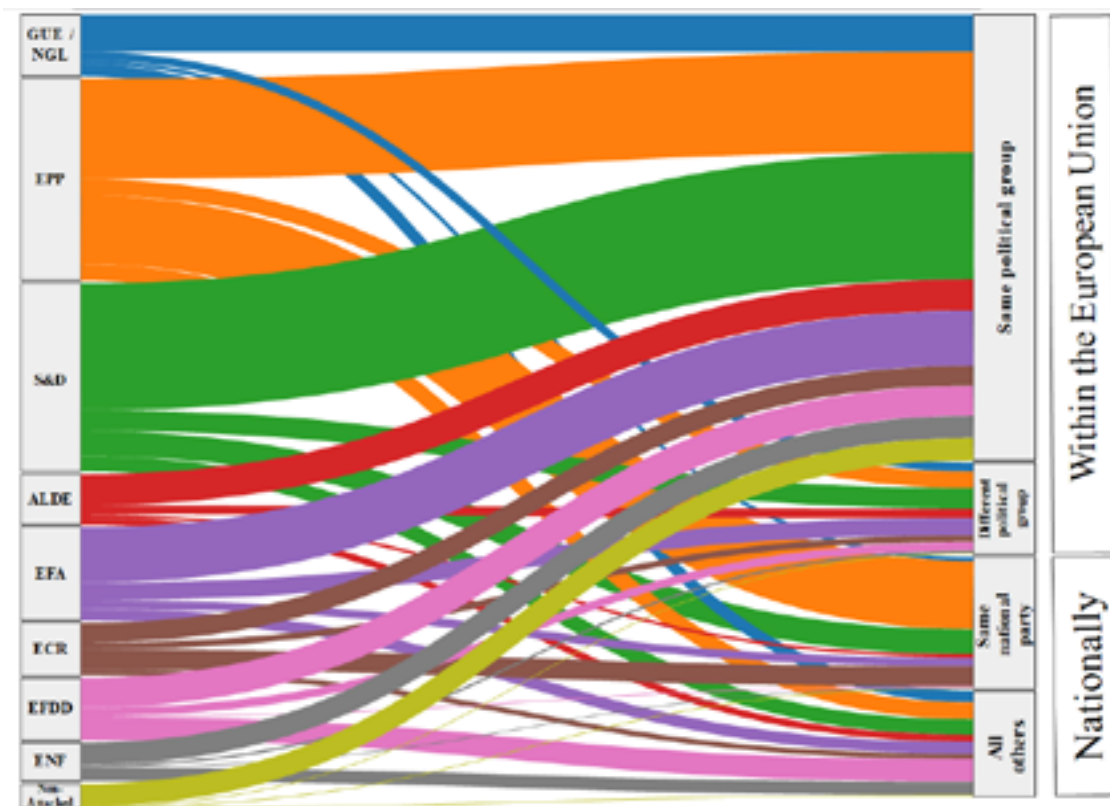


Figure 4.1: This alluvial diagram shows the classifications of interactions from the different political groups in European parliament (on the left). It shows the proportion of interactions that were directed towards the same political group or national party (Source: the authors).

Following the results of the indicators, we find that the politicians are treating their political group in the European parliament as their primary political entity, and other MEPs as the primary group with whom they engage in debates. The allegiance to the European political group indicates in particular that the groups are institutionalized enough to create pressures on MEPs to show allegiance, despite that their national parties have powers to control their future assignments. That the debate is taking place on the European level indicates that the parliamentarians are engaging with EU level issues, and that they view MEPs as their primary opponents.

Table 4.1: European Parliament political groups and their binary orientation on the Eurosceptic spectrum (based on Brack, 2018)

Political group	Eurosceptic spectrum
European United Left/Nordic Green Left (GUE/NGL)	Eurosceptic
European People's Party (EPP)	Europhile
Progressive Alliance of Socialists and Democrats (S&D)	Europhile
Alliance of Liberals and Democrats for Europe (ALDE)	Europhile
European Free Alliance (EFA)	Eurosceptic
European Conservatives and Reformists (ECR)	Eurosceptic
Europe of Freedom and Direct Democracy (EFDD)	Eurosceptic
Europe of Nations and Freedom (ENF)	Eurosceptic

To examine the differences between political groups, we classify them on a Eurosceptic spectrum (as seen in Table 4.1), with the Europe of Nations and Freedom (ENF), the Europe of Freedom and Direct Democracy (EFDD) and the European Conservatives and Reformists (ECR) being more Eurosceptic, and the European People's Party (EPP), the Progressive Alliance of Socialists and Democrats (S&D) and the Alliance of Liberals and Democrats for Europe (ALDE) on the pro-EU side of the spectrum. Figure 4.2 reports the level of the indicators per country (A) and per political group (B) on the left, where the bar graphs to the right visualize the indicators. The figure reveals significant variance of both indicators across both countries and political groups.

Fig 4.2 (A and B).

Country (A)	I1: Allegiance	I2: Debate
Belgium	0.95**	0.69**
Denmark	-0.30**	0.13**
Finland	0.25**	0.47**
France	0.89**	0.60**
Germany	0.34**	0.55**
Greece	0.07*	0.51**
Ireland	0.40**	0.47**
Italy	0.16**	0.50**
Malta	-0.38**	0.18**
The Netherlands	0.32**	0.58**
Poland	0.10**	0.04**
Slovenia	0.01	0.49**
Spain	0.64**	0.61**
Sweden	0.81**	0.86**
United Kingdom	0.43**	0.24**

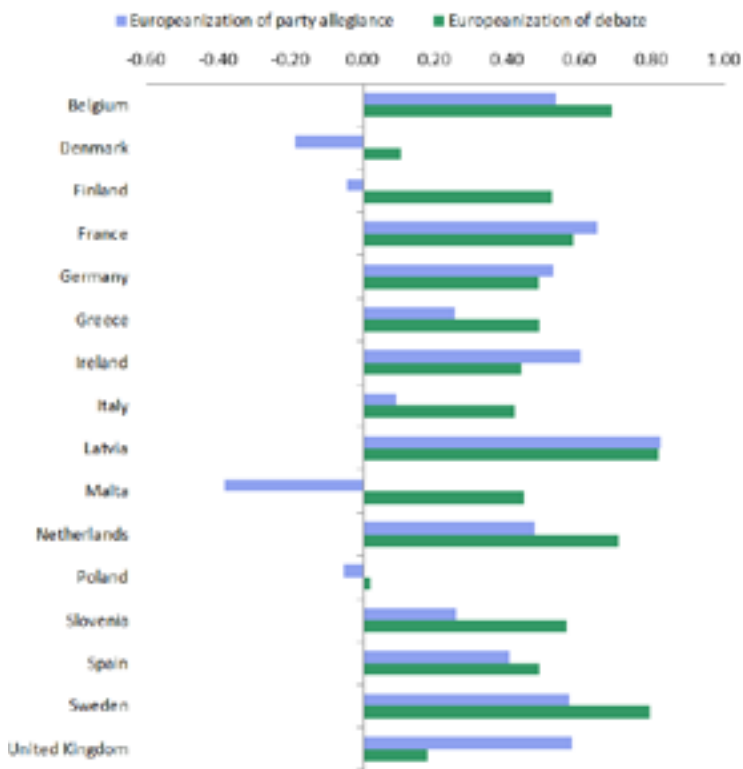
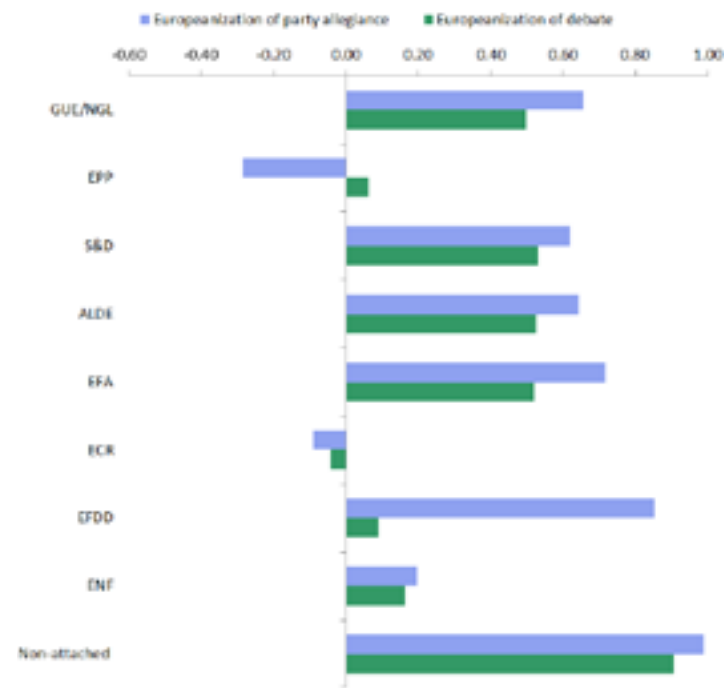


Figure 4.2 (A and B): These figures to the right of the tables show the results of the indicators of allegiance and debate are aggregated by country (A) and political group (B). The stars indicate the outcome of the Binomial test, and whether the Bernoulli probability is different from 0.5. ** p -value<0.01. * p <0.05 (Source: the authors).



Political group (B)	I1: Allegiance	I2: Debate
European United Left/Nordic Green Left (GUE/NGL)	0.69**	0.56**
European People's Party (EPP)	-0.15**	0.09**
Progressive Alliance of Socialists and Democrats (S&D)	0.61**	0.56**
Alliance of Liberals and Democrats for Europe (ALDE)	0.80**	0.58**
European Free Alliance (EFA)	0.43**	0.57**
European Conservatives and Reformists (ECR)	-0.24	0.01**
Europe of Freedom and Direct Democracy (EFDD)	0.93**	0.24**
Europe of Nations and Freedom (ENF)	0.79**	0.28**
Non-attached	0.99**	0.89**

Looking at the variance between the indicators across political groups, we find that they partially follow what the literature expects. For instance, Eurosceptic and newer groups tend to be more nationally oriented than pro-EU groups. This can be seen in the Europe of Nations and Freedom (ENF), the Europe of Freedom and Direct Democracy (EFDD) and the European Conservatives and Reformists (ECR) – all whom are among the lowest in indicators of debate. While the positive results of the indicator I2 suggest that a transnational populism is emerging on the European level (McDonnell & Werner, 2020), the low figures imply that this is very far from being a coherent international group. The findings are thus more in line with Brack's (2018) suggestion that Eurosceptic parties tend to emphasize their national arena.

Eurosceptic groups also tend to score lower in I1, showing more allegiance with their national party over their political group. ENF and EFDD are however exceptions. While these political groups have more nationally oriented debates than the average, they show greater allegiance with their political groups over national parties. This may be due to the parties that are part of these groups, such as the largest party of the EFDD group – the British “Brexit Party”, having a larger presence in the European parliament than they do in their national parliaments.

The non-attached members almost exclusively orient themselves toward the transnational arena both in terms of debate and allegiance. A more nationally oriented group – the European People's party (EPP)⁹ – is one of the oldest groups in parliament, yet they are especially nationally oriented in terms of the allegiance indicator. This is surprising, as they are an old and well-established political group, and the literature suggests that, together with the Socialists and Liberals, they are the most transnational in institutional terms (Dietz, 2000). It is also somewhat unexpected to see that the EFA – the Greens – is among the most transnational groups, as they are a relatively new group with limited institutionalization. These findings call for further research.

For countries, we find that Belgium, France, Germany, Ireland, Netherlands, and Sweden are the countries whose indicators show strongest orientation toward the European

political arena, while Denmark, Malta, and Greece are the most nationally oriented countries. We see that for newer members of the European Union, such as Malta, Poland and Slovenia, indicator I1 is around zero or below, indicating that the Europeanization of the party allegiance is a process that takes time. Malta and Denmark have allegiance scores (indicator 1) that are more nationally oriented, while they are debating in primarily the transnational arena (as shown by scores above 0 on indicator 2). Such discrepant scores between the two indicators may suggest that the MEPs primarily engage with colleagues in their daily interactions, while more overtly supporting and helping spread messages from their national parliamentarians through retweets.

Generally speaking, the results thus largely follow expectations from the literature, as countries that are Eurosceptic or recent additions to the union tend to be more oriented towards national politics, while the more pro-EU countries are more transnationally oriented. Denmark, however, stands out as having nationally oriented political arena, despite being a relatively old EU member. This may be the result of the EU skeptic Danish People Party winning the largest vote share in the 2014 Danish EU election. The United Kingdom, which had at the period covered by this study already voted to leave the union, has among the lowest values for the indicator of Europeanization of debate, but are relatively nationally oriented in terms of allegiance. This can be explained by the large difference between the representation of parties in the UK national parliament compared to in the EP – in part due to the low turnout in the British 2014 EU election, with only 35% of eligible voters. UKIP, for instance, was the largest British party in the EU election with 26.6% of the votes, winning them 24 seats in the EP – while having only one seat in the national House of Commons.

4.5 Discussion & Conclusion

A central research focus within European political science has been the question of the democratic legitimacy of the EU. Criticism has in particular focused on the suggestion that the EU is treated as a second-order election, with voters and candidates being primarily oriented towards national politics, parties and issues (Reif and Schmitt, 1980; Schmitt, 2005). Significant empirical research has suggested the presence of a problematic

⁹ A traditionally Christian-democratic and conservative group

disconnect between the political arena through which voters engage with politics and select their parties, and the policy influence of these parties, implying that the politicians are elected on the basis of issues over which they have no or limited policy influence, while the issues that they then have influence over are left largely un-debated. This risks creating the image of the EU as an undemocratic and redundant institution, as voter choice and the effect of this choice become decoupled.

A number of recent developments have put this question back on the agenda: the Spitzenkandidaten-system has been introduced with the hope of increasing voters' sense of political influence, a number of transnational crises have increased the salience of EU political issues, and the advent of new digital media platforms has been suggested to potentially enable the emergence of a European public sphere. Twitter, in particular, has become the go-to platform for debate among the political elite. However, Twitter does not only potentially contribute to a transnational public sphere, but also gives researchers new ways of examining the Europeanization of political parties. These digital data provide new ways of addressing the methodological challenges involved in capturing the locus of the political arena, as previous studies have primarily focused on whether political communication and party manifestos are focused on European or national level issues. Twitter allows seeing with whom parliamentarians show allegiance and with whom they are engaging in political debate, thus creating a direct way of capturing the structure of the political arena. We have made use of this data to address the extent that MEPs are oriented towards the European political arena in their daily interactions.

This paper has employed digital methods to examine 298,015 Twitter interactions – among 489 MEPs, or between these MEPs and 1,621 NPs, in the period from January 2018 until the EP elections on May 23, 2019. This has allowed us to revisit and throw new light on level of Europeanization of the political parties, in terms of MEPs' daily social media interactions. Based on the second-order hypothesis, we expected that MEPs have more allegiance with their national party than their EU political group. We further hypothesized that the political arena primarily remains the national one, where MEPs interact more with national parliamentarians.

Surprisingly, we found that when examining the everyday interactions of parliamentarians on Twitter, MEPs are more likely to endorse members of their political group than they are to endorse members of their national party. Similarly, they are more likely to engage in debate with colleagues in the European political arena than they are to engage with those in the national arena. Contrary to the literature, our findings suggest that MEPs view their European colleagues as their main allies and sparring partners – their most central relationships in their everyday political lives. These results are not in line with the second-order hypothesis, and may be suggestive of the incentives under which the MEPs view themselves as operating: if MEPs can be assumed to be acting strategically, the engagement on the European level indicates that they may be assuming that their electorate are engaging and voting on the basis of European level politics. This striking finding contradicts the findings of much of the previous literature, and may be suggestive of a shift towards Europeanization of politics. It also speaks to previous research suggesting that Twitter is contributing to the emergence of a European public sphere, which is seen as a necessary precondition for a political arena. While it should be stressed that our findings merely contribute a piece to a larger puzzle, they are indicative that, Europe may be in the process of transitioning towards a more European-oriented politics, in which the European political arena is no longer second-order.

While MEPs overall tend to be oriented towards the European political arena, we also found significant variance across countries and political groups. With some exceptions, pro-EU countries who are long-term EU members tend to be more Europeanized – in line with the expectations from the literature. Similarly, older and more pro-EU political groups were found to be more oriented toward the European political arena than newer and Eurosceptic groups – with EFDD and EPP constituting exceptions to the rule. The indicators thus fit much of the expectations from the literature, while at the same time showing some surprising results that call for further investigation. For instance, what is the relationship between the arena of interaction and the topic of conversation? Is there more national or European orientation for certain topics than others? Is there a constructive debate over policy issues taking place in these conversations, or something else? These questions in particular speak to the important point that while Twitter enables engagement in a European-level political arena, this does

not necessarily imply that this will lead to further support for European integration, as previous literature suggests that Twitter is also an arena for the contestation of the EU. This suggests further research exploring the content of debate in the European political arena.

