

Determinants of Individual Position-taking on Social Media

by

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My parents supported me all the way, no matter how often I changed my major. They let me choose my own path. My father always joked he had to choose between a doctorate and me. Well, I hope this settles that.

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PUBLISHED AND SUBMITTED CONTENT

The following dissertation is submitted to the School of Social Sciences at the University of Mannheim in fulfillment of the requirements for receiving the degree of a “doctor rerum socialum” (Dr. rer. soc.). This cumulative dissertation consists of three individual research papers and one comprehensive framework paper.

- The first article „Finding the Bird’s Wings - Dimensions of factional conflict on Twitter“ (<https://journals.sagepub.com/doi/pdf/10.1177/1354068820957960>) was published in Party Politics (Impact Factor: 2.817)
- The second article „Intra-party Roots of Affective Polarization“ is submitted to the Journal of Politics.
- The third article “Twitter Made Me Do It! Twitter’s Tonal Platform Incentive And Its Effect On Online Campaigning” (doi.org/10.1080/1369118X.2020.1850841) was published in Information, Communication and Society (Impact Factor: 4.124)

The first two articles are single-authored. The third paper of this dissertation is coauthored work with Samuel (Universität Mannheim). Concept, idea and theory were devised to equal parts by the authors. The main responsibility of the Marius Sältzer was data collection and estimation of latent constructs (positions and negativity), while Samuel Müller was responsible for statistical hypothesis testing.

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The dissertation fulfills all formal requirements of a paper-based dissertation at the School of Social Sciences at the University of Mannheim. I assure that the digital version and the printed version are identical

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1. FRAMEWORK PAPER

The framework paper gives an extensive overview over the state of the literature to situate the papers presented in this dissertation. It contextualizes the theoretical arguments and puts them into a coherent framework.

Page numbers on the bottom refer to page numbers of this dissertation, page numbers in the top right corner refer to page numbers inside the respective document.

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1 Introduction

With the rise of social media, high hopes for the improvement of democracy itself defined much of the early political discourse. From better representation, generating direct connections between voters and their representatives, to novel forms of deliberation (Loader and Mercea, 2011). While the real effects on quality of representation are contested, social media has, without a doubt, transformed how politics is conducted, organized and perceived (Jungherr, Rivero and Gayo-Avello, 2020).

Moreover, the use of social media by politicians has opened up new means to observe elite behavior more directly than ever before (Barberá et al., 2019) and has developed into an accepted proxy for individual preferences (Russell, 2018; Ceron, 2016*b*; Barberá, 2015). The fact that a large share of public politics now takes place in a standardized, accessible environment opens new avenues for political science to test existing theories and developing new ones.

The potential of studying social media has increased tremendously (Watts, 2007), but also creates new challenges for social science. This dissertation tackles these challenges for data analysis and provides novel insights in elite behavior, while developing new concepts to make this incredible data source more accessible for a wide range of questions.

I make three contributions for using social media to explore political behavior more directly. First, it develops a theory and a methodology to measure political positions from social media text. Second, it provides a framework on how to conceptualize the effects of real world politics that determine positions taken on social media. Third, it illuminates the role the medium itself

might have on the message it is used to send.

1.1 Elites and Social Media

Most of the social media research of political phenomena has focused on the broader electorate (Jungherr, 2016; Barberá et al., 2015) and on the role of regular users and their interactions with politics. However, social media can be considered first and foremost as a tool of political communication for political elites (Jungherr, Rivero and Gayo-Avello, 2020; Barberá et al., 2019; Gilardi et al., 2021). The growing importance of social media for everyday life has made it into a mixture of communication device, marketing platform and source of political information. This is of course attractive for political actors interested in communicating their position and campaigning in this new arena.

Twitter in particular has become one of the main venues for political interaction, as in contrast to other social media, it is a direct broadcasting platform. Important messages to the public, like the candidacy of Hillary Clinton in 2016, are no longer just announced through press conferences, but via Twitter¹.

This relevance can be observed in sheer numbers: Figure 1 shows the shares of members of parliament that currently use a Twitter account. While some countries do not have a high adaption rate, most Western Democracies have at least 60 percent, to extreme cases like Canada or the United states, where almost all of them do. This broad use is complemented the easy availability of Twitter data for research purposes (van Vliet, Törnberg and Uitermark, 2020) compared to other platforms.

Interestingly, the analysis of social media communication by political elites is not very well theorized or applied to broader questions of political science. This dissertation fills this research gap by providing a theoretical and methodological framework to study political elite communication and applies them to empirical questions of factionalism, polarization and negativity.

¹<https://twitter.com/hillaryclinton/status/587336319321407488>

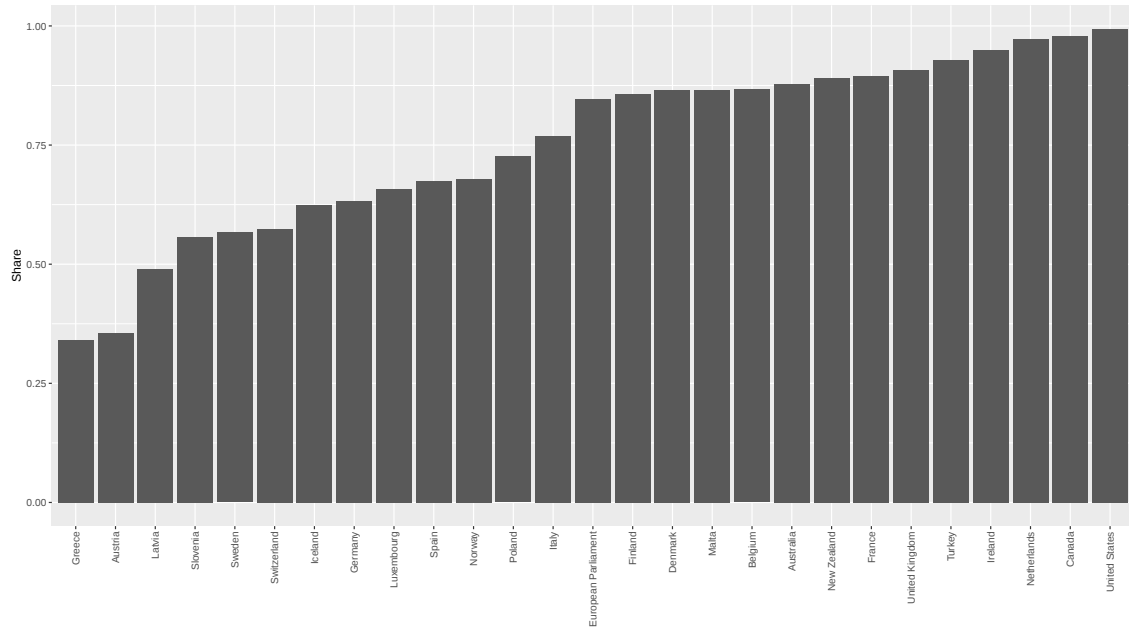


Figure 1: Share of Parliamentarians with Twitter accounts (Twitter Parliamentary Database)

1.2 Individual Elite Positions on Social Media

One specific feature that is of particular interest for the study of political elites is the fact that social media offers new ways to study *individual* behavior instead of mere party strategy. This offers a new avenue for the study of parliamentarians and candidates in more party-centered systems.

It allows political scientists to identify the conflict dimensions relevant to politics. This lets us infer the relationship between political preferences, positions, content and networks, and allows us to place the individual spatially based on social media data.

A key interest of this dissertation is the ideological mapping of individual elites using social media data. Focusing on elites' political communication, I use methods for inferring political positions based on language (Slapin and Proksch, 2008; Baturo, Dasandi and Mikhaylov, 2017). I adapt previous methods applied to traditional political texts to the new medium and develop new tools for improving and visualizing results. Based on Saliency Theory (Budge and Farlie, 1983), I develop a theoretical framework for the use of Twitter messages to track and analyze the behavior of positions on social media. I argue that salience is the main driver of position-taking and we can infer positions applying the same logic that we do for party manifestos.

1.3 To Whom are Politicians responding?

Social media allows politicians to more freely express their political preferences and avoid traditional gatekeepers like their party or the media (Gilardi et al., 2021). They may choose to represent voters, their parties or whatever other social structure presently attracts them.

But how do politicians use this new ability? What inferences can we draw from it? Who determines what positions politicians take on social media? Do politicians use it to represent? Do they signal their positions to their voters? How are these signals influenced by the medium itself? And what determines these positions? Who are they representing?

Beyond their individual preferences, politicians speak to a number of audiences: voters, parties, media and followers. Which of those determine the positions a politician takes in the end, or who is important to a politician? Using these new measures for individual positions, I test one of the oldest concepts of democratic theory: congruence. Do politicians use social media to respond to the preferences of voters? Do they use it to show loyalty to their parties? Is social media less individualized than we would assume, or is it a partisan arena? I test the relative weight of parties, voters, intra-party groups and even the social media audiences themselves on social media political communication.

1.4 Outline

This dissertation is grounded in the literature on intra-party heterogeneity and the role of individual politicians inside their parties, but extends to a theory of social media position-taking. This introduction closes the gap between the three pillars of this dissertation: The underlying questions of representation, the foundations of communication science necessary to understand social media, and the political factors that incentivize this behavior.

A Measurement Theory of Social Media Positions I start by conceptualizing *congruence* between voter preferences and political positions of elites, and how it can be achieved using communication. Then, I compare social media to other forms of communication, deriving how political communication is augmented and *mediatized*. Third, I conceptualize *individualization* of politics,

and derive incentives to use social media to this end. The most important contribution is the ability to use social media text to establish positions in terms of spatial politics, partisanship and sentiment.

A Substantive Theory of Positions on Social Media After this dependent variable can be estimated, we can test which actors explain these positions, and therefore can estimate the relative influences they have on individual position-taking. Beyond the voter and the social media audience, parties and intra-party actors like primary voters, leadership or faction might influence this process, depending on the political system. I then present a variation of the competing principals model with the aim to estimate the relative weight of different actors in the position-taking of politicians, which formalizes the questions asked and answered in the empirical papers forming this dissertation.

Three Contributions using Positions on Social Media After establishing these fundamental concepts, I introduce the three papers of my dissertation, which all contribute to the task of explaining individual positions by taking the relative weight of preferences of potential principals in electorate, party and social media itself. First, I address the role of intra-party politics in a party centered system, namely the effect of factionalism in Germany. Second, I focus on the matter of affective polarization in the United States. Third, in a contribution with Samuel Müller, we show how the medium itself influences communication.

2 Positions and Partisanship on Social Media

Social media in politics has manifold applications: as a way to connect, communicate, debate or mobilize (Jungherr, Rivero and Gayo-Avello, 2020). This functionality is open to all users, but offers particular benefits for political elites. They can be used instrumentally to accompany strategies in campaigns (Druckman, Kifer and Parkin, 2010), to establish contact with potential voters and constituents and to rally latent support.

2.1 Congruence

Social media can also be seen as a way for politicians to represent and improve the link between voters and politics. Normative theories of representation argue that politicians work to further constituent preferences (Pitkin, 1967). Social media can be used to symbolically and substantively represent, if politicians use it to speak to voter grievances. They can inform voters about what is important and potential policy solutions for these problems and improve the information aggregation function of democracy, easing the exchange of preferences. Politicians can find out what is important to voters, while voters can find out about the policy positions of politicians.

2.1.1 Political Space

The most common form to address this proximity is spatial. It is used to

describe[s] politics in terms of “dimensions” of similarity and difference, such as left–right and liberal–conservative. (Laver, 2014, p. 298)

Of course this is a simplification of political reality that is made up of millions of individual policy decisions from agrarian politics to zoning laws. The political process is complex however, and the agenda in terms of political proposals is too large for regular voters to process. Politics demands information reduction to become organizable. Every political issue that offers choice between two or more options produces positions on that issue. An actor, may they be voters, parties or politicians, may derive different utility from each choice if implemented. The set of all positions on all issues are called *preferences*. This depends on the perceived difference between the two options. We understand individual decisions, which seem correlated to another, as being mappable in an underlying political space (Benoit and Laver, 2012). This aggregation allows dimensional reduction to a low number of political "super-issues". Politicians take a position in the political space representing some kind of political dimension like a left-right scheme (Huber and Inglehart, 1995).

Technically, political space has as many dimensions as issues exist. But not every actor holds a position, or even a preference on each dimension. Important dimensions are called salient. Salience may differ between actors. A nurse might care about health policies, while a salesman

worries about tax policy. *Saliency* defines the importance actors place on specific dimensions and is part of the utility function, weighting the utility based on how important the choice is. Even when considering differences in saliency, or specific policy focus, political space is extremely complex. While political elites might have clear preferences on many issues, voters do not (Converse, 2006). Still, in democracies these complexities must map to a simple vote choice to allow meaningful representation. Political actors therefore "bundle" issues on which actors might have correlated preferences into political platforms. Positions on specific issues serve as cues to voters, about the general party position. This also allows voters to use heuristics to infer their own preferences on issues they know little about (Druckman et al., 2020). The exact amount of dimensions depends on the number of valid options the voter is faced with, and therefore strongly on the number of parties making bundle suggestions. So each point in any political space represents a saliency-weighted bundle of positions. Each voter and political actor has a preferred bundle, a so called ideal point.

2.1.2 Ideal Points and Stated Positions

While an ideal point is a position, a position does not have to be an ideal point. As Laver (2014) argues, the difference between sincere preferences and behavior is not always clear. The traditional roll call vote (RCV) literature is based on revealed preferences and conceptualizes politicians as basically policy-seeking. In the rational choice literature however there are numerous factors which diverge the actions of a politician from his sincere preferences, most prominently seeking office through votes (Strøm and Müller, 1999). Action does not necessarily reveal sincere preferences, but can be purely strategic. Since politicians do not merely serve their own preferences but have institutional incentives to incorporate other's preferences, may it be party or voters, their behavior, in contrast to their ideal points, is pressured. Once reelection and office seeking ambitions play a role, politicians strategically signal their 'preferences' to voters or party members deciding their fate.

2.1.3 The Signaling Game of Congruence

In a world where policy preferences define the utility of all actors, politicians should make policies according to their preferences. Success of this relationship leads to congruence between the preferences of the *constituents* and the political actor. Miller and Stokes (1963) understand **congruence** as the

extent of policy agreement between legislator and district. (Miller and Stokes, 1963, p. 49)

This is most often interpreted in spatial terms. *Congruence* is the proximity of ideal points, and is high if politicians make policy which is "close" to the voter positions. In general, congruence is understood in terms of implemented policy (Stimson, Mackuen and Erikson, 1995). However, policy outcomes can only be realised if legislators are elected by voters, who judge them based on how close their ideal points are to policy (Downs, 1957). This is called position-taking and, according to Mayhew (2004), the only action relevant for reelection. While policy making is substantive representation, position-taking is what voters perceive and sanction. To get elected, politicians need at least to appear congruent with their voters. In order to do so, politicians suggest policies, or "take" positions by stating them. They signal their proposed point to the voters who then make their voting decisions based on the policy they anticipate from the politician's communication.

So how do political actors signal their position to voters? Traditionally, literature on representation or responsiveness focuses either on parliamentary behavior, like roll call votes, or policy implementation in the long term (Stimson and Carmines, 1980). However, in terms of electoral competition, actual policy is less important than the promise of future policy making.

Pappi and Shikano (2004) argue that parties use their manifestos to signal their positions to voters. This can be considered a first move in a signaling game between voters and parties, to decide which policy should be implemented. Representation in terms of congruence reflects most directly in policy, or at least observable behavior aimed at implementing policy. Therefore congruence does not need to be based on implemented policies, but can also be achieved if the signaled positions match the preferred positions. This form of verbal representation of preferences is part of the information exchange process that makes democracy work. We can imagine this

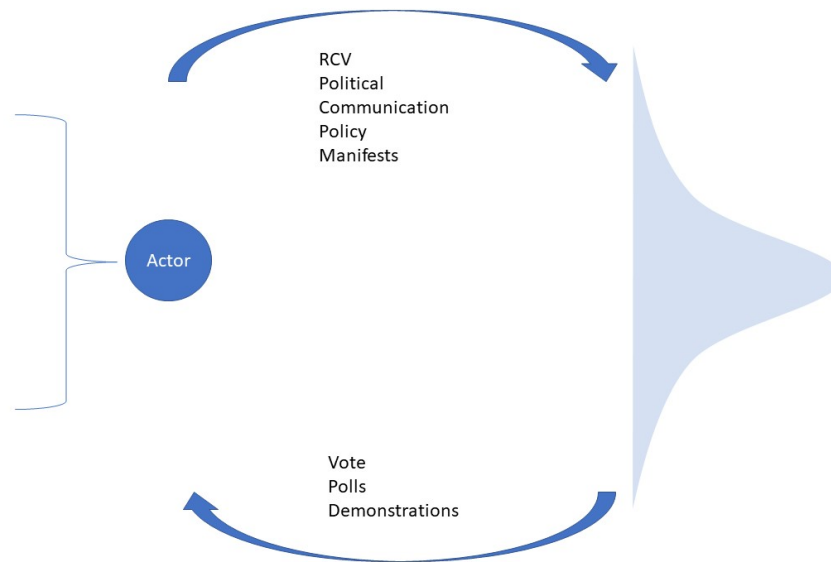


Figure 2: The Signaling Game of Congruence

exchange of signals as in figure 2. Politicians position themselves using different media outlets to communicate to their voters. They make press releases (de Sio, de Angelis and Emanuele, 2018), run campaign advertisement, publish manifestos or vote in parliament. Voters receive these signals and vote based on the policy they expect. The politician is elected, or not, and then gains information about the amount of support this position gained.

