Political Communication and Voter Choice - Description and Analyses in Times of Social Media

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"By voting, we add our voice to the chorus that forms opinions and the basis for actions."

Jens Stoltenberg

Summary

The dissertation contributes to the politico-economic research specifically focusing on the understanding of political competition. It comprises 9 chapters including introduction and conclusion. Of these chapters, Chapter 5.2 "Implicit Motives" is published. An opening chapter summarizes the extensive and interdisciplinary literature on relevant actors and interaction relationships. Another chapter describes the applied text mining methodology. The chapter includes the strengths and weaknesses of the approach.

Chapter 4 applies text mining to Facebook political communication of parties represented in the Bundestag after 2017. Between 30 and 40 topics per party are generated via the unsupervised clustering method and assigned using a codebook. The results are in line with theories on the behavior of political parties known from the literature. Differences between political camps, mainstream and niche parties, and incumbents and opposition can be demonstrated. The discourse shows clearly the positioning in the left-right continuum.

In addition to the textual representation, the unconscious content of the messages can be presented in Chapter 5. Two different methodologies are used. A sentiment score based on a dictionary approach is generated in an unsupervised procedure. Deep psychological motives were extracted via a supervised procedure. The motives of the parties were successfully analyzed and processed for the distinction of internal and political communication.

The results of chapters 4 and 5 are analyzed in chapter 6 with additional voter survey data with socio-economic variables in terms of their effects on electoral choice. The evaluation is conducted within the framework of a case study for the 2014-2017 legislative period of the Federal Republic of Germany. The methodology is based on the approach of Dewenter, Linder, and Thomas, 2019, instead of the media portrayal of politicians, the communication of the parties via social media is added as an explanatory variable. Despite some specific features, such as the emergence of a new

party as well as the re-entry of another party, promising results could be generated for the case study.

A concluding chapter 7 provides a critical appraisal of the selected approaches regarding topic modeling, sentiment analysis and the empirical evaluation. The evaluation method is contrasted with an alternative approach, an agent-based model. In the thought experiment, the merits of the agent-based model are highlighted with regard to voters' decision-making processes based on political communication.

Zusammenfassung

Die Dissertation trägt zur polit-ökonomischen Forschung konkret zum Verständnis des politischen Wettbewerbs bei. Sie umfasst inklusive Einleitung und Fazit 9 Kapitel. Von diesen Kapiteln ist eines veröffentlicht. In einem einleitenden Kapitel wird die umfassende und interdisziplinäre Literatur zu den relevanten Akteuren und Interaktionsbeziehungen zusammengefasst. Ein weiteres Kapitel erläutert die verwendete Text Mining Methodik. Die Stärken und Schwächen des Ansatzes werden analysiert.

Das 4. Kapitel wendet das Text Mining auf die politische Kommunikation der nach 2017 im Bundestag vertretenen Parteien auf Facebook an. Über das unüberwachte Clusterverfahren können zwischen 30 und 40 Themen pro Partei generiert und mit Hilfe eines Codebooks zugeordnet werden. Die Ergebnisse entsprechen den aus der Literatur bekannten Theorien zum Verhalten politischer Parteien. Es können Unterschiede zwischen den politischen Lagern, Mainstream und Nischenparteien sowie Amtsinhabern und Opposition nachgewiesen werden. Der Diskurs zeigt die Positionierung im links-rechts-Kontinuum gut auf.

Neben der textlichen Darstellung kann in Kapitel 5 der unbewusste Inhalt der Nachrichten dargestellt werden. Es werden zwei verschiedene Methodiken verwandt, ein Sentiment Score basierend auf einem Wörterbuchansatz wird in einem unüberwachten Verfahren generiert. Tiefenpsychologische Motive konnten über ein überwachtes Verfahren extrahiert werden. Die Motive der Parteien konnten für die Unterscheidung interner und politischer Kommunikation erfolgreich analysiert und aufbereitet werden.

Die Ergebnisse der Kapitel 4 und 5 werden in Kapitel 6 unter der Hinzunahme von Wählerumfragedaten mit sozio-ökonomischen Variablen auf ihre Effekte bezüglich der Wahlentscheidung hin untersucht. Die Auswertung erfolgt im Rahmen einer Fallstudie für die Legislaturperiode 2014-2017 der Bundesrepublik Deutschland. Die Methodik orientiert sich an dem Ansatz von Dewenter, Linder, and Thomas, 2019, statt der medialen Darstellung von Politikern wird die Kommunikation der Parteien

über soziale Medien als erklärende Variable hinzugezogen. Trotz einiger Besonderheiten, wie dem Aufkommen einer neuen Partei sowie dem Wiedereinzug einer weiteren Partei konnten für die Fallstudie vielversprechende Ergebnisse generiert werden.

Ein abschließendes Kapitel 7 beinhaltet die kritische Würdigung der gewählten Ansätze zum Topic Modeling, zur Sentiment Analyse sowie der empirischen Auswertung. Die Auswertungsmethode wird mit einem alternativen Ansatz, einem Agent-Based-Model, kontrastiert. Im Gedankenexperiment werden die Vorzüge des Agent-Based-Models bezüglich der Entscheidungsprozesse der Wähler auf Grund politischer Kommunikation herausgestellt.

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List of Abbreviations

ABM	**A**gent **B**ased **M**odel
AfD	**A**lternative **F**or **G**ermany
API	**A**pplication-**P**rogramming-**I**nterface
BoW	**B**ag-**o**f-**W**ords
CDU	**C**hristian **D**emocratic **U**nion
CMP	**C**omparative **M**anifesto **P**roject
CSU	**C**hristian **S**ocial **U**nion
DMNB	**D**iscriminative **M**ultinomial **N**aive **B**ayes
DTM	**D**ynamic **T**opic **M**odel
FDP	**F**ree **D**emocratic **P**arty
FRG	**F**ederal **R**epublic of **G**ermany
GIS	**G**eographic **I**nformation **S**ystem
GRUENE	Alliance '90/The Greens
LDA	**L**atent **D**irichlet **A**llocation
LINKE	The Left Party
LIWC	**L**inguistic **I**nquiry and **W**ord **C**ount
LSA	**L**atent **S**emantic **A**nalysis
MARPOR	**M**anifesto **R**esearch on **Po**litical **R**epresentation
MNB	**M**ultinomial **N**aive **B**ayes
NLP	**N**atural **L**anguage **P**rocessing
OMT	**O**perant **M**otive **T**est
PDS	**P**arty (of) **D**emocratic **S**ocialism
pLSA	**p**robabilistic **L**atent **S**emantic **A**nalysis
SED	**S**ocialist **U**nity Party of **G**ermany
SPD	**S**ocial Democratic **P**arty (of) **G**ermany
STM	**S**tructural **T**opic **M**odel
SVD	**S**ingular **V**ector **D**ecomposition
SVM	**S**upport **V**ector **M**achine
TAT	**T**hematic **A**pperception **T**est
UK	**U**nited **K**ingdom
VSM	**V**ector **S**pace **M**odel
WASG	Electoral Alternative fo Labour and Social Justice

For my family

Chapter 1

Introduction

1.1 Motivation

> "Democratic nations settle the question of who should hold various public offices by holding elections. The answers provided by the electoral process strongly influence the public policies that the people in these countries end up living with. As a consequence, public-choice scholars are interested in the implications of the choices that voters can be expected to make for the choices made by elected public officials and by politicians who would like to get elected." Coughlin, 1992

Ever more voters are changing their voting decisions from one election to the next. With increasing volatility, election campaigns are gaining in importance and the interest in the underlying decision-making strategies of voters is growing. While swing voters have traditionally been highly significant for the outcome of presidential elections in the U.S. context, traditional party affiliations have long been central in German elections. For decades, a three-party system stabilized, swinging to the left and right of the center and generating stable coalition majorities with two parties.

During the early 1990s, the number of parties in the Bundestag fluctuated between four and five. Recent developments show a 7-party system (or 6 factions) that includes parties close to the center as well as parties on the extreme edges of the spectrum. Furthermore, it can be observed that the traditional popular parties are losing their core constituencies and that the distance to formerly niche parties is decreasing. Two relevant conclusions emerge from this observation. First, switching between parties has become more likely; swing voters are discussed in detail in post-election analyses (see Brenke and Kritikos, 2020). Second, majority finding in

coalition negotiations is becoming more complex. This leads either to a so-called grand coalition of the two mainstream parties or to coalitions with at least three partners.