Some limitations should be noted with regards to these findings. While examining the interactions of parliamentarians provide a relational perspective on the question of the Europeanization of political parties, it should not be understood as definitive evidence but as a piece of a larger puzzle. Additional research is necessary, for instance, to examine the content of this communication. Moreover, for a complete assessment of the consolidation of a European political arena, it is necessary to also examine the demand side, studying whether the everyday engagement of parliamentarians reflects how voters engage with European politics, and how politicians and voters engage in social media. Additionally, the study did not include all nations in the European Union, as some countries had limited use of Twitter among their national parliamentarians. For the countries that are not included, this may indicate that they are more likely to employ traditional national-oriented broadcasting media, but they may also employ other transnational social media, such as Facebook. This requires additional study including other forms of digital media. We furthermore cannot say whether the countries or the political groups are driving the observed variance. For this, a model would be needed in order to look at interaction effects. The analysis is focused on a limited time span during one electoral period, meaning that additional analysis is necessary to map the historical evolution of the European political arena and verify if these results also hold beyond the selected electoral period, and also during electoral campaigns. While such limitations and open questions need to be addressed, the kind of Twitter data we used here offers great and largely underused opportunities for studying European and national politics as well as interactions between them.

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CHAPTER 5



Moral expressions in
280 characters or less:
An Analysis of Politician
tweets following the
2016 Brexit referendum
vote

Chapter 5. Moral expressions in 280 characters or less: An Analysis of Politician tweets following the 2016 Brexit referendum vote

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Abstract

Ideas about morality are deeply entrenched into political opinions. This article examines the online communication of British parliamentarians from May 2017 - December 2019, following the 2016 referendum that resulted in Britain's exit (Brexit) from the European Union. It aims to uncover how British parliamentarians use moral foundations to discuss the Brexit withdrawal agreement on Twitter, using Moral Foundations Theory as a classification basis for their tweets. It is found that the majority of Brexit related tweets contain elements of moral reasoning, especially relating to the foundations of Authority and Loyalty. There are common underlying foundations between parties, but parties express opposing viewpoints within a single foundation. The study provides useful insights into Twitter's use as an arena for moral argumentation, as well as uncovers the politician's uses of moral arguments during Brexit agreement negotiations on Twitter. It contributes to the limited body of work focusing on the moral arguments made by politicians through Twitter.

Keywords: Twitter, Moral Foundations Dictionary, Moral Foundations Theory, Brexit, Political Communication, European Union, LIWC, Linguistic Inquiry Word Count.

5.1 Introduction

The United Kingdom European Union membership referendum, herein referred to as Brexit, took place on June 23, 2016. 51.8% of the voters were in favor of leaving the European Union (EU) and the narrow victory was promised to be implemented. The succeeding government - with Theresa May as the Prime Minister - led the withdrawal process, attempting to negotiate an agreement about the future relationship between the United Kingdom (UK) and EU (Tzelgov & Dumitrescu, 2018). May's Prime Minister appointment was marred by political divisions, and she was unable to secure the backing of Parliament on any Brexit deal. Thus, the period of debate about the type of Brexit there should be is of the greatest interest to this article. The negotiations of the departure of the UK from the EU has been referred to as a 'divorce process', wherein agreements needed to be made regarding trade, memberships of certain EU bodies, immigration and so forth. During May's appointment, certain issues such as immigration and trade could not be agreed-upon (Zappentini, 2019). A second referendum was proposed, as a way to break parliamentary deadlock. Hence, the times following the Brexit referendum were politically tumultuous and deserve further academic scrutiny, especially considering that many of the negotiations involved arguments that were moral in nature.

Political scientists often distinguish moral issues from non-moral (or pragmatic) ones; the latter relies on pragmatic, consequentialist reasoning, whereas the former depends on principles and deontological reasoning (Colombo, 2021). Thus, moral arguments are distinguishable from other arguments as they express moral values - things that ground judgments about what is good or bad, right or wrong, desirable or undesirable (Ryan, 2019). They consist of an expression of political sentiment - positive or negative associations towards moral claims - where the subject matter offers a moral conclusion (Feinberg & Willer, 2015). Although not all political arguments can be classed as moral, moral-based arguments hold pervasive power on many different political issues (Feinberg & Willer, 2013), so much so, that morality is noted to underline much of political decision making (Lipsitz, 2018; Day et al., 2014; Voelkel & Feinberg, 2017). Much of the work on political moral decision making is rooted in Moral foundations theory (MFT), which is composed of 5 foundations that are thought to be responsible for the unique moralities

we see across cultures. The foundations have been observed across a variety of cultural contexts, where left and right-wing individuals respond to moral arguments in different ways (e.g. Graham et al., 2009; Strimling et al., 2019). Online social networking websites provide an arena to examine these moral arguments.

Twitter is a micro-blogging social network platform, most often used for news and information dissemination, making it ideal for political research compared to other platforms (del Gobbo et al., 2020). As it is so accessible, Twitter data is often used to research many socio-political issues, such as social movements (e.g., Ince et al., 2017; Ray et al., 2017; Xiong et al., 2019 etc) and political campaigns (see Jungherr, 2016 for a systematic review). Authors in this realm mainly focus on 3 main areas of interest: election prediction, sentiment analysis of political topics and social analysis of the interaction between politicians and citizens (Korakakis et al., 2017). Tweets - messages of 280 characters or less - are broadcast to large audiences of 'followers', or can also be directed to specific members on the platform, in the form of 'mentions'. Brexit is one of the most prominent and important political events in the last decade - over 135 million tweets containing 'Brexit' were made in just a 3 month period: between Dec 2019 - Feb 2020 (del Gobbo et al., 2020). Hence, Twitter serves as an ideal research point to examine the messages from politicians regarding the Brexit agreement negotiations.

This article aims to study the moral arguments used during the campaign for the Brexit referendum in the Twitter dialogue of politicians. It looks at moral arguments specifically made by political actors - in this case, members of the British parliament, as moral arguments endorsed by political actors are more persuasive than informative arguments from non-political actors (Tzelgov & Dumitrescu, 2018). Moreover, moral frames may explain the high levels of polarization over the negotiations (Feinberg and Willer, 2012; Maher et al., 2018). The main question is;

How do British parliamentarians use moral foundations to discuss the Brexit withdrawal agreement on Twitter?

The aim is to provide a deeper empirical exploration of tweets made by politicians on Twitter during the UK's withdrawal negotiations from the EU. Initially, tweets are examined for whether or not they contain moral arguments, as the sound bite-style affordances of the platform may not be appropriate for moral argumentation. We are therefore also able to learn more about Twitter communication, especially the frequency in which moral foundations are used by parliamentarians.

5.2 Related Work

The Importance of Brexit on Twitter

The Brexit debate has caused rifts between parties, with the parties not being able to agree on the terms for leaving the EU. For instance, Labour was generally more in favor of a friendly deal with the EU, whereas the conservatives were more inclined to want greater [economic] independence (Hobolt, 2018). This political infighting leads to the suggestion that there is a clash of worldviews, potentially on moral grounds. These disagreements may be seen on Twitter, as the content of politician tweets comprises one important part of public politician communication. While one may not immediately expect moral arguments on Twitter (especially due to the restriction of 280 characters), Brexit arguments on other media are largely made on moral grounds (Smith, 2019). Hence, the brief nature of tweets lend themselves to 'straight to the point' content, yet it is unclear if moral arguments are pervasive due to the brevity.

Moral and pragmatic (especially economic) arguments surrounded the Brexit referendum vote. For example, the 'vote remain' side often argued negative economic consequences if the UK were to leave the EU, which are usually regarded as more pragmatic arguments (Sampson, 2017). On the other hand, the 'vote leave' campaign largely relied on moral arguments to secure the win for the referendum, such as the idea that more money could be given to the national healthcare system instead of going to the EU (Tzelgov & Dumitrescu, 2018; Smith, 2019). It is unclear if these arguments are expressed on Twitter, as while analyses of Brexit data often consists of millions of Tweets (e.g Khatua & Khatua, 2016; Grčar et al., 2017 etc), few point out specific tweets with clear moral arguments.

Although there have been a number of studies that look at the Brexit debate on social media (e.g. Agarwal et al., 2017; Khatua & Khatua, 2016; Hänska & Bauchowitz, 2017; Grčar et al., 2017; Llewellyn & Cram, 2016; Lansdall-Welfare et al., 2016; Hürlimann et al., 2016; Usher et al., 2019; del Gobbo et al., 2020), there are few which focus on political sentiments surrounding Brexit on Twitter, let alone moral foundations (Lansdall-Welfare et al., 2016; Hürlimann et al., 2016). Generally, sentiment towards Brexit is inferred from hashtags used, such as #voteleave for positive sentiment towards Brexit (or conversely, negative sentiment towards the EU) or #voteremain for the opposite (Usher et al., 2019; Khatua & Khatua, 2016). On the contrary, other sources such as parliamentary debates may provide thick descriptions of parliamentary discussions, but Twitter is another medium that these discussions can play out in the public eye. Moreover, due to its informal and brief nature, tweets may garner more public attention than the discussions in parliament. Thus, political communication on Twitter is a relatively understudied but important area of research for polarizing and moralizing topics.

Overall the leave campaign used a complex entanglement of moral foundations, especially in the key leaving arguments of healthcare and immigration (Smith, 2019). Following the vote to leave the EU, it is important to adhere to these moral reasonings, as they were the promises made by the vote leave campaigners. In doing so, they can maintain faith in government (Anderson et al., 2020), discourage civil conflict (Outhwaite, 2017) and set the ground for what is wanted from the EU withdrawal agreement, especially regarding money, citizens' rights and the like. Hence, the period following the referendum is when this moral reasoning can be translated to more concrete ideals set in future legislation. We can better understand these in the way of Moral Foundations Theory (Haidt, 2012).

MFT and Political Ideology on Twitter

Moral reasoning underlies political ideologies, and differences in moral judgments can have significant implications for political discourse and relations (Haidt, 2012). The 5 foundations are:

- # Care / harm: focused on caring for the vulnerable, and protecting others from harm
- # Fairness / cheating: the importance placed on equal treatment for all
- # Loyalty / betrayal: the importance of loyalty towards ones in-group
- # Authority / subversion: regards the respect for authority and community rules
- # Sanctity / degradation: mainly concerned with protecting spiritual / religious purity

Individual sensitivities to the five moral foundations are correlated with political ideologies (Graham, Haidt & Nosek, 2009). There is growing evidence that left and right wing supporters show preference for different moral foundations to inform their political views (Graham et al. 2009; Graham et al. 2013; Haidt, 2012). When considering the use of moral arguments, it is famously postulated that left-leaning individuals rely more on foundations of care and fairness, whereas right-leaning individuals rely more on loyalty, authority and sanctity (Graham et al., 2009). Other research has found that right-leaning people use arguments related to authority and sanctity (Frimer, 2020). Interestingly, while the values may appeal to left and right-wing individuals differently, violations of these values elicit different reactions. Right-leaning individuals respond more to violations of authority and control, whereas left-leaning individuals react stronger to perceived suffering and unequal treatment (Graham et al., 2013; Haidt et al., 2009). Hence, while the spectrum of moral values may appeal more to right-leaning individuals, violations of authority garnered the strongest reactions.

Why MFT is Important in the Case of the Brexit

In general, the argument for following through with the referendum vote is that it should reflect the will of the people, which can be seen as a moral rather than pragmatic argument. However, 'Vote Leave' - the official group campaigning for the UK's exit from the EU - often attacked the lack of available healthcare by the NHS for British citizens appeals greatly to the foundation of Care, whereas arguments around the issues of immigration - especially concerning those from Islamic nations - were noted as a threat to British Sanctity (Smith, 2019). Interestingly, 'Vote Leave' was led by Conservative parliamentarians Boris Johnson and Michael Gove, along with Labour parliamentarian Gisela Stuart. Hence, the campaign had support from both sides of the political spectrum, which is contrary to the research showing that left and right-wing parties tend to place emphasis on different moral arguments (Graham et al. 2009; Graham et al. 2013; Haidt, 2012).

Additionally, voting leave was predicted by political conservatism, social change insecurities, and placing moral importance on personal liberty, relating largely to the foundations of Loyalty and Authority. In contrast, only an adherence to the Care foundation of morality predicted "remain" voting (Harper & Hogue, 2019). This is quite contradictory considering many of the 'vote leave' arguments attacking the inability of the NHS to care for British citizens. Overall, Brext brought to light many different moral arguments which were supported or opposed by parliamentarians on different ends of the ideological spectrum.

There have thus been many studies that examine the Brexit debate, yet none which examine the debate about what kind of Brexit there should be, as in, whether the 'divorce agreement' should retain strong ties with the EU, or whether Britain should cut almost all ties – an event known as a 'no deal Brexit'. As Theresa May's government came into power following the referendum vote, this is the legislative period which is focused on, as data from two parliamentary periods should not be mixed. This research contributes to the body of knowledge on the presence of moral foundations in parliamentary tweets, especially in the case of Brexit.

It asks;

How do British parliamentarians use moral foundations to discuss the Brexit withdrawal agreement on Twitter?

To answer the main question, several aspects are examined, focusing especially on the frequency of moral arguments, the key terms associated with each foundation, and the differences between parties. From the literature, both the null and alternative hypotheses are considered when it comes to the use of moral foundations by parliamentarians:

H0: There will be few tweets that contain moral arguments, due to the limited number of characters available for complex moral expression.

H1: There will be a proportion of tweets that contain clear moral arguments

Secondly, the literature stating that different ideologies rely on different moral foundations to argue their position on the Brexit agreement is also considered (Smith, 2019; Haidt, 2012; Graham et al., 2009), and further hypothesize:

H2: Left-leaning parties (Labour and Labour Co-op) will focus on arguments centered on Care and Fairness, whereas Conservatives will use a wider variety of moral arguments.

First the methods will be outlined, which involves a rigorous hashtag selection process, followed by the construction of a Brexit-specific dictionary. Then the results are presented in the order of the hypotheses outlined. Finally, the results are discussed in light of the moral arguments found in parliamentary Brexit tweets.

5.3 Methods

The entire stream of tweets from 590 British Parliamentarians was gathered using Twitter's Streaming API from June 1, 2017 until the election of the new parliament on December 12, 2019 (van Vliet et al., 2020). During this time, there were parliamentary deadlocks on what exactly would happen in the divorce process with the EU. This date was also chosen because it is prior to the entanglement with SARS-CoV2. For the analysis, retweets were removed, as retweets represent moral arguments which may be echoed or endorsed, rather than those which are stated by the parliamentarians themselves. With retweets removed, 30,122 tweets from British parliamentarians regarding Brexit were analyzed. The process model for the methods can be seen in Figure 5.1.

Identifying Brexit Tweets

From the database of tweets from 590 incumbent British Parliamentarians, tweets about Brexit were first identified. Hashtags were used to filter the tweets, which were selected through an iterative process. Firstly, tweets were extracted using the Brexit related hashtags from Bastos and Mercea (2017), as well as related tags from the website Ritetag (Ritetag, 2020), which shows related hashtags to a specific query. The parliamentary tweets were also searched for any hashtags containing "brexit" and added to the selection list. From this list of hashtags, a sample of 100 tweets was labeled as being relevant to Brexit or not. In the cases where there were less than 100 tweets for that hashtag, all tweets were labeled (N = 3,492). During the labeling, more related hashtags were uncovered and also validated for their relevance. From there, only hashtags that had over 100 tweets with 95% of them directly related to Brexit were selected for the analysis. Finally, retweets were also excluded as a main aim of this article is to identify the moral arguments directly made by politicians, rather than those disseminated or endorsed by them. The final list of hashtags used in the analysis are outlined in Table 5.1. Through this process it was found that politicians generally use hashtags for issue positioning, in line with literature (Barberá et al., 2019; Enli & Simonsen, 2018; Hemphill et al., 2013), and some hashtags that were used by the public regarding brexit (e.g., #moreincommon) were used

for a completely unrelated event by politicians. Overall, hashtag selection is extremely important to be able to narrow the analysis down to a specific subject. Broader tags like #cor and #theresamay are not narrow enough with regards to brexit and hence were left out of the analysis

Quantifying Moral Foundations

The tool used to label the tweets by their moral foundations is Linguistic Inquiry Word Count (LIWC). LIWC calculates a percentage of words in a corpus that belong to several predefined categories (Tausczik & Pennebaker, 2010). In our case, these categories are the five moral foundations: care, fairness, loyalty, authority and sanctity. The percentage of words per category is calculated over a text where all words are given the same weight, and a score per category is calculated for the text. Past studies on the empirical validity of LIWC have found that it is able to detect meaning from texts, including emotional states, motivations and thinking styles (Chung & Pennebaker, 2018).¹⁰

Several studies have employed the tool Linguistic Inquiry Word Count (LIWC) for studying moral foundations in highly politicized arenas, such as the 'Ground Zero Mosque' (Dehghani et al., 2014), stem cell research (Clifford & Jerit, 2013), entertainment media (Ji & Raney, 2015) and immigration (Grover et al., 2019). It was also used by Harper and Hogue (2019) to study moral intuitions regarding Brexit vote intentions. In the domain of political tweets, LIWC has thus far been applied to various political issues (Alizadeh et al., 2019; Day et al., 2014; Grover et al., 2019; Johnson & Goldwasser, 2018), but there are no studies yet which focus on the moral foundations of tweets of politicians surrounding Brexit.

The moral foundations dictionary is a pre-built set of words that enables LIWC to label texts by their moral underpinnings, and assigns a numerical score to the tweet based on the intensity of moral undertones - the higher the numerical assignment, the higher the intensity of that foundation. This results in a numerical figure per category, indicating

¹⁰ However, the virtue and vice labels were removed, as what is virtuous depends on which issues that a politician supports (e.g. loyalty to British citizens, or loyalty to the EU).

the moral intensity of that foundation within the tweet. For example, a tweet may score 8 in Authority and 3 in Loyalty, indicating a more intense expression of Authority. Thus, a tweet can be labeled as having elements of care, fairness and loyalty with equal intensity for each, or higher intensity for one foundation over others.