Accordingly, positions are measured by choices facing a specific decision like roll call votes. As these data sources are not available for parties or individual legislators in party-centered systems, other means of measurement, such as the analysis of issue emphasis in political texts are used.

Politicians receive signals as policy feedback

- Polling Results
- Election Results
- Protests
- Media Reports
- Comments and Feedback in Social Media
- Letters or direct contact by constituents

Politicians send their positions

- Interviews
- Press Statements
- Manifestos
- Roll Call Votes
- Social Media
- Advertisement

2.1.4 Limited Signals and Saliency Theory

In the US, measurement of positions (or preferences, or ideology) is largely based on the analysis of roll call votes (Clinton, Jackman and River, 2004; Clinton, 2006; Miller and Stokes, 1963). Typically, these are scaled to estimate the political positions of individual legislators on super-dimensions which structure political competition. In the context of parliamentary systems, this argument does not work, as roll call votes are simply not informative. Politicians have little chance to signal their individual positions to voters through actions, as the logic of supporting their government trumps constituency representation (Carey, 2007; Bräuninger, Müller and Stecker, 2016). Since individual legislators are under party discipline for purely institutional reasons, they cannot express ideology here. However, we would expect nothing else when looking at how we measure positions of parties in Europe. We analyze their stated preferences, not roll call voting behavior of their members.

This leads to obscuring expressed differences inside political parties, and is then blamed on electoral incentives for individualization, which are weak in parliamentary systems (Carey and Shugart, 1995). However, I argue that it is not the incentive for deviation that is weak, but the ability of expression which is low instead. There are numerous approaches to find hints of rebellion (Sieberer, 2006; Andeweg and Thomassen, 2011)². To find representation by individuals in parliamentary systems, we need to extend the way we measure party positions to the individual.

²for a more detailed review, see section 2.3

Theories of political competition typically revolve around the party positions. They rely on the analysis of stated positions in election manifestos (Budge et al., 2001; Ecker et al., 2021). Congruence can be understood as matching positions, but also as matching salience, placing emphasis and addressing problems considered important by society (Reher, 2015). Which of these issues political actors emphasize allows us to derive positions on a political dimension. This concept is called *Saliency Theory* and was developed by Budge and Farlie (1983) for the study of election manifestos of parties. The assumption that party competition was driven by issue emphasis, and therefore allowing to position parties based on these issues, led to the emergence of the Comparative Manifestos Project (CMP) (Budge et al., 2001). In a gigantic effort, issue emphasis was coded from election manifestos in numerous political systems. Coding the content by issue, the relative emphasis of issues was used to measure the positions of political parties. To find these associations between issues and position, two approaches dominate the literature: theory-based and inductive. (Benoit and Laver, 2012; de Vries and Hobolt, 2012; de Vries and Marks, 2012).

In terms of CMP, the underlying dimension is based on the assumption that these issue bundles, as they are proposed by political parties, have a traditional association because of issue ownership (Petrocik, 1996). Issue ownership means that parties are perceived as competent on issues they own by voters. If voters care about an issue, they will vote for parties they see as competent on these issues and therefore express their support for the party. Due to this traditional focus, for example on law-and-order policies for right-wing parties and social welfare for left-wing, some issues are considered right-wing or left-wing a priori. Focus on specific policies allows voters to infer actor positions. For instance, a particular focus on social welfare is ideologically proximate to healthcare. In context of the CMP, theory driven classification of issues can be projected onto lower dimensional space following the Manifesto Left—Right scale (RILE) score, which uses salience on predetermined issues to estimate the left-right position.

The second approach is identifying dimensions inductively with dimensional reduction. Following the logic of heuristics that led to the necessity of dimensions, we can use the co-occurrence of topics within manifestos to identify these bundles empirically. This method is used by (Gabel and Huber, 2000) to derive the "vanilla" method for manifesto dimensionality, which uses the first di-

mension extracted by factor analysis. As a further step, Lowe (2016) uses correspondence analysis to map these salience scores in a two-dimensional space, as do Däubler (2017) and Däubler and Benoit (2017). These approaches are inductive and require ex-posteriori interpretation.

The logic of using election manifestos to estimate the positions of parties based on the issues they emphasize is a means to apply position measurement to systems in which roll call votes and other methods are unavailable. Accordingly, there is a large amount of literature on this on the party level. But as soon as we go below the level of the national party, hand coded manifestos are rarely an option (Bräuninger, Debus and Müller, 2012). Resulting from this, measuring political positions of individual actors requires more fine grained information, based on text produced by individual actors.

2.1.5 Individual Positions from Text

To tackle these questions, different means have been developed to extract positions of individuals from text. In contrast to election Manifestos, the main problem is the sheer amount of documents to be analyzed. With the rise of computer science and the the further applicability of text analytical models, new approaches towards text as data have been developed.

Closely related to the coding of text, Laver and Garry (2000) first introduced keyword dictionaries to political science, to measure the issue emphasis in election manifestos, not by coding each sentence, but looking for specific predefined keywords. Automatic searching for these terms allowed classification of text into issues and subsequent scaling based on Saliency Theory. However, dictionaries are difficult to develop and obtain, even to the point that the effort is larger than just coding political text. A more automated approach was the application to supervised learning: the wordscores model (Laver, Benoit and Garry, 2003). In contrast to dictionaries, the individual categories are not assigned, but instead texts are placed along a pre-defined left-right dimension. To achieve this, some texts which are considered "endpoints" of the searched for dimension are given numerical values. Based on comparing word frequencies alone, each document is placed between these two poles.

However, not in all cases it is clear what the true underlying dimension is and what documents

could be the endpoint. In election manifestos, to which word scores is often and successfully applied (Bräuninger, Debus and Müller, 2012) they are often easily found and coded. However, in individual communication, which is most relevant for this dissertation, so called unsupervised methods are required. Unsupervised techniques like dimension-reduction algorithms best known from factor analysis extract the most important dimensions of differences between numerical values. They attempt to explain the largest amount of differences with the minimal number of "dimensions". Here we already see the analogy to information aggregation in substantive political terms of the previous subsection. These methods are used in the analysis of roll call votes (Lewis et al., 2019) in the famous NOMINATE algorithm (Poole and Rosenthal, 1985), but also in the analysis of political text. The Wordfish algorithm which estimates document positions on an unknown scale requires no further input than the documents to be scaled and identifies the main underlying dimension (Slapin and Proksch, 2008). Since words often relate to particular topics or political positions, the underlying dimension of word use is often ideological in nature and therefore represents positions on something that resembles a left-right axis. Wordfish has been applied and refined (Lauderdale and Herzog, 2016) to parliamentary speech (Lowe and Benoit, 2013) and also, most importantly for this dissertation, social media (Boireau, 2014; Ceron, 2016*b*; Temporão et al., 2018). However, social media is a very special case for text analysis, as the next section will show.

The underlying models for all papers of this dissertation are based on a signaling relationship between politicians and voters, who try to respectively inform each other on the policy they prefer or plan to implement. The focus of this model, as is the main question of this dissertation, lies in the individual position-taking. So how can individual politicians send policy signals to their voters via social media?

2.2 Political Communication on Social Media

Social media has become an ever more important tool for politics to a point where it has been hypothesized to change politics as a whole. While this can be doubted (Jungherr, Rivero and Gayo-Avello, 2020), it nonetheless developed toward an important form of political communication (Russell, 2020, 2018). Understanding the interaction between social media and politics necessitates

an understanding of media and political behavior in general.

Political communication is often differentiated into three "ages" or phases (Blumler and Kavanagh, 1999), which are defined by the main "sender". The first age, in which parties dominate message and medium, reflecting entrenched social cleavages. It allowed parties to have full control over these messages. The rise of mass media such as television has shifted this influence to centralized news organizations, that require nonpartisan reporting, yet carrying high agenda setting power (McCombs and Shaw, 1972). The third age is an era of growing diversification, fragmentation and individualization as numerous news stations with political agendas compete for viewer attention. Social media is a further extension of this development that allows differentiation. Entrance costs are close to zero, and control over message lies solely with the account owner. Everybody who wants to send out messages can reach a comparatively large number of recipients or followers. This makes Twitter a form of mass communication. It allows an active sender to send out messages to largely passive consumers. Candidates will try to use social networks as a medium of mass communication, just like an unfiltered news outlet, comparable to press releases they might publish on their personal website (de Sio, de Angelis and Emanuele, 2018).

Second, the easy use of this individualized mass medium allows a more visible, personalized and individualized message (Ausserhofer and Maireder, 2013). The question of personalization, specifically relevant in party centred systems, has spawned a tremendous literature (Kriesi, 2012; Balmas et al., 2014) to which social media adds new empirical evidence. If the dependence on institutions becomes weaker, individuals are more able to act on their own.

The control politicians have over their accounts gives a near unfiltered view. When analyzing media outlets, we can only see the *filtered* result, while if we analyze Twitter data on the account level (not pre-selected by topic or algorithm) we can see the part not published, too. In a sense we have digital trace data on unsuccessful as well as successful communication. From the perspective of a researcher, this is a great advantage. If we assume that the motives for tweeting are to send out messages and attempting to be heard (tweeting to not be seen is rather illogical), we can analyze MP behavior without having it biased by media or institutional constraints which promote uniformity in parliament. In other words: if we would try to infer political communication action

from media, we would already have it biased towards publicly perceived relevance and importance of the candidate. It is very important to note that it is not of interest how many people actually receive the message, but if the candidate *sends* it. We can therefore consider tweets as press statements (de Sio, de Angelis and Emanuele, 2018), which could have been sent out using any other medium.

2.2.1 Adapting to Social Media

However, social media is not a magically free place. Any medium influences the sender to some degree. This idea is expressed in the mediatization literature (Mazzeloni and Schulz, 1999) which argues that the medium changes politics because politicians adapt their communication to the medium. The media used to distribute messages defines its content in some way. It creates a specific *logic* (Klinger and Svensson, 2018). Media logic is the set of rules under which attention is allocated. In mass media, editors select what is important based on financial incentives. They distribute messages that maximize attention. "Network media logic" differs mainly in this regard, as the selection of importance and the subsequent allocation of attention and audience depends on the composition of the audience itself, intermediated only by algorithms. Accordingly, those who receive a message at first decide over further proliferation. In this analogy, followers on social media can be compared to "editors" of social media behavior.

As Stieglitz and Dang-Xuan (2013) argue, the selection of messages of politicians depends on message traits, like issue, content, professionalism and tone. This leads to the question whether political messages are augmented not only towards the preferences of the electorate, but also to the preferences of the audience on social media. If we consider followers of politicians decisive for the success of a message, we would consider them a low tier principal for the message specifically sent via social media. While they are not powerful in terms of controlling office ambitions, they decide the ability of politicians to reach their audience on this channel. Those politicians who try to use social media explicitly to circumvent editors or their party are therefore faced with a dilemma. If this is the case, positions would be slightly skewed to the preferences of the followers, at least for politicians who have very compact followings.

But who are those followers? If we compare them to our other actors, such as votes, partisan selectors or even editors, they seem to combine many of their characteristics. While in general social media users can also be voters, they are not completely representative, neither demographically (Cook, 2017; Correa, Hinsley and de Zúñiga, 2010) nor ideologically (Vaccari et al., 2016). As followers self-select, like consumers of traditional media (Iyengar and Hahn, 2009), their preferences will likely be closer to the preferences of the politician than the general population or the totality of social media users. This goes so far that Barberá (2015) demonstrates the predictive ability of following behavior for political ideology. Politicians are surrounded by filter bubbles of supporters.

2.2.2 Estimating Positions from Twitter Text

Now how do politicians send signals of ideological congruence on social media? As argued above, the most established manner of communicating position is the selective emphasis of political issues. While manifestos are limited in this regard, social media allows not only issue based position-taking, but also signaling partisanship or attacking the political opponent. I argue in this dissertation that these signals to voters, followers and other partisans can all be interpreted as spatial positions.

The most successful approaches for Twitter (Barberá, 2015) and Facebook (Bond and Messing, 2015) use the revealed preferences framework on the act of following other accounts. Connecting social media behavior to the literature on roll call votes, the decision to follow or not is considered a ye a nay vote, as in congress. Since users can only follow a limited amount of accounts, every additional account reduces the informational value of all the others. The decision to follow another account can therefore be interpreted as a trade-off between the utility of previously following someone and following someone new. They are not mutually exclusive, but create a slight trade-off situation. This measurement has shown great predictive value for positions obtained through expert surveys and roll call votes (Ecker, 2016; Barberá, 2015).

This relates to preference, but not to stated positions that can be adapted to preferences of voters or parties. Instead, measurement of communication in the form of "press statements" on social media can be used for measurement of positions, not preferences. To make inferences from

tweets in the same way we do so for election manifestos, we need to extend Saliency Theory (Budge and Farlie, 1983) to this text form.

This connection is first made by Boireau (2014) and then applied by Ceron (2016*b*) and Temporão et al. (2018), who all use versions of the wordfish model to scale semantic ideal points of those Twitter messages. However, while these approaches show some face validity and correlation to roll call votes, it is not clear why those positions correlate and how they matter for actual political positions and the issues these positions represent.

In contrast to manifestos, social media allows more dimensions of political action that might relate to political positions: issues, but also support for one's own party or attack on the political opponent. Therefore on social media we measure the salience not only of terms related to issues, but also to political parties and opponents.

Issues Selective emphasis of issues allows us to derive a measurement theory: We can infer political position from emphasis. Following the logic of manifestos, politicians use Twitter to state policy preferences by emphasizing issues. However, being developed for party manifestos which are carefully crafted (Budge et al., 2001), a feature not necessarily applicable to tweets, theory has to be adapted. To make inferences about relative salience, we need to address a strong assumption: that salience tells us about policy preferences, and nothing else we don't know about. This has two dimensions: First, to make a comparison of two actors, they need the same underlying set of possible issues they might encounter. This places constrictions on cross-time and cross-country comparisons. If two documents are produced with different issue spaces they might not differ on the ideological dimension but simply in terms of context. For coded manifesto data König, Marbach and Osnabrügge (2013) suggested a procedure to remove time and country effects from the estimated positions. Second, to make inferences about ideological position from text, the motivation of choosing certain words has to be ideological in some way (Temporão et al., 2018). This does not mean that all topics or words have to be ideological, but the main dimension on which they differ have to be.

Partisanship on Social Media On social media, and on the individual level, politicians can demonstrate their individual partisanship not only by taking positions based on issues, but also by taking *partisan* stands. These stands can either be positive, emphasizing the party or other members of one's party directly, or negative, by attacking the political opponent. In social media, these two distinct concepts flow into another, negative partisanship (Abramowitz and Webster, 2016) describes a form of divide between the parties that is not entirely explained by positional differences on political issues, but by the party itself. This partisan polarization is distinct from but has its roots in ideological polarization (Rogowski and Sutherland, 2016; Druckman et al., 2020). The concept of partisanship and negative partisanship is defined by the growing focus on the political opponent and their policies. This phenomenon was intensively researched in the literature on negative campaigning and its effect on institutional trust and turnout (Kahn and Kenney, 1999; Iyengar et al., 1994). Political language becomes more negative and the creation of out-groups makes polarization focused on the political opponents themselves, instead of policy. In contrast to paid campaign ads, direction is not a satisfying indicator of negative campaigning in political communication. As talk is cheap, there are presumably many neutral or even positive messages about members of the opposing party. Instead of referring to a political issue to campaign, they turn towards partisan identity, particular focusing on the opponent as a group or entity. Politicians are of course divided in terms of ideology, but their communication on social media can entail purely partisan attacks on the opponent. This "affective" communication entrenches in-groups and out-groups identified as driving affective polarization on the voter level. Affective political communication is therefore defined by being focused on the political opponent in a negative way (Iyengar, Sood and Lelkes, 2012). It can be targeted attacks on the political opponent or using terms like "socialist" or "right-wing". These terms, and terms used in the same context, are sure to describe partisan diversion and create in-groups and out-groups or at least entrenching this divide. This stands in contrast to messages that directly refer to political issues that divide the parties.

However, this dissertation is on the question how individual politicians use social media to posit their positions, independently of the party. The next section will develop a framework of positioning inside of political parties for politicians, both in party centred and personalized political

systems. After we established social media as a means to measure position, with all the difficulties and potentials associated with it, we now focus on the question of what determines this process beyond the ability for politicians to individualize. In line with theories of congruence, they are not only influenced by voters or the medium itself, but also by the ideological structures they are embedded in. This section will focus on the relationship between the politician as an individual and the politician as a partisan. First, I will review the literature on this topic, before I introduce a model of competing principals that allows us to estimate the relative influence of the party.

2.3 Politicians and their Parties

The relationship between individuals and parties strongly depends on the institutional context, and theories concerning this connection are often either theories of individual politicians constrained by parties or of parties constrained by individuals.

2.3.1 Application Level Models

The most party-centered interpretation of intra-party heterogeneity treats it as an independent variable, in which the variable of interest is party level behavior, from party competition to coalition formation.

Party Competition In party-centered systems, theory naturally revolves around parties as unitary strategic actors. The literature on party competition sees strategic agency on the party level (Dalton, Farrell and McAllister, 2013; Adams and Ezrow, 2009; Strom, 1990; Ezrow et al., 1999). This is in line with explaining party positions as strategic variables mainly determined by the preferences of the electorate and behavior of other parties.

Intra-party Heterogeneity Intra-party effects add a second layer to these party level explanations: the preferences and actions of actors inside of political parties. While agency is usually still on the party level, freedom of movement is not just limited by credibility, but depends on sub-party actors. These actors include policy-seeking activists challenging office seeking party leaders, while other authors focus on features of *party organizations*, issue emphasis (Wagner and Meyer, 2014)

and positions (Meyer and Wagner, 2019).