These observations underscore the relevance of political competition. The importance of party alignment and appealing to voters increases when traditional linkages diminish. The party can and must integrate its alignment into strategic considerations in the election campaign. For the most part, however, politicians are integrated into voting models as an exogenous variable, or incorporated on the basis of voter evaluations. The former denies politicians and parties a strategic orientation and adaptation of it. The second leads to endogeneity problems, as voters interpret parties' positions based on their own ideological standpoint.

In addition, a change in communication between voters and parties can be observed. The spread of the Internet and the almost unlimited access to cheap information via mobile devices and the proliferation of Social Media suggest that direct exchanges without a transmission channel between voters and parties are becoming more important. In addition to its importance for strategic alignment, direct exchange is a new opportunity for political competition research. Whereas party manifestos have been the central source of information on political positions until now, direct communication makes it possible to monitor party political positions on an ongoing basis. Social media is generally and freely accessible compared to media or official party events. In addition, communication is more immediate and is not affected by an interpretation step. In contrast to media reports, statements by politicians can be read directly. However, continuous monitoring of party positions has hardly been included, if at all, in the analysis of political competition and the empirical examination of election models.

Voting models have a long tradition. In particular, the development of theoretical models and resulting theories of voter and politician behavior is extensive. Coughlin, 1992 emphasizes the multidisciplinarity of the field, which is obvious because of the diversity of institutions and problems studied. The literature includes economics, mathematics, political science, psychology, or sociology. However, the research is diverse not only in terms of the perspectives of each field, but also addresses both the elections themselves and the influences of election outcomes on the issues addressed in the electoral process.

Unlike other studies, this thesis does not aim to predict voting behavior, but to explain what causes changes in voters' electoral decisions. Certainly, the results also have implications for election outcomes and could also be interpreted as predicting outcomes. However, this thesis will focus on the underlying decision-making process. What makes voters vote for one party or another. Unlike other papers, this work contains several unique aspects that, at least to my knowledge, have not been combined before. First, the study includes assumptions about voters' decision-making processes, including psychological considerations. Second, it uses newly available data on direct communication between parties and voters to provide a proxy for party campaigns and issues. This allows for a more accurate observation of changes in voters' electoral choices and how they relate to party issues. Third, an approach to analyze deeply embedded psychological motives is integrated as another variable to incorporate unconscious influences on voters in the analysis.

Observations of volatility and relevance of voter-party communication and the proliferation of Social Media lead to the central research questions of this thesis. The thesis is based on a data set which includes the Facebook status messages of the 7 parties elected to the Bundestag after the 2017 election for a period from 2014-2017. In addition to methodological considerations, the case study explores the following research questions:

- Can parties be differentiated on the basis of their communication on Social Media for the legislative period 2014-2017 and does the communication meet expectations based on theoretical models and empirical results from party programs?
- Does party communication via Social Media channels have a measurable impact on voters' electoral decisions?

The remainder of this chapter provides a short and comprehensive overview of the literature in order to contextualize this thesis, a short description of the thesis structure follows.

1.2 State of the Art

Chapter 2 addresses each of the aspects raised in this section in detail. This chapter provides the methodological context for the thesis and outlines the research gap.

Downs, 1957 work is the most cited work on Spatial Voting Models and the starting point for politico-economic considerations (see also Black, 1948, Hotelling, 1929). In Downs, 1957 tradition, a rich, primarily theoretical, literature of deterministic voting models developed . These are characterized by stable equilibrium outcomes, leading to a convergence of issues towards the median voter. For this purpose, perfectly rational and fully informed agents are assumed on both the supply and demand sides. (see e.g. Plott, 1967, Davis, DeGroot, and Hinich, 1972, Kramer, 1973, Enelow and Hinich, 1990)

Extensions have been established from deterministic models with an intermediate step in Committee Voting (see, e.g., Wilson, 1971, McKelvey, Ordeshook, and Winer, 1978) as opposed to General Elections. Romer and Rosenthal, 1978 introduced the theory of agenda setters. The theory establishes a strategic component of agents. First, the assumption of complete information was relaxed. Uncertainties on the part of voters and/or parties allowed new inferences to be drawn. Probabilistic election theory assumes that one has to act with expected values based on the uncertainty regarding the electoral choice. Consequently, issues will no longer necessarily converge to the median voter. (Hinich, Ledyard, and Ordeshook, 1972, Coughlin and Nitzan, 1981, Enelow, Hinich, and Arrow, 1990)

In the context of probabilistic models, agents are of more central importance with greater decision space and freedom of action. Voters are assigned to different voting strategies. In addition to the fundamental question of why voters exercise their right to vote (Paradox of Voting) (Dhillon and Peralta, 2002, Geys, 2006), several theories have been established. The retrospective voter consults the historical performance of incumbents in particular for his or her voting decision (Healy and Malhotra, 2013, Anderson, 2007). In expressive voting (Brennan and Hamlin, 1998, Brennan and Buchanan, 1984, Fiorina, 1976, Hillman, 2010, Schnellenbach and Schubert, 2015), as opposed to instrumental voting (Riker and Ordeshook, 1968, Ferejohn and Fiorina, 1974, Ledyard, 1984, Palfrey and Rosenthal, 1985, Tullock, 1967), it is not so much the outcome of the election that is of interest, but rather the communication of one's political decision. Issue voting requires high cognitive performance from voters; it entails searching for information, processing that information, and comparing it with one's own positioning on various political issues (Conover, Gray, and Coombs, 1982, Congleton, 1991, Mudde, 1999). Concerning polarization (Alvarez and Nagler, 2004), more parties and close races (Lachat, 2010) suggest increasing importance of issue voting. In strategic voting decisions, voters apply probability-based values for the

success or failure of a candidate or coalition in order to determine the optimal voting decision for them in light of these values (e.g. Forsythe et al., 1996, Forsythe et al., 1993, Blais et al., 2001, Myatt, 2007,Geschwend, 2007). There is a broad consensus among scholars that none of the decision models will stand alone in General Elections.

For parties, three central theories are important. The theory of issue ownership suggests that parties have a comparative advantage over their opponents in certain issue areas. They can be expected to exploit this advantage and focus on its owned issues (Petrocik, 1996, Riker et al., 1996, Denter, 2020, Green and Hobolt, 2008). In addition to ownership, the salience of issues is relevant for voters' electoral decisions. Parties could push the salience of individual issues in which they enjoy an advantage, for example (Budge, Farlie, et al., 1977, Budge and Farlie, 1983, Robertson, 1976, Dolezal et al., 2013). Bordalo, Gennaioli, and Shleifer, 2012 describe the process as attention shifting. In addition to issue focus and comparative advantages, mainstream and niche parties are subject to different preconditions. This affects what they communicate (successes vs. controversies) and voter acceptance of thematic adjustments (Green-Pedersen and Mortensen, 2010, Adams et al., 2006).

The application of spatial voting models in empirical studies has provided ample evidence of parties' strategies (Adams and Merrill, 2009, Adams et al., 2006, Ezrow et al., 2010, Somer-Topcu, 2009, Ansolabehere and Snyder, 2000, Schofield and Sened, 2005). Voter response to adjustments is less well documented. While an adjustment of the voting decision based on changed left-right positioning could not be demonstrated, issue ownership and issue salience were found to be relevant (Meguid, 2005).

One possible reason for these results arises from the measurement procedures of party strategy. In previous studies, this was represented either by the left-right positioning of issues in party manifestos (e.g. Wagner and Meyer, 2014, Zulianello, 2013, Guinaudeau and Persico, 2013, Dolezal et al., 2013) or by the ranking of parties according to voters. Implications for modeling in Spatial Voting Models emerge from the measurement procedures. Party strategy is either assumed to be exogenous or introduced via indirect measurement. The former leads to parties being implemented without their own strategy, while the latter introduces measurement biases due to voter anchor point bias (Enelow and Hinich, 1984). This is the niche in which the present thesis operates, with the aim of incorporating party strategy endogenously into modeling and fathoming the resulting decision-making processes of voters.