LIWC is used primarily because 1) it has foundations in social science research and has been used in similar research contexts (e.g. Dehghani et al., 2014, Grover et al., 2019) and 2) the moral foundations dictionary (MFD) built for LIWC is theoretically refined and has the most suitable existing lexicon for testing our hypotheses (Hopp et al., 2021; Frimer et al., 2019; Graham et al., 2009). The dictionaries contain word stems that are designed to deal with singular / plural forms of words, and also include lemmas for several terms. Hence, LIWC is known for its methodological and theoretical consistency in researching moral foundations in tweets. As noted, the dictionary used with LIWC provides multi-label output, meaning that more than one foundation can be detected per tweet.

Validating the Dictionary

In the analysis an updated version of the MFD is used, the extended Moral Foundations Dictionary (eMFD) (Hopp et al., 2021). A sample of tweets (N=300) was taken and manually labeled based on their foundations. Out of the box, the eMFD agreed with manual labeling 66% of the time, across moral and non-moral Brexit tweets. To increase labeling accuracy, the eMFD was amended to make it more Brexit-specific. During labeling, specific Brexit-related words and phrases were noted, such as issues of immigration usually being related to sanctity, and most tweets mentioning Theresa May or Boris Johnson were to do with either questioning or praising them as an authority. The mislabeled tweets were also examined, and the eMFD was further amended based on these errors. For instance, only two words were removed: 'faith' and 'lords' from the terms for sanctity. Prior to removal of the words, all tweets containing 'lord' (N = 197) and 'faith' (N = 85) were checked, and found that they were not at all related to religion, but rather about having faith in people, or the titles for people, or referring to the house of lords. Terms surrounding immigration, Islam and Turkey were added, as in the case of the Brexit, they are noted to be largely related to

sanctity (Smith, 2019).¹¹ [2] It was crucial to add these terms as well as remove ‘lord’ and ‘faith’, for more accurate labeling of the data. Without the removal, at least 170 tweets would be mislabeled as relating to sanctity, resulting in an erroneous overrepresentation of this foundation.

To ensure the dictionary was not just modified to suit the sample tweets, two trained coders manually labeled another random sample (N = 200). The coders followed the same coding guidelines from Hoover et al. (2020), as well as some extra notes on Brexit-specific issues, such as those on immigration and healthcare. The coding guidelines can be found in Appendix 5.2.1. For all foundations, the coders were in agreement for over 85% of cases. Krippendorff’s alpha (α) produced high scores for Care ($\alpha = .81$), Authority ($\alpha = .72$) and Non-moral ($\alpha = .86$) labels, however the results were lower for the less-used foundations, such as Loyalty ($\alpha = .59$), Fairness ($\alpha = .64$) and Sanctity ($\alpha = .39$), despite having a high percentage of agreement between coders.

The coders agreed with over 75% - 81% of the labels from the Brexit-adapted dictionary agreed with manual labelling (whereas the initial sample resulted in 87% agreement). This shows that the adaptation of the dictionary to Brexit-specific terms results in an overall improvement in accuracy, and that we did not only create the dictionary based on the sample data. Finally, we note that human agreement with moral labels is not perfect, and agreement can range from 66 - 95% depending on the study and method of measuring agreement (Weber et al., 2018). Therefore we find the level of 75% agreement acceptable. In Table S.5.1 In the Appendix are examples of tweet labels assigned by LIWC.

5.4 Results

The Frequency of Moral Arguments

To test the first hypothesis - that there will be a proportion of tweets that contain moral arguments - we looked at the proportion of tweets that were assigned a score on any moral value with LIWC. From the tweets extracted (N = 30,122), 65% (N = 19,760)

contained some element of a moral argument. We can confirm H1 - there are a proportion of Tweets that contain moral arguments - however we are not fully able to confirm a lack thereof, as LIWC is only able to test the presence of certain words, and not tweets that may be laden with moral judgements without explicitly stating them. Fig 5.1 shows the moral labelling of the tweets, where 38% (N = 11,374) of tweets contained some element of Authority, which is more than those that were labelled as having no moral underpinning (N = 10,362). Thus, with regards to the first hypotheses, we see that the majority of tweets do contain moral underpinnings. Authority was the most frequently used foundation, followed by Loyalty (31%) and Care (17%).

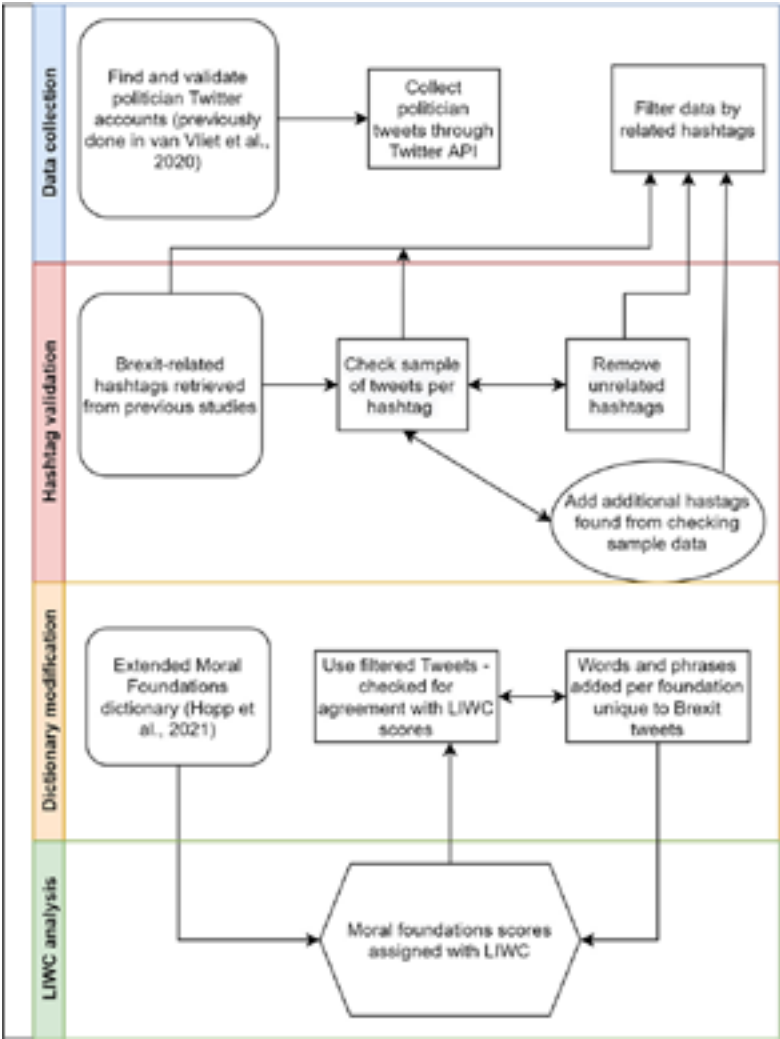


Fig 5.1: Process diagram showing the iterative methods in hashtag selection and dictionary modification (Source: the author).

11 The link to the full Brexit-specific dictionary can be found in S.5.2 of the Appendix

As LIWC is a frequency counter that produces multi-label output, we further test if there are correlations between foundations, to determine if two foundations are often used together in one tweet. Due to assumptions of normality being violated, Spearman’s Rho was used to test the correlation between two foundations (N = 30,122). It was found that there are several negligible but significant relationships between several of the foundations. For instance, Fairness correlates positively with Care (rs = 0.029, p = 0.000), Authority (rs = 0.042, p = 0.000) and Sanctity (rs = 0.019, p = 0.000). This means that arguments rooted in Fairness are likely to also contain elements of Care, Authority and Sanctity. For example, one parliamentarian tweeted:

“The Government’s plan for #Brexit will make it harder to bring international drug gangs to justice. By losing the European Arrest Warrant and information sharing arrangements, these criminals will be much harder to catch. #ExitFromBrexit”.

Within this tweet there is the argument of Fairness (justice against international drug gangs), Care (caring for the safety of the population by reducing criminality), Authority (the European Arrest Warrant sharing agreement) and Sanctity (protecting the purity of the population).

Loyalty on the other hand only correlates very slightly positively with Care (rs = 0.015, p = 0.010). Thus, arguments rooted in loyalty also may contain elements of Care. For example, another parliamentarian tweeted:

“Half of doctors from other EU countries considering leaving UK, a fifth already made plans, 89% fewer EU nurses coming #Brexit”.

Within this tweet we see the entanglement of Care and Loyalty foundations, where healthcare workers are considering leaving the UK, and hence showing loyalty to the EU and reducing the healthcare capacity in the UK. Generally, the correlations were very weak and can be found in Table S.5.3.2 in the Appendix.

Moral Arguments over time

In order to better understand the data before looking at the moral arguments within, the distribution of the most frequent hashtags was examined (see Table 5.1). It was found that in line with previous studies (e.g., Khatua & Khatua, 2016), some of the hashtags used by parliamentarians already contain an element of moral judgment. For example, #BackTheBrexitDeal, #getbrexitdone and #StandUp4Brexit are in support of the current Authority to go through with Brexit and the proposed agreements, and are sometimes mixed with tweets about Loyalty to Britain over the EU. On the other hand, #stopbrexit and #revokearticle50 are in direct opposition of it and are used in support of the Authority of the European Union as well as Loyalty to the EU. We see from Table 5.1 that #brexit was the most commonly used, followed by #stopbrexit and #nodeal. It should be noted that the hashtags are grouped by their word stem, so #brexit also contains the tags #brexitchaos #brexitshambles #brexitdeal and so forth. These hashtags were often used alongside one another too.

Table 5.1: Hashtags used in the analysis. Retweets are excluded.

Hashtag	All tweets (N)	Retweets (N)	Mentions (N)	Related tweets (%)
brexit *	37056	15078	21978	100%
getbrexitdone	2589	1044	54	100%
stopbrexit	2143	462	1652	100%
nodeal *	1643	554	1089	100%
exitfrombrexit	671	37	634	100%
BackTheBrexitDeal	496	246	250	100%
revokearticle50	481	170	311	100%
article50	424	173	248	99%

Hashtag	All tweets (N)	Retweets (N)	Mentions (N)	Related tweets (%)
StandUp4Brexit	353	266	87	100%
remainer	244	123	119	98%
euref	240	109	125	100%
RoadtoBrexit	192	98	94	100%
backstop	137	50	86	99%
hardbrexit	126	44	70	100%
britainbeyondbrexit	109	44	62	100%

To first see if the moral arguments differ over time, we look at the hashtag distribution over time. We see from Fig. 5.2 that #brexit was clearly the most used hashtag, and others were only used for certain periods. There was a large general increase in Brexit related tweets from November 2018 - April 2019, with a large peak of #brexit hashtag activity in March 2019. The activity then dropped significantly until October 2019, where it rose again, alongside the #getbrexitdone hashtag, which was largely unused until September 2019. This largely coincides with campaigning times, with elections being held on December 12 2019, since #getbrexitdone was a slogan for Boris Johnson's campaign for the Conservatives.

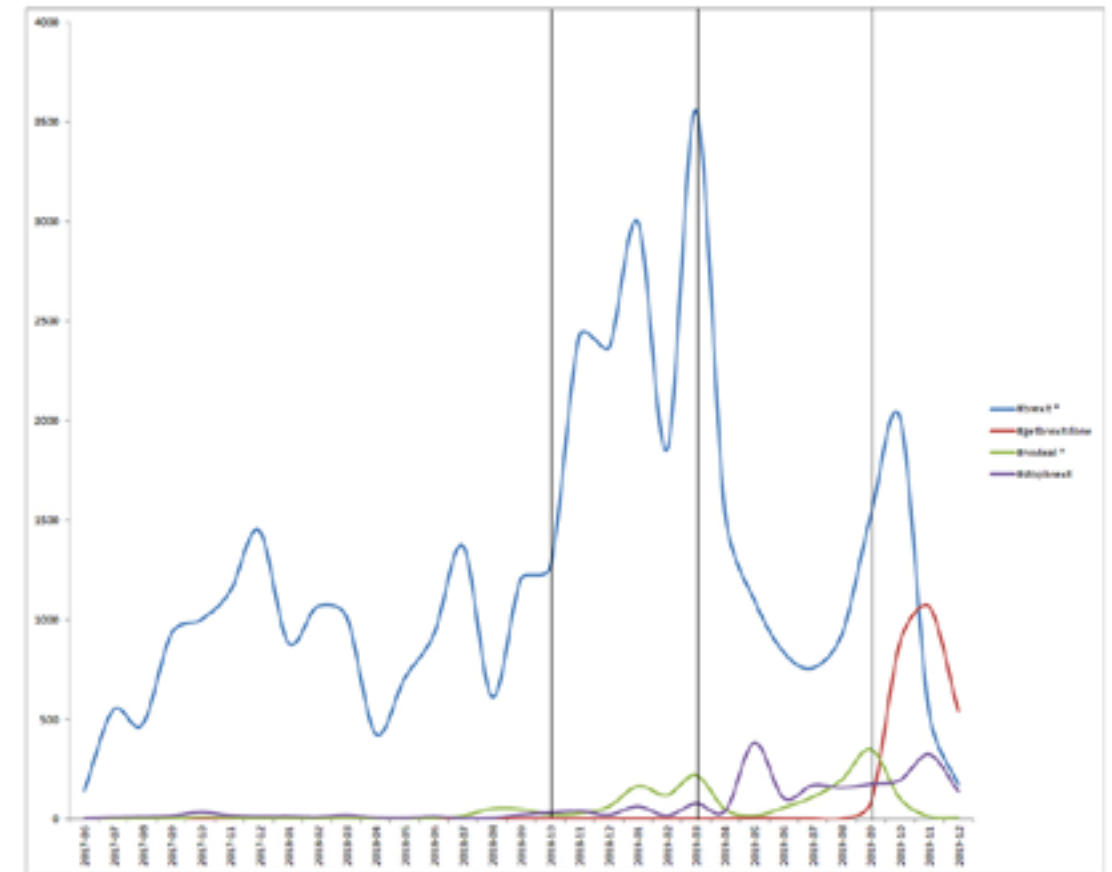


Fig 5.2: Line graph showing the hashtag frequency over time. Hashtags denoted by * also include derivatives of that hashtag as a word stem. The lines denote salient hashtag activity (Source: the author).

Once the tweets were labeled, we checked to see if there were differences in the intensity of moral arguments over time, depending on what might hold the public interest. From Fig 5.3, we see that the average intensity of Fairness and Sanctity generally remains the same. However, there are fluctuations over time in the average intensity of Authority, Loyalty and Care. On average, the arguments of Authority and Loyalty were used the most intensely over time. Overall, parliamentarians appealed most often to the foundation of Authority with regards to Brexit. This makes sense, due to many arguments questioning and challenging authority, such as the competence of Prime Minister Theresa May in creating a deal the cabinet could agree with, or to support Boris Johnson's new proposed deal.

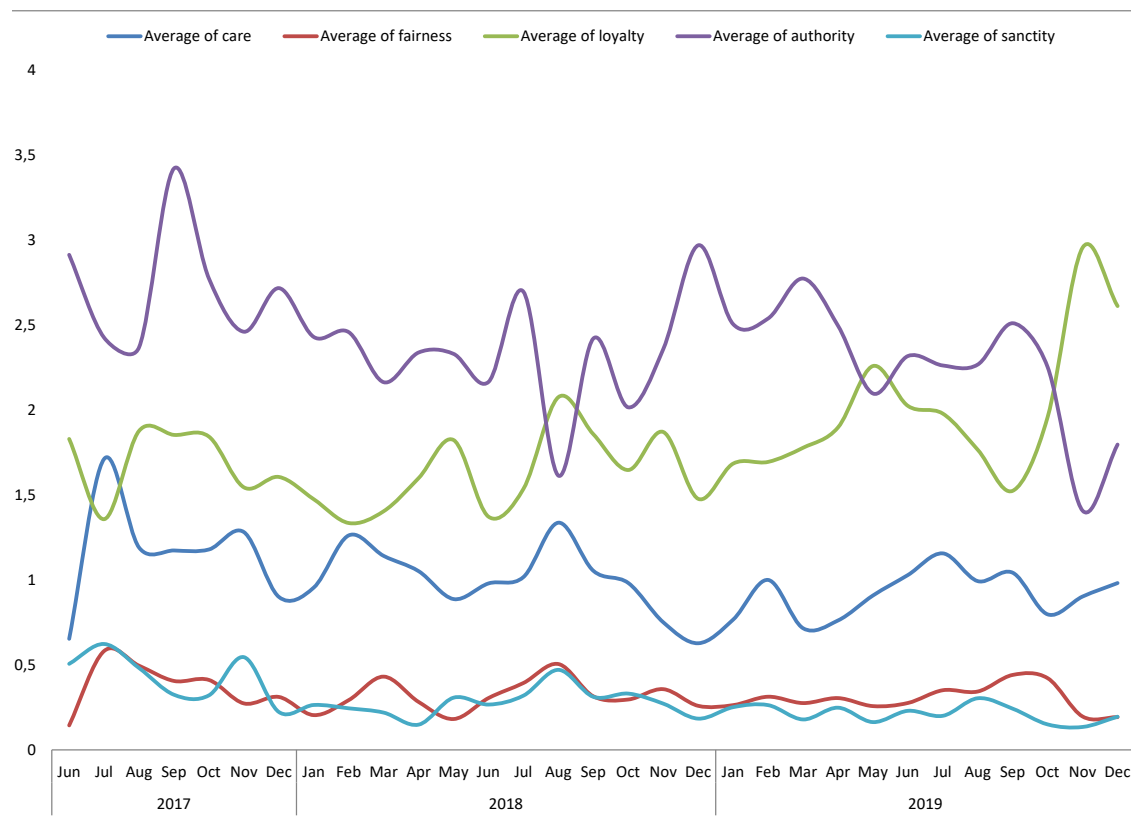


Fig 5.3: Line graph showing the average moral intensity of Brexit tweets over time. The foundations of authority and loyalty were most strongly used. This shows that moral arguments overall are sustained over time (Source: the author).