Theoretical models including sub-party groups deal with problems of coalition governance (Laver and Shepsle, 1990) or positing with directly modeling sub-party actors as groups inside parties (Budge, Ezrow and McDonald, 2010). Other literature relating to this concept deals with selection methods on the party level (Rahat and Hazan, 2001; Reiser, 2011; Katz, 2001; Pennings and Hazan, 2001; Hazan and Rahat, 2010; McElroy, 2011) and their effect on the ability to move (Lehrer, 2012).

2.3.2 Explaining Heterogeneity

A second level of literature includes the party level, but is directly interested in heterogeneity itself as a dependent variable. They ask questions about institutional determinants, mostly on the system level or by exploiting institutional variation.

Party Unity While being rooted on the individual or subgroup level, it is still understood and measured on the party level. Parties are therefore more or less united. The difference is that here unity is the dependent variable *on the party level* and is explained on the party level (Bowler, Farrell and Katz, 1999; Sieberer, 2006; Stecker, 2011; Andeweg and Thomassen, 2011). Explaining defection with institutional factors led to a new interest in identifying causes of why parties contain varying preferences in the first place.

Sub-party Organizations One of these explanations is based on the idea that parties are large bodies that do not represent singular positions, but ranges inside a party system. Accordingly, parties develop more or less formal sub-organizations that represent different positions inside the same group. This literature on factionalism analyzes the emergence and characteristics of sub-party groups (Bernauer and Bräuninger, 2009; Belloni and Beller, 1976; Zariski, 1960; Boucek, 2009; Benedetto and Hix, 2007; Ceron, 2016*b,a*).

2.3.3 Hybrid Theories between Party and Individual

The influx of theories from the United States and the growing dealignment of parties (Dalton, Wattenberg and Press, 2002) result in a literature gap that deals with individuals inside their parties. While previous theories might work on the individual level, but are modeled and measured on the party level, the strand of literature defined by Hix (2002) and Carey (2007) works on the individual level, treating parties as exogenous actors that explain parts of the individual behavioral variation. It is much closer to the US literature, except for the fact that it takes the assumption of powerful parties as actors more seriously.

Personal Voteseeking At the same time, these theories work in line with American theories of individual accountability (Fiorina, 1978; Ansolabehere, Snyder and Stewart, 2001; Canes-Wrone, Brady and Cogan, 2002; Burden, 2004; Peress, 2013), where individual candidates respond to their individualized voting incentives. This literature has been extended to party-centered systems only recently. Members of the same party might differ in positions in the first place. In line with Strøm and Müller (1999) these explanations can be found in individuals seeking policy, office and votes. These sources of heterogeneity are analyzed in the literature on individual responsiveness (Hanretty, Lauderdale and Vivyan, 2017; Zittel and Nyhuis, 2019) to voters with different policy preferences.

Competing Principals In a way, this *competing principals framework* (Carey, 2007) allows including both strong parties and individual incentives as relevant factors for the individual action. This has spawned literature on the effect of these incentives, particularly in systems where there is variation in these incentives. The US mainly looks for differences in how strong these incentives affect behavior in different expressions (competitiveness of elections) (Fiorina, 1978). In other systems like the German mixed member system, even different incentive types are considered. This has led to extensive studies where individual behavior like positioning is the dependent variable (Sieberer, 2010; Manow and Nistor, 2009; Gschwend and Zittel, 2015; Stoffel and Sieberer, 2017; Stoffel, 2014; Bernauer and Munzert, 2014; Debus and Bäck, 2014; Crisp, 2007), taking questions of party loyalty to the individual level.

2.3.4 Explaining Parties

Up to this point, parties were a fact of life and the focus of much of the literature treats parties as unitary actors. However, sub-party variation, as it relates to broader party competition and as an endogenous determinant of party change, needs to be explained. The opposite is the case in large parts of the US literature, which is informed by a highly personalized election system, with weak parties and little incentive to act cohesively. Here, partisanship is an explained variable on the individual level. Instead seeing the party as a force that influences individual behavior, collective action is an outcome if individuals coordinate. Here the dependent variable is not heterogeneity, but to the contrary, coordination.

Collective Action The importance of political parties in the US system, where individual incentives and behavior dominate the understanding of politics, has led to various neo-institutionalist approaches that seek out causes of partisan coordination (Cox and McCubbins, 1993). These scholars emphasize the necessity of stabilizing institutions for politics to work in the first place. Without parties, legislation would not be possible due to their inability to aggregate preferences. The focus is here on the idea of functioning of policy making as a whole, and therefore is close to the party competition literature in terms of explaining party level behavior with individual action. This is enriched by literature that asks about individual partisan behavior.

Individual Selection Below these "collective action models" are concepts of parties as organizations to fulfill personal ambitions of individuals. In contrast to collective action models, they are solely focused on the behavior of the individual, and use the party not as an outcome but a strategic tool. These modes understand parties as labels or selectorates for higher positions. They are based on office seeking individuals that interact with mostly policy-seeking selectors.

In the US context, this means explaining the utility of parties to individual candidates or legislators. Parties are considered labels (Aldrich, 1995) that help aggregate preferences and allow identifiable policy platforms. This perspective heavily flows into the literature on individual ambitions (Lawless and Fox, 2005; Herrick and Moore, 1993; Maestas, 2003) where incentives depend on career stages of individuals. These career stages are typically differences in party roles, from newly

elected freshmen, to rank-and-file members, to committee leaders and party leadership. Since different roles face different selectorates and definitions of aims and success, behavior changes over the course of careers (Ohmura et al., 2018).

This level also includes literature on the effect of intra-party nominations and elections on the individual behavior of candidates, therefore speaking to questions of primary elections (Aldrich, 1983; Burden, 2004; Gerber and Morton, 1998) and other direct modeling of nomination procedures (Baumann, Debus and Klingelhöfer, 2017; Reiser, 2011). In a sense, this is an extension to concepts like the competing principals model, as it models preferences of leadership, activists or co-partisans more directly and interactively.

Anarchy At the very bottom tier of this literature typology lies the strand of American literature that denies the relevance of parties to explain individual behavior all together. This "anarchic" image of politics focuses on the individual and sees parties merely as loose alliances. Krehbiel (1993) argues that parties are little more than clubs of like-minded people, with little causal effect on behavior. Mayhew (2004) argues that mainly individual representation to voters matters, as does Fiorina (1974).

While these 7 strands of literature are not the only way to conceptualize the vast body of party-individual relationships, it helps motivating the model used in the contributions of this dissertation. As they relate to different political systems, there are substantive differences to be considered, but also theoretical decisions that matter and define a coherent framework. I place this dissertation between the party discipline and the individual selection model.

The next section presents the core assumptions of a model of individual interaction between party members in response to their individual voters. This explicit modeling is closest to the individual selection tier, as it explains behavior with the preferences of politicians, co-partisans and voters. The dependent variable here is individual position choice.

3 A Model of Individual Ideology and Partisanship on Social Media

To understand congruence on social media, we need to estimate the relative influence actors have on the position taken by the politician. To explain position-taking, we need to develop a general model that allows incorporation of the preferences of these actors. If we can measure positions of politicians as well as preferences of parties, voters and followers, we can solve for the this relative importance. This section will first derive the causes of differences between individuals inside parties and track those back to differences in incentives. It provides a framework that allows being tested in different political systems to find answers for each of them.

3.1 Intra-party Preferences

Parties are nothing if not groups of ideologically like-minded individuals. Whether we consider parties loosely organized groups of politicians standing for election or all controlling party apparatuses, they are always platforms that develop positions on political issues.

Politicians who become candidates for election seek, like parties, policy, office and votes. In other words they have policy preferences of their own, and speak to the preferences of other actors who nominate and elect them, to satisfy theirs. Members select themselves into parties based on their preferences and therefore reinforce the position of the party. In other words, the policy preferences of the individual $pref_{individual}$ are likely closer to the position of their party than other parties.

Party positions are the results of the preferences of members, who select leadership and decide on party policy for the same policy and vote-seeking considerations.

These coordination tasks are results of diverse processes of intra-party politics. Most parties choose elites which coordinate these decisions. The exact make-up differs between countries and even parties (Greene and Haber, 2016). While some are more bottom up, others coordinate from top to bottom. Other parties develop their program in membership participation. What they all have in common is that, just as other institutions of governance, they aggregate and coordinate

preferences of the selectorate (Lehrer, 2012).

As the institutionalist perspective argues, institutions stabilize expectations in complex settings (Laver and Shepsle, 1999). As political positions themselves are bundles of topics, political parties organize positions on these issues, prioritize them and combine them into platforms. Platforms can be considered ideological brands, that allow members of a party to coordinate around policy goals (Aldrich, 1995).

However, these are rarely a perfect fit for the wishes of all party members. While party members are more alike ideologically than they are compared to members of other parties, there is still a high variability inside parties. If we understand ideology or positions in spatial terms, as we do here following the literature on party competition, ideology is continuously distributed while the number of parties in a system is limited. The wider these preference distributions, the more likely it is that individuals with common preferences create ideological groups inside parties, so called factions. These groups might be representations of different strata of society the party speaks to, rivaling groups for political power or simply clubs of like-minded politicians (Bernauer and Bräuninger, 2009; Zariski, 1960; Boucek, 2009).

3.2 Individual position-taking in Social Media

Inside their parties, politicians take positions Pos_i that relate to their preferences, factions or electoral incentive, in the same political space as their parties. In this model, we assume positions to be dependent on putting salience either on their own party or on political issues that the party also emphasizes. In other words, politicians use their messages on social media to create proximity or distance towards their party. Given a latent political space, each party and each individual take a position on a dimension. In this purely policy-seeking core model, each member takes a position that is determined by their policy preferences $Pref_i$.

However, of course parties and individuals are not only policy-seeking. As Strøm and Müller (1999) note, policy cannot be implemented without winning office. Additionally, politicians might have other rewards from office such as income, power or status. Their utility function is therefore dependent not only on policy preferences, but also on the likelihood of keeping or gaining office.

$$U = p(Office) - (Pos_i - Pref_i)^2 \quad (1)$$

3.3 Potential Selectorates

In any political system, this likelihood depends on the selectorate which awards office. In representative democracies, this is typically the voter. However, in more nuanced systems, parties, intra-party groups or other audiences might have a say in nomination or promotion. In a model of position-taking, we must assume that the probability of winning office is influenced by the positions the politicians take.

Accordingly, politicians' utility does not merely depend on their position based on their own preferences, but also to the degree that their respective distance to their selectorates influences their reelection chances. In other words, what is p and how does it depend on the position?

Based on the Downsian assumption that voters choose the option that is closest policy-wise (Downs, 1957), politicians face a trade-off if several groups affect their reelection chances. The following section models these groups: voters, the party and intra-party actors.

3.3.1 Voters

All models of political competition are about the question of which strategies actors employ to win elections and gain public office (Downs, 1957). Median voter theory suggests that parties should move to the median voter and take the central position in a two-party system to achieve a chance on the majority of votes. In other systems, it is not necessary to achieve the majority, but the plurality in a multi-party competition such as proportional voting systems. The main objective is not to maximize votes for individual reelection, but enough votes to *win* reelection.

The same concept can be applied to individuals between ideologically diverse electoral districts. While the party as a whole faces a national electorate, individual party members face small scale electoral districts with potentially very different preferences. If we consider voters policy-seeking and voting based on political positions, politicians have to take position near the constituency ideal point. This dependency is realized through the voters ability to sanction representatives. Candi-

dates deriving utility from office can be held accountable by voting them out of it or threatening to do so. How relevant these elections are for individual MPs depends on two factors: How decisive is the constituency for office and how likely is it to lose it, if there is deviation? This is based on a valid opposing candidate that is closer to the preferences of the constituency and is elected over the individual (Downs, 1957). However, politicians do not just have to face an existing opponent, but also have to anticipate new competitors if they move too far from constituency preferences. For the sake of simplicity of this model, we assume probability of being elected by one's constituency to be inversely related to the distance between *stated position* and the preferences of the median voter of the constituency. As it is common in this sort of utility function, we assume that the utility loss from increasing distance grows with increasing distance (Singh, 2014)

$$p = p1 * r1 * (Pos_i - Pref_{constituency})^2 \quad (2)$$

where $Pref_{constituency}$ denotes the constituency preferences and $r1$ their dependency on the candidate's policy position. $p1$ denotes the influence the constituency has over their chances to get into or stay in office.

This simple case of representative democracy would lead to politicians only choosing between their personal preferences and the position of the voter. This link is not likely to be problematic, as candidates will likely run in districts they feel ideologically at home in or are even socialized in. Candidates who can hold themselves in districts for a longer time will likely be somewhat representative of the district. However, if district preferences and party preferences differ, the influence of the party itself becomes obvious.

3.3.2 Party

As argued above, politicians represent their parties in terms of preferences, simply by being self selected members. However, those are rarely a perfect fit and legislators need to represent their constituents to some degree. But parties want to present a cohesive policy platform and therefore might influence individual position-taking.

Most directly, party members might affect the reelection chances of politicians via *nomination*.

Since parties play a major role, it is often difficult to run for election without the label (Aldrich, 1995) or formal party support. Accordingly, being nominated by a party is a crucial step towards office. This is most important for districts with a clear partisan orientation, in which the district almost always votes for a particular party.

Who's preferences influence the stated position depends on who can hold the individual accountable. This might be the party leadership if they control nominations, a state level body that compiles closed lists in a proportional system, the local party chapter or a primary selectorate. This problem is discussed heavily in literature on primary elections (Aldrich, 1983; Burden, 2004; Gerber and Morton, 1998), where politicians have to mediate their position between the preferences of their voters and their party members. Another case are list system, where politicians face electorates aggregated on regional or national preferences. Politicians might need to satisfy not only the preferences of voters, but also members of their own party.

Nomination Party members choose candidates from their peers. They choose candidates who are closer to their own preferences. In contrast to two-party models, I do not explicitly model elections, but instead understand election probability as a monotonous function of distance between voter preferences and positions of officials. For the individual member, probability of being nominated by one's party is inversely related to the distance between *stated position* and median party member preferences.

$$p = p_2 * r_2 * (Pos_i - Pref_{party})^2 \quad (3)$$

Depending on the system, $pref_{party}$ relates to the local party group, primary voters, party factions or party leadership.

Beyond nomination alone, elected legislators face further party actors attempting to influence their positions. While reelection is a major concern, politicians might also strive for higher office to which access is controlled by party leadership, factions or the parliamentary party group. Accordingly, even if reelection is safe in the election for the main office, party influence could still affect the member in the way modeled above.

3.4 Competing Principals

Individual politicians are caught between the wishes of voters who decide over their office and the wishes of the party. This model is called the competing principals model (Carey, 2007), based on the idea that individual politicians are accountable to their party and their constituency. It treats the party influence, as well as the electorate, as exogenous variables.

While this model is very similar to models of candidate selection and primaries, it is flexible in terms of adding additional principals. As argued above, followers control the success of a politician's message, in particular if the followership is small and social media is the only viable alternative of communicating. Accordingly, we can assume that politicians are incentivized to adapt their message to the preferences of followers.

$$p = p_3 * r_3 * (Pos_i - Pref_{follower})^2 \quad (4)$$

Therefore, candidates deal with several distinct electorates with different preference distributions. The relevance of these two elections depends on the institutional rules. This variable changes between electoral systems. In systems based on party lists, nomination is decided by the political party. In single member districts, candidates are elected by their constituents. These two points are extremes on the axis of dependency.

If a politician's utility depends on their position via their own preferences and the product of the ability of a selectorate to control their election, selection and nomination, we would expect that the position they take is a weighted average between the positions of these selectorates.

$$Pos_i = b_1 * Pref_{party} + b_2 * Pref_i + b_3 * Pref_{follower} + b_4 * Pref_{constituency} \quad (5)$$

where b are the relative weights of the respective electorates and proxies for the p 's from the previous equations, as long as we assume that voters, party and followers are equally responsive to policy positions. Of course, this could also imply differences in their ability and interest to observe the position of the MP, but this cannot be elicited at this point. However, we can estimate the relative relevance of the specific actor for position-taking.

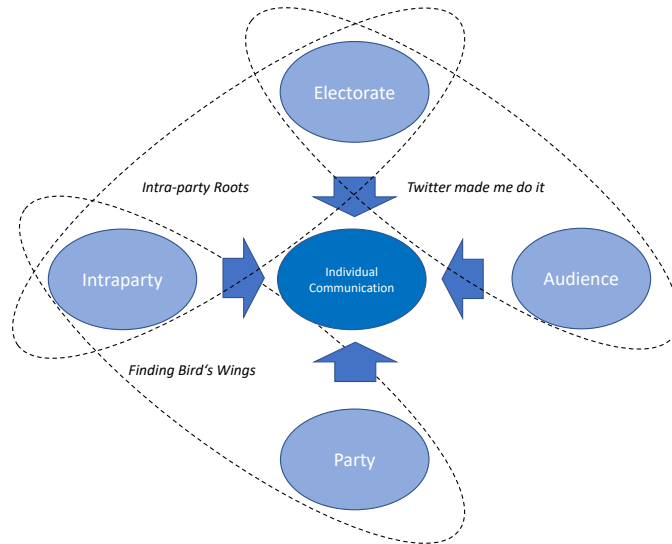


Figure 3: Overview

4 Contribution

This dissertation observes three links on Twitter in two political systems that represent the poles of intra-party theories. In terms of the model of the previous section, they all test a relative effect of two selectorates. In the first paper, I analyze the German case, which is heavily influenced by strong parliamentary parties. The second and third paper focus on the individualized system of the United States. In both cases, we can find significant and meaningful variation in social media behavior. While these papers make contributions to different research questions, they all ask about determinants of social media communication.