1.3 Structure

The thesis is divided into 6 main chapters and the conclusion, with the first two chapters laying the theoretical foundation of the thesis. Chapters three and four build the data set for the subsequent empirical analysis, chapter five contains the consolidation of the previous four chapters into an empirical model. Chapter six concludes the study with a critical review and an alternative approach to examine political competition. A final seventh chapter summarizes the main findings and highlights the thesis' contribution to research.

Chapter 2 *Electoral Process* is a comprehensive account of political competition. For the later analysis, the consideration of all actors, their strategy formation as well as the institutional framework is relevant. At the beginning, the interaction mechanisms are presented; this reveals the reciprocal relationship of both actors - voter and party. As a consequence, an endogenous implementation of both actors is indispensable for an evaluation of political competition. In the following steps, the strategies of voters and parties are outlined on the basis of various theoretical and empirical studies. The observation shows that issues should have an influence on the voting decision in the case that voters are interested in politics. Likewise, differences between different parties and their choice of issues are assumed on the one hand, and differences over time with regard to the salience of issues on the other. The measurement methods of party communication are explained and highlighted, which is why topic modeling, applied in this thesis, offers an advantage in the continuous observation of party communication.

Chapter 3 *Topic Modelling* explains the emergence of automated text mining and presents the Latent Dirichlet Allocation (LDA) method used in the thesis in detail. The algorithm and evaluation method of the resulting topic lists are discussed. In a concluding sub-chapter, other algorithms are presented and their advantages and disadvantages in relation to the evaluation of political communication are outlined. For further research over longer time horizons, it is concluded that the application of a dynamic topic model, which allows varying topics on the time axis, should be preferred.

Chapter 5 *Party Communication on Social Media* is the central building block to build the data set for endogenous involvement of party communication and strategy. Additionally, the chapter already provides a good qualitative overview of the parties' communication. The evaluation takes up the methodological explanations of the

previous chapter and shows that the methodology provides meaningful and interpretable results for the selected case study, in terms of the previously presented assumptions on party strategy. The theories of party strategy formation presented in Chapter 2 are compared with the results from the parties' Social Media communication.

With respect to *the Tone of the Debate* an additional variable in the form of sentiments and deeply embedded motives is introduced in Chapter 4. Additionally, the chapter contributes to the methodological discussion of supervised and unsupervised approaches. While for the data used, the general dictionary used to identify sentiments can only produce superficial results, the evaluation via a trained procedure for the exploration of psychological motives is meaningful. The psychological motives are evaluated with the help of a logarithmic model regarding their significance for party political strategies. In addition to the expected results of the analysis, psychological research shows that the subconscious perception of motives and sentiments can influence the decision-making processes of voters. Therefore, the integration of motives and sentiments should help to improve the explanatory value of the following empirical investigation.

Chapter 7 *Effect of Party Communication on Voter Behavior* combines the results of the previous chapters in an overall approach. The theoretical results form the basis for hypothesis generation, the issues identified via topic modeling from chapter 4 serve as a proxy for the analysis of issue voting and the influence of issue salience. Finally, tonality takes into account the results of psychological studies that there should be an influence on the decision-making process. The chapter relies on the school of thought of Spatial Voting Models in the form of a probabilistic approach that accounts for voter and party uncertainty regarding election outcomes. While the detailed decision-making process cannot be traced in the chosen probit model, it is possible to observe the basic effects of changing issue priorities on voting decisions. In addition to the data generated in the previous chapters, survey data from the Forschungsgruppe Wahlen, Mannheim, 2014-2017 is used to integrate voter socio-economic variables and basic macroeconomic indicators into the analysis. The Forschungsgruppe Wahlen, Mannheim, 2014-2017 is a longitudinal data set of voting intention including socio-economic characteristics of the electorate. To my knowledge, an integration of political communication, underlying unconscious language, and known socioeconomic and macroeconomic variables has not yet been undertaken.

Finally, Chapter 6 is a critical appraisal of the chosen data analysis methods. It critically examines the topic modeling approach, the measurement of tonality, and the application of the probit model, and identifies further research needs. The criticism of the application of the probit model is obvious: an integration of the reciprocal relationship between voter and party is hardly possible. Moreover, the complexity of the political system and relationships can only be modeled to a limited extent. While its use is justified for the case study and an initial exploratory investigation of whether measurable effects are present, further research should consider methodological alternatives. The agent-based modeling alternative presented in this thesis addresses several weaknesses. In particular, the simulation-based study allows to generate a better understanding of the underlying decision mechanisms.

The thesis closes with a conclusion. All relevant results are summarized concisely and put into context of the research and their contribution to it.

Chapter 2

Electoral Process

Ordeshook, 1986 underlines the difficulty of summarizing the literature of political theory. The field has developed an immensely rich and complex body of theoretical work. The first to cover the topic in a structured and methodologically profound way were Downs, 1957, Black, 1948, Buchanan and Tullock, 1965, Riker and Ordeshook, 1968, Riker and Ordeshook, 1973, but also Arrow, 2012. Comprehensive interdisciplinarity characterizes the coverage of the topic. Ordeshook, 1986 covers the fundamental formal structure of political theory (game theory).

The electoral process in modern democracy presents itself as an endogenous relationship between voters and politicians. Voters change their electoral choices on the basis of the issue positions of politicians, and politicians, in turn, react to changes in public opinion. Therefore, neither can be studied without considering the other (Tomz and Houweling, 2008). The following chapter is divided into four parts, covering the two main agents, voters and politicians or parties, and the institutional environment, which consists of political competition and campaigns and the final voting decision. The interdependencies are high in this complex system of influencing and reacting on other agents.

2.1 Agents and Institutional Setting

Tomz and Houweling, 2008 conduct an experimental approach to investigate the decision rules of voters. They state that despite the high academic interest, the analysis of the decision process is subject to well-known difficulties.[1] Particularly relevant is the endogenous relationship of demand-side (voters) and supply-side (parties) in

[1] See e.g. Adams, Bishin, and Dow, 2004, Lewis and King, 1999.

political competition. In addition, the challenges of measuring issue positions and incorporating them into the analysis of issue voting are to be considered.

The complex structure of principal-agent relationships and the resulting heterogeneous interests of the reciprocal relationship are briefly summarized. The decision-making processes of the individual actors are examined in greater detail in the following chapters. This includes aspects of voters' decision-making, such as political positions, personal characteristics and relationships, and that of parties, such as maximizing votes and signaling their political positioning. In addition, the internal party decision-making process is considered in determining the party line. Since this process is of secondary importance for the analyses that follow, the topic is only briefly touched upon. The relationship between voters and parties is also influenced by institutional frameworks. A general overview of democratic systems and their implications is followed by a more precise discussion of the German system (see chapter 2.1.2.2).

2.1.1 Interaction of Voter and Party

The electoral process is characterized by the interdependencies between parties and voters in the context of the institutional setting. The interaction of parties and voters is crucial to the outcome of elections in the democratic process. As voters decide with their votes in the democratic process, parties compete for approval. The decision rule depends on various factors. On the one hand, political positions are included, and on the other, individual characteristics of leading politicians can play a role. Here, reference should be made to the chancellor model of German electoral law (see chapter 2.1.2.2). Political positions are strategically determined by the parties in order to come as close as possible to their defined campaign goals. Consequently, the cyclical interaction of voters and parties leads to an endogenous relationship. In other words, voters can be viewed as the demand side and parties as the supply side of politics. Election outcomes can be stable or volatile, depending on demand- and supply-side variables, and they also depend on changes in the electoral system. A model that is designed to measure both election outcomes and volatility must therefore account for all these variables.

The demand-side variable set comprises voters' socio-economic characteristics, party affiliation and issue-specific preferences. In addition, voters may be influenced by other voters, especially close friends or familiy (e.g. Schmitt-Beck, 2000). Various

theories attempt to formalize the decision-making behavior of voters. Each comes up with different implications for supply-side strategy to maximize, for example, votes. In the following, three of these theories are briefly summarized in terms of their implications for the interaction process of political supply-side and demand-side strategies. A more detailed discussion of the strategies can be found in section 2.2.