Key Terms Associated with Each Foundation

Previous literature suggests that arguments rooted in Care will primarily involve the NHS, whereas those centered on Loyalty and Sanctity will be more related to immigration and the backstop (Smith, 2019). Fig 5.4 visualizes word frequencies per foundation, with the removal of stopwords, including 'Brexit', 'EU' and 'deal'. From this figure we see that tweets labeled with Care discusses 'people', 'UK' and 'jobs', although these words are generally outnumbered by 'StopBrexit', and 'PeoplesVote'. We also see that tweets labeled with Loyalty mainly discuss 'UK', 'support', 'vote' and 'parliament', whereas tweets categorized with Sanctity tend to discuss 'immigration', 'food' and 'people'. These findings somewhat are in line with previous literature, with arguments relating to Sanctity discussing immigration and the backstop (Smith, 2019).

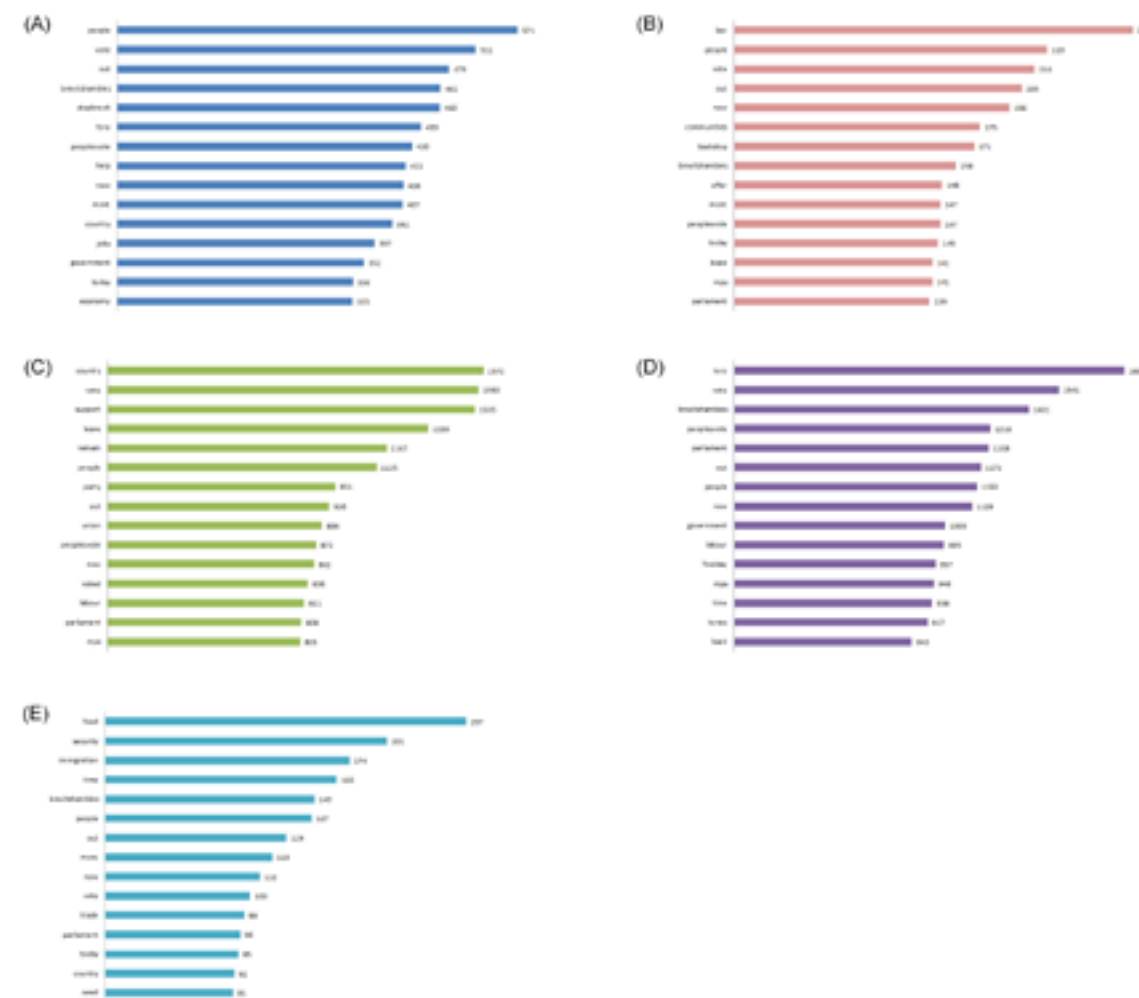


Fig 5.4: Word clouds and frequencies per foundation - Care (A), Fairness (B), Loyalty (C), Authority (D) and Sanctity (E). Words are sized by their frequency and colored randomly. Frequency bars for words containing 3 characters or more are shown on the right (Source: the author).

After removal of stopwords, the 10 most frequent words per moral foundation that were not commonly shared with the other foundations were extracted (i.e., the word did not appear in the top 50 most frequently used words in the other foundations), and calculated the log-likelihood (LL) value to indicate overuse or underuse respectively, in one foundation relative to tweets that are not labeled in that foundation (Arlt et al., 2019; Boukes & Trilling, 2017). In other words, the LL value shows how frequently a word appears in one group of tweets over another (i.e., belonging to one

moral foundation over others). If a word occurs more or less frequently than expected by chance in one of the groups of tweets, the higher the LL value is. We further calculated the probability based on the chi distribution to determine if the frequency difference was statistically significant. The results can be found in Table S.5.3.1 in the Appendix for Chapter 5.

It was found that ‘help’ ($p = 0.000$), ‘jobs’ ($p = 0.002$), ‘fight’ ($p = 0.000$) and ‘damage’ ($p = 0.000$) were significantly more likely to appear in tweets categorized with Care over other foundations. Interestingly, the NHS was not significantly mentioned more in tweets regarding Care. Words such as ‘law’, ‘community’, ‘offer’, ‘blame’, ‘fair’ and ‘honest’ were all significantly more likely to appear in the Fairness foundation than others ($p = 0.000$ for all). For the Loyalty foundation, the words ‘union’, ‘customs’, ‘local’ and ‘together’ appeared significantly more in those tweets ($p = 0.000$ for all). For Authority, the most significant words were ‘finalsay’, ‘tories’, ‘theresa’, ‘prime’ and ‘boris’ ($p = 0.000$ for all). Finally the words ‘food’, ‘security’, ‘immigration’, ‘clean’, ‘bill’ and ‘money’ were significantly more likely to appear in tweets labeled with Sanctity ($p = 0.000$).

Although words may appear more frequently in one foundation over others, when compared with the rest of the text (and not directly to another foundation), only around 5 words were said significantly more in each foundation over others (See Table S.5.3.3 in the Appendix). Moreover, some words were used significantly less in the labeled foundation when compared to the rest of the tweets. Lastly, it should be noted that due to LIWC being dictionary-based, certain words were consistently categorized as belonging to a certain foundation, and thus did not appear at all in the rest of the text as they were exclusively assigned to a certain foundation. This happened commonly with the Fairness foundation, with words such as law, community and fair.

Differences in the Use of Moral Foundations per Party

It was hypothesized that Labour would focus on arguments centered on Care and Fairness, whereas the Conservatives will use a wider variety of moral foundations in their arguments (Haidt, 2012; Graham et al., 2009). Fig. 5.5 shows the proportion of moral foundations per party. Most parties use arguments of Authority, Loyalty and Care.

However there is a marked difference between the proportion of tweets labeled with Care between the Labour party and the Conservative party, where the bulk of moral tweets by the Conservative party focused on Loyalty and Authority.

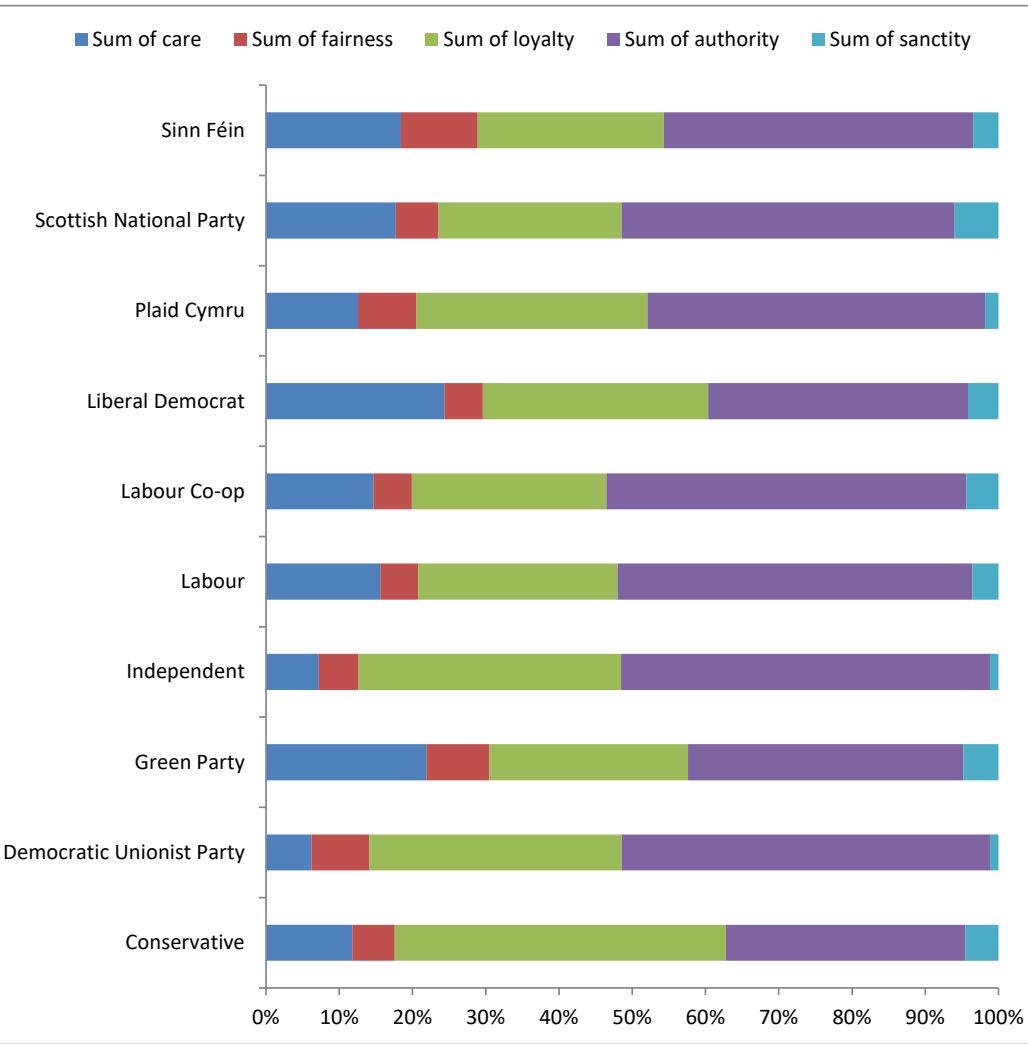


Fig 5.5: Stacked bar graph showing the proportion of moral intensity for each moral foundation, per party. We see that most parties generally used arguments of Authority, Loyalty and Care (Source: the author).

To further test H2, the two largest parties were examined - Labour and the Conservatives - who had the largest volume of Brexit-related tweets: 39% and 27% of all Brexit related tweets were issued by Labour and Conservatives, respectively. A one-way ANOVA was conducted to compare the means of moral intensities between the two parties, to determine if there was a statistically significant difference in how intensely each party expresses certain moral foundations. We found that there were significant differences between Care (\bar{x} Labour = 0.62, \bar{x} Conservative = 0.38, $p = 0.000$), Loyalty (\bar{x} Labour = 1.10, \bar{x} Conservative = 1.48, $p = 0.000$) and Authority (\bar{x} Labour = 1.198, \bar{x} Conservative = 1.07, $p = 0.000$). These mean differences can be seen in Fig 5.6. Thus, those in the Labour party appeal more intensely to the foundations of Care and Authority than Conservatives, whereas Conservatives appeal more to the foundation of Loyalty. There were no significant differences in the foundations of Fairness and Sanctity.

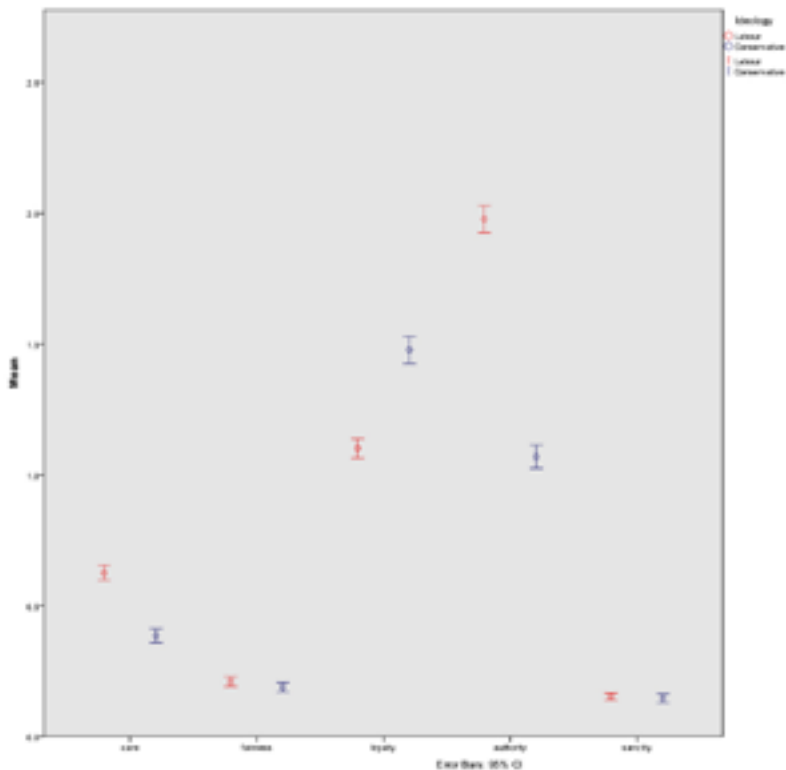


Fig 5.6: Mean differences with error bars for moral intensity per foundation between Labour and Conservatives. There are significant differences in the use of Care, Loyalty and Authority (Source: the author).

The differences in intensity however, do not mean that each party discusses each foundation in a similar way. Taking a random sample of tweets per party (N = 100 per party), it was found that the parties approached the foundations differently. For instance, as we see from Fig. 5.5, most parties do appeal to the foundation of Authority, yet discuss them in different ways - Labour often criticized the competence of the cabinet to be able to go through with creating an agreeable deal, whereas the Conservatives discuss Authority in more positive terms, such as respecting and supporting the cabinet responsible for implementing a Brexit deal. Thus, the Labour party undermining authority could result in a response from (or be a response to) the Conservatives in support of the Brexit deal and the responsible authority. The same was found for arguments rooted in Loyalty: the Conservatives spoke of loyalty towards the United Kingdom and its citizens, whereas Labour emphasized loyalty towards the European Union.

5.5 Discussion and conclusions

There were several moral frames used to discuss Brexit by British parliamentarians on Twitter. The majority of tweets (65%) were rooted in at least one moral argument. The rather frequent use of moral frames may explain the high levels of polarization over the issue (Feinberg & Willer, 2013; Maher et al., 2018). Indeed, during the manual labeling and validation of the tweets, there were a surprising amount of negative tweets between parties - especially those attacking the opposition - often calling into question the competence of other parties as well as the current leadership. Therefore there were clear contentions between parties.

Moreover, hashtag and tweet validation was a critical step in the process not only for ensuring relevant data was analyzed, but also for better understanding how politicians use Twitter. For instance, with the #brexit tag, since the study focused on politician only data, there were no irrelevant tweets or people piggybacking on the hashtag, which is common when looking at unfiltered Twitter data. Thus, in line with present research, politicians generally use hashtags to strictly demarcate specific issues (Barberá et al., 2019; Enli & Simonsen, 2018; Hemphill et al., 2013). It was further found that the hashtags used by politicians also differed from those used by the public

(e.g., Bastos & Mercea, 2018). For instance, the hashtag #strongertogether was used for a totally different event that was not Brexit related.

Most surprisingly, Labour and Conservatives both appealed to similar foundations, especially Authority and Loyalty, but expressed arguments to these foundations in different ways. For instance, concerning Authority, Labour would call into question the authority and competence of Theresa May to get support for her proposed Brexit agreements. The Conservatives on the other hand, appealed to the authority of the cabinet and called for support for the proposed agreements. The expression of Loyalty also differed between the parties, where Labour expressed loyalty to the European Union, but Conservatives expressed loyalty towards the United Kingdom and the British people. Therefore, the difference in how parties use each foundation is a topic for further research.