4.1 Intra-Party Positions

The first paper of this dissertation speaks to the role of the party in the behavior of individual positions. In the German party system, parties are not unitary blocks of policy preferences we often assume they are. Instead, they are made up by factions of different preferences, competing to make the party policy. This sort of conflict is often invisible to outsiders, but social media gives an impression of its scope. In this paper I develop a social media text-scaling measure for intra-party positions in a party-centered system. The ideological positions of individuals relative to their party are measured based on their Twitter timelines, and explained by their factional

orientation. It explicitly models two actors: all other members of one's own party in the same policy space, and the factional political orientation. So after we control for party, is there still some sort of congruence with the preferences of the sub-party group?

To estimate the positions in the same policy space, I apply correspondence analysis to derive political positions in the same policy space as political parties. Namely, I recover the cultural and economic left-right axis from the 800.000 tweets 500 German MPs sent on Twitter between 2017 and 2020. I show that parties matter the most for the positions of German MPs, but factions do so, too. In both the cultural and economic dimension, politicians represent more conservative positions (being closer to conservative parties), if they are members of conservative factions inside their parties. This shows that while parties are by far the dominant force in position-taking in Germany, Twitter allows some leeway to take positions relative to the party. Whether this is due to their preferences (as they self-select into factions) or the effect of the faction itself is of course unclear. But it shows that intra-party positions matter substantively. This piece also works as a first proof of concept for deriving positions from Twitter data.

4.2 Intra-party and voter preferences

The second paper compares the effect of intra-party and electoral (voter) context on both positions and partisanship. Being motivated by increased affective polarization in the United States, it asks about the relative importance of voter preferences and intra-party challengers. Just as the first paper, it derives political positions from social media text. In contrast to the first, it extends the approach by separating issue-based polarization and affective, partisan polarization which is not indicative of differences in policy preferences, but represents purely partisan sentiment and distance.

Using a new approach called Latent Semantic Scaling (Watanabe, 2020), I add to the unsupervised methods shown in the first paper by using a semi-supervised model that allows more direct measurement of the underlying dimensions of interest. Just as the first paper, it is based in Saliency Theory (Budge and Farlie, 1983), but beyond that moves to negativity in language as a proxy for partisanship. The main contribution of this paper is that both voters and intra-party

challenges explain parts of positions, making US representatives responsive to both groups. More so it shows that those members of congress who represent more extreme districts are more responsive to their constituents under the threat of a primary (intra-party) challenge. In this case, we do not see competing principals, but complementary ones, who drive representatives towards partisan hostility. It shows that in contrast to common wisdom, neither national political competition nor local district competitiveness explain the growing amount of affective polarization, but instead the interaction between constituency preferences and intra-party politics.

A second important contribution of the paper is the validation of the method with existing outside measurements. While roll call votes are uninformative in parliamentary systems, they allow valid estimates for individual positions in the US. I show that the Twitter based scaling method correlates with more than .88 with known roll call positions. In contrast to roll call, social media is available and informative in most political systems, allowing to transport this finding to other systems.

4.3 Social Media Influence

After we established the validity of the methods necessary to derive positions from Twitter text, the last question that remains is to what degree the medium itself influences political communication. The third paper with Samuel Müller measures the effect of audience on social media behavior. While the dependent variable is negativity, not position, it relates to whether politicians adapt to audience or their electoral context.

As demonstrated in the second paper, negativity is an important part of American politics and is directly related to partisanship. More extreme politicians are using more negative language, in particular about the political opponents. Most theories on negative campaigning argue that it is mostly induced by competitive electoral races, or in other words, if the district has comparatively heterogeneous preferences and might as well elect a Democrat or a Republican. We would expect that district competitiveness drives negativity. In contrast, how does the audience, the so called filter bubble, influence this negativity. In general, social media incentivizes negative language, as it is more likely to be shared and retweeted. But how does this interact with the exact ideology of

the *individual* filter bubble. To answer this question, we measured the preferences of the Twitter audiences of 339 candidates in the 2018 midterms based on who they follow on Twitter. We show that incentive to be negative on Twitter exists, therefore the audience can be considered something like a weak principal for this specific medium of communication. However, we also show that this plays no role and electoral factors, in this case win probability, determine the amount of negativity in language.

While this does not relate directly to positions that legislators take on social media, it shows to what degree the audience on social media influences the politician relative to their voters. The answer is not at all. We show that while social media offers incentives based on audience ideology, it does not influence the politician's behavior.

4.4 Future Research

Combined, these three papers show that depending on the political system, different principals or selectorates matter for the exact tone and content of the political message on Twitter. In Germany, parties determine the tone, while in the US the voter is more important. In any case, intra-party actors matter.

While this dissertation stops at the question of *if* there is response to different actors, it opens up a whole research agenda for comparative research to answer questions of *why*.

Institutional Incentives Many important questions about what leads to representation, may it be parties, individuals or institutions, can be directly tested in systems in which many legislative indicators of individual positions are not informative. It is a first step to build a unified framework between Comparative Manifesto data and NOMINATE that offers potential for a large body of research. It is a measure that exists in almost any political system, and even reflects differences inside the same system.

Intra-Party Coalition Bargaining Based on individual positions, individual positions cannot only be used as a dependent variable, like in this dissertation, but also as an explanatory variable. For coalition bargaining research, knowing individual positions of the relevant members of the

party might give valid estimates for which coalition there is an intra-party consensus.

One Scale for All Even inside the United States, where valid individual position data exists, this approach can help estimate positions of candidates or members of different state parliaments on the same political dimensions, making them comparable where NOMINATE is not. This approach allows not only to estimate factional differences inside parties, but also the positions of members of state parliaments on the same dimension. It allows putting candidates on the same scale as their competitors, allowing to trace them back years before they became candidates and years after. It allows testing the effect of primaries without selecting on the dependent variable, as we would if we observe only the successful candidates.

Temporal It also allows comparing positions over time. While this dissertation focuses mainly on the individual, there is no reason why party positions cannot be estimated using this approach. In contrast to election manifestos however, Twitter is used every day by hundreds of party members, allowing to get monthly, weekly, maybe even daily data points. Beyond this more fine grained analysis of ever the same, it also creates the data structure required for causal inference in differences-in-differences designs.

More Data During the time frame of this dissertation, the second important medium, Facebook (Kosinski et al., 2015) remained largely unavailable (Mancosu and Vegetti, 2020). In 2020, Facebook deployed a new researcher access to the data (Shiffman, 2019). This new age of access to social media is accompanied by the new academic Twitter API which allows circumventing certain restrictions in the data collection process, and makes research more replicable and valid (twitter, 2021). While on Twitter adaption rates are comparably low for countries like Germany, the recent opening of the Facebook API to academic research creates a completely new venue. As Facebook is much more prevalent in many systems, the methods developed for Twitter can soon be adapted to a much more complete subset of politicians.

While social media research turns into a very important sub-field of its own, it mirrors processes we see in the real world and makes them measurable. This dissertation has one major contribution to political science research: it shows that social media data analysis works, that it is valid, and

that we can make meaningful inferences on real world phenomena. It describes the pitfalls, but also shows how to avoid them.

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2. FINDING THE BIRD'S WINGS

The first article „Finding the Bird's Wings - Dimensions of factional conflict on Twitter“ (<https://journals.sagepub.com/doi/pdf/10.1177/1354068820957960>) was published in Party Politics (Impact Factor: 2.817).

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Finding the bird's wings: Dimensions of factional conflict on Twitter

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Party Politics

1–10

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Abstract

Intra-party politics has long been neglected due to lacking data sources. While we have a good understanding of the dynamics of ideological competition between parties, we know less about how individuals or groups inside parties influence policy, leadership selection and coalition bargaining. These questions can only be answered if we can place individual politicians and sub-party groups like factions on the same dimensions as in inter-party competition. This task has been notoriously difficult, as most existing measures either work on the party level, or are in other ways determined by the party agenda. Social media is a new data source that allows analyzing positions of individual politicians in party-centered systems, as it is subject to limited party control. I apply canonical correspondence analysis to account for hierarchical data structures and estimate multidimensional positions of the Twitter accounts of 498 Members of the German Bundestag based on more than 800,000 tweets since 2017. To test the effect of intra-party actors on their relative ideological placement, I coded the faction membership of 247 Twitter users in the Bundestag. I show that Twitter text reproduces party positions and dimensions. Members of factions are more likely to represent their faction's positions, both on the cultural and the economic dimension.

Keywords

factions, intra-party heterogeneity, social media, Twitter

Introduction

Intra-party conflict is an often neglected, albeit important dimension of party politics. It is highly important for changes in party strategies and positioning (Bowler et al., 1999; Budge et al., 2010; Wagner and Meyer, 2014), leadership selection (Greene and Haber, 2016) and coalition politics (Bäck et al., 2016; Ceron, 2016a).

A common way of organizing this conflict inside parties are factions of principle (Sartori, 2005), groups of party members who share an ideological predisposition inside the bounds of the party. These factions of interests or party wings position themselves along the dimensions of inter-party competition and attempt to influence leadership selection, party strategy and policy. But do members of these factions express differing ideological positions?

To measure ideological differences, I apply spatial models of politics (Laver, 2014) to individuals inside parties. In parliamentary systems, this presents a daunting task, as common measures of positions like roll-call votes (Poole and Rosenthal, 1985) and election manifestos mainly reveal party positions. As an alternative, social media data

is an established data source to estimate preferences of users, parties and legislators on a common scale. Social media gives individual party members the ability to communicate their political positions with no consequence for government stability and little agenda control by the party (Ceron, 2016b). Up until now, these measurements are mainly validated for the U.S. context where individual-level measurements are available (Barberá, 2015). I suggest a way to conceptualize political position taking on social media in such terms as we can apply text-based position measurement (Laver et al., 2003; Proksch and Slapin, 2010) that addresses the main issues of social media data. I apply correspondence analysis (Greenacre, 2007; Lowe, 2016) to 800,000 tweets of 498 Members of the German Bundestag. I show that the dimensionality of policy positions of individual Members of Parliament (MP) mirrors the political dimensions found in expert survey data on the

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party level, both in terms of expected party position and substantive content of the policy dimension.

Based on a qualitative evaluation of faction membership for 247 MPs with Twitter accounts, I show that members of ideological factions express their ideology relative to their partisans both on the economic and cultural dimension.

Parties and their inner conflicts

Parties are often seen as unitary actors, as they propose a common position that the leaders, or maybe even most of the members, compromised on. These positions are elemental for coalition bargaining, campaigning and governing, but are heavily influenced by intra-party processes. The recent focus (Polk and Kölln, 2017) on these intra-party conflicts reflects the overwhelming anecdotal influence of conflicting groups inside parties influencing policy and personnel decisions.

Budge et al. (2010) argue that replacement mechanisms inside parties heavily determine the final positioning of parties. Ceron and Greene (2019) show that these conflicts change the salience of issues in manifestos, while Greene and Haber (2016) show this effect for leadership selection.

Beyond internal decision making, this diversity influences government formation (Ceron, 2016a) and coalition negotiation (Bäck et al., 2016; Giannetti and Benoit, 2009). They result from negotiations and conflicts between heterogeneous actors inside the same party, may they be individual candidates or organized subgroups, so-called *factions*.

Factions and tendencies

Factions are considered any kind of party subgroup, from personal network to ideological club. While factions are involved in leadership or policy struggles, they are not necessarily ideological in nature. Typical factionalized parties such as the Japanese Liberal Democratic Party are not split along ideological lines, but personal networks of patronage (Boucek, 2009).

Sartori (2005) called ideological groups “factions of principle.” Differences, even “ideological” ones, do not necessarily need to mirror the main dimensions of party competition, but can also reflect differences on other issues or dimensions of political conflict. These conflicts can be understood in spatial terms (Laver, 2014), meaning that factions, like parties, occupy a position on one or more policy dimensions. To be influential in terms of party competition and coalition bargaining, differences produced by factions need to be visible in their member’s position on the relevant dimensions of inter-party competition.

Intra-party groups which align themselves ideologically along the main dimensions of party competition I call *wing*, if officially organized, or *tendency*, if not. They represent certain positions inside a political party (Bettcher, 2005) that might conflict with one another.

Positions of faction members

So how will ideological conflict present itself in intra-party politics? Individual politicians, just as parties, can be considered seeking office, policy and votes (Strøm and Müller, 1999). If a faction aligns along a relevant dimension of political conflict, we would assume policy-seeking members of this faction will share their ideology. Party members who make the active choice to join an ideological faction therefore signal position in ideological intra-party conflict. However politicians can also be merely office or vote-seeking, being dependent on faction-based patronage networks, and therefore strategically take their position (Bernauer and Bräuninger, 2009; Ceron, 2016b). Analogously, we would assume that members of a party wing are close to their own party, but also take a faction-influenced position inside their party. To test this concept of intra-party spatial conflict, we need to observe some degree of individual positioning inside political parties.

Observing conflict on Twitter

Intra-party conflict is a part of political reality, but has only recently found major scholarly attention, mainly since parties go out of their way to hide it. As Greene and Haber (2015) show, voters punish parties that seem divided, so parties attempt to apply discipline (Andeweg and Thomassen, 2011) to act and appear united.

This limits the expression of dissent and makes it difficult to observe from the outside. One way to do so is the use of elite surveys. Carroll and Kubo (2019) present an internationally comparable measurement of intra-party heterogeneity while Steiner and Mader (2019) show the effect of this heterogeneity on issue salience. Jankowski et al. (2019) demonstrate the validity of these methods to measure changes over time. However, elite surveys are limited in two major ways: First, they do not represent actual conflict, but only preference differences between members. Whether or not this translates into influencing the party line is not given. To measure conflict, the stated positions should matter more than preference heterogeneity. Second, due to anonymity the data can’t be linked to external data sources such as faction membership.

The traditional data source is the analysis of parliamentary rollcall votes to analyze party unity or individual positions. This approach to measuring individual-level positions was developed for the U.S. context (Poole and Rosenthal, 1985), where there is little incentive for party unity, but a large incentive to adapt to the voters in one’s constituency. This is not the case in parliamentary systems, in which the government depends on the parliamentary majority (Bräuninger et al., 2016). Roll-call votes against one’s party can have dire consequences and therefore induce the necessity of loyalty and possibly discipline, even if preferences deviate. This leads to roll-call vote analysis underestimating intra-party conflict in parliamentary systems.

A less dire form to state deviating positions is political communication (Laver et al. 2003), as talk is comparatively cheap. Speaking against the party is much less consequential than voting. Accordingly, parties are less likely to apply disciplinary measures. Accordingly, numerous contributions analyzed legislative speech (Bäck and Debus, 2018; Proksch and Slapin, 2010) to estimate positions in parliamentary systems. However, in many parliaments parties select who speaks for them in parliament (Proksch and Slapin, 2012). As speaking time is scarce, it will more likely be allocated to members who represent the party line.

But there are means of communication parties can't influence directly. Interviews and quotes allow individuals to communicate deviant opinions but require a certain prominence and are potentially biased by the media. A specifically unrestricted and non-consequential form of communication is social media activity. Social media is comparatively free from agenda setting or selection power by political parties. An arena, in which personal preferences and individual strategic considerations dominate position taking.

Social media has been used successfully to estimate the preferences of users on Twitter (Barberá, 2015). As we are mostly interested in stated positions of politicians, we apply text analysis to position estimation on Twitter. Boireau (2014) and Ceron (2016b) apply Wordfish (Slapin and Proksch, 2008) models to the textual content to estimate positions on the left-right dimension. Ceron (2016b) shows that Twitter data produces valid estimates for individual politicians and uses these positions to successfully predict party fission and ministerial appointments. In this contribution, I extend the Wordfish approach to multiple dimensions and present a theoretical framework for this measurement. While Boireau (2014) briefly refers to Saliency Theory (Budge et al., 2001), it is not clear how this relates to the data generation process on Twitter. In the following section, I will present a way to account for the specific features of Twitter data.

Saliency theory and social media

Text analysis started mostly with the systematic analysis of party positions in the Comparative Manifesto Project (Budge et al., 2001) and led to numerous methodological innovations and countless substantive publications based on their data. While manifestos only provide party level data, the theoretical basis is also applicable to individual communication. Subsequently, these manifestos were analyzed without the original codings using quantitative text analysis (Laver et al., 2003; Proksch and Slapin, 2010). Based on the idea that specific words in political text are indicative for positions, the differences between word use is interpreted as distance. The assumption behind models like Wordfish and Wordscores (Laver et al., 2003) is to some degree based on Saliency Theory applied to manifestos before.

Budge et al. (2001) argue that politics as stated in manifestos is not directly oppositional. They do not take negative positions, but ignore the positive positions of the opponent and talk about their own issues. As Budge puts it, they are not pro-unemployment, but anti-inflation, therefore emphasizing their side of the issue and neglecting the opponent's. Saliency Theory was developed for and during the research on party manifestos which are "carefully considered and finely honed documents" (Budge et al., 2001) a feature not necessarily applicable to tweets. Party manifestos mirror the full scope of the political space as they are drafted to be general and apply to all fields. They have a catch-all, encyclopedic character. Twitter however is the opposite of a controlled, thought-out political environment, but a place for individual members and officials as well as party accounts to communicate to the public constantly without topic restrictions and limitations, closer to press statements than manifestos. Grimmer (2010) describes the content of press statements of politicians as their "expressed agenda," they signal attention toward a certain topic to their constituents. Press statements are used in the same way as Twitter: In contrast, they can be produced as often as wanted, are not limited to a certain timing and can be single issue. A single press statement does not contain a policy position as in Saliency Theory, but the combination does.

While Twitter data seems free, the reason for individual politicians to address a certain issue could be non-ideological. When we consider intra-party heterogeneity, we have to assume some division of labor. This is a problem of all individual salience measurement as there is heterogeneity inside parties in terms of shared workload. Parties have speakers for certain issue areas, send legislators into parliamentary committees and control government ministries. For politicians that have these roles, we need to account for this potential bias. I present a framework that allows modeling the hierarchical structure and multidimensionality.