Issue voting assumes that voters make their decision on the basis of the parties' policy positions in relation to the voter's self-positioning. Experimental approaches to issue voting take place under ideal conditions, i.e., the study participant has all relevant information on party policy positions available. The decision is made in the fictitious setting solely on the basis of the issue positioning (e.g. Claassen, 2007, Lacy and Paolino, 2010, Tomz and Houweling, 2008). Non-experimental approaches measure the approval of parties and their thematic focus on the basis of a ranking of party positions by the voter. Two main weaknesses can be identified in this approach. In the non-experimental approach, it is unlikely that voters do not include individual characteristics of leading politicians in their ranking of parties and subsequent voting decision. In addition, voters are often asked primarily about their classification of parties on the left-right spectrum, which, is very slow to adapt when looking at time series (see e.g. Lehmann et al., 2022). However, if voters decide on the basis of issue-specific positioning, a better understanding of voters' reactions to political positioning and its changes would be crucial.

Strategic voting, as opposed to sincere voting, refers to voters who do not necessarily vote for their preferred party, but in certain cases switch to the second-best option. This may be due to the fact that voters do not want their vote to be "lost" as their preferred party is unlikely to make it into parliament, for example. Additionally, these voters seek to maximize the influence of their vote on the government. Therefore, these voters may vote for the party that is most likely to form the government. (Kawai and Yasutora, 2013) Sincere voting, in contrast, means that voters generally vote for the party that most closely matches their preferences (Bol and Verthé, 2019). In case of strategic voting, reduced emotional attachment or party affiliation can be assumed (Bartolini and Mair, 1990; Lisi, 2010; Willocq, 2016). Strategic voting may be more prevalent in established democracies with better access to information, higher education and political sophistication. These results though, are highly debated without clear conclusions (Lisi, 2010; Inglehart, 1970). In the case of multiparty systems and especially mixed electoral systems (see chapter 2.1.2.2) with coalition governments, strategic voting is relevant. Voters can express support for their preferred coalition

by strategically allocating their primary and secondary votes between mainstream and niche parties.

Bischoff, 2012 finds that it is not so much the demand-side characteristics that cause an increase in swing votes, but the choices offered, i.e., the supply-side variables. The supply side is measured by the number and age of parties and any memberships. In addition, other characteristics are listed, such as strategic incentives, economic performance or incumbents accountability. The results show highly significant robust effects on electoral volatility. Spoon and Klüver, 2014 show that parties react to changing voter preferences as well as to issue salience of other parties. Therefore, it is relevant to gain a better understanding of the impact of party strategy on electoral decisions. This dissertation attempts an alternative approach to measure party strategy and issue positioning over time. The aim is to reduce measurement errors by using the voters' assessment of party positions and to make it possible to measure party strategy over the entire election period. The availability of this data allows to include party strategy endogenously.

The outcome of supply-side and demand-side strategy and choice determines changes in majorities, in government and coalition compositions. Volatility of electoral behavior is seen as a sign of political competition, as voters hold the government responsible for its behavior (Lewis-Beck and Stegmaier, 2000). Moreover, parties have an incentive to adapt their program to voter preferences (Bischof and Wagner, 2017, Miller and Stadler, 1998, Guntermann and Persson, 2021). While measuring final voting decisions is comparatively easy, measuring party strategy is more difficult. The last part of this chapter 2.4.2 addresses the difficulties of measurability and leads to the approach of this dissertation.

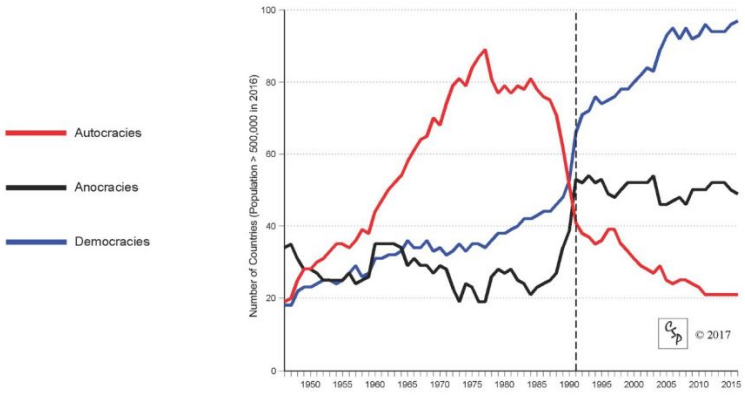
2.1.2 Institutional Setting

2.1.2.1 General

The term democracy dates back on Greek roots, demos - the people and kratos - power. In other terms it literally means power of the people. The measurement of democracies is not an easy task, as several attributes need to be fullfilled to classify a country as democracy or autocracy vice versa. Some of the most important features of democratic regimes are equality and political freedom, implicating the constitutionally guaranteed right to free, equal and secret elections, the freedom of speech and human rights. Various indices try to aggregate the attributes to quantify

the regime type. While all indices have limitations, the trend across all is clearly in direction of an increasing number of democracies or at least anocracies / flawed democracies[2]. The growing number of democratic elections shows the importance to gain a better understanding of the decision process as well as the (strategic) political competition (see figure 2.1). The above mentioned interaction of the two actors voter and party is of interest for the latter part of this work. Though, the interaction is critically affected by the institutional setting of the democratic process. The general term democracy does not include detailed assumptions on how many people are allowed to vote, nor does it include information about the election system.

FIGURE 2.1: Global Trends in Governance 1946 - 2017, Source: Marshall (2017, p.31)



While the voter-party interaction is primarily relevant for interpreting the results, the institutional system is the basis on which political competition and decision rules are modeled. To reduce the complexity of the following section, only the executive and legislative electoral system is considered. In addition, autocracies and dictatorships, as well as absolute monarchies, will not be considered in detail, since free elections do not take place.

The broadest distinction can be made between republics and constitutional monarchies. Since in most constitutional monarchies the executive / legislative body is not the monarch but the elected parliament, these can be considered like republics in the analysis. The interest lies in the electoral system of the parliament, and the representative function of the monarch can be compared to that of, for instance, the Federal

[2]Anocracies or flawed democracies denote regimes that show parts of democracies as well as autocracies. These regimes lack some basic rights like freedom of press, free political competition or free elections.

TABLE 2.1: Regime Types of Countries Worldwide

Regime Type	Number of States
Parliamentary Democracy	52
Mixed (semi-presidential) Democracy	28
Presidential Democracy	38
Civilian Dictatorship	38
Military Dictatorship	24
Royal Dictatorship	12

Source: Cheibub, Gandhi, and Vreeland, 2009.

TABLE 2.2: Electoral Systems of Countries Worldwide (Chamber 1)

Voting System: Chamber 1	Number of States
Plurality (FPTP):	66
Alternative Vote:	6
Block Vote:	13
Two-Round System:	18
Parallel*:	27
Single Non-Transferable Vote:	4
List Proportional Representation:	85
Mixed Member Proportional:	9
Single Transferable Vote:	2
Other:	9
No information available:	6
Not applicable:	5

* Parallel (Segmented) (PR Lists and Majoritarian constituencies)

Source: ace The Electoral Knowledge Network, 2023.

President of the Federal Republic of Germany (FRG). The most general distinction relevant to the analysis is between presidential (e.g., the United States or France) and parliamentary (e.g., Germany, Austria or Sweden) democracies. While presidential systems mostly have a majority voting system, parliamentary democracies are distinguished according to majority, proportional or mixed voting.

Table 2.1 first shows the number of regime types. The large number of democratic regime types shows the relevance of improving the understanding of the interaction mechanisms between voters and parties. A brief summary of the electoral systems (first chamber) of countries worldwide can be found in the table 2.2 below.[3]

[3]In Appendix A table A.1 includes the listing of regime types by state and table A.2 the first chamber electoral systems by state. A more detailed analyzes of electoral systems can be found e.g. in Bormann and Golder, 2013, Golder, 2005.