Limitations

Using a pre-built labeling program such as LIWC is not without its limitations. From a technical standpoint, it is unclear how LIWC deals with things like typos and word stems. From a theoretical standpoint, moral foundations are ambiguous and mixed, and in this case it is unclear to the extent which tweets were supporting or protesting certain aspects of Brexit. Thus, the virtue and vice judgements were removed, as virtue terms may differ depending on which issues a politician was in support of (e.g., loyalty to the UK or loyalty to the EU). Omission of the moral valence of the foundations therefore limits the study only to which moral arguments were used, but not which types of virtues were favored by each side.

Moreover, like human coders, LIWC cannot perfectly label tweets. The dictionary-based approach does not take words in their context and can therefore mislabel foundations simply based on the presence of a certain word. This is shown through using the most frequent terms to analyze the differences in word frequency between the foundations - with some words it essentially resulted in reverse-engineering the dictionary. That said, it worked surprisingly well after amending the dictionary, bringing coder agreement with the labeling up to 81%. However, multi-label output can be difficult for drawing succinct conclusions, and thus we can only discuss the intensity of a certain foundation within a

tweet, rather than the core idea of the argument behind it. Other open source projects could be tested and compared with LIWC for better labeling of the data.

Another limitation is the selection of data. Although it was carefully attempted to look at a wide variety of hashtags tied to Brexit, Brexit issues and the referendum, it is not sure that all Brexit-related tweets are included. Moreover, members of the European Parliament are not included in the analysis, and may play a key role in communicating and disseminating moral arguments to their fellow politicians and constituents.

Conclusions

This study has examined the Brexit debate between British parliamentarians on Twitter. The study focused on the question; how do British parliamentarians use moral foundations to discuss the Brexit withdrawal agreement on Twitter? Most tweets analyzed were using the hashtag #brexit (or a derivative of it), followed by the ideologically laden hashtags #getbrexitdone and #stopbrexit. The frequency of use of these hashtags changed over time, where hashtags like #getbrexitdone started gaining popularity in the last 3 months of 2019, and was closely associated with Boris Johnson's campaign for the upcoming elections. The results could confirm H1, as a large proportion of tweets contained clear moral arguments were found. In fact, the majority of tweets about Brexit contained moral underpinnings. The most frequently labeled foundation was Authority, followed by Loyalty. Authority was also the most intensely used, indicating that Authority was the prominent foundation for most of the moral tweets.

When looking at the content of these arguments, the literature postulated that arguments rooted in Care will primarily involve the NHS, whereas those centered on Loyalty and Sanctity will be more related to immigration and the backstop. Indeed, we did find that arguments related to Care did mention the NHS, although this was not statistically significant. Instead, Care was significantly related to 'help', 'jobs', 'damage' and 'fighting'. On the other hand, Sanctity was related to 'immigration' and 'security', and Loyalty was more about 'customs' and [the European] union, with those words being statistically more likely to appear in tweets categorized with those foundations. Conversely, in the case of immigration, this significant difference

makes sense due to ‘immigration’ being one of the key words added in the dictionary for the Sanctity foundation.

It was also hypothesized that left-leaning parties will focus on arguments centered on Care and Fairness, whereas Conservatives would use a wider variety. Proportionally, both Labour and the Conservatives tweeted most intensely with arguments rooted in Loyalty and Authority. One-way ANOVA found that indeed Labour focused significantly more on arguments of Care and Authority, but interestingly Conservatives focused significantly more on arguments of Loyalty. Moreover, although both parties used arguments of Authority intensely, the expression of the foundation was different in each party. Labour used it to question the current cabinet, whereas the Conservatives used it in support of it. Similarly, Loyalty was expressed in different ways between the parties, where Labour indicated loyalty towards the European Union, and the Conservatives spoke of loyalty to the British people. Thus, the same foundation was used by parties in different ways.

All in all, the study finds that there are moral arguments from parliament in Brexit-related tweets. Different moral arguments are used by the parliamentarians and the intensity of these arguments differs between Labour and Conservatives. Arguments may appeal to the same foundations yet be used in very different ways, depending on the underlying ideology. This work contributes to the growing body of knowledge over the use of moral arguments by politicians, especially in public online settings.

5.6 References

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CHAPTER 6



Conclusions &
reflections

Chapter 6. Conclusions & reflections

This thesis has developed and deployed a computational comparative approach to political communication on Twitter, which addresses the limitations of the current dominant approach to studying Twitter data. It sought to answer the question:

How can Twitter data be used as part of a comparative computational approach to studying political communication?

This question was answered by focusing on three empirical sub-questions, relating to specific, long-standing questions in political communication. The thesis first addressed the limitations of current Twitter research by building the Twitter Parliamentarian Database (TPD), which works to maximize the potential of what we can know from Twitter data. After that, sub-questions were addressed that spoke to pertinent and long-standing questions in political science and political communication. This section begins by answering the research question and sub-questions, starting with what we can know from Twitter data, followed by what was learned from looking at the patterns of parliamentary communication on the platform. It finishes with the overall contributions of the thesis, as well as its limitations. Lastly, some ideas for future research are outlined.

6.1 What contributions can be made with Twitter data?

Existing research using Twitter data has been criticized both for issues in data collection – concerning sampling, delineation and validation (Tufekci, 2014; van Vliet, Törnberg & Uitermark, 2020) – and a lack of links to existing theory and research questions within the field of political communication (Hofman et al., 2021; Lazer et al., 2020; Törnberg & Törnberg, 2018). It was therefore pertinent to address these issues to properly understand what can be known from Twitter, before being able to draw conclusions about the behavior of politicians on the platform. This thesis introduced a database that resolves these problems within the study of parliamentary communication, by using rigorous sampling

methods to build the TPD. Building on this data, the thesis utilized a computational comparative approach to political communication on Twitter, allowing comparisons between countries, parliaments and parties to be made (Theocharis & Jungherr, 2021). In this sense, the TPD opened a new context that focuses on *parliamentarian to parliamentarian* communication, thereby resulting in a comprehensive dataset that could give interesting insights into parliamentary communication that was previously not feasible on this scale. This approach was applied in three empirical studies, focusing on the insights into political communication that can be drawn from three aspects of Twitter data: retweets, mentions, and content.

Analysis of the content of tweets can show what parliamentarians discuss (e.g. Lyons & Veenstra, 2016), how frequently, and the sentiment behind it (e.g., Feinberg & Willer, 2015). As noted in Chapter 2, the benefit of sampling parliamentarians rather than hashtags means that all tweets can be gathered through the Twitter application programming interface (API). Thus, when looking at the data, one can gain a pretty complete picture of parliamentary discussion on Twitter. In summary, there are many ways in which one can study politician behavior on Twitter. The first decisions that need to be made are in defining what constitutes a politician (A candidate? A local politician? A parliamentarian? A member of the senate?) and what type of behavior you want to capture.

Due to the careful and purposive sampling of parliamentarians, the affordances of Twitter as a platform provide interesting insights into coalitions, and contentions within and between parliaments (Cherepnalkoski et al., 2016; van Vliet et al., 2020). It can therefore speak to questions regarding who endorses whom, coalitions and contentions, communication across parliaments, and questions regarding the content of parliamentarians' tweets. Hence, Twitter data, and especially data from the TPD, can contribute a new and important window into the messages, endorsements and communication of and between parliamentarians – maximizing the potential of what can be known from Twitter data (Antonakaki, Fragopoulou & Ioannidis, 2021). There are many insights that can be garnered from parliamentary behavior on Twitter that can be used to provide nuance, add another angle, and validate or disprove existing theories and questions in the social sciences. Primarily, the thesis contributes insights into

cross-party endorsements, national parliamentary communication, overlapping topics, and using Tweets as an indication of moral discourse by showing examples of ways in which Twitter data can contribute to theory.

Cross-party endorsements

The third chapter discussed cross-party endorsements, testing the idea that proportional systems are more cohesive than majoritarian ones (Lijphart, 2012). Using retweets (direct reposting of someone else's tweet from one's profile) displayed as network data between parliamentarians within a national parliament resulted in a stark and telling visual display of who endorses whom, both on an individual and party level. A large number of endorsements within parties show tight-knit agreement between members, whereas endorsements outside of the party, especially on an individual level, may be telling of individuals who plan to leave or break off into another party. The article uncovered a typology of 4 distinct Twitter networks: cohesive, bipolar, fringe party, and fragmented. Countries using proportional representation (PR) systems were shown to be somewhat more cohesive on Twitter, while other PR systems appeared fragmented, showing few endorsements between parliamentarians of different parties. Moreover, Twitter can uncover the positioning of fringe parties – parties excluded from the larger parliamentary network. In some cases, the exclusion was mutual (they did not retweet others in the network), but in others it was one-sided (no other parliamentarians wanted to show support for members of the fringe party, despite being endorsed by them). While there was an expectation of a clear relationship between the electoral system and the structure of the endorsement networks, the results showed that this was not the case, especially in PR systems. Thus, there is something to be said about Twitter endorsement networks, and this article made headway in looking at the different networks across countries, showing that parliamentarians behave in a strategic manner that may be somewhat related to the electoral system, but not as strongly related as expected from the literature.

Supra-national parliamentary communication

Not only do members of national parliaments show interesting patterns in their

communication that do not perfectly align with current theory, but Members of the European Parliament also show surprising results. It is generally thought that MEPs are more nationally oriented – as in, communicate more with members of their national parliament – (Mühlböck, 2012) but on Twitter the opposite is seen. Instead of showing patterns of frequent communication with national parliamentarians, MEPs were communicating more frequently with their European Parliament political groups. It should be noted that the European Parliament is organized not by nationality, but political affiliation, which then forms the Parliament's political groups. Thus, on the whole, MEPs tend to engage much more with other MEPs from their political group than their national parliamentarians. Clearly there is much to be learned about how parliamentarians across national and supranational parliaments communicate and build a unified force. Moreover, it also shows that there may be different driving forces between loyalty to a national party and loyalty to a European political group, or other fellow MEPs over national parliamentarians.

Using tweets as an indication of moral discourse

Lastly, despite tweets being limited to 280 characters, they can still be loaded with moral values which can be distilled with text analysis. Generally it is thought that left-leaning politicians are more responsive to arguments surrounding care for others (Graham, Haidt & Noshek, 2009). The case of Brexit presented an interesting topic for analysis of this notion, since a large part of campaigning to leave the European Union was centered on healthcare funding, specifically the argument that leaving the union would free up more money for the National Healthcare System (NHS). During the campaign, narratives of caring for British nationals (over European nationals) were a paramount part of the discussion. It was therefore expected that Labour parliamentarians would be centered on caring for UK citizens when discussing the terms of the withdrawal agreement. Interestingly, while Labour does appeal to values of care significantly more than the Conservatives, their primary arguments were centered on issues of authority. Thus, Labour somewhat fulfilled the expectation of relying on the moral argument of care, but they also shifted to appeal to values of authority, especially concerning questioning Theresa May and the leadership of the Conservatives. Overall, when it comes

to the case of the Brexit withdrawal agreement, there are different arguments and motivations coming from both parties that may not have been used (or were underplayed) during the campaigning for the referendum.

6.2 Contribution of the thesis

This thesis has outlined a computational comparative approach to studying political communication on Twitter. It has shown how computational methods and tools can be used to contribute to existing research fields, demonstrating ways of studying parliamentary behavior that have not yet been applied with such a large sample of incumbent parliamentarians. A computational comparative approach allows better linking to existing theories and data, going beyond existing computational approaches to Twitter through linking to long-standing questions in political science and political communication. This has been illustrated through three studies concerning: the relationship between electoral systems and politician cohesion, the allegiance and debate between Members of the European Parliament and national parliamentarians, and questions around the arguments used by British parliamentarians surrounding the Brexit withdrawal agreement.

In order to use a computational comparative approach, the TPD was created to allow for these comparisons. The TPD links to other political databases (such as the Electoral System Design Database, the Chapel Hill Expert Survey, and so forth) with variables that are important to research in political science and political communication, and promotes transparency and sharing of data. It is freely available to download at twitterpoliticians.org, as well as from the linked repository from Chapter 2: 'The Twitter Parliamentarian Database'. There has been clear interest in the data, shown by an existing user community that has sent emails for support, as well as requests for specific data. In accordance with Twitter's terms and conditions, the database only releases the Tweet IDs of parliamentarians' tweets, as tweet texts and identifiable user IDs are not allowed to be shared – which does encumber its ease of use. Arguably, the main contribution is however the member list, a collection of 9,481 parliamentarians, with associated information on their parties and countries, as people can easily use the Twitter accounts to gather new data of their own, especially with the recent addition of the Twitter Academic application

programming interface (API), which allows more data to be gathered for free by academic researchers than ever before. The TPD therefore enables a computational comparative approach through linking Twitter data to important variables in existing comparative research, fostering a combined approach beyond what is currently used by other computational scholars.

Not only is the database itself a contribution to the scientific community, but the computational comparative approach also provides a new angle to deal with long-standing topics where debates have persisted long before Twitter came into existence, providing new insights into these continuing discussions. As noted, the third chapter looks specifically at political contentions and coalitions on Twitter, linking it to Arend Lijphart's (2012) ideas of political systems and political culture, speaking to the question of the differences in cooperation in proportional and majoritarian parliamentary systems. The general claim is that proportional representation fosters cross-party cooperation (Lijphart, 2012), but when looking at the Twitter data, there are subtle differences across countries, where proportional systems may be cohesive yet still exclude certain parties from endorsements. Informal coalitions can be easily seen between parliamentarians (beyond the traditional way of researching roll call votes) and shown in a network.

Secondly, communication patterns between national and supranational parliaments can also be studied to determine the allegiance and debate between national and supranational parliamentarians (e.g., Cherepnalkoski et al., 2016). Through looking at the communication between European Parliamentarians and national parliamentarians, the fourth chapter speaks to the question of the former's national orientation. Previously, self-reporting by parliamentarians was the primary method of studying the relations between parliamentarians on different levels (e.g., Aul, 2019; Borońska-Hryniewiecka, 2021; Winzen, 2022). It has also been claimed that European Parliamentarians are more aligned with national parliamentarians from their own parties (Mühlböck, 2012), yet Twitter data indicates that MEPs are more aligned with other MEPs.

Finally, a case study on the debate of the terms of the Brexit withdrawal agreement presented in Chapter 5 contributes a fresh and novel look at the moral underpinnings of the debate from the point of view of parliamentarians.

It speaks to the question of whether or not Labour and Conservatives formulate moral arguments differently from one another. Thus, each chapter not only demonstrates the usefulness and variety of analyses able to be conducted with the TPD, but also provides new insights into parliamentary behavior on Twitter in light of ongoing debates. By focusing specifically on tweets from parliamentarians, the research uses a systematic way of identifying political elites, and is able to use the data to make comparisons across countries. As such, Twitter data can give insight into the coalitions and contentions of politicians.

6.3 Limitations & future research

While there is a lot of good to be said about the TPD, there are several limitations with this thesis and its methodologies. The limitations for each of the articles are discussed within them, so this section discusses the more general imitations with this thesis. Firstly, it is important to note that collecting data similar to what is found in the Twitter Parliamentarian Database is an extremely laborious undertaking, as not all parliamentarians complete a full term – some may leave and be replaced prior to a new electoral period (Kotakorpi, Poutvaara & Terviö, 2017). In rare cases, parliamentarians pass away during their term. In any case, members who are unable to complete a full term need to be replaced. Hence, it was not feasible to keep the TPD perfectly up to date, especially since some governments were a few weeks delayed in updating their websites to reflect changes in their parliament. The question is, does this matter for the bigger picture? The answer depends on exactly what one wants to research (Williams et al., 2013). For the research conducted in this thesis, removing a few outliers whose data became redundant during the analysis period did not change the results. However, if one wishes to track specific interactions between parliamentarians over a long period of time (e.g., Scully, 1999), or to look at the changing of network parameters over time (e.g., Cruickshank & Carley, 2020), and across different legislative periods, then the missing data may be important. Thus in the larger picture, automated notifications of when there are changes in each parliament should be considered when building such a database.

Generally, when conducting research on Twitter, it must be noted that Twitter *used* differs per

country – some parliamentarians in very active countries use the app religiously, whereas others may only tweet once a week or less, especially in countries that do not have such an active number of parliamentarians on Twitter (Omnicores, 2022). Therefore, with some research, it may not be possible to transfer the same methodology between countries. For example, in some countries, parliamentarians do not communicate that much with one another, so it is not as interesting to look at the content of the mentions between them (Praet, Marrens & van Aelst, 2021). This is why retweet networks in Chapter 3 were looked at over a longer period of time, allowing enough time for parliamentarians that may not retweet as frequently to develop retweet patterns. In a similar vein, it takes time for newly elected parliamentarians to create a Twitter account. Some do not use the same account for their incumbent term as what they used for campaigning, and others may be completely new to the platform (for an overview on campaigning literature, see Jungherr, 2016). Therefore, the uptake of Twitter data from new parliamentarians in the beginning of a term may be a little sparse.