Research design

These theoretical implications of measurement bias in parliamentary systems necessitate Twitter analysis of a party-centered parliamentary system with known dimensionality and according party wings. In this contribution, I will analyze heterogeneity in and between German parties. The main conflict in German politics is expressed in two dimensions. Traditionally, the economic left-right scale described party politics well enough. Over time, through further differentiation, the cultural dimension of liberal versus conservative attitudes became more important (Däubler, 2017). Accordingly, factions that will be considered as wings or tendencies have to be placed on at least one of these dimensions. Following Bräuninger et al. (2012),

factions are coded as being relatively conservative or economically liberal *in comparison to their party*.

Heterogeneity in German parties

The Social Democratic Party (SPD) has three major factions: the “Parlamentarische Linke” (Parliamentary Left, PL) which officially organizes economically left-leaning MPs in the parliamentary party group, the “Seeheimer Kreis” (Seeheim Circle, SEEH), a more conservative and business oriented group as well as the “Netzwerk Berlin” (Network Berlin, “NB”) (Bernauer and Bräuninger, 2009). The Seeheimer Kreis takes more conservative positions in economic issues but also on law and order issues (Decker and Neu, 2018). The Netzwerk Berlin is ideologically less clear, but seems economically closer to the Seeheimer Kreis, while not sharing their social policy positions (Niedermayer, 2013).

The Left Party (DIE LINKE) is the fusion of the PDS (German Socialist Party), which stems from the East German Communist state party, and a split-off of left-wing SPD politicians during the SPD-led government that imposed labor market reform. They are ideologically split in numerous factions: the pragmatic “Forum Demokratischer Sozialismus” (Forum for Democratic Socialism, FDS), the left-wing factions “Kommunistische Plattform” (Communist Platform, KP) as well as the “Antikapitalistische Linke” (Anticapitalist Left, AKL) and the “Sozialistische Linke” (Socialist Left, SL). Orthogonal to this conflict, the “Emanzipatorische Linke” (“Emancipation Left”) stands for a more post-materialist approach, focusing on environmentalism and gender.

In the **Christian Democrats (CDU and CSU)**, factionalism is less important (Decker and Neu, 2018). Traditionally, the “Mittelstandsvereinigung” (Middle Class Union, MIT) proposed economically right-wing positions, against the leftist “Arbeitnehmerflügel” (Wing of Employees, CAD). More recently, three culturally oriented factions, the liberal “Union der Mitte” (Union of the Center, UM) and the socially conservative “Werteunion” (Values Union, WU), as well as their less extreme parliamentary counterpart, the “Berliner Kreis” (Berlin Circle, BK).

The “natural ally” of the CDU are the **Liberals (FDP)**, which had two factions, the social liberal and the market liberal wing. While starting out as the kingmaker between the major parties, the FDP gradually moved to the conservative side of the political spectrum and with it elevating the market liberal forces inside, ending ideological factional conflict.

Traditionally, the **Green Party** is split into two major factions, the Fundis (Fundamentalists, FUNDI) and the Realos (Pragmatists, REAL). While the former was leftist and against governing, emphasizing the role as a social movement over party, the latter was actively lobbying for coalitions with the SPD (Decker and Neu, 2018;

Niedermayer, 2013). Today, Fundi members of parliament are considered the left-wing, while Realos are considered the moderate faction, both economically and socially.

The **Alternative für Deutschland (AfD)** has entered the Bundestag as a populist challenger in 2017. While starting as a mainly economically conservative party (Jankowski et al., 2017), it evolved quickly into a socially conservative anti-immigration party with right-wing tendencies. This internal conflict has led to strong factionalism inside the AfD: “moderate” ordoliberal economists of the “Alternative Mitte” (Alternative Center, mod) versus the nationalistic “Flügel” (The Wing, rw) and the national-conservatives (nk), mainly in eastern German states (Decker and Neu, 2018).

The membership in a faction is a more or less official act. Some factions are highly institutionalized and provide full member lists. Other “factions” can only be inferred by press articles or qualitative assessments. Bernauer and Bräuninger (2009) used a survey of MPs to assess themselves and others. In this study, faction membership was coded by the analysis of a wide number of sources (found in the Online Appendix). Based on 75 individual sources, faction associations for 246 MPs with Twitter accounts could be identified. Membership was coded if a news article, an official list or the MP themselves in an interview reveals faction membership explicitly. For the AfD, official faction referrals are very rare. In press articles, members were labeled “moderate,” “national conservative,” “ultra-right” based on previous affiliations and actions of the MPs. While this is far from optimal, it again makes the case for the necessity to develop quantifiable measures for intra-party heterogeneity. Table 1 summarizes the expectations of MP behavior based on their orientation.

I use the Twitter API implementation in the R package *rtweet* (Kearney, 2018) to collect data from the timelines of 500 German MPs for the year 2017. As retweets are considered affirmative, at least inside a party, a retweet is indicative of emphasis. However, I removed all Twitter handles, since they create artificial proximity of words of accounts. Analysis including hashtags and mentions creates slightly stronger clusters of parties, which can’t be considered common position, but a feature of social networks created by Twitter itself.

I relied on the *Quanteda* (Benoit et al., 2018) package to clean the data. To prepare the data, I removed all URLs, lower cased and cleaned for HTML code (like in emojis etc.). I removed stopwords, names of politicians, punctuation and numbers. Since tweets are quite informal and scaling mechanisms are very susceptible to clusters of unique terms, I removed very rare words (Slapin and Proksch, 2008), more particularly those words that were used by less than 100 accounts. This step is optional but otherwise requires removal of outliers later on. It also makes the wordplots used to evaluate the substantive content of the dimensions more difficult to interpret. Results from other specifications can be found in the Online Appendix.

Table 1. Factions and their ideologies in the German Bundestag.

party	name	social	economic	type	faction	count
AfD	Flügel	2	0	Tendency	RW	10
AfD	Alternative Mitte	−1	0	Tendency	MOD	17
AfD	Nationalkonservativ	1	1	Tendency	NK	24
CDU	Werte Union	2	0	Wing	WU	0
CDU	Berliner Kreis	1	0	Wing	BK	7
CDU	Union der Mitte	−1	−1	Wing	UM	5
CDU	Mittelstandsvereinigung	0	1	Wing	MIT	23
CDU	Arbeitnehmer	0	−1	Wing	CDA	1
FDP	Liberaler Mittelstand	0	1	Wing	LM	1
FDP	Liberaler Aufbruch	1	1	Wing	LA	0
FDP	Dahrendorfer Kreis	−1	−1	Wing	DK	0
GRUENE	Fundis	−1	−1	Wing	FUNDI	17
GRUENE	Realos	1	1	Wing	REAL	21
LINKE	Forum Demokratischer Sozialismus	1	2	Wing	FDS	4
LINKE	Antikapitalistische Linke	−1	−1	Wing	AKL	9
LINKE	Sozialistische Linke	1	−1	Wing	SL	11
LINKE	Netzwerk Reformlinke	0	0	Personalized Wing	RL	2
LINKE	Kommunistische Plattform	0	−2	Wing	KP	1
LINKE	Emanzipatorische Linke	−2	0	Wing	EL	3
SPD	Seeheimer Kreis	1	1	Wing	SEEH	18
SPD	Netzwerk Berlin	0	1	Wing	NB	15
SPD	Parlamentarische Linke	−1	−1	Wing	PL	18

As argued above, the assumptions of a purely ideological selection of issues and therefore expressed agenda do not necessarily hold for individuals inside political parties. To account for these effects, it is necessary to control for mechanisms that might lead to this behavior. To do so, I collected the committee memberships, government positions in ministries and mandate type of all members of the German Bundestag from the homepage www.abgeordnetenwatch.de, which is based on the less accessible database of the Bundestag.

4.2 Method: Canonical correspondence analysis

Measuring latent positions empirically means projecting them in lower dimensional political space. Two approaches dominate the literature: the theory-driven classification of particular issues as defining a dimension. The second approach is recovering the dimensions from the data itself, using methods of dimensional reduction (Benoit and Laver, 2012; de Vries and Hobolt, 2012). These approaches are inductive and require a posteriori interpretation. To allow interpretation, it is useful to consider additional results these models provide, the factor loading or feature scores used by the model to define the dimension and scale the position. For the analysis of social media, the creation of a priori dimensions is impossible due to the large amount of unstructured data.

While the substantive meaning of the many data sources available for position estimation differ, the methods applied to them have been quite similar (Lowe, 2016). To make qualified assumptions about the substantive meaning

of the dimensions, we have to interpret the features which constitute the dimension. Based on this, we can interpret the proximity of the feature and the case as being similar and content-wise related. Lowe (2016) suggests correspondence analysis (CA) and biplots to maximize interpretability (Greenacre, 2007).

A major problem addressed in the previous section are non-ideological causes of salience. Due to intra-party division of labor, individual politicians might have issues they emphasize, not because they are more conservative, but because they represent their party on these issues. For example, members of the labor and welfare committee might discuss issues that are considered “leftist,” not because they are leftist themselves, but because they are members of the committee.

Ter Braak (1987) presents *canonical correspondence analysis* which incorporates multivariate analysis of “environmental” factors in the scaling of positions. Therefore, we can reduce the impact terms used by all members of a committee on the derived ideological position.

Dimensions and determinants of heterogeneity

Based on Twitter data since January 2017, I estimate the ideological position of 498 members of the German Bundestag who have active Twitter accounts. First, I will show the dimensionality of the Twittersphere and what issues and terms distinguish politicians from one another. Then, I will test the effect of faction membership on these respective dimensions.

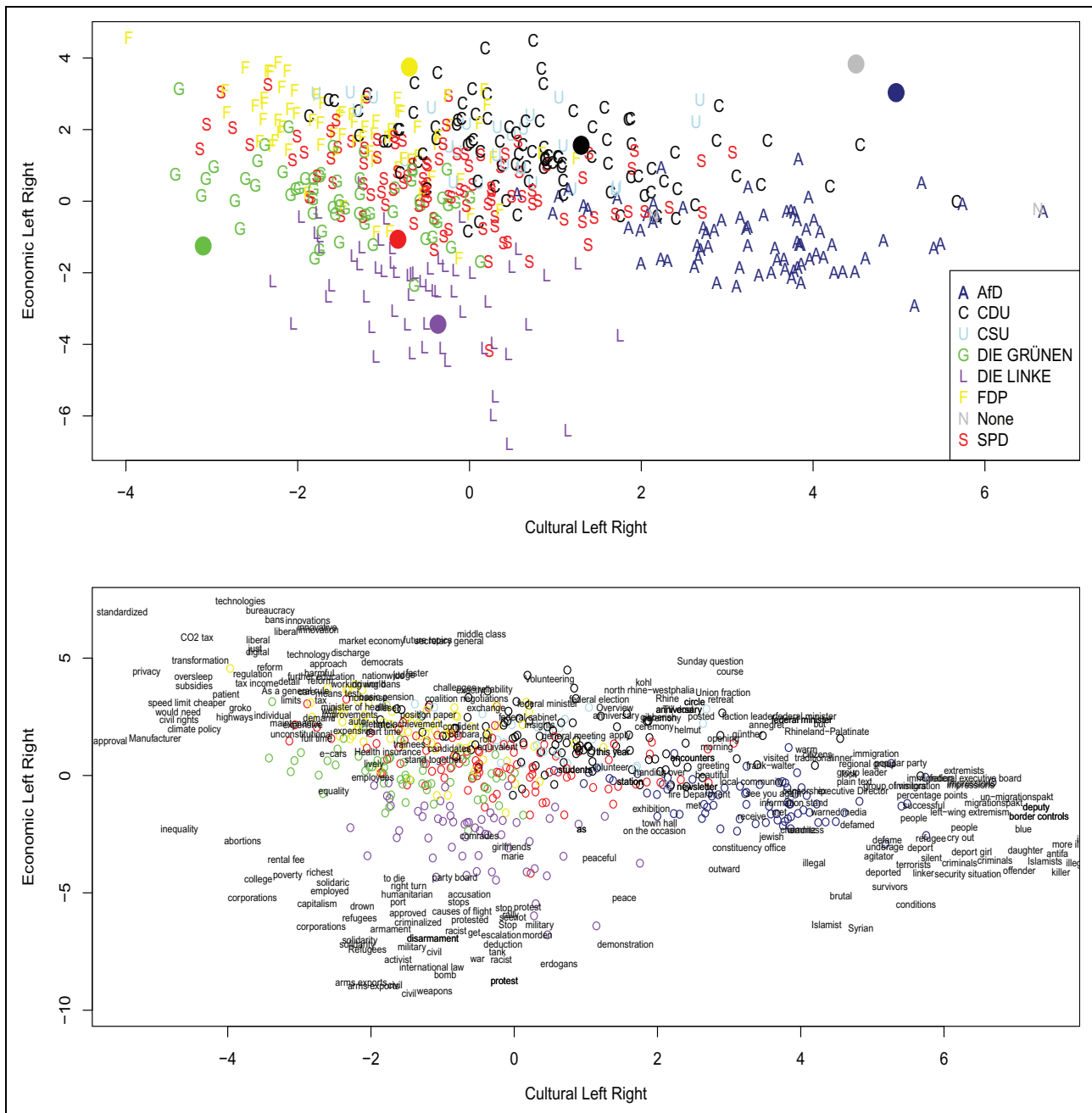


Figure 1. First and second dimension. Terms automatically translated and placed approximately. Dots indicate expected position based on CHES 2017.

Dimensions of Twitter space

Correspondence analysis extracts dimensions based on their ability to explain variation in the data. I chose the first three dimensions based on inspecting the screeplot (see Online Appendix figure 5.2). The main dimension of difference extracted from the model can be interpreted as the emphasis on migration (see Online Appendix). In other words, the biggest difference between politicians in Germany is whether or not they talk about refugees. The second dimension is the classical left-right dimension, while the third represents

liberal emphasis not related to migration. Dimensions one and three can only be interpreted in combination with the underlying left-right dimension. They have to be separated.

To compute the *economic* left-right dimension I remove all terms which also correlate to migration and cultural salience and subtract the corresponding coordinates. To compute the *cultural* dimension, I add these migration and cultural terms to the left-right dimension and add the corresponding coordinates. The results are shown in Figure 1, the upper of which shows the positions of all 500 MPs in

political space (I removed one outlier on the third dimension).

We see the parties cluster as we would expect them based on the underlying dimensions. The expected positions from the Chapel Hill Expert Survey (Polk et al., 2017), scaled on the Twitter dimensions, overlap with the party clusters derived here. Only the AfD seems less economically conservative and the SPD very heterogeneous on the cultural dimension.

The terms are scaled accordingly and can be observed in the lower part of Figure 1. To validate my findings, I first substantiate the dimensions based on the content of the dimensions and the general party positions. Then, I test whether individual differences in faction membership influence the relative position inside their parties. In the upper left quadrant, we have terms related to civil liberties from civil rights to data protection. This area is occupied by the Liberals. Straight on top, we find terms like market democracy and middle class, subsidies and innovation. Moving to the left end of the spectrum, we see environmental issues, covered by the Green Party. In the overlapping areas, we find terms like CO2 taxation, highways, regulation. Moving down the economic left-right scale, we find cultural left-wing issues such as women rights, abortion, equality and equal pay. Further down in the area of the Left Party, we see straight up terms such as capitalism, solidarity, rents, pensions. Moving along on the cultural axis, we now find issues like refugees and anti-war efforts. In the center of the distribution, we find the quite scattered SPD, some of which are part of the FDP cluster, while some move quite for the cultural right, overlapping with the CDU. The CDU occupies issue areas that are quite “apolitical.” Their tweets mainly communicate party events and district visits. However, some are scattered into FDP territory while some are closer to the AfD. The AfD is the most separate cluster. In contrary to expert surveys, the AfD is not economically right-wing. It is about as conservative as the SPD and less conservative than the CDU. Instead, the AfD polarizes heavily on the cultural dimensions. They occupy terms such as migrant, illegal, terrorism, deportation and border control. While this seems to be surprising, the cause is that the AfD talks about little else, and specifically not about social or economic issues. This is why the model can’t really judge the AfD’s economic position and scales them at 0.

Factional determinants of positions

After substantiating the meaning of the dimensions and successfully placing the party clusters, the question remains whether the extracted positions are valid on the **individual level**. Are individual differences inside parties indicative for intra-party heterogeneity?

Based on the concept of a two-dimensional policy space and the relative factional orientations, I test their effect on

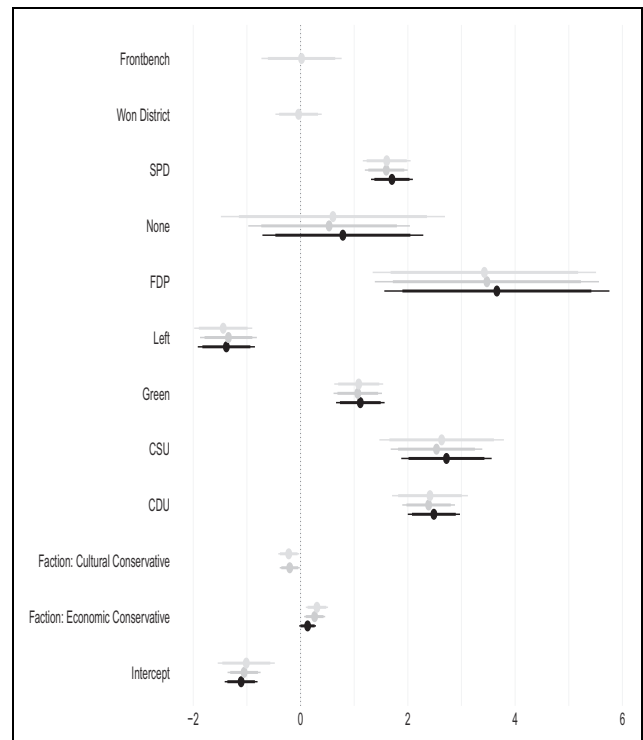


Figure 2. Effect of faction membership on the economic dimension. Error bars indicate 95 and 90 percent confidence intervals. $N = 489$. Regression tables in the appendix. Reference Party: AfD.

the respective dimensions. All in all, 247 individuals identified with both a Twitter account and a faction membership or known ideological orientation. Each of them was assigned their factions political orientations, based on Table 1. All other individuals were coded zero, as if having no orientation, leading to a very conservative estimate. I test the effect of faction membership on the economic left-right dimension.