Some key implications arise from a country's chosen electoral system for voters and parties. In systems with absolute or relative majority voting, politicians are elected in an individualized, personalized campaign. Voters decide directly on the person who will hold the office. Votes for the other candidates are not considered in the formation of a majority. Majority voting tends to promote a two-party system (see, for example, Great Britain or the USA). In proportional representation, the parties are of greater importance for campaign strategy, since they decide on the candidates nominated. In addition, voters choose a party list rather than a specific candidate. In contrast to majority systems, all votes are counted and seats are allocated on the basis of the percentage of votes. The disadvantage for the voter is a less personalized election and less influence on the individual politician who enters parliament. In addition, politicians are criticized for feeling less committed to the voter than to the party line or to the party's leading politician. Some electoral systems, especially in Europe, counter the criticism with mixed electoral systems. These are explained in more detail in the following subsection, using the FRG as an example. In general, proportional representation systems tend to produce multiparty systems. (see Norris, 1997, Duverger, 1959, Shugart and Wattenberg, 2001, Blais and Massicotte, 1996)

2.1.2.2 Germany

The German electoral system dates back to the period immediately after the end of World War II and is thus influenced by the failure of the Weimarer Republic. The Allied Forces in particular were therefore skeptical of proportional representation. The fragmented party system, political instability and ongoing coalition negotiations contributed to the failure of the Weimarer Republic and radicalization. However, it should be made clear that the aforementioned points were by no means the sole reasons or most relevant points. Nevertheless, they can be credited with a share. (WD 1: Geschichte, Zeitgeschichte und Politik, 2012) In contrast to the Weimarer Republic, the Federal President has less political and constitutional power in the FRG. The Weimarer Republic ended up as a semi-presidential system, which can be considered another reason for the radicalization and implementation of an authoritarian system. In summary, the Basic Law (Grundgesetz) attempted to prevent the fragmentation of the party system and establish a clear parliamentary democracy. In addition, the personalized proportional representation system attempted to balance the advantages and disadvantages of majority and proportional representation.

As mentioned above, the electoral system of the FRG differs in some respects from

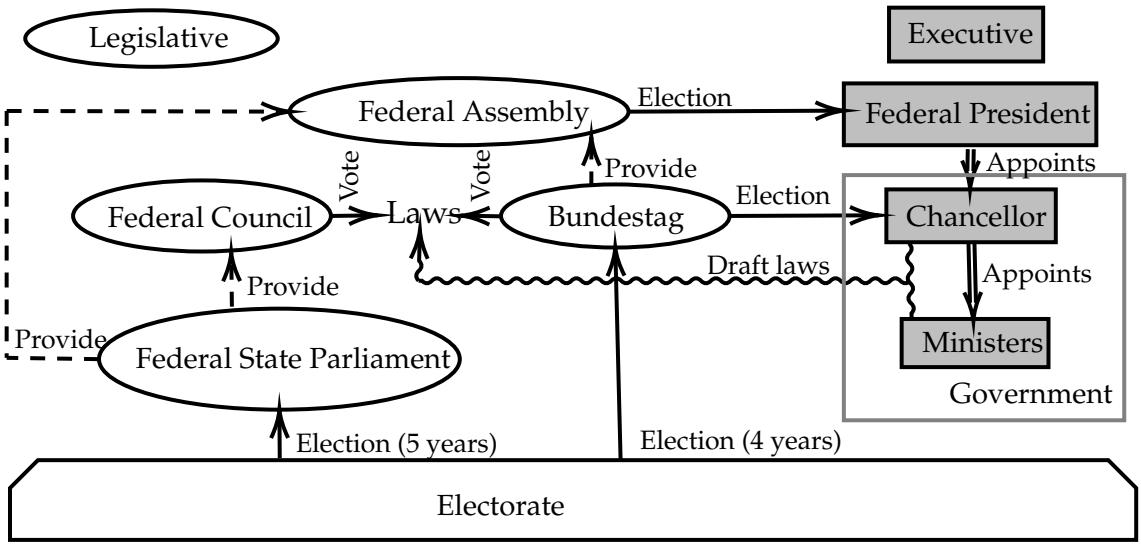
that of the Weimarer Republic. However, the federal system remains a central component of state organization law. The interaction mechanisms between the national and state levels are shown in figure 2.2. The organization of the semi-autonomous states follows the principle of subsidiarity with the aim of bringing democracy closer to the people. Although this dissertation focuses on political competition at the national level, the federal system has some relevant implications for electoral outcomes and the legislative process at the national level. At the national level, each of the 16 states is represented in the Federal Council (Bundesrat) by a semi-autonomous government. Since most laws must be ratified by both the Bundestag and the Federal Council, state politics and majorities in the Federal Council influence the legislative process. In addition, there are asynchronous election periods for the states as well as for the states and the federal government; this can lead to changing majorities during a legislative period. Furthermore, the federal system influences the election of members of the Bundestag. The voting lists are determined at the state level, so citizens vote for different politicians depending on the state. This is particularly evident in the example of the *Christian Democtatic Union* (*CDU*)/ *Christian Social Union* (*CSU*). These parties form a parliamentary group within the Bundestag, but the *CSU* is only eligible in Bavaria as a regional party. The *CDU* is electable in the other 15 states, except Bavaria. Although not equally obvious, the party lists of the remaining parties also differ at the state level. Relevance can be attributed to this procedure, especially when considering internal party competition. However, an effect on the election decision cannot be ruled out with regard to personal characteristics of the party list candidates.

Germany's electoral system has undergone a number of changes over its lifetime. Since this dissertation only looks at the period since the advent of Social Media, the following analysis is limited to the currently applicable electoral law.[4]

In principle, each voter has two votes. The first vote is used to elect the direct candidate of the constituency. In contrast to most presidential systems, the candidates do not require an absolute majority; the count is based on simple majority voting. The first vote is the personalized component of the German personalized proportional representation system. The second vote is awarded to a party list, which is determined individually at the state level. (§4 BWahlG) The Sainte-Laguë/Schepers

[4]For changes in electoral law see e.g. Reimink and Teusch, 2009.

FIGURE 2.2: Interactions in the German Electoral System (Legislative and Executive Branch), following Islar, 2021



procedure is used to transfer the votes into the seat distribution.[5] The second votes are divided by a common divisor and the number of seats is determined by this. To counteract the tendency of proportional representation systems to fragment the party landscape, German electoral law contains a 5% hurdle. This means that parties below the 5% hurdle cannot enter the Bundestag via the party list. However, smaller parties can still be elected to the Bundestag by winning at least three direct mandates. The distribution of seats is determined exclusively by the second vote. In a second step, the direct mandates won are subtracted from the total number of seats won by the respective party. The remaining seats are filled from the party list. In the event that a party wins more direct mandates than it is entitled to via the second vote, the party receives these in the form of overhang mandates. (§6 BWahlG) Since this leads to a distortion of the distribution of seats, the Federal Constitutional Court has ruled that overhang mandates must be compensated for in full. The remaining parties receive compensatory mandates until the original distribution of seats is restored. This procedure reduces a shift in majorities, but in the process enlarges the Bundestag. Instead of the regular 598 seats (§1(1) BWahlG), the Bundestag had 709 seats in 2016 (Bundeswahlleiter, 2017 p. 332) due to the distribution of overhang and compensatory mandates.