Finally, Twitter is just one relatively new aspect of political communication that can be researched and may bring about completely different results than what would be expected according to previous literature (e.g. van Vliet, 2021). Moreover, there are limits on conclusions that can be drawn from the data and one must be careful in what can be interpreted (Lazer et al., 2020). For instance, while it may seem that certain countries with proportional systems are endorsing more across party lines, this may not necessarily mean that these governments are more consensual, or proportional systems are superior due to increased communication and endorsement. In fact, some systems with proportional representation instead show fragmentation in their endorsement networks (van Vliet, Törnberg & Uitermark, 2021). Thus, Twitter provides a window into several aspects of political communication.

Computational comparative analysis and the database developed here opens doors for computational research that is embedded in existing theoretical issues and perspectives within political communication. This opens up a range of possible future research, tied to long-standing issues that would be challenging to answer using traditional methods (e.g., Hofman et al., 2021; Theocharis & Jungherr,

2021; Törnberg & Uitermark, 2021). It also enables researchers to examine how relatively new forms of media are reshaping political debate, using large amounts of digital data that can be collected and analyzed on an unprecedented scale (Russell, 2021). This thesis merely scratches the surface of the potential of what can be done with computational methods in a comparative setting to examine political communication between and across parliaments. For instance, information dissemination, signed networks and follower networks are important next steps that can be taken when studying parliamentary behavior on Twitter.

All in all, this thesis has provided insights into what can be done with a large and comprehensive database of politician Twitter data, answering how Twitter data can be used as part of a computational, comparative approach to studying political communication. The thesis uses linkages to existing databases in order to provide a comprehensive demonstration of how retweets, mentions and tweet content can be applied to long-standing questions in political science and communication. Overall, it is clear that parliamentarians use Twitter very deliberately – they are careful who they endorse, they use hashtags to demarcate their ideological point of views, and whom they primarily engage in conversation with differs between parliaments. The broader relevance of the findings show that there is a wealth of knowledge to be harvested from parliamentary tweets through using their digital trace data that can provide nuance, add another angle, and validate or disprove existing theories and questions in the social sciences. This thesis has provided demonstrations showing what can be done with a large and comprehensive database of politician Twitter data and contributes to this understanding of political communication, through examining retweets, mentions, and the content of parliamentary tweets between and across national and supranational parliaments.

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LIST OF ACRONYMS

- EP - European Parliament
- ESDD - Electoral System Design Database
- EU - European Union
- MEP - Member of European Parliament
- NP - National Parliamentarian
- TPD - Twitter Politician Database

APPENDIX

Chapter 2

S.2.1 Table: *This table shows the number of MPs on Twitter per country in the database. The legislative period id is an arbitrary id number that distinguishes each legislative period.*

Country	Legislative period id	Total MPs (N)	MPs on Twitter (N)	MPs on Twitter (%)
Australia	38	149	134	90
Austria	54	183	86	47
Austria	37	183	65	36
Belgium	35	150	130	87
Canada	34	334	327	98
Denmark	33	186	161	87
Denmark	45	185	157	85
European Parliament	32	750	635	85
European Parliament	43	747	639	86
Finland	31	202	173	86
Finland	42	199	177	89
France	30	575	515	90
Germany	28	662	355	54
Germany	29	707	511	72
Greece	27	299	102	34
Iceland	26	64	40	63
Ireland	25	158	150	95
Italy	23	637	525	82

Country	Legislative period id	Total MPs (N)	MPs on Twitter (N)	MPs on Twitter (%)
Italy	24	630	449	71
Latvia	21	100	41	41
Latvia	22	100	57	57
Luxembourg	19	60	37	62
Luxembourg	20	45	32	71
Malta	18	67	58	87
Netherlands	17	151	147	97
New Zealand	15	119	104	87
New Zealand	16	110	100	91
Norway	14	168	114	68
Poland	13	460	334	73
Slovenia	11	90	47	52
Slovenia	12	91	54	59
Spain	10	325	219	67
Sweden	8	349	163	47
Sweden	9	357	237	66
Switzerland	6	200	123	62
Turkey	4	544	482	89
Turkey	5	596	576	97
United Kingdom	3	650	590	91
United States	1	440	435	99
United States	40	440	438	100

S.2.2 Table. *This table shows clustering and degree measures, as well as fractions of external mentions and the strength of relationship between party and cluster membership, applied to the individual country networks.*

Country	Democratic system	Type	Fraction external retweets	Average modularity	Clusters (N)	Average clustering coefficient	Degree kurtosis	Cramer's V
Australia	M	2	0.04	0.575	8	0.399	-0.24	0.679
Belgium	PR	1	0.23	0.793	7	0.398	2.37	0.929
Canada	M	1	0.08	0.550	9	0.451	3.12	0.857
Denmark	PR	4	0.16	0.583	6	0.326	0.60	0.793
Finland	PR	3	0.20	0.560	7	0.342	-0.66	0.696
Germany	Mixed	1, 3	0.19	0.716	9	0.352	0.32	0.896
Ireland	PR	2	0.04	0.529	5	0.5	-0.80	0.950
Italy	Mixed	1	0.26	0.686	6	0.348	4.73	0.767
Malta	PR	2	0.05	0.461	5	0.594	-0.56	1.000
Netherlands	PR	3	0.13	0.656	7	0.396	-0.05	0.859
New Zealand	Mixed	2	0.08	0.562	6	0.402	0.68	0.650
Norway	PR	4	0.21	0.623	8	0.212	-0.56	0.612
Poland	PR	2	0.04	0.518	5	0.47	0.57	0.699
Spain	PR	1	0.11	0.677	9	0.471	0.68	0.739
Sweden	PR	2	0.33	0.687	9	0.277	1.43	0.826
Switzerland	PR	4	0.16	0.520	8	0.331	1.24	0.577
Turkey	PR	1	0.10	0.651	10	0.274	2.28	0.926
United Kingdom	M	2	0.08	0.519	9	0.328	1.03	0.590
United States	M	2	0.14	0.517	14	0.281	8.26	0.813

S.2.3 Table. *This table shows the highest Log-Likelihood values (shown in brackets) of hashtags used by the two largest parties in 2018. High values indicate that a term occurs more frequently than chance amongst one party.*

Australia	
Labour	The Nationals
auspol (634)	lovegippsland (1608)
politas (480)	getactive (1345)
qt (316)	regionsmatter (1310)
youradf (111)	lovesport (1198)
ausdef (99)	parkeselectorate (972)
insiders (96)	tyfys (646)
estimates (83)	ruralhealth (364)
lestweforget (73)	improud (326)
ausvotes (65)	riverina (318)
nbn (63)	wombattrail (289)

Canada	
Labour	Conservative
barrie (4158)	cdnpoli (3996)
innisfil (4103)	polcan (591)
cpc (1896)	scarbto (519)
onpoli (1398)	yourbudget2019 (397)
eml (1330)	lib2018 (347)
lavscam (1167)	goc (315)
yxe (1156)	ottawacentre (314)
cpc_hq (1055)	yourbudget2018 (311)
kitcon (921)	parkhp (308)
skpoli (846)	hamont (299)

United Kingdom	
Labour	Conservative
brexit (13873)	harlow (4868)
pmqs (6637)	torbayhour (4825)
peoplesvote (4610)	cpc17 (4409)
labourdoorstep (4562)	boosttorbay (4390)
tomorrowspaperstoday (4084)	ukaid (3912)
plymouth (3471)	torycanvass (3725)
lab17 (2855)	cpc18 (3372)
brexitshambles (2728)	southend (3163)
forthemany (2254)	crawley (2687)
universalcredit (2248)	backthebrexitdeal (2618)

United States	
Republican	Democrat
taxreform (12248)	goptaxscam (5464)
utpol (5086)	trumpcare (3961)
taxcutsandjobsact (4631)	trumpshutdown (3572)
ohio (2656)	netneutrality (2825)
betteroffnow (2429)	protectourcare (2566)
va10 (2090)	forthepeople (2363)
venezuela (1935)	getcovered (1879)
softa (1783)	aca (1650)
schumersshutdown (1760)	dreamers (1357)
ms01 (1410)	protectdreamers (1352)

S.2.4 Table. *This table shows the number and percentage of MPs who mentioned another politician in the EFTA in 2018.*

Country	MPs that made at least one external mention (N)	MPs that made at least one external mention (%)
Austria	24	37
Belgium	41	32
Denmark	64	40
Finland	55	32
France	271	53
Germany	195	38
Greece	28	27
Iceland	12	30
Ireland	102	68
Italy	60	13
Latvia	14	34
Malta	31	53
Netherlands	78	53
Norway	30	26
Poland	95	28
Spain	126	58
Sweden	57	35
Switzerland	38	31
United Kingdom	318	54

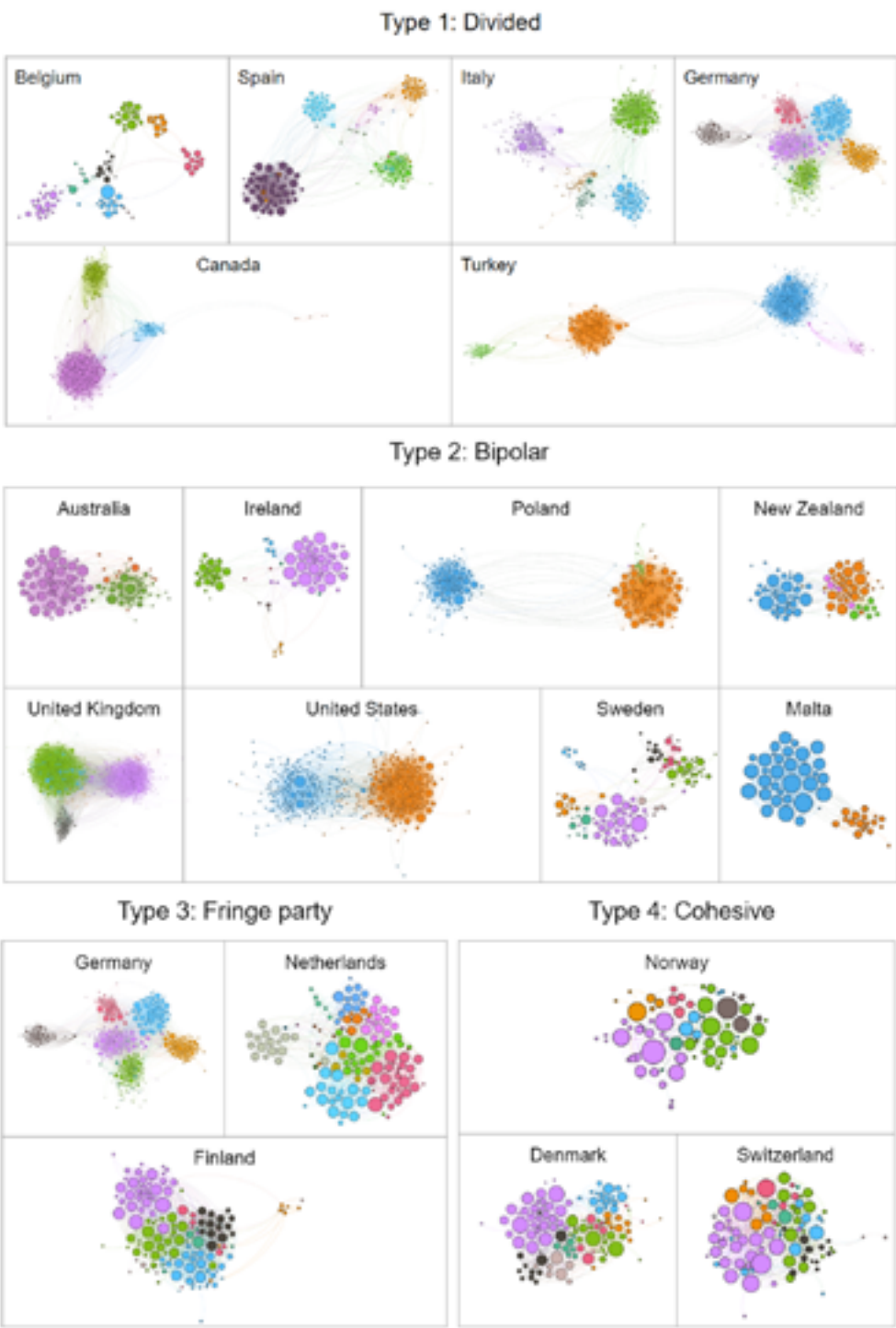


Fig S.2.5: Retweet networks per country, 2018. *Shows the individual country retweet networks for 2018. The nodes are colored by party and the network is visualized with the ForceAtlas2 algorithm, with each node sized by in-degree (1-10) and scaling set to 1.*

S.2.6 Codebook

This codebook contains all of the sources of data used in the database, a summary of each of the tables as well as example queries on how to access certain things in the database.

Data sources

- # Government websites - see codebook index for all websites scraped
- # Twitter
- # Electoral system design database (<https://www.idea.int/data-tools>)
- # Manifesto Project Database (<https://manifesto-project.wzb.eu/>)
- # Parlgov database (<http://www.parlgov.org/>)
- # Chapel Hill Expert Survey (<https://www.chesdata.eu/>)

- # Manual addition of electoral periods and legislative period data

Tables

Summary of all tables

Table name	Description
members	All of the member names, taken from official government websites
legislative_periods	The legislative period that the country is in and its electoral details
countries	The countries of which parliamentarians on twitter which are included in the study
parties	The political parties
political_groups	Political groups - only applicable to some cases. Some nations emphasise political groups (coalitions) over party membership
parties_political_groups	This table is the mediating table for the many-to-many relationship between parties and political groups. Parties can change political groups between legislative periods.
parlgov_parties	The database from parlgov.org
mp_data	The database from the manifesto project
ches2014	Data from the Chapel Hill Expert Survey 2014

Table name	Description
ches2017	Data from the Chapel Hill Expert Survey 2017
tcat_tweets	Tweet_ids and uids
tcat_mentions	All the tweet_ids from retweets and mentions
tcat_hashtags	All the hashtags & their tweet_ids

Individual tables

Members

The members table can have the same person with two different member ids, but one twitter uid.
This is because some members change parties per legislative period

column name	format	description
member_id	int	Primary key identifying each member per legislative period
name	varchar	The name of the politician
party_id	int	Foreign key linking to the parties table
pol_group_id	int	Foreign key linking to the political_groups table
party_pol_group_id	int	Foreign key linking to the parties_political_groups table
chamber	varchar	Whether or not the member is in parliament or the senate
uid	int	The twitter user id
party	varchar	The party name: for readability
name_link	varchar	A link to the individual profile of the member on the government website
function	varchar	The function of the member
region	varchar	Which region the member serves
constituency	varchar	Which constituency the member serves
scraper_url	varchar	The url from the government website that the data was scraped from.
date_of_inactivity	varchar	If a member becomes inactive before the official term ends

Members		
The members table can have the same person with two different member ids, but one twitter uid. # This is because some members change parties per legislative period		
column name	format	description
country	varchar	Name of the country, for usability
country_id	int	The foreign key linking to the countries table
legislative_period_id	int	The foreign key linking to the legislative_periods table
mp_party_id	int	Links members to mp_data, ches2014, ches2017 and parlgov_parties
legislative_periods		
Column name	format	description
legislative_period_id	int	Primary key identifying each unique legislative period per country.
country_id	int	Foreign key linking to country table
country	varchar	For usability
official_legislative_period	int	(If available) The official legislative period of the country. <i>Note: Some countries don't count this</i>
assigned_legislative_period	int	The legislative period of the country that we have since collection (i.e if it is the first or second [maybe 3rd but that'd be rare] legislative period of the country that we have in the database).
legislative_size	int	The number of people in parliament. From the electoral system design database.
legislative_voting_size	int	The number of people in parliament that vote on legislature. Usually this is the same as the legislative_size.
legislative_start_year	varchar	Starting year of the legislative period
legislative_end_year	varchar	End year of the legislative period
start_election_date	date	The election date of the legislative period
upcoming_election_date	date	The upcoming election date to start the new legislative period
legislative_start_date	date	The date that the new parliament is formed (sometimes differs vastly from the election_date)

legislative_periods		
Column name	format	description
legislative_end_date	date	The date that the current parliament is no longer seated (overlaps with the date that the new legislative period starts)
chamber	varchar	Whether the entry refers to the parliament or senate
electoral_system_family	varchar	From the electoral system design database.
electoral_system_for_national_legislature	varchar	From the electoral system design database.
tiers	int	The number of legislative voting tiers. From the electoral system design database.
electoral_system_for_president	varchar	From the electoral system design database.
is_current	bool	Whether the legislative period is currently active.

countries		
Column name	format	description
id	int	Primary key
country	varchar	Name of the country
country_abbr	varchar	2 character abbreviation for the country
lower_chamber_name	varchar	Name of the lower chamber (if applicable)
upper_chamber_name	varchar	Name of the upper chamber (if applicable)

parties		
Column name	format	description
party_id	int	Primary key
party	varchar	Party name
party_abbr	varchar	Abbreviation for the party (e.g. PVV)
country	varchar	For usability
country_id	int	Foreign key linking to country table
mp_party_id	int	Foreign key linking to the manifesto project table
is_nationalist	bool	(From Wiki) Indicates nationalist parties

political_groups		
Column name	format	description
pol_group_id	int	Primary key
political_group	varchar	Political group name
legislative_period_id	int	Foreign key to legislative_periods table
country	varchar	For usability
country_id	int	Foreign key to countries table