Figure 2 shows the results of three OLS-regressions. In the first model, I test the main effect. In the second model, I include the cultural faction orientation as a control variable. In the third model, I control for mandate type since party, faction and mandate type are not independently distributed. I also control for being a frontbencher, as we would assume that this correlates with faction membership and ideology and might bias estimates.

In general we can see that the effect of parties dominates almost completely: Left-wing parties are of course more left-wing on Twitter, an observation we already encountered in the dimensional analysis. However, members of economic right-wing factions are slightly more economically right-wing than their counterparts. While this effect is small, it is statistically significant. Of course, the low number of actual cases in which faction membership is known is low and inflated by many zeros. It replicates the results of Bernauer and Bräuninger (2009) who find 3 percent of variation explained by faction membership.

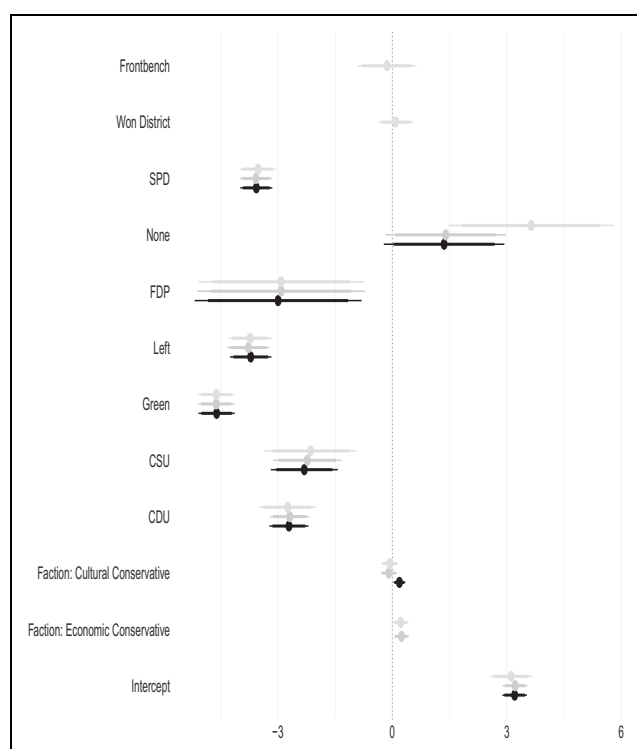


Figure 3. Effect of faction membership on the cultural dimension. Error bars indicate 95 and 90 percent confidence intervals. $N = 489$. Regression tables in the online appendix. Reference Party: AfD.

On the cultural dimension, which is tested analogously in Figure 3, we also find the expected effect, albeit small, after controlling for the faction's economic orientation.

Conclusion

In general we can constitute that the expected effects are visible in social media. Members of conservative parties and factions are more likely to tweet conservatively, therefore validating measurement. However, the strong party effects we observe indicate that factions play a minor, yet significant role in MP's expressed positions.

This contribution presents and validates a new method to extract political positions for individuals. Through the application of quantitative text analysis of tweets, we can estimate individual positions of political actors, even in party-centered systems. Ceron (2016b) showed the first application of a comparable method, I provide multidimensional ideal points for all Twitter using members of a parliament and show that the underlying dimensions have substantive meaning for intra- and inter-party competition. Like Ceron, I can validate my findings, showing that Twitter is a valid and useful data source that is easily collected and, along with the right tool set, easily analyzed.

This method can contribute to various fields in political science from research on party discipline, coalition research or party competition, in which individual

preferences or positions in contrast to parties are relevant. One particular advantage is that it not only allows to scale members of the same legislature, but extends to any politician or institution with a Twitter account. Future research will extend this approach to nominally non-ideological factions such as regional and demographic party organizations like youth wings or state-level parties as well as state-level legislators. In principle we can project ministers, politicians or interest groups in the same political space. This would allow to tackle questions of multi-level party competition and connect geographic intra-party heterogeneity and regional party systems. It would also allow the comparison of individual positions in different stages of political careers.

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Supplemental material

Supplemental material for this article is available online and at <https://github.com/msaeltzer/birdfish/tree/master/partypolitics>.

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3. INTRA-PARTY ROOTS OF AFFECTIVE POLARIZATION

The second article „Intra-party Roots of Affective Polarization“ is submitted to the Journal of Politics.

Page numbers on the bottom refer to page numbers of this dissertation, page numbers in the top right corner refer to page numbers inside the respective document.

Intra-party roots of Affective Communication on Social Media

Marius Sältzer

May 1, 2021

Abstract

Affective polarization in the US is mirrored by increasing partisan warfare, incivility and verbal attacks on the opposing party in social media. Traditional theories of negative campaigning offer few answers to this development, as negativity on social media is not induced by competitive inter-party elections, but negative partisanship. We argue that elite affective polarization on social media is a result of nationalized politics in safe electoral districts, which creates incentives for legislators to polarize affectively in order to prevent primary challenges. We present a novel text-based spatial measure of affective polarization and partisan warfare in social media. We separate affective from issue polarization in social media, based on >1,200,000 Twitter messages of 411 representatives between 2017 and 2020. We demonstrate it is a strong predictor of conventional ideology as measured using roll call votes. We show that safe, non-competitive districts induce affective communication. The effect of district safety is intermediated by the presence of a primary challenger

1 Introduction

Partisan polarization has been attributed as one of the most important social problems the United States is facing (Finkel et al., 2020) and a well established fact in the scientific literature (Layman, Carsey and Horowitz, 2006). The growing dislike and anger between elites and voters of the two major political parties leads to potential for violence and reduces potential for fostering bipartisan compromise on salient issues. Concepts of societal polarization (Mason, 2015), affective polarization (Iyengar and Westwood, 2015; Iyengar et al., 2019) or negative partisanship (Abramowitz and

Webster, 2016) describe a form of divide between the parties that is not entirely captured by positional differentiation on substantive policy preferences, but by party identification itself.

Political actors often drive or at least mirror this divide (Diermeier and Li, 2019) by attributing blame to or critiquing their political opponents as a means to mobilize their voters and appeal to disaffected groups. These "affective" strategies have been referred to as "partisan warfare" (Theriault, 2013) or negative partisanship (Abramowitz and Webster, 2016). This growing polarization becomes particularly apparent in social media discourse, a medium solely controlled by the individual candidate, yet showing pronounced partisanship and aggression.

Negativity in communication is traditionally understood as "negative campaigning" (Lau and Rovner, 2009; Kahn and Kenney, 1999; Iyengar et al., 1994), the focus often centering on the opposing candidate or their policy platform. While this concept is helpful for explaining the use of attack ads, communication in social media follows its own rules.

Instead of traditional negative campaigning, which has been shown to be more prevalent in competitive districts, partisan warfare on social media is nationalized, party-centered and employed by candidates from ideologically partisan districts. We argue that affect in social media is induced by intra-party factors, not political competition with the opposing party. Politicians use purely partisan attacks as a substitute strategy to mobilize voters and fend off primary challengers. This leads to stronger partisan polarization even beyond issue ideology in party strongholds.

To test these hypotheses, we analyze Twitter of 411 members of the House of Representatives between 2017 and 2020. We apply Latent Semantic Scaling (LSS), a semisupervised association model for document scaling which only requires a small number of seed words to produce word embeddings (Watanabe, 2020). We separate affect from issue by estimating two models of word use.

In line with theory, district preferences predict affective extremism. But in contrast, electoral incentives that increase intra-party competition drive partisan attacks. Very safe districts for either party and the threat of primary challenge lead to more partisan communication. More so, affective communication increases with district partisanship, if incumbents of the Republican party are challenged.

2 Partisan Warfare and Negative Campaigning

The simultaneous increase in affective polarization and the political importance of social media has generated interest as to how related these two phenomena are. Social media has become an increasingly uncivil battleground for partisan politicians. While this has been attributed to affective polarization from the general public and social media companies alike, politicians have increasingly used "affective" communication behavior that speaks to affect and partisanship. Partisan warfare (Theriault, 2013) goes "beyond ideology" and has long been associated with negative campaigning (Kahn and Kenney, 1999; Iyengar et al., 1994). Negativity is here defined as being about the opponent, which is the "directional" interpretation. This definition stems from research on attack advertisements. As no politicians would produce and buy airtime for a positive ad about the opponent, they are by definition negative. Political language becomes more negative and the creation of out-groups makes polarization center on the political opponents instead of policy. Research on political messages has focused on negative tone (Soroka, 2012). However, finding the target is challenging. Messages about hurricanes might as well be categorized as negative in this regard. "Affective" political communication is defined by being both focus on the opposition and explicit negative tone (Iyengar, Sood and Lelkes, 2012), like a targeted attack on the political opponent. This often involves use of contextually pejorative terms like "socialist" or "right-wing" or terms used in the same context. It emphasizes partisan diversion and creates or at least entrenches, in-groups and out-groups.

Intra-Party Competition and Partisan Polarization The exact choice of message is strategic in nature. As Diermeier and Li (2019) argues, it is not necessary to assume politicians to be "affective" in terms of being affected by negative emotions for the opponent, but act strategically affective to interact with their voters. In general, we would assume that just like issue positions, partisanship would be more pronounced in districts with a high party vote share.

Studies of negative campaigning in political ads on the other hand argue that close districts are more likely to see negative campaigning. Negative campaigning is a correlate of the intensity of political competition (Lau and Rovner, 2009; Grofman and Skaperdas, 1995).

Candidates in very safe districts face an electorate that is made up mostly by their own party. Accordingly, they are more likely to be successful with partisan clues. Attacks on the political opponent are very likely to satisfy partisans. They might attempt to create a common out-group in ideologically homogeneous electorates. Safe districts will make it more likely to polarize based on partisanship.

H1: *The safer a district, the more affective is communication.*

Partisan attacks on the other hand are not a strategy to win over larger shares of the general electorate. We argue candidates use issue polarization for intra-party competition, instead. Polarization has often been attributed with primary challenges (Boatright, 2013; Brady, Han and Pope, 2007; Burden, 2001; Fiorina, Abrams and Pope, 2005; Jacobson, 2012, p. 17). While the evidence in terms of roll call votes is thin (Hirano et al., 2010), other signals of partisanship might be induced by the threat of challenge.

The probability of facing a serious challenge from a co-partisan rather than the opposite party is higher in safe districts. Ideological challengers might then induce a substitution effect, appealing to partisans by offering a more viable alternative. Issue ideology itself might damage a legislator so vulnerable candidates might avoid taking issue positions (Shepsle, 1972) and instead focus on the political opponent. If incumbents can not win on issues, they might instead focus on the opposing party.

H2: *Expected ideological challenge leads to relatively more affective polarization*

While primaries might introduce additional polarization and partisan warfare, they are also an instrument to generate responsiveness. In distinctively partisan districts, moderate incumbents might not be representative of the district and the primary electorate. Especially for the Republican party primary challenges seem to be tools to make sure extreme districts are represented by extreme candidates (Boatright, 2013).

H3: *Districts with challenged incumbents see more affective polarization based on their partisanship*

3 Disentangling Affect

To separate affect and issue ideology in political communication, we will present a new measure based on social media text by 411 members of the 116th House of Representatives. To test our hypothesis, we need to establish a connection to ideology, district partisanship and primary challenge. The most established indicator of legislator ideology is scaling their voting behavior using the NOMINATE algorithm as provided by (Lewis et al., 2019). For district preferences, we used Cook report Partisan Voting Index (PVI) (Cook, 2020), a widely accepted measure for district competitiveness. This index is polarized by giving Democrat leaning districts negative values. This range is then divided by 10 to bring it to a more comparable scale and more interpretable coefficients.

To measure the expectation of primary challenges, we took hand-coded data of the 2020 primaries. Of course, candidates cannot know whether or not they will be challenged. However, we can make the assumption that politicians in districts that are likely challenged in the future know this vulnerability and adapt their behavior. To measure the character of these challenges, each district primary for the House elections 2020 was evaluated if ideological based on expert coding (Cowburn, 2020).

Affect and Ideology Politicians can use political communication to represent their position to their voters. They communicate through political advertisement, interviews, speeches and increasingly, social media. Of all these channels, social media seems most "free" in terms of low cost and low party or editorial control over the message. Twitter has become one of the main outlets for politicians to communicate their public statements (Russell, 2018, 2020; Barberá et al., 2019).

Measuring positions from text has a long tradition in political science (Laver, Benoit and Garry,

2003; Slapin and Proksch, 2008; Lauderdale and Herzog, 2016). Scholars measured issue emphasis in election manifestos (Budge et al., 2001), arguing that the specific emphasis of particular owned issues indicates position (Budge and Farlie, 1983). Social media text allows us to search for dimensions of interest. We can give each legislator a "position" in terms of issue-based distance to the opposing party and second in terms of the affective distance.

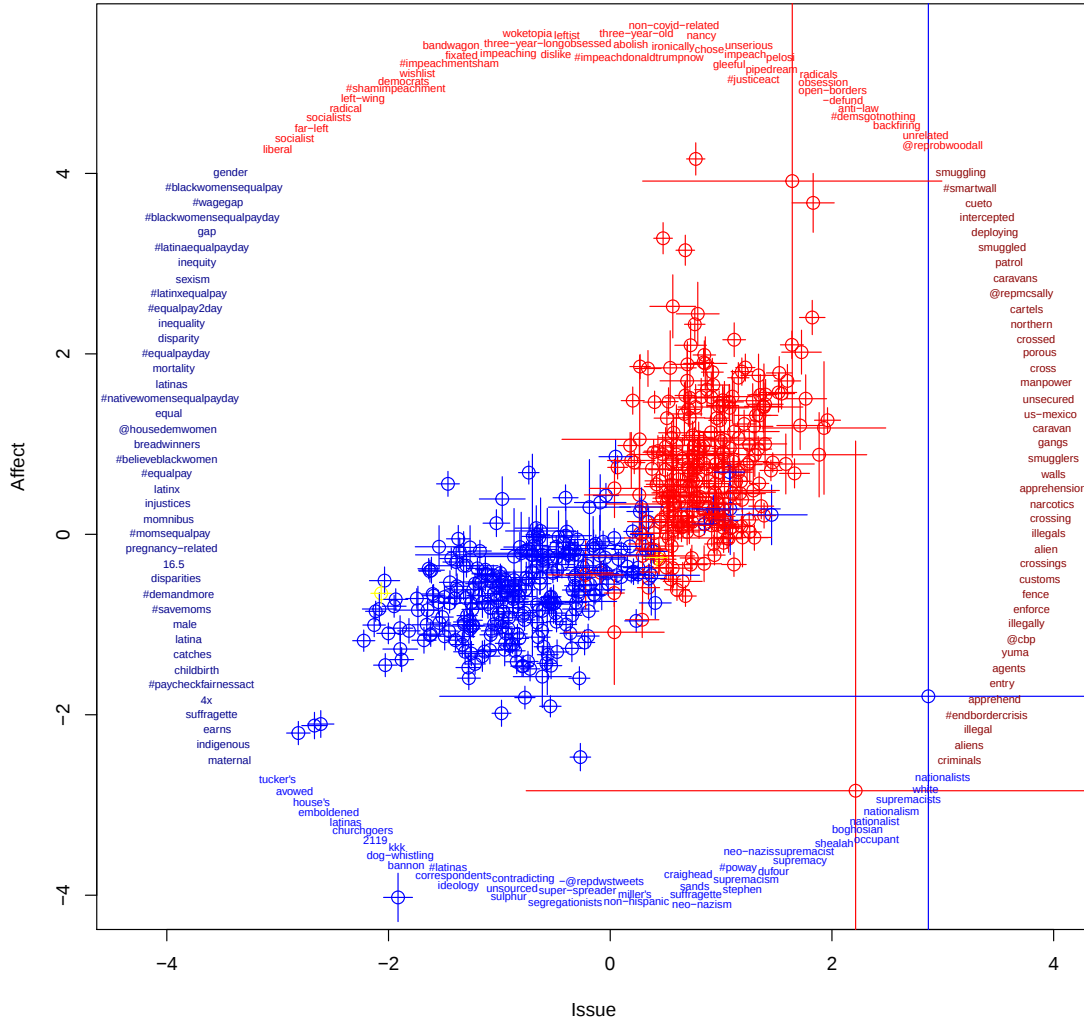


Figure 1: Affect and Issue Position

Several scaling mechanisms have been suggested, mostly differentiated between supervised and unsupervised scaling approaches. Approaches like dictionaries define particular topical categories as progressive or conservative. However, dictionaries have to be adapted to each corpus and use case (Laver and Garry, 2000). For Twitter in particular, vast varieties of topics make supervised

approaches difficult.

Unsupervised approaches (Ceron, 2016; Sältzer, 2020; Slapin and Proksch, 2008) solve this problem by extracting the main dimension of difference between texts and are closely related to scaling mechanisms used for roll call votes (Clinton, Jackman and River, 2004). But this main dimension of difference does not always have to be ideological.