[5]Sainte-Laguë/Schepers use a divisor to calculate the allocation of seats. The divisor is calculated by dividing the total number of valid second votes by the number of seats. In case that the preliminary divisor results in more seats than attributable in total, the divisor is adjusted. The divisor is interpretable as the number of votes necessary to obtain one seat in parliament. (Bundeswahlleiter, 2015)

Strategic voters (see chapter 2.2.1) can allocate the first and second votes to different parties and thus express a preference for the desired coalition. In addition, it is in the voters' calculation to vote for the direct candidate with the first vote who is considered to have the greatest chance of entering the Bundestag. For decades, the German party system was dominated by three parties. The *CDU/CSU* cover the conservative spectrum, the *Free Democratic Party of Germany* (*FDP*) strives for liberal policies and the *Social Democratic Party of Germany* (*SPD*) serves the left spectrum. For a long time, the *CDU/CSU* and *SPD* could be considered major parties of the people, which were able to find majorities with the help of the *FDP*. In the early 1980s, the *Green Party* entered the Bundestag, expanding the left-wing spectrum. In 1993, the *Greens* merged with an East German activist group and have since stood for election under the name *Bündnis '90 die Grünen* (*Gruene*; Alliance '90 / The Greens). Furthermore, the successor party to the East German *Socialist Unity Party of Germany* (*SED*), the *Party of Democratic Socialism* (*PDS*), was also able to enter the Bundestag. After merging with the *Electoral Alternative for Work and Social Justice* (*WASG*), the party was renamed the *Left Party* (*Linke*). The entry of the *Linke* did not succeed in all subsequent legislative periods. The newest party in Germany that managed to enter the Bundestag is the *Alternative for Germany* (*AfD*). The party was founded in 2013 to cover the conservative spectrum. (Bundeswahlleiter, 2022)

While only a few overhang mandates were distributed in the three-party system, the increase in the number of parties is associated with an increasing number of overhang mandates. With a larger number of parties, a strategic voter has an increased opportunity to communicate his or her preferred coalition through first and second votes. For example, if the voter prefers a coalition of the *SPD* and the *Gruene*, it is rational to vote for the direct candidate of the *SPD*, since this party has a higher chance of success, and to vote for the party list of the *Gruene* with the second vote. Thus, the voter maximizes the chance that his first vote will enter the Bundestag and with the second vote the coalition partner is supported in order to enter the Bundestag with sufficient votes. However, another perspective also sees difficulties associated with the mixed electoral system. For example, the assumed straight ticket phenomenon, i.e. the allocation of the first and second vote to the same party, or the systematic hurdles for small parties. If one looks at the changed vote shares of the formerly large popular parties *CDU/CSU* and *SPD* to smaller parties, the assumption seems to be increasingly invalid, at least for Germany. (Geschwend, 2007)

2.2 Voter Choices

The fundamental question of democratic systems is why voters cast their ballots. Their single vote is not decisive compared to millions of other votes. While the question of still voting or staying away from the election is not part of this dissertation, the question of why voters should invest time to find out the parties' positions is. Enelow and Hinich (1984, p. 37) puts it as follows: "most voters in mass elections lack incentives to invest much time and energy in acquiring information about the issue positions of the candidates. When one's vote is combined with millions of other votes, it is unreasonable to expect the voter to expend the same type of energy in searching out information about candidates as he would learning about different brands of a consumer product." Whereas before the constant availability of digital media, television and newspapers were the primary sources for obtaining information about the parties, current digital offerings additionally provide the opportunity to obtain information directly from parties and politicians via Social Media. Enelow and Hinich (1984, p. 38) assumes the following information flow in their analysis of the mid-1980s: "How is it that voters come to know the issue positions of the candidates? The answer, typically, is by some indirect means, such as newspapers or television. Such sources typically offer simplified descriptions of the candidates. Concentrating more on nonpolicy issue[...]." The central question of this work is whether voters include the direct interaction possibilities and information sources via Social Media in their election decision.

The following chapter is divided into two sections. Beginning with a presentation of the potential decision rules of voters in the democratic process. As already discussed, initially, the question of the voter's exercise of the right to vote is relevant. Should the voter exercise his or her right to vote, the individual voter must make a decision for a party or politician. The criteria already mentioned, such as the parties' policy positioning, personal characteristics and close contacts, serve as a basis. Several theories, some of which contradict each other, attempt to explain the decision rules in a formalized way. Assuming that voters make at least partially informed decisions based on external information, the processing of this information plays a role. The second part of the chapter therefore includes psychological insights into the underlying cognitive processes.

2.2.1 Choice Rules

Despite various impeding issues, the analysis of decision rules and the decision making process receives attention in both empirical and theoretical literature (Tomz and Houweling, 2008). There are two main obstacles that shall be mentioned at this point. One is the endogenous relationship of voter and politician, which has already been addressed (Milazzo, Adams, and Green, 2012; Tomz and Houweling, 2008). Second, measuring issues and characteristics of both parties and individual candidates are methodological challenges (Tomz and Houweling, 2008). Nevertheless, there are different approaches which try to explain voter behavior. The different aspects of voting behavior will be explained in the coming chapters, i.e. decision rules of voters, the party perspective and in a last sub-chapter 2.5 the perspectives will be combined.

The voter undergoes a multistage decision process, regarding information, until the final voting decision is made. Briefly summarized, the voter must first seek information about parties, politicians and their programs. In the next step, the information must be processed and compared. Since searching for information involves costs, the voter weighs up how much information he wants to search for in order to make his voting decision. The costs result, for example, from the time required, the cognitive demand of information processing or expenses for newspapers, for example. Before a party decision is made, the voter first decides whether to vote or to abstain from the election. In the last decision step, the final decision is made in favor of a party. This final step will be the focus of this dissertation.

Paradox of Voting - Voter Turnout

The paradox of voting describes the individual's actually irrational decision to cast a vote. In large representative democracies, the individual vote has hardly any measurable effect on the outcome of the election. The low probability of influencing the election with one's own vote would imply low voter turnout under a strict rationality assumption. However, this is countered by relatively high turnouts in established democracies. Various approaches seek to explain voter turnout despite high costs and low influence on the election outcome.

Since voter turnout is of secondary importance for later consideration, for a comprehensive review see Dhillon and Peralta, 2002 and Geys, 2006. At this point, only the central assumptions are briefly stated. Dhillon and Peralta, 2002 summarize existing approaches regarding the question to vote or not to vote in their paper and

classify them according to four overarching categories. They distinguish according to two main types of voter objective functions, the instrumental theories and the expressive theories. A second category reviews rationality assumptions. The third category includes group-based explanations and the last category deals with information-based explanations. In particular, the instrumental, expressive, and information-based theories are discussed in more detail below. The focus of the thesis lies on the information-based approach. As a basis, it is referred to Riker and Ordeshook, 1968's formalized account of choice decision-making. The calculation listed under formula 2.1 is to be seen as an extension of the original approach by the benefit D. Without this benefit, the cost of voting implies that a rational individual's preference in equilibrium would be to stay away from voting. In terms of utility of voting the act itself is irrational, as it costs more than one gets in return. The discussion is led among others by Downs, 1957 and Tullock, 1972. In the article "On the calculus of voting" (Riker and Ordeshook, 1968) the expected utility of voting is reduced by the individual cost of casting a vote. In a further step, it is assumed that the voter derives a benefit from mere democratic participation and that this increases the utility of voting.

$$R = (BP) - C + D \tag{2.1}$$

with R = Individual reward by act of voting, B = Differential benefit if preferred candidate wins, P = Probability that voter brings about the benefit B, C = Cost of Voting, D = Benefits

The inclusion of a benefit from voting leads arithmetically to a positive benefit for the individual voter and can explain a sufficiently high voter turnout. The assumption of a positive benefit does not apply to all voters in a society; if the proportion of voters with a positive benefit is sufficiently high, it can explain adequate turnout in large democracies.

Representatives of the objective function theory can be distinguished following Dhillon and Peralta, 2002 once again into decision-theoretical and into game theoretical approaches. Downs, 1957 as the first approach of the political-economic consideration of choice behavior can be assigned to none of the two preceding categories for lack of formalization. The approach states some assumptions which lead to a voter's participation or abstention in elections. Initially, the expected values for the utility if the desired candidate wins and the utility if the opponent wins are subtracted. In doing so, the voter must include what share he or she has in the

election outcome, so the discount factor decreases with the number of eligible voters and increases if the election outcome is expected to be close. Assuming that voting has no cost, Downs, 1957 suggests that every eligible voter should vote unless they are strictly indifferent. Existing costs extend the assumptions to include the benefit already mentioned above. Formalized approaches to instrumental and expressive voting will be discussed in more detail later in the chapter, particularly with respect to their relevance to voting decisions.