Parties_political_groups		
The parties_political_groups table is the mediating table for the many-to-many relationship between parties and political groups.		
# One party can belong to different political groups depending on the legislative period and country (e.g. lots of countries have a ‘green’ party)		
# Some parties switch political groups with a new legislative period		
Column name	format	description
party_pol_group_id	int	Primary key
party_id	int	Foreign key linking to the party table
party	varchar	For readability
country	varchar	Easier querying
country_id	int	Foreign key to countries table
political_group	varchar	For readability
Political_group_id	int	Foreign key linking to political_groups table

Parlgov_parties		
The parlgov_parties table is the database downloaded from the parliaments and governments database		
Column name	format	description
cmp	int	Foreign key linking to mp_data table (links to the mp_party_id), can also be linked to mp_party_id in parties table
For other columns see: http://www.parlgov.org/#documentation		

Mp_data		
The mp_data table is the database downloaded from the manifesto project		
Column name	format	description
mp_party_id	int	Foreign key linking to parties table
For other columns, see: https://manifesto-project.wzb.eu/tutorials/main-dataset		

ches2014		
The ches2014 table is the database downloaded from the chapel hill expert survey		
Column name	format	description
mp_party_id	int	Foreign key linking to parties table
For other columns, see: https://www.chesdata.eu/2014-chapel-hill-expert-survey		

ches2017		
The ches2017 table is the database downloaded from the chapel hill expert survey		
Column name	format	
mp_party_id	int	Foreign key linking to parties table
For other columns, see: https://www.chesdata.eu/1999-2014-chapel-hill-expert-survey-ches-trend-file-1		

tcat_tweets		
Column name	format	description
id	int	Tweet id, primary key
created_at	date	Date the tweet was created
from_user_name	varchar	Screenname of the user
from_user_id	int	Twitter id of the user Foreign key: links to members table
to_user_id	int	The id of the person being mentioned (in the case of @mention)
to_user_name	varchar	The screenname contained in the @mention
in_reply_to_status_id	int	Original tweet id if the tweet is a reply to another

tcat_mentions		
Column name	format	description
id	int	Primary key
from_user_name	varchar	The person who is doing the retweeting
to_user	varchar	Source account of the original retweet
tweet_id	int	Tweet id from twitter
created_at	date	Date the tweet was created
from_user_id	int	Twitter id of the user Foreign key: links to members table
to_user_id	int	User id of the original retweet Foreign key: links to members table
is_retweet	bool	1 for retweet, 0 for mention
from_leg_period	int	Legislative period of the retweeter/mentioner Foreign key: links to legislative_periods table (legislative_period_id)
to_leg_period	int	Legislative period of the retweeted/mentioned Foreign key: links to legislative_periods table (legislative_period_id)

tcat_hashtags		
Column name	format	description
id	int	Primary key
tweet_id	int	Id of the tweet that contains the hashtag
created_at	date	Date the tweet was created
from_user_name	varchar	The person who is tweeting
from_user_id	int	Twitter id of the user Foreign key: links to members table
text	varchar	The hashtag only

S.2.7 Codebook Index

Government websites

Country	URL
Austria	https://www.parlament.gv.at/WWER/SUCHE/index.shtml?jsMode=&xdocumentUri=&NAME_TYP_ID=1201&NAME=&R_ZEIT=ALLE&listId=1&LISTE=Suchen&FBEZ=FW_001
France	http://www2.assemblee-nationale.fr/deputes/liste/tableau
Germany	https://www.bundestag.de/en/members
Belgium	http://www.dekamer.be/kvvcr/showpage.cfm?section=/depute&language=nl&cfm=/site/wwwcfm/depute/cvlist54.cfm
Denmark	http://www.thedanishparliament.dk/searchResults.aspx?pageSize=100&pageNr=1#search
Finland	https://www.eduskunta.fi/EN/kansanedustajat/nykyiset_kansanedustajat/Pages/default.aspx
Greece	http://www.hellenicparliament.gr/en/Vouleftes/Stoicheia-Epikoinonias-Voulefton/
Italy (17th)	http://www.camera.it/leg17/28
Latvia (12th)	http://titania.saeima.lv/personal/deputati/saeima12_depweb_public.nsf/deputies?OpenView&lang=EN&count=1000
Luxembourg	http://www.chd.lu/wps/portal/public/Accueil/OrganisationEtFonctionnement/Organisation/Deputes/DeputesEnFonction
Malta	http://www.parlament.mt/membersofparliament-13thlegmain
Poland	http://www.sejm.gov.pl/Sejm8.nsf/poslowie.xsp?type=A
Spain	http://www.congreso.es/portal/page/portal/Congreso/Congreso/Deputados?piref73_1333056_73_1333049_1333049.next_page=/wc/menuAbecedariolnicio&tipoBusqueda=completo&idLegislatura=12
Slovenia	https://www.dz-rs.si/wps/portal/en/Home/ODrzavnemZboru/KdoJeKdo/PoslankelnPoslanci/PoPoslanskihSkupinah!/ut/p/z1/04_Si9CPvkssv0xPLMnMz0vMAfIjo8zivT39gv2dDB0N_CON3Qw8Q43dTYx9QwwMvlz0w_EqMDbUj8lj7WRMQL-HEWX6Q4nUb4AD0BpQZj9QORRF4Ueh_70g-vF4ryA3FAIcFRUB3jOJVg!!/dz/d5/L2dBISEvZ0FBIS9nQSEh/
Iceland	https://www.althingi.is/alttext/cv/en/
Norway	https://www.stortinget.no/no/Stottemeny/kontakt/Partier-og-representanter/Representantenes-e-postadresser/
Switzerland	https://www.parlament.ch/en/ratsmitglieder
Sweden	http://www.riksdagen.se/en/members-and-parties/
Ireland	http://www.oireachtas.ie/members-hist/default.asp?housetype=0&HouseNum=32&disp=mem

Country	URL
UK	http://www.parliament.uk/mps-lords-and-offices/mps/
Netherlands	https://www.tweedekamer.nl/kamerleden_en_commissies/alle_kamerleden
Italy (18th)	http://www.camera.it/leg18/28?lettera=A
New Zealand	https://www.parliament.nz/en/mps-and-electorates/members-of-parliament/
Turkey	https://www.tbmm.gov.tr/develop/owa/milletvekillerimiz_sd.liste
EU Parliament	http://www.europarl.europa.eu/meps/en/full-list.html
US House	http://www.house.gov/representatives/#byName
US Senate	https://www.senate.gov/senators/contact/
Australia	https://www.aph.gov.au/Senators_and_Members/Parliamentarian_Search/Results?expand=1&q=&mem=1&par=-1&gen=0&ps=100&st=1
Canada	https://www.ourcommons.ca/Parliamentarians/en/members
Latvia (13th)	https://titania.saeima.lv/personal/deputati/saeima13_depweb_public.nsf/deputies?OpenView&lang=EN&count=1000

Example Queries

Count number of tweets per politician

```
select          from_user_id, count(*),
                country
from            tcat_tweets tt
where          tt.created_at between '2018-01-01' and '2018-12-31'
group by       uid, country;
```

Getting a RT network for Australia

#get node data

```
select
    m.uid
    m.name as label,
    p.party,
    m.country,
    concat(m.country, ' ', lp.chamber, ' ', lp.legislative_period_id) country_chamber_ period,
    concat(m.country, ' ', p.party) country_party,
    lp.legislative_period_id,
    m.party_pol_group_id,
    m.constituency,
    mp.corpusversion,
    mp.mp_country,
    mp.rile,
    mp.is_latest,
    mp.is_current,
    mp.oecdmember,
    mp.eumember,
    mp.mp_party_id,
    mp.partyname,
    mp.partyabbrev,
    mp.parfam,
    lp.electoral_system_family,
    lp.chamber,
    p.is_nationalist
from
    members m,
    parties p,
    legislative_periods lp,
    mp_data mp
where
    m.party_id = p.party_id
    and mp.mp_party_id = p.mp_party_id
    and m.country_id = p.country_id
    and lp.legislative_period_id = m.legislative_period_id
```

```
and mp.is_current = TRUE
and m.uid is not null
and m.country = 'Australia';
```

#get edge data

```
select
    tm.from_user_id,
    tm.to_user_id,
    tm.from_country_id,
    tm.to_country_id,
    tm.from_leg_period,
    tm.to_leg_period,
    count(1) cnt
from
    tcat_mentions tm
INNER JOIN legislative_periods lp on
    lp.legislative_period_id = tm.from_leg_period
INNER JOIN legislative_periods lp2 on
    lp2.legislative_period_id = tm.to_leg_period
where
    tm.is_retweet = true
    and extract(year
from
    tm.created_at) = 2018
    and tm.from_chamber = 'Parliament'
    and tm.to_chamber = 'Parliament'
    and country = 'Australia'
group by
    from_user_id,
    to_user_id;
```

Chapter 4

Table S.4.1. The N and % of MEPs and NPs on Twitter, as well as the interactions between them.

Country	MEPs (N)	MEPs on Twitter (N)	MEPs on Twitter (%)	NPs on Twitter (N)	NPs tweeted by MEPs (N)	NPs tweeted by MEPs (%)
Belgium	21	21	100%	122	59	48%
Denmark	13	12	92%	161	69	43%
Finland	13	12	92%	174	69	40%
France	74	70	95%	515	158	31%
Germany	96	75	78%	511	200	39%
Greece	21	17	81%	179	61	34%
Ireland	11	10	91%	150	117	78%
Italy	73	71	97%	449	243	54%
Malta	6	6	100%	58	44	76%
Netherlands	25	24	96%	147	99	67%
Poland	51	34	67%	334	66	20%
Slovenia	9	8	89%	54	24	44%
Spain	54	44	81%	219	110	50%
Sweden	20	18	90%	237	45	19%
United Kingdom	73	67	92%	590	257	44%
TOTAL	560	483		3900	1621	

Table S.4.2: Binomial one-sample test results for indicators of Allegiance and Debate per country (A) and political group (b)

(A) Country	Indicator 1: Allegiance					RTs to Political Group (%)	Indicator 2: Debate					
	N	test statistic	SE	standardized test statistic	sig		N	test statistic	SE	standardized test statistic	sig	Interactions with MEP (%)
Belgium	937	23	15.035	-29.075	.000	98	4715	736	34.3	-47.21	.000	84
Denmark	344	224	9.274	5.553	.000	35	1938	844	22.01	-5.66	.000	56
Finland	380	142	9.747	-4.873	.000	63	3142	839	28.03	-26.1	.000	73
France	18004	961	67.089	-119.847	.000	95	43825	8685	104.67	-126.37	.000	80
Germany	4492	1490	33.511	-22.545	.000	67	22166	5025	74.44	-81.37	.000	77
Greece	970	451	15.572	-2.151	.031	54	4660	1151	34.13	-34.53	.000	75
Ireland	1668	499	20.421	-16.318	.000	70	9706	2575	49.26	-46.24	.000	73
Italy	3171	1324	28.156	-9.27	.000	58	14733	3659	60.69	-61.08	.000	75
Malta	919	632	15.158	11.348	.000	31	3071	1265	27.71	-9.77	.000	59
Netherlands	2785	948	26.387	-16.287	.000	66	9992	2089	49.98	-58.15	.000	79
Poland	24291	10972	77.928	-15.052	.000	55	58084	27796	120.50	-10.34	.000	52
Slovenia	821	408	14.327	-0.14	.889	50	3641	930	3.17	-29.49	.000	74
Spain	9599	1746	48.987	-62.322	.000	82	30412	5901	87.19	-106.71	.000	81
Sweden	516	50	11.358	-18.269	.000	90	2802	198	26.47	-45.43	.000	93
United Kingdom	22893	6520	75.652	-65.114	.000	72	80071	30615	141	-66.6	.000	62

(B) Political group	Indicator 1: Allegiance						Indicator 2: Debate					
	N	test statistic	SE	standardized test statistic	sig	RTs to Political Group (%)	N	test statistic	SE	standardized test statistic	sig	Interactions with MEP (%)
GUE/NGL	4553	704	33.738	-46.594	.000	85	23306	5154	76.33	-85.135	.000	78
EPP	23404	13421	76.492	22.466	.000	43	75577	34325	137.46	-25.192	.000	55
S&D	27485	5397	82.893	-100.672	.000	80	68454	15191	130.82	-145.511	.000	78
ALDE	4977	499	35.274	-56.387	.000	90	16775	3514	64.76	-75.248	.000	79
EFA	7594	2155	43.572	-37.673	.000	72	36204	7835	95.14	-107.913	.000	78
ECR	5834	3612	38.19	18.185	.000	38	20972	10381	72.41	-1.443	.149	51
EFDD	6333	206	39.79	-74.39	.000	97	25705	9728	80.16	-38.97	.000	62
ENF	3430	357	29.283	-46.358	.000	90	15450	5594	62.15	-34.281	.000	64
Non-attached	8180	39	45.222	-89.57	.000	100	10515	586	51.28	-91.104	.000	94

Chapter 5

S.5.1 Data Availability Statement

The dictionary generated for this study, as well as the tweet ids and their labels based on the LIWC dictionary can be found in the figshare repository with the doi: <https://doi.org/10.6084/m9.figshare.14465445>

S.5.2 Supplementary Data

Moral Foundations Dictionary [Brexit Specific] – can be found at the link <https://figshare.com/s/a4a83fde5ebfe00c9f58> with the doi: 10.6084/m9.figshare.14465445

S.5.2.1 Coder guidelines: Brexit specific

Coders were instructed to follow the annotator instructions from Hoover et al. (2020), as well as the following Brexit-specific guidelines:

- # **Care/harm** - Often to do with healthcare and the NHS, but can also be to do with the welfare state
- # **Fairness/cheating** – Which deal is more balanced, is one side favored over the other
- # **Loyalty/betrayal** – Can be to do with loyalty to the UK / British people OR loyalty to the EU and its traditions
- # **Authority/subversion** – This also has to do with questioning/praising the authority of Theresa May (who was in power at the time of these tweets), or proposing a new, more competent authority (e.g. Boris Johnson)
- # **Sanctity/degradation** – The “threat” of Islam to the Christian values of the UK, as well as anything to do with keeping Britain “pure”, including keeping out immigrants

S. 5.3 Supplementary Tables

Table S.5.3.1: Tweet examples with LIWC classification and the agreement with manual classification

Tweet	Foundation scores	Party	Manual classification
#Brexit was supposed to be about UK Parliamentary sovereignty & taking back control. Boris Johnson makes clear what has always been the case, for Tory hard Brexiteers its about *them* taking control. We can't allow that to happen #StopTheCoup https://t.co/T2R9diRo66	Authority (13.96)	Labour	Agree, can also be partially loyalty
@ColinBaldy Ordinary MPs like me don't get the figures. Some evidence of some leaving over #Brexit in my own area, but that's the very worst thing to do at this vital moment & when I speak to them I can usually persuade them to stay.	None	Labour	Disagree - this could be classified as containing loyalty
Tory #contempt for @HouseofCommons knows no bounds - regularly ignore opposition motions, and now PM's short A50 extension request effectively contradicts *her own motion* agreed last Thurs, saying if no deal had been agreed by today then longer delay wd be needed #BrexitShambles https://t.co/Fkke7S00c2	Authority (4.34)	Scottish National Party	Agree
.@accessjames #CorbynsLabour conned ppl on scrapping tuition fee debt & they're conning ppl again. Let's be clear #Labour support #Brexit	Care (4.76) Loyalty (4.76)	Conservative	Agree
Scottish Tories have long accused SNP politicians of using #brexit to talk up Scottish independence, but the number of times Tory Ministers have talked about the linkage between the two in the #BrexitDebate it is almost becoming a self fulfilling prophecy	Loyalty (2.44) Authority (4.88)	Scottish National Party	Agree
The threat of a No Deal Brexit looms ever larger and it is clear that, whether we get a Brexit deal or No Deal, Brexit will damage to our communities and economy. If you @JDjanogly agree that harm will be caused by #Brexit , back a #finalsayonthedeal https://t.co/Um5abZmoE1	Care (6.0) Fairness (2.0)	Liberal Democrat	Agree
Raab can't answer Peter Bone's #pmq on whether we'll leave the EU on October 30th with a simple "yes". Telling. #brexitshambles #FinalSay #PeoplesVote #PMQs	Loyalty (4.17) Authority (4.17)	Labour	Agree
#awks #brexithaos	None	Labour Co-op	Agree

Tweet	Foundation scores	Party	Manual classification
So tomorrow Britain will have a new PM - but with 100 days to go until #Brexit it's the red lines that need to change, not the faces - the Withdrawal Agreement will not be reopened!! https://t.co/Kwq8be09b5	Authority (2.63)	Sinn Féin	Agree
@i_mac123 Eliminates the need for transition and backstop and allows for a cleaner Brexit.	Sanctity (6.67)	Conservative	Agree, also related to loyalty
Lots of people about in Thame. Good 'Conversations in the street' about the Food Festival and what I made of Brexit	Sanctity (4.76)	Conservative	Disagree – No moral argument

Table S.5.3.2: Spearman's Rho correlations between moral foundations

		care	fairness	loyalty	authority	sanctity
care	Correlation coefficient	1	.029*	.015*	.017*	.046*
	Sig. (2-tailed)	.	.000	.010	.004	.000
fairness	Correlation coefficient	.029*	1	.010	.042*	.019*
	Sig. (2-tailed)	.000	.	.070	.000	.001
loyalty	Correlation coefficient	.015*	.010	1	.007	-.006
	Sig. (2-tailed)	.010	.070	.	.234	.267
authority	Correlation coefficient	.017*	.042*	.007	1	.008
	Sig. (2-tailed)	.004	.000	.234	.	.154
sanctity	Correlation coefficient	.046*	.019*	-.006	.008	1
	Sig. (2-tailed)	.000	.001	.267	.154	.