A compromise is semi-supervised learning. Watanabe (2020) presents a new approach to unite the advantages of each in his Latent Semantic Scaling model (LSS). LSS allows defining the end-points of scales based on dictionaries and lets the model "learn" associated terms which co-occur in the same context using word embeddings. Watanabe (2020) shows that we can create whole dictionaries that measure the desired theoretical concept by only pre-processing a low number of keywords.

As we want to separate these two dimensions to focus on ideology and affect distinctively, we need to combine the theory-driven approach of dictionaries with the model's ability to find **all** terms connected to this. We based the analysis on a total of 1,118,255 tweets collected using the rtweet package (Kearney, 2018) wrapping the Twitter API. The text was only transformed by lower casing (no stopwords removed, no stemming) and then aggregated to the individual level; providing full samples of legislators' posts. To identify the main underlying dimension, we applied exploratory correspondence analysis (Lowe, 2016), to find keywords that differentiate the parties best. Then, we separated terms associated with political issues and terms that relate to the political opponent.

The Issue Dimension relates to terms that define political conflict. As Russell (2020) argues, the most important issues in American politics are Macroeconomics, Civil Rights and Health. To identify these issues we used terms relating to topics of health insurance (#healthcarenow), abortion (#prolife, reproductive rights). For civil rights we used topics of racism (riot, racism, abolition, #blm, police violence, mobs), gender (equalpay, lgbt) and migration (borderwall, detainment). The macroeconomic topic mostly centered around tax policy (#taxcutsnow, #goptaxscam, worker, rich etc.) We also added issues that are particular to the specific party like focus on religion or the military (military, defense) for the Republicans and focus on gun violence (#endgunviolence)

and climate change (climate, green new deal) for the Democrats. To account for the role of the SARS-Covid-19 crisis, we added the terms herd and immunity for Republicans and #stayathome on the Democrat side, based on the most likely used terms for both parties in that time frame.

The Affective Dimension on the other hand is defined by group descriptions of the political opponent. It is defined as terms that are used to describe the political opponent with a negative connotation. Republicans use terms that describe liberal extremists: "liberals", "socialists", "radicals", "extremists" or "libtards". While these terms of course have an ideological connotation, they are not issue-based, but group level terms for the political opponent. Democrats use terms like "rightwing", "supremacists", "fascists", "nationalists", "churchgoers" or "neoconservatives" but also emphasize the corruption of Trump government with terms like "cronies" and "complicity".

These keyterms (Full list in appendix) are enriched using word embeddings. Figure 1 plots the affective dimension on the y-axis against the issue dimension, along with confidence intervals of three standard errors. Top terms that lead to positions on the respective dimensions are plotted on the end of the scales.

The most divisive issue that separates Democrats and Republicans is the emphasis on civil rights. Democrats focus strongly on gender and racial issues, while Republicans focus on immigration. Some observations are extreme outliers with large confidence intervals, which is solely explained by the lack of text for those legislators. A total of 6 who's standard error was larger than 0.2 were removed them from subsequent analysis.

4 Validation

Developing a new measure for a concept requires clearly showing its validity. There are three components to this spatial interpretation of affect: semantic validity in terms of negativity, spatial validity in terms of measuring distance between representatives and predictive validity as plausibility of individual legislator positions.

For semantic validity, I compare *tone* and *ideology*. As argued above, negative campaigning in social media is often addressed as tone. If this measurement is a valid indicator of negative

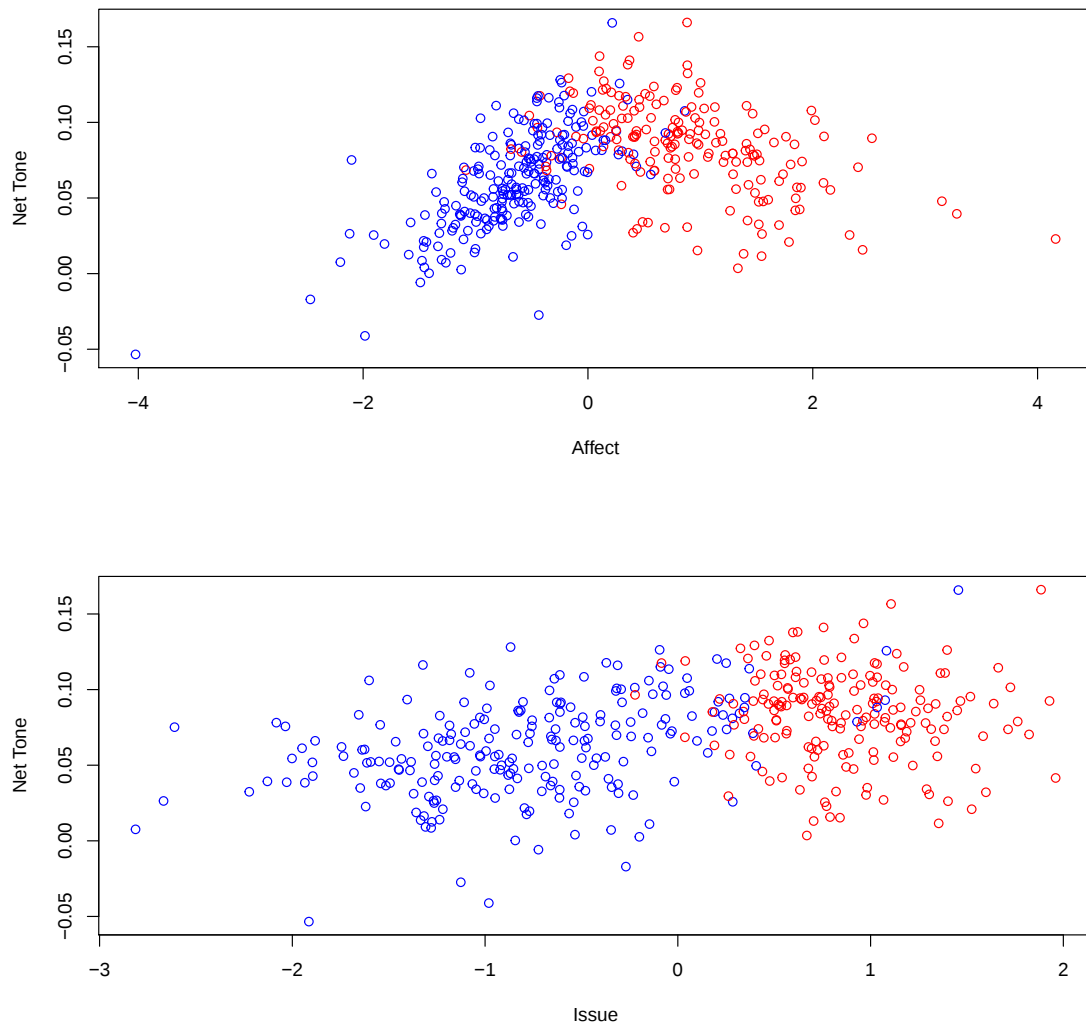


Figure 2: Tone and Affect

partisanship, not general negativity, we would expect a more generally negative language to be connected with affective, but not issue-based communication. Figure 2 shows the average tone based on lexicoder sentiment dictionary (Young and Soroka, 2012). More affective members of both parties use a much less positive tone. This is further evidence that negativity and affect are concepts unrelated to strategically induced negative campaigning, but aspects of polarization.

Figure 3 shows how roll call positions and Twitter positions on the affective and issue scale correspond to one another. First, we see a high correlation of both scales, both inside and between parties.

Figure 4 shows the relative weights of the different measures to explain roll call vote positions

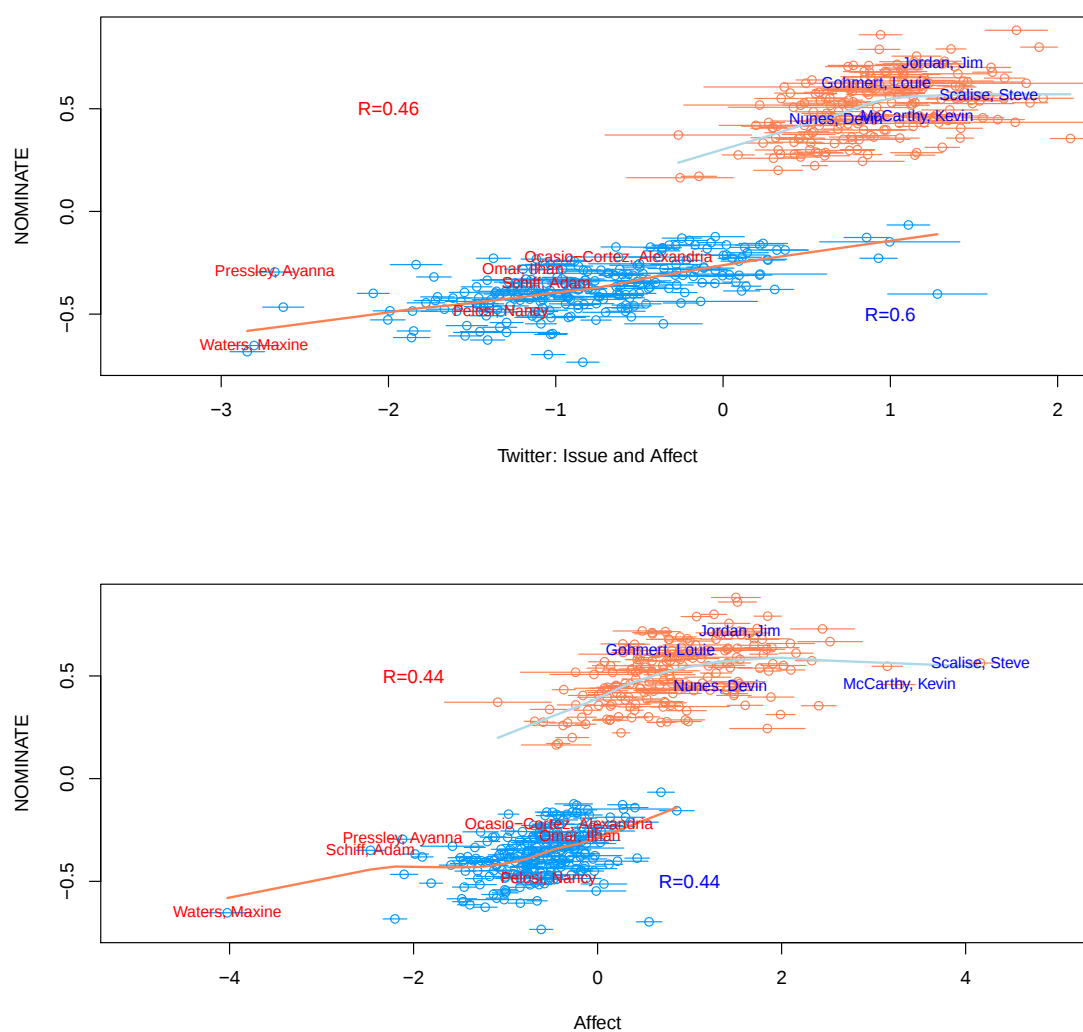


Figure 3: Twitter Text and NOMINATE in Comparison
Confidence Intervals are based on three standard errors

on NOMINATE: We can see that PVI, issue ideology and affect all explain parts of this variation, while the combination is the best predictor. Ideologically partisan districts are more likely to have representatives that are ideologically extreme. However, issue ideology is much better in predicting district preferences and roll call votes.

It becomes obvious that this correlation demonstrates a certain validity of the approach, but also some differences. Typically, NOMINATE is interpreted as ideology. However, sometimes the intuitive perception of ideology does not fit the results. One example would be the relative positions of ideological "radicals" and the party leaders. In NOMINATE Nancy Pelosi is more extreme than members of "the Squad" of Ilhan Omar, Rashida Tlaib, Alexandria Occasio-Cortez and Ayanna Pressley. However, most anecdotal evidence leads to the assumption that the opposite is the case. Using the Twitter ideology measure, we can see that at least two of these legislators are much more extreme on social media than in RCV.

The affective dimension is not defined by the "ideological" extremists in terms of roll call votes, but by Maxine Waters on the left, and Steve Scalise on the right. Party leaders, who focus mainly on national political conflict are here the extreme points.

5 Intra-party Roots of Affect

After establishing the validity of these measures, we focus on the connection between the affective dimension of partisan communication and elections.

We argued in Hypothesis 1, that not competitiveness, but to the contrary, safe districts predict affective communication. In figure 5, we can see the effect of district safety (measured in PVI/10) on affect. It shows that in contrast to theories on negative campaigning, safe districts indicate more negative communication. This is in line with the idea that affective and negative communication in social media is less of a district-level strategy of competition, but participation in a national ideological debate. This effect is also visible for issue-based communication. As one would expect given the high correlation of these dimensions, district "ideology" leads to polarization, both and issues and partisanship.

This assumption is underlined by findings regarding hypothesis 2, the role of ideological chal-

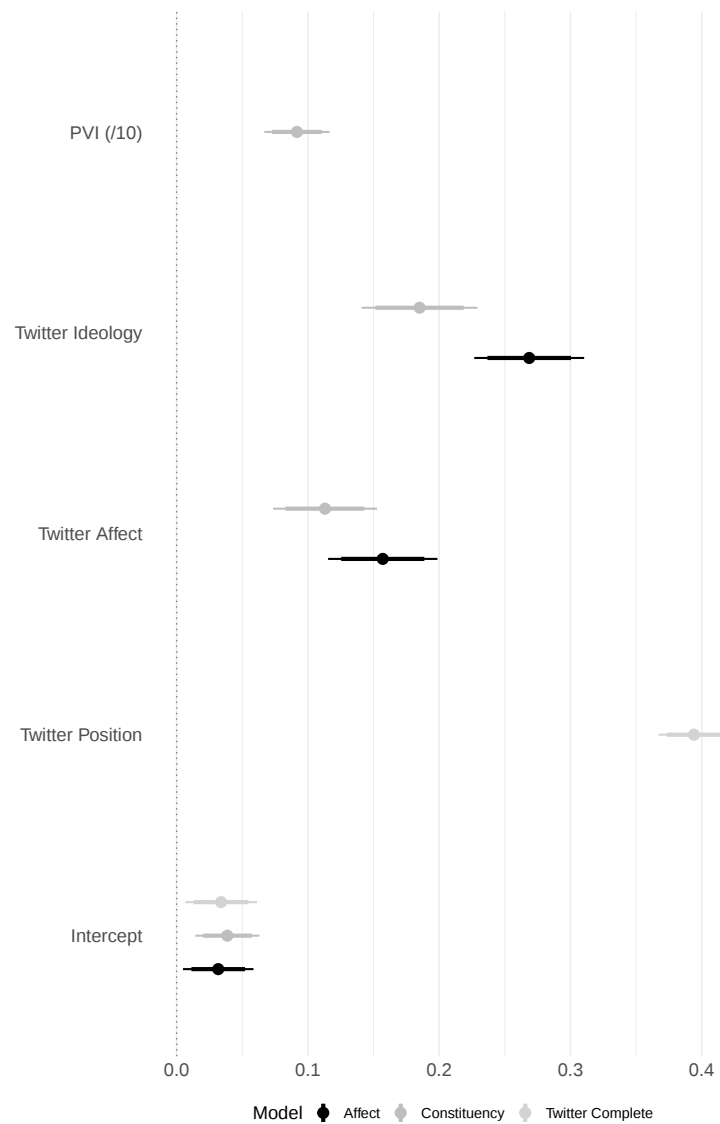


Figure 4: Correlations with NOMINATE
5% and 1% percent confidence intervals

lengers.

Of course the direction of causality is counter-intuitive here, as the fact of being challenged is the independent variable in a regression, but not in theory. However, as regressions only depict correlations, this way of modeling shows this connection most transparently ¹

We find that ideological challenge is negatively correlated with affective Republican partisanship. In other words, the more affective the legislator communicates on the right, the less likely he is challenged, if he is a Republican. We do not find a significant effect for Democrats, however.

¹For the inverse logistic regression, see appendix: While district safety increases likelihood of challenge, affect reduces it.

This finding is rather surprising but is in line with the generally stronger explanatory power of affect for Republicans. As we saw above, Democrat positions are more distinct on issue grounds than affect, accordingly, they might be more likely to be punished on the issue dimension (see appendix for analogous plots for NOMINATE and the ideological dimension that show no effects).

A closer analysis is conducted in models three and four, which show the interaction between challenge and ideology. We can see that while in general challenged legislators are less affective, they become more affective the more partisan the district. In other words, they respond to the voter preferences if challenged.



Figure 5: Affective Communication

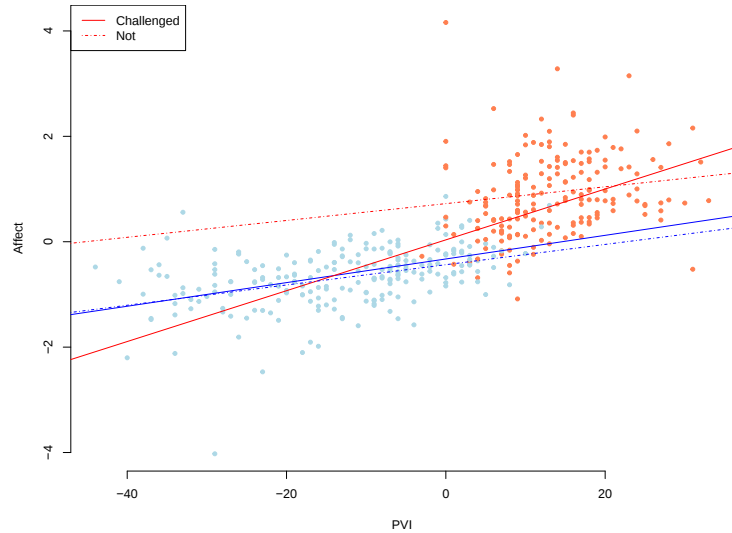


Figure 6: Mediated Effects

6 Discussion

Social media has developed into one of the main arenas of campaigns and party politics. In the US in particular, partisan polarization is increasingly expressed through verbal attacks at the political opponent, and diffuses towards partisan followers, dividing the electorate as a whole. This contribution provides a way to conceptualize and measure this divisive behaviour, and offers some explanation on its causes.