The assumption of fully rational agents leads to very low turnout in models of voter turnout and is thus in contrast to empirical observations. Subsumed under the category bounded rationality, various approaches can be found that relax the rationality assumption. Among others, Sieg and Schulz, 1995 and Demichelis, Dhillon, et al., 2002 show that under the assumption of adaptive learning the benefits of voting can exceed the costs and both an equilibrium solution can be achieved and a higher voter turnout can be predicted. Two strategies of learning can be distinguished. Kanazawa, 2000 concludes that voters stick to their decision when the "right" candidate wins and change their strategy when the "wrong" candidate wins. Sieg and Schulz, 1995 assume the observation of successful strategies and their adaptation. Conley, Woodders, and Toossi, 2001 seek to explain the motivation for expressive voting behavior in their model and to use this to calculate voter turnout. However, not all learning models assume that the outcome of the election influences the strategy of the upcoming election. Among others, Gerber, Green, and Shachar, 2003 states that voting or abstaining becomes entrenched in behavior.

Group-based approaches posit an ethical motivation for voting. Accordingly, voters derive a benefit from exercising their civic duty. Voters coordinate in groups and thus have greater power than under the assumption of individual choice. Among others, Coate and Conlin, 2004 and Fowler, 2005 argue that belonging to a social group increases voter turnout. In summary, turnout increases when election outcomes are expected to be close, when costs are low, if groups have an higher influence on election outcomes (Schram and Van Winden, 1991), or when the benefit of voting ethically is high (Lapp, 1999). The group-based approach suggests that social structure, group membership, and socioeconomic factors are relevant for turnout. These factors will also be important for the final decision in voting. In particular, group affiliation determines not only turnout, but likewise the party voted for. Belonging to a group increases social pressure on individuals (Uhlaner, 1989; Shachar and Nalebuff, 1999). However, the models make no assumptions about which channels candidates use to

influence "the micro-level decision making of voters" (Feddersen (2004, p. 106)).

The last group of voter turnout models considered, sees information as an important building block of turnout. In an early and one of the few empirical accounts, Tollison, Crain, and Pautler, 1975 suggest that information in the form of newspapers and TV and radio, on the one hand, increases the explanatory power of voter turnout and provides significant evidence of the narrowness of electoral outcomes. While the theoretical models are hardly able to explain the basic issue of positive turnout, they contribute significantly to explaining an individual's probability of going to the polls (Geys, 2006). The central result is, that it is only rational for informed voters to cast their ballots. Uniformed voters delegate the decision to informed voters. (Feddersen and Pesendorfer, 1996, Matsusaka, 1995, Larcinese, 2009) Information, along with education and income, is considered a relevant predictor of turnout levels (Palfrey and Poole, 1987, Wolfinger and Rosenstone, 1980).

In subsequent chapters, information becomes more important. This is because only those voters who cast a ballot, and thus presumably the informed voters, will be included in the election results.

Information and Voting

Information about candidates, parties and their political positioning allows to make an informed choice and avoid wrong decisions. Voters should have an interest in making an informed decision so that the candidate they choose best matches their preferences. However, as explained earlier, information comes at a cost. Different perspectives explain the relationship between information and decision behavior in general and specifically in the electoral process. Generally speaking, some factors increase the probability of gathering information. Besides the mentioned factors education and income (Palfrey and Poole, 1987, Wolfinger and Rosenstone, 1980), group size, party affiliation (Jessee, 2010) and the expected closeness of the election outcome are important. In addition, information is gathered in the close family environment (Straits, 1990).

The endogenous relationship between voter and party is also evident with respect to information. Thus, Glazer, 1987 shows that "the candidate who [...] discover[s] what images the voters want, and to effectively project these images, is most likely to win." At the same time, voters have a preference to signal their point of view. Accordingly, an optimal electoral outcome would require both the party and the voter to have the most detailed knowledge possible of their respective viewpoints. Matsusaka, 1995

concludes that favorable information and thus higher knowledge increases voter turnout, as voters are more certain to vote for the most appropriate candidate.

In addition to the consistent finding that information increases turnout and informed voters are more likely to meet the above characteristics, the channel of information acquisition matters. Voters can receive information through various channels, Settle and Abrams, 1976 showed that the introduction of TV and radio increased voter turnout and Ashenfelter and Kelley, 1975 found that contact to campaign workers increases the probability for voting. Tollison, Crain, and Pautler, 1975 and Houser, Morton, and Stratmann, 2011 found, though, that it depends on who is responsible for the information sent. While neutral information for example by the broadcasting company have a positive impact on voter turnout, commercial party advertisements have the opposite effect. The evidence suggests that voter turnout is higher if information are easily available. In the context of Social Media election campaigns several factors coincide. First, information are easily and freely available. Second, discussions with politicians and parties as well as with other voters are possible. Third, social groups with similar opinions can pool information. Therefore, it is reasonable to look at the usage of Social Media channels and the information presented and to consider this information to influence turnout and potentially the electoral decision. However, most studies are based on the US system with a presidential majoritarian election system. Therefore, the results are not necessarily transferable to a proportional election system. The next paragraphs will discuss several voter decision models that give a better overview of the decision process and its implications for election systems. While it is almost impossible to observe a "pure" voting behavior in elections, several models develop pure voting models. Below, four approaches will be summarized in view of the possible influence of politicians on the voting behavior.

Retrospective Voting

Information is proven to be relevant for the decision to vote or to abstain. Economic theory mostly assumes well-informed voters with defined preferences. However, empirical evidence shows that voters are generally poorly informed, moreover, bounded rationality of the voters is to be assumed. Retrospective voting takes into account, that voters tend to have fading memory and risk averse behavior.

Retrospective voting assumes that voters tend to hold the incumbent responsible

for the macroeconomic performance during his term.[6] Healy and Malhotra, 2013 present retrospective voting as a four-stage process. Stage one involves observing events, outcomes, and the action of decision makers. Stage two consists of judging the policies of the office holders. In these two stages, psychological background processes play a major role in voters. Because of their importance, these processes are presented separately in chapter 2.2.2. The observations and assessment in the first two stages lead to an evaluation of the incumbents' performance and thus an influence on the electoral decision in stage three. Because of the effect on the voter, parties include the influence of policy decisions on the election outcome in their calculus. Parties adjust their policies depending on whether they face an election or not. This fourth stage has received little attention in the literature to date. The present thesis incorporates this point into the analysis of electoral behavior through specific party communication observed over time. Moreover, lags can be used to examine the extent to which voters look back into the past to make an election decision.

Risk aversion for gains and risk seeking for losses as Quattrone and Tversky, 1988a put it in terms of prospect theory, can explain the choice for the incumbent in good times. With the incumbent being the less risky choice, the incumbent benefits from a favorable macroeconomic situation. Fading memories, though, impede long-term evaluations of policy performance, instead a short-term perspective of around two years is the evaluation horizon for voters (Findley, 2015). On the one hand, retrospective voting holds politicians responsible for their policy. On the other hand, the short-term evaluation neglecting future success of policy decision decoy politicians to change their policy portfolio optimized for short-term success. Spiegler, 2013 refers to that as the incentive of politicians to implement "placebo reforms" (Spiegler (2013, p. 1491)). Voters are assumed to account for an active reform even though it does not have a real effect. Voters with a given mindset might update their beliefs for a given election based on the performance of the incumbent. For example Bischoff and Siemers, 2013 interpret the evaluation of competence of the incumbent as retrospective voting. The voters strategy is therefore based on observations during the candidates term in office including the performance in their predefined mindset. It is assumed that voters with sufficient education can at least differentiate between good and poor results.

[6] Many studies provide evidence for retrospective voting. The first to provide a systematic study was Kramer, 1971, an early review of literature can be found in Kiewiet and Rivers, 1984. For a more detailed review see for example Healy and Malhotra, 2013 or Anderson, 2007.

It is assumed that retrospective voting is easier when policies can be clearly assigned to one party and the economy is less exposed to external influences (Duch and Stevenson, 2008). Therefore, e.g. Duch and Stevenson, 2008 assume that European voters in parliamentary democracies must have a better political understanding to enable retrospective voting. Although better political understanding allows for the analysis of more complex contexts, psychological biases can still lead to biased election outcomes. For example, incumbents are punished or rewarded for events beyond their control (Achen and Bartels, 2004, Leigh, 2009, and Wolfers, 2002). Likewise, Esponda and Pouzo, 2017 show in their model with integrated bounded rationality and voters learning from the past that if the latter use only their own private information and neglect that of other voters, they make their voting decision based on systematically biased information. Some authors therefore question whether democratic accountability of incumbents can be improved. Healy and Lenz, 2014 conclude that proper framing of information and more complete presentation of economic information by journalists can lead to a reduction in bias. Snyder Jr and Strömberg, 2010 also show that media coverage influences policy decisions.