Table S.5.3.3: Log likelihood and significance values per foundation, for the top 10 most frequent words unique to each foundation

Foundation	Word freq in foundation	Word freq in rest of tweets	Log-likelihood	χ^2 Sig.		
Care						
stopbrexit	460	1126	72.60	0.000	***	-
help	411	408	40.12	0.000	***	+
jobs	367	458	9.37	0.002	**	+
economy	335	459	2.87	0.090		+
fight	330	326	32.85	0.000	***	+
damage	311	307	31.05	0.000	***	+
nhs	295	429	0.68	0.409		+
stop	275	809	92.87	0.000	***	-
libdems	262	576	23.05	0.000	***	-
hard	254	781	100.05	0.000	***	-
Fairness						
law	284	0	1046.75	0.000	***	+
communities	175	0	640.99	0.000	***	+
offer	148	97	255.92	0.000	***	+
leave	141	1164	23.93	0.000	***	-
laws	130	0	473.67	0.000	***	+
blame	119	5	403.81	0.000	***	+
community	115	0	417.95	0.000	***	+
fair	103	0	373.39	0.000	***	+
honest	102	8	325.95	0.000	***	+
trade	92	921	36.28	0.000	***	-
Loyalty						

Foundation	Word freq in foundation	Word freq in rest of tweets	Log-likelihood	χ^2 Sig.		
union	896	0	571.54	0.000	***	+
customs	584	113	52.26	0.000	***	+
getbrexitdone	559	754	502.11	0.000	***	-
local	494	20	204.39	0.000	***	+
referendum	479	485	216.67	0.000	***	-
together	460	4	264.36	0.000	***	+
future	440	506	274.46	0.000	***	-
great	426	715	598.97	0.000	***	-
libdems	410	433	206.98	0.000	***	-
good	409	841	837.47	0.000	***	-
Authority						
finalsay	957	0	278.93	0.000	***	+
tories	917	0	266.86	0.000	***	+
minister	791	211	35.72	0.000	***	-
theresa	1429	0	421.52	0.000	***	+
prime	776	7	183.20	0.000	***	+
boris	618	0	176.81	0.000	***	+
public	550	561	825.61	0.000	***	-
right	546	570	853.14	0.000	***	-
voted	533	773	1425.20	0.000	***	-
stop	508	580	923.85	0.000	***	-
Sanctity						
food	257	0	1106.731656	0.000	***	+
security	201	0	863.2640401	0.000	***	+
immigration	174	0	745.9291255	0.000	***	+
trade	99	894	1.882170886	0.170		-
clean	83	0	350.971415	0.000	***	+

Foundation	Word freq in foundation	Word freq in rest of tweets	Log-likelihood	χ^2 Sig.	
leave	82	1125	28.32229276	0.000	*** -
bill	70	2	287.1503469	0.000	*** +
future	67	872	18.60686036	0.000	*** -
being	65	758	10.62976194	0.001	** -
money	64	238	24.05826085	0.000	*** +

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AUTHOR CONTRIBUTIONS

For the articles written by multiple authors, the contributions of the authors are outlined below.

Chapter 2

Reference: van Vliet, L., Törnberg, P., & Uitermark, J. (2020). The Twitter parliamentarian database: Analyzing Twitter politics across 26 countries. *PloS one*, 15(9), e0237073.

Contributions: All authors contributed substantially to the article. LV contributed primarily to the conceptualization, data curation, analysis, software, methodology, project administration, validation, visualization, writing and reviewing of the article. PT and JU contributed to the conceptualisation, methodology, analysis, software (python code for analysis), supervision, validation, visualisation reviewing and editing.

Chapter 3

Reference: van Vliet, L., Törnberg, P., & Uitermark, J. (2021). Political Systems and Political Networks: The Structure of Parliamentarians’ Retweet Networks in 19 Countries. *International Journal of Communication*, 15(21).

Contributions: All authors contributed substantially to the article. LV contributed primarily to the conceptualization, data curation, analysis, methodology, project administration, validation, visualization, writing and reviewing of the article. PT and JU contributed to the conceptualisation, methodology, analysis, software, supervision, validation, reviewing and editing.

Chapter 4

Reference: van Vliet, L., Chueri, J., Törnberg, P., & Uitermark, J. (2023). Political groups over national parties: Measuring the Europeanization of the political arena through MEPs Twitter interactions. *Party Politics*, 13540688231158486.

Contributions: All authors contributed substantially to the article. LV contributed primarily to the conceptualization, data curation, analysis, methodology, project administration, validation, visualization, writing, editing and reviewing of the article. PT, JC and JU contributed to the conceptualisation, literature, methodology, analysis, supervision, writing, reviewing and editing.

EXTENDED SUMMARY

Online social networking platforms provide a deep and relatively untapped well of information about political life, where Twitter has emerged as a central point of research in many academic fields. The ease of which data is gathered, as well as the popularity of the platform situate it to answer many long-standing questions in political science and political sociology. Comparative research in political science and political sociology have long been interested in the major questions surrounding politician cooperation in different political systems, international communication between politicians such as Members of the European Parliament and their national parliamentarians, and the sentiment of politicians surrounding [polarizing] issues. However, there have been data limitations. For instance, politician cooperation is most commonly studied using roll call votes and ideological surveys and analysis of party manifestos. International communication between politicians is most often studied within the scope of news media. Hence, social media has changed the research landscape and has come to play a prominent role in the social and behavioural sciences.

Consequently, a rich and extensive toolkit is needed in which to study collective social behaviour in large datasets. Computational Social Science (CSS) can provide such a toolkit, enabling insights into relationships, sentiment and salient topics within a social network. Hence, CSS is able to contribute a lot to political science and political sociology, due to providing measures and analysis techniques that can be used to quantify online social behaviours. Relationships and sentiment are some of the most important and obvious things that can be studied with CSS and social network data. For instance, legislative debates between parliamentarians can be studied through looking at the Twitter network of the legislative bodies of governments across countries, where cooperation on a topic may be ascertained through endorsements between parties. It is also possible to use these endorsements to study allegiances between parliamentarians in different countries. Salient issues can be uncovered through examining the frequency of certain terms by politicians, as well as using classification tools to determine sentiment surrounding these terms. Thus, CSS is able to use social media data to study a broad array of social life, and is

able to help fill several holes in the literature when looking at parliamentary relationships, salient issues and the sentiment towards these issues.

In order to address these enduring questions in political science and political sociology, a large database of politician Twitter accounts is necessary, so that comparisons can be made across countries and political systems, as well as provide the ability to examine communication between politicians in different countries, especially those from members of a supranational parliament: The European Parliament. Rigorous sampling and data collection methods are used so that comparison between countries is possible, as well as the ability to link it to other existing datasets. The database can therefore aid in answering questions regarding parliamentarian endorsement within and between parties, as well as communication between parliamentarians in different countries. Moreover, through gathering the content of the Tweets it is possible to ascertain what the salient topics are in certain countries as well as the way in which different parties talk about them. Additionally, Twitter research examines a new context where politicians speak to one another as well as their constituents. Thus, not only does the new data address older questions, but it also contributes to understanding of how politicians conduct themselves in a new and important public setting. Such a database can also be used to examine a range of questions beyond those that are addressed in the thesis.

This dissertation - Digital soapboxes: Analyzing Twitter politics across 26 countries - highlights the similarities and differences in the behaviour of parliamentarians on the social networking website Twitter across 26 different countries, as well as the supra-national European Parliament. Motivated by a lack of comparable data, a database was built, which now contains over **33,846,064 million** tweets, gathering the public interactions of **9,481 parliamentarians** (during the time they were incumbent) in **26 countries**, as well as the European Parliament. The database was kept up to date throughout the 4 years of this thesis, and thus spanned **53 legislative periods**.

The first paper introduces the **Twitter Parliamentarian Database**, which forms the basis of all other papers in this thesis. The paper outlines the need for a more systematic and structured way of being able to study political elites across countries - namely by using a rigid and rigorous sampling method in order to be able to compare data. The motivation

for this paper is to justify the necessity of such a database and its potential contributions to political science and political sociology. It goes into further detail regarding how the database was built, as well as outlines some examples of analysis that is possible such a dataset. These examples of analysis rely on computational methods such as network analysis and natural language processing in order to provide insight into the ways which parliamentarians behave on Twitter.

Along the vein of network analysis, the second and third papers go deeper into the parliamentary Twitter networks. The former uncovers a typology of network structures of parliamentary endorsements, which seem to have some link to the electoral systems of the country. Proportional representation systems tend to have more cohesive networks, with some important exceptions, whereas countries using plurality/majority systems tend to have more bipolar endorsement networks. This article attempts to use network analysis methods to answer a long standing question- do plurality systems foster more cooperation than majoritarian? - a question that is traditionally limited to being examined through looking at parliamentary roll-call votes. This article adds refinement to the idea that proportional systems foster cooperation, as well as shows that public online endorsements via Twitter is another way of examining the links between the electoral system and intra-party relationships.

The third article examines the communication networks of public directed messages (@mentions) between members of the European Parliament and their national parliamentarians. The motivation for this article was to use the database not only in a comparative way (as done in the 2nd article), but in a way that examines communication *across* parliaments in multiple countries - something which has not been previously studied to this extent in the literature (van Vliet et al., 2021). A general claim is that members of the European Parliament (MEPs) would be more aligned to national parliamentarians from their national party rather than those in their parliamentary group (e.g. Hix, 2002; Mühlböck, 2012). However, the data from Twitter shows that MEPs actually largely mention other MEPs over national parliamentarians. When they do mention national parliamentarians, they do generally tend to be national members of their own party, yet this varies greatly across countries and political groups. Hence, the paper adds nuance to

the assumption that MEPs are more aligned to their national parties.

The final paper delves into the content of the messages (tweets) broadcasted by parliamentarians on Twitter. This is somewhat different to current studies about the moral debates held by the general public (e.g. Koch, 2017), as well as the moral arguments by political elites leading up to the Brexit referendum vote (Smith, 2021). Instead, it looks at the period of time following the vote for Britain to leave the European Union (the Brexit), looking at the language used by parliamentarians for negotiating the terms of the Brexit agreement. More specifically, it looks at the moral underpinnings of these arguments made by the different parties, testing the assumption from Moral Foundations Theory which claims that left-leaning parties (e.g. Labour) would appeal more to arguments centered on 'caring for others', whereas right-leaning parties (e.g. the Conservatives) would have a broader spectrum of moral arguments (Graham et al., 2009). The article finds that both Labour and Conservatives focus primarily on arguments appealing to authority figures. However, Labour did appeal to values of care significantly more than the conservatives. This article fills the gap in the literature regarding the moral foundations of the agreement negotiations, as most choose to focus on the campaigning times leading up to the referendum vote. Moreover, it adds further information to existing assumptions about the moral foundations that are thought to be used by left and right leaning parties. Overall, the thesis uses methods from CSS to contribute to the body of knowledge about the way parliamentarians use Twitter to communicate amongst one another, as well as towards their constituents, through the construction and public provision of the Twitter Parliamentary Database.

SUMMARY

In the last decade, the micro-blogging social media platform Twitter, has become a central point of research in many academic fields. This dissertation - *Digital Soapboxes: Analyzing Twitter politics across 26 countries* - highlights the similarities and differences in the behaviour of parliamentarians on Twitter across different countries, as well as the supra-national European Parliament. Motivated by a lack of comparable data, the Twitter Parliamentarian database was built, which gathered the public interactions of incumbent parliamentarians in 26 countries, as well as the supra-national European Parliament.

The dissertation looks at how Twitter data can be used as part of a comparative, computational approach to studying political communication. It used tools from (visual) network analysis and text mining to better understand the Twitter behaviour of parliamentarians. From the networks, it was found that there is a relationship between the network structure and the electoral system. It was also found that Members of European Parliament interact with their fellow parliamentarians far more than their national parliamentarians. Lastly, a case study of the Brexit in the United Kingdom showed that the underlying moral arguments justifying the referendum differed per party.

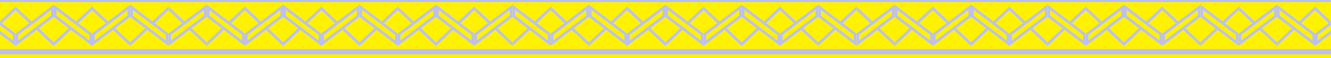
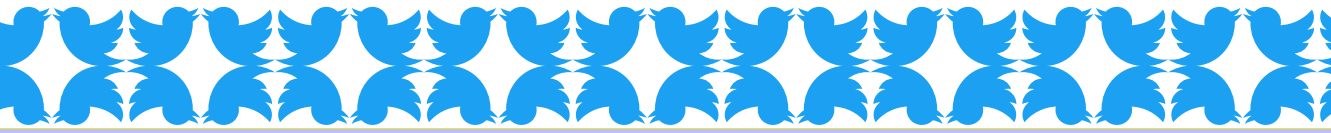
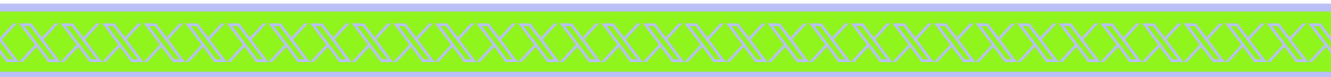
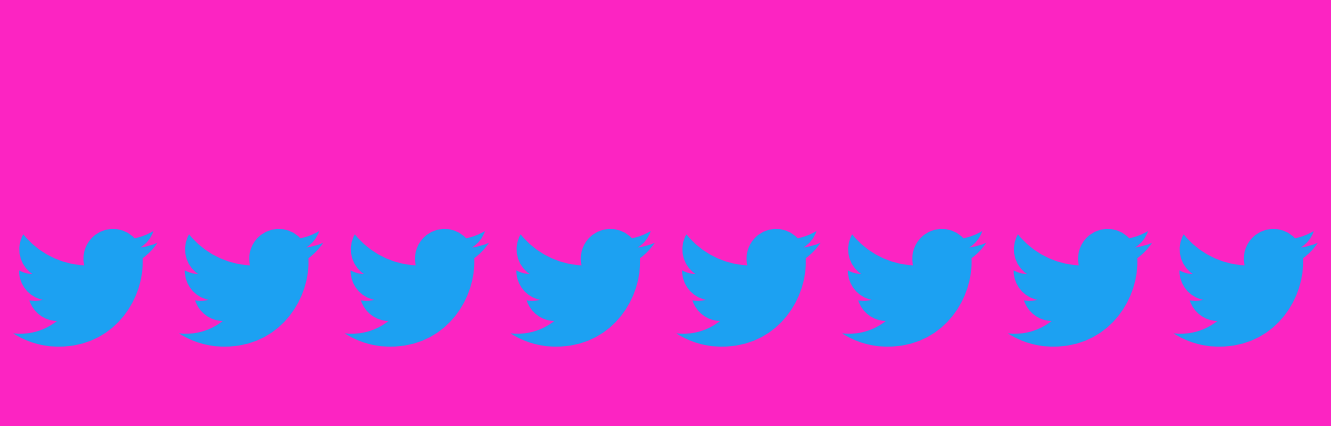
Overall, the dissertation used computational methods to contribute to the body of knowledge about the way parliamentarians use Twitter to communicate amongst one another, as well as towards their constituents, through the construction and provision of the Twitter Parliamentarian Database.

NEDERLANDSE SAMENVATTING

In de afgelopen tien jaar is het microblogging-socialmediaplatform Twitter op veel wetenschapsgebieden een centraal onderzoekspunt geworden. Dit proefschrift - *Digital Soapboxes: Analyzing Twitter politics across 26 countries* - belicht de overeenkomsten en verschillen in het gedrag van parlementariërs op Twitter in verschillende landen, evenals in het supranationale Europese Parlement. Gemotiveerd door een gebrek aan vergelijkbare gegevens werd de Twitter-database voor parlementariërs gebouwd, waarin de publieke interacties van zittende parlementariërs in 26 landen en het supranationale Europese Parlement werden verzameld.

Het proefschrift onderzoekt hoe Twitter-gegevens kunnen worden gebruikt als onderdeel van een vergelijkende, computationele benadering van het bestuderen van politieke communicatie. Het maakte gebruik van tools uit de (visuele) netwerkanalyse en text mining om het Twitter-gedrag van parlementariërs beter te begrijpen. Uit de netwerken kwam naar voren dat er een relatie bestaat tussen de netwerkstructuur en het kiesstelsel. Er werd ook vastgesteld dat leden van het Europees Parlement veel meer interactie hebben met hun collega-parlementariërs dan met hun nationale parlementariërs. Tenslotte bleek uit een casestudy van de Brexit in Groot-Brittannië dat de onderliggende morele argumenten die het referendum rechtvaardigden per partij verschilden.

Over het geheel genomen gebruikte het proefschrift computationele methoden om bij te dragen aan de kennis over de manier waarop parlementariërs Twitter gebruiken om met elkaar en met hun kiezers te communiceren, via de constructie en het openbaar aanbieden van de Twitter Parliamentarian Database.



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