The question why politicians choose to polarize on **partisan warfare** instead of ideological issues has important implications for affective polarization. The fact that affective communication is driven by intra-party factors shows that the primary system and systematic redistricting create incentives for partisan warfare. This is important for the roles of electoral institutions on the supply side of polarization. While voters are an important part of affective polarization, politicians respond to these demands based on their intra-party incentives.

These forms of incivility and negativity are not a sign of lively competition for issues, but a result of partisan entrenchment. The ever more safe strongholds of the parties drive partisan conflict, even though they are not really competitive. This runs counter to the intuition that inter-party competitiveness drives negative campaigning but adds a whole level of problems to partisan

redistricting and partisan sorting. As the United States move away from a system of "strategic" negativity into a conflict laden social polarization, the existing institutional set up might reinforce the problem (Reilly, 2002).

While we can find an association between behavior and primary challenges, the direction of causality is not clear to this point. Future research should apply this approach in a dynamic perspective and analyze the responses of incumbents to challenges and the decision of candidates to challenge in sequence.

Lastly, we can find differences between both parties in terms of relevance of the affective dimension. In general, Republicans are more differentiated in terms of affect, while Democrats are more distinct in terms of issues. This transfers to intra-party challenges as well and might indicate that intra-party conflicts might be more issue-based within the Democrats and more affective within the Republican party.

We also find that primary challenges lead to more responsiveness towards district partisanship for Republicans. This is in line with Boatright (2013)'s finding that challenged Republican incumbents are likely less radical than their districts.

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7 Appendix

Table 1: Seed Terms for Latent Semantic Scaling

	Republican_Affect	Democrat_Affect	Republican_Topic	Democrat_Topic
1	libtards	churgoers	immunity	blacklivesmatter
2	far-left	cronies	herd	climate
3	socialists	ideology	bureaucrat*	criminalize
4	liberals	complicity	officer	#raisethewage
5	left-wing	nationalists	taxcuts	raise
6	leftist	neoconservatives	defense	#goptaxscam
7	communis*	rightwing	pro-growth	worker*
8		extremists	religious	defund
9			firearms	brutality
10			pro-life	#endgunviolence
11			prolife	abolition*
12			bornalive	healthcare
13			family-owned	richest
14			pro-business	racism
15			business*	deportations
16			rural	xenophobia
17			well-qualified	sexism
18			borderwall	homophobia
19			wall	pollution
20			god	contraception
21			immigrants	gender
22			aliens	eviction
23			military	lgbtq
24			criminals	#flattenthecurve
25			illegal	anti-immigrant
26			gang	reproductive
27			hiring	anti-health
28			paychecks	pregnancy-related
29			mobs	wealthy
30			anarch*	
31			riot*	

Table 2:

<i>Dependent variable:</i>	
	Challenge
Absolute District Extremity	0.025** (0.012)
Absolute Affect	−0.406** (0.198)
Constant	−0.717*** (0.212)
Observations	412
Log Likelihood	−258.556
Akaike Inf. Crit.	523.112
<i>Note:</i> *p<0.1; **p<0.05; ***p<0.01	

Table 3:

	<i>Dependent variable:</i>	
	Twitter Affect	ideology
	(1)	(2)
PVI (/10)	0.218*** (0.030)	0.236*** (0.025)
Democrat:Id. Challenger	0.071 (0.086)	0.157** (0.072)
Republican	1.055*** (0.105)	1.142*** (0.089)
Republican:Id. Challenger	-0.332** (0.134)	-0.338*** (0.113)
Intercept	-0.408*** (0.063)	-0.544*** (0.053)
Observations	412	412
R ²	0.619	0.726
Adjusted R ²	0.615	0.723
Residual Std. Error (df = 407)	0.624	0.527
F Statistic (df = 4; 407)	164.964***	269.592***

Note:

*p<0.1; **p<0.05; ***p<0.01

Table 4:

	<i>Dependent variable:</i>		
	NOMINATE Dimension 1		
	(1)	(2)	(3)
Twitter Position	0.394*** (0.010)		
Twitter Affect			0.092*** (0.010)
Twitter Ideology		0.157*** (0.016)	0.113*** (0.015)
PVI (/10)		0.269*** (0.016)	0.185*** (0.017)
Intercept	0.034*** (0.011)	0.032*** (0.010)	0.039*** (0.009)
Observations	412	412	412
R ²	0.777	0.787	0.825
Adjusted R ²	0.776	0.786	0.824
Residual Std. Error	0.215 (df = 410)	0.210 (df = 409)	0.191 (df = 408)
F Statistic	1,425.825*** (df = 1; 410)	755.208*** (df = 2; 409)	643.340*** (df = 3; 408)

Note:

*p<0.1; **p<0.05; ***p<0.01

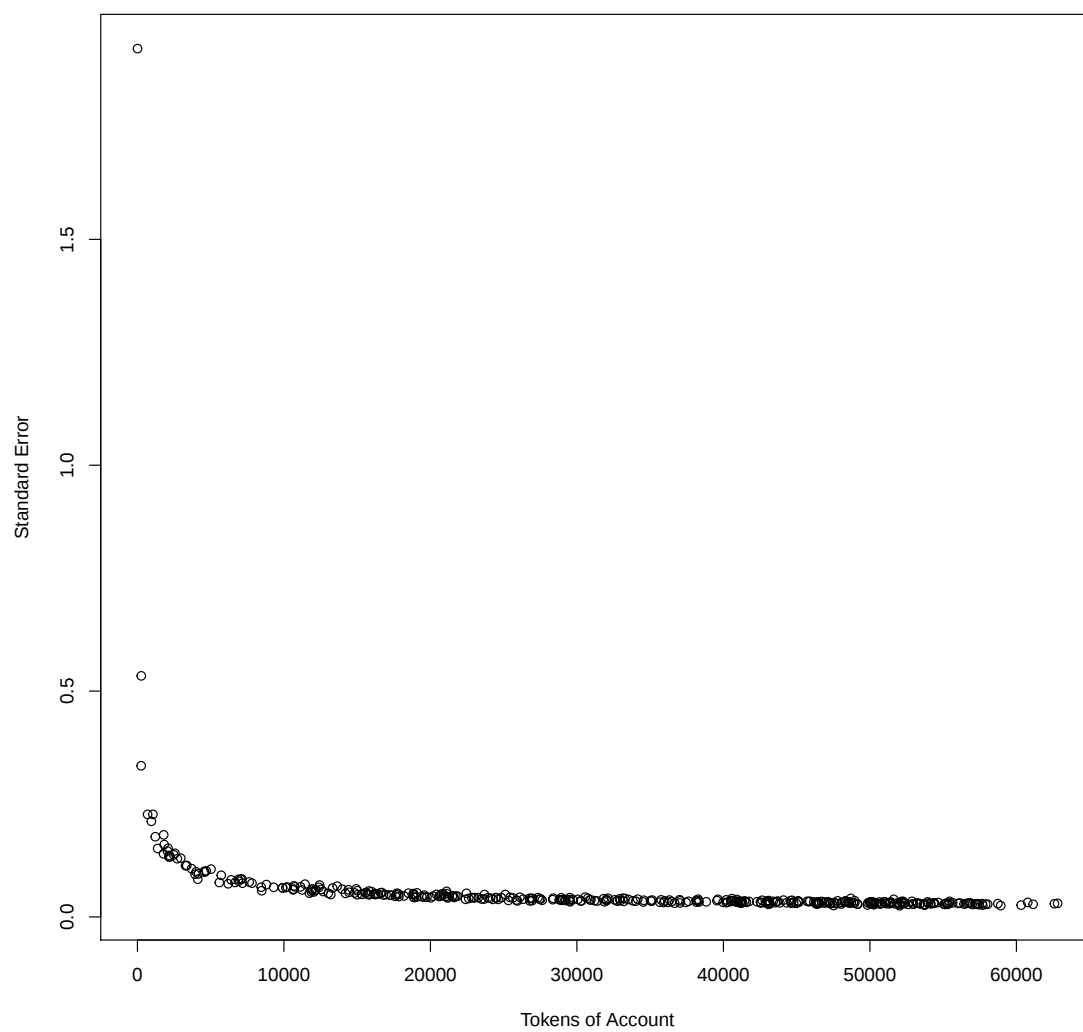


Figure 7: Tokens per Account and Positional Errors

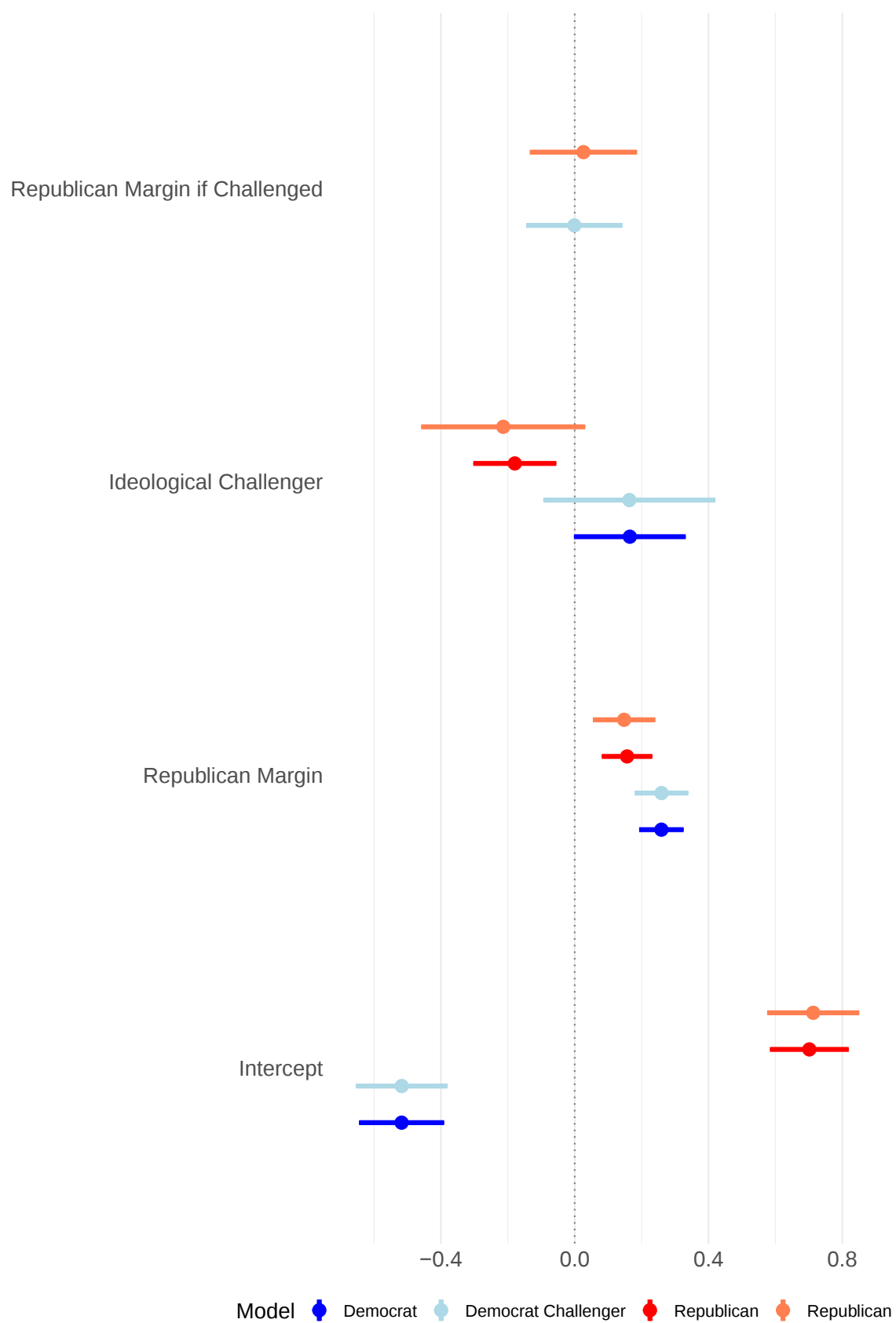


Figure 8: Ideology to Primary Challenge

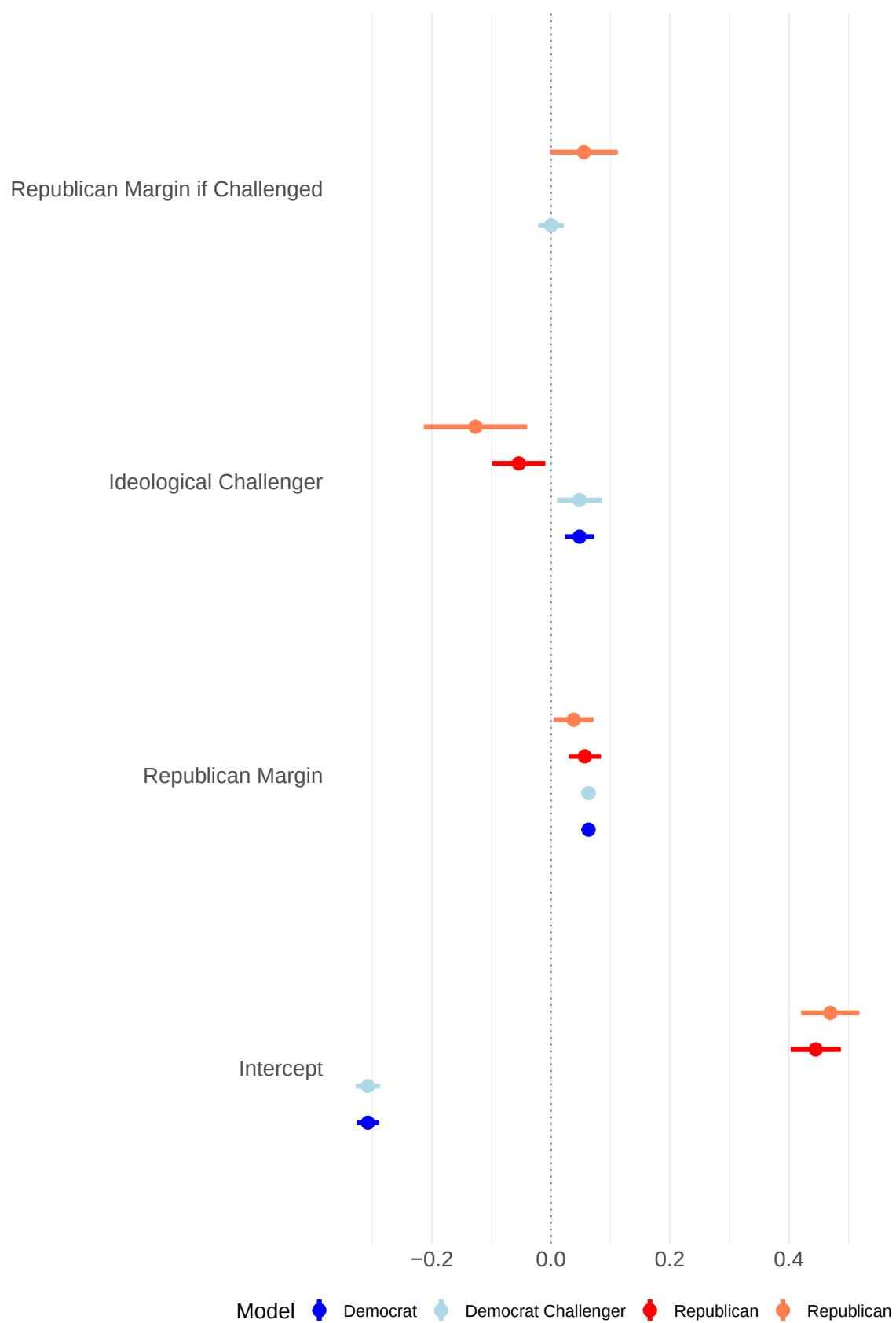


Figure 9: NOMINATE to Primary Challenge

4. TWITTER MADE ME DO IT!

The third article is “Twitter Made Me Do It! Twitter’s Tonal Platform Incentive And Its Effect On Online Campaigning”. This is an ‘Accepted/Original Manuscript’ of an article published by Taylor Francis Group in Information, Communication and Society on 12.12.2020, available online:
<https://www.tandfonline.com/doi/abs/10.1080/1369118X.2020.1850841>

Abstract:

Does Twitter trigger negative tones in politicians’ digital communication? On social media direct feedback mechanisms such as retweets or likes signal to politicians which message and tone are popular. Current research suggests that negative language increases the number of retweets a single tweet receives, indicating preferences for negativity in the audience on Twitter. However, it remains unclear whether politicians adapt to the logic of Twitter or simply follow the rules determined by the broader political context, namely the state of their electoral race. We use sentiment analysis to measure the tone used by 342 candidates in 97,909 tweets in their Twitter campaign in the 2018 midterm elections for the U.S. House of Representatives and map the ideological composition of each politician’s Twitter network. We show that the feedback candidates receive creates an incentive to use negativity. The size and direction of the tonal incentive is connected to the ideological composition of the candidate’s follower network. Unexpectedly, the platform-specific incentive does not affect the tone used by candidates in their Twitter campaigns. Instead we find that the tone is mainly related to characteristics of the electoral race. We show that our findings are not dependent on our sentiment measurement by validating our results using hand coding and machine learning. Keywords: campaigning, filter bubble, sentiment, social media, platform effects.