Healy and Malhotra, 2013 see three main points which should be illuminated in future research. First, whether voters not only respond to the policies of officeholders, but whether they respond "correctly". Second, a discussion of normative evaluative criteria regarding "better" policies. And last, consideration of the relationship between retrospective voting and policy outcomes. In addition, there are methodological considerations and a high concentration of the existing literature on the U.S. electoral system.

Expressive Voting

Hamlin and Jennings, 2011 provide a systematic overview on the range of expressive voting definitions and contrast expressive and instrumental voting. Generally speaking, an expressive voter obtains benefit by "expressing" her opinion, values, ideology or identity, an instrumental voter, though, obtains a benefit not by the expression of will but from her preferred election outcome (see also Brennan and Hamlin, 1998, Brennan and Buchanan, 1984, Fiorina, 1976, Hillman, 2010, Schnellenbach and Schubert, 2015). Both approaches received attention in theoretical and empirical studies. Hamlin and Jennings, 2011 following Brennan and Hamlin, 1998 emphasize that expressive and instrumental approaches are complementary and vary in importance

depending on institutional settings.[7]

Several arguments are discussed to explain why voters act expressively. Four major approaches have strong academic support. The general argument for expressive behavior is that voters receive a benefit from voting other than the election outcome. The formal representation by Riker and Ordeshook, 1968 indirectly suggests this benefit with the introduction of the additional benefit D (see formula 2.1). D can be interpreted as a benefit representing the own identity. The expression of identity can either be oneself or publicly. Akerlof and Kranton, 2000 introduce identity in a broader sense for a variety of different economic questions. They find that identity as a definition of oneself in the context of social categories and groups can expand the understanding of behavioral economics. The introduction of identity in the classical utility function changes payoffs both for the individual and others. However, Akerlof and Kranton, 2000 also claim that social categories can change over time and outcomes, thus, may change as well. Identity is understood as voters want either to confirm their identity for themselves or express their opinion to others. Voters will primarily vote for candidates with similar policy positions or candidates with appealing attributes such as character, ethnic group identification or general ideology (Brennan and Hamlin, 1998). If parties or candidates are located too far from the own position, voters are assumed to abstain or feel alienated. Politicians understand about the expressive behavior will adjust their position to attract voters. This is especially important having in mind that character, rhetoric or presentation style might strongly affect voters in their decision. The importance of characteristics other than policy outcomes is the most severe difference from instrumental voting. In terms of this thesis expressive voting theory underlines the importance of candidates speeches, voter communication or the Social Media presence.

Schuessler, 2000 interprets the expression of identity in terms of groups. Meaning that voters will want to identify with a group. The groups should neither be too small, with minorities being generally less attractive, nor too large, as the expressive character of voting decreases with group size. The parties are therefore, interested in presenting the party as a sort of club with benefits for members. The definition does not make assumptions about strictly defined groups; rather, it is possible for groups to change based on a variety of important issues. Hillman, Metsuyanim,

[7]The approaches on instrumental voting are more interested in the question why voters vote rather than how. Therefore, it is of secondary interest for the thesis. For a more detailed discussion of instrumental voting see for example Riker and Ordeshook, 1968, Ferejohn and Fiorina, 1974, Ledyard, 1984, Palfrey and Rosenthal, 1985 and Tullock, 1967.

and Potrafke, 2015 discuss the problem of permanent group identification for the democratic process. If voters were permanently committed to a particular group of a fixed size and on all issues, election outcomes would be predictable in the long run. This would hinder the cyclical democratic process in which parties are part of the government or the opposition. However, they found evidence of group-based voting as defined above only at the local level. Voting was then primarily determined by religious considerations or voting for extended family members.

A motive for expressive voting may be an attempt to vote for a candidate who represents a particular characteristic or to vote for a desirable policy such as redistribution. The argument is closely related to voter identity, which is potentially reinforced or mediated by voting (Brennan and Hamlin, 1999, Schnellenbach and Schubert, 2015). However, as Jones and Hudson, 2000 argues, voting for morally desirable candidates or policies is not the same as viewing voting as civic duty. Rather, civic duty is a variant of intrinsic motivation.

Issue Voting

Spatial theories acknowledge the importance of policy issues by assuming that proximity of voter and party position determine the voting decision. However, it is not finally resolved how issues as important component affect voter choice. Neither the size of the effect nor the institutional component are discussed in depth. Early studies from the 1940s through the 1960s initially failed to find any measurable effects of issues on voting decisions. This was attributed to a lack of information or even a lack of political understanding and cognitive abilities (see e.g. Carpini and Keeter, 1996, Converse, 1964 or Campbell et al., 1980). In the 1970s, the first positive effects were demonstrated. On the one hand, methodological progress has been made, and on the other hand, a decline in party loyalty is assumed and thus a higher importance of issues can be expected (see Dalton, 2013, Dalton, 2016).

In 1989, Rabinowitz and Macdonald, 1989 developed the directional model as an response to Downs' proximity model, which is hardly observable in empirical results. They assume that voters do not have sufficient knowledge of the political positions of the parties to be able to make utility-maximizing decisions. Rather, they decide on the direction, e.g. higher or lower taxes, and vote for the party that most clearly signals them to act in their direction. Issue voting is hampered by voters' cognitive limitations. Voters, according to many studies, lack knowledge about political issues (Campbell et al., 1980, Markus and Converse, 1979), make time-inconsistent decisions

(Markus and Converse, 1979), and have little knowledge about the basic political system (Converse, 1964). These findings, which hardly speak in favor of issue voting, are mitigated by, among other things, psychological findings and group dynamics. For example, Page and Shapiro, 1992 or Erikson, MacKuen, Stimson, et al., 2002 find that a meaningful political opinion can nevertheless be mapped across the entire voting population. Psychological findings are discussed more specifically in chapter 2.2.2.

Most studies address the question of whether greater polarization and more parties increase the likelihood of issue voting. If the parties' positions differ from each other, voters can better distinguish between the parties. Therefore, it becomes more attractive for parties to enhance their profile and issue position. If it is more attractive for voters to focus on more complex decision criteria than on traditional loyalties, party competition should increase. This trend can be observed in the German party system. The major parties are losing their traditional supporters and smaller parties are gaining influence. It is therefore to be expected that political issues will gain in importance. Mauerer, Thurner, and Debus, 2015 show that party-specific issues influence voting decisions. However, the influence is not homogeneous across parties; while mainstream parties have the least influence, niche parties and polarizing parties have a noticeable impact on voting decisions.

In summary, several conditions must be met in order to enable issue voting. Voters must have sufficient access to information about the parties' positions; voters must be able to distinguish between the parties' positions. Finally, voters must have personal beliefs that enable them to compare the parties' positions with their own. Issue voting, however, requires a considerable amount of effort to obtain a sufficient level of information and it is cognitively demanding. Therefore, it is questionable whether issue voting in terms of proximity is the relevant voting decision process for the majority of voters. In contrast, voters perceive issues as important to their voting decisions. Single issue voting, where voters focus on the most important issue and choose the most appropriate party, could solve the problem (e.g. Conover, Gray, and Coombs, 1982, Congleton, 1991, Mudde, 1999). Identification with a party and traditional loyalties could also be the drivers of voting decisions. However, polarization (Alvarez and Nagler, 2004), the growing number of parties or close races (Lachat, 2010) suggest that issue voting is getting more important.

Studies show that issue voting can influence the outcome of elections under certain conditions (Vries et al., 2011, Alvarez, 1998). The size of the effect cannot yet be

quantified. In addition to the factors already mentioned, Quattrone and Tversky, 1988b adds that the framing of issues can also determine the outcome of elections. Voters value information differently if parties for example speak about employment or unemployment, same holds true for the expectation about crime rates for minority and majority groups. The importance of issues can thus be higher due to direct party communication with the possibility to communicate policy position in a certain way.

Strategic Voting

The last theory of voter choice discussed is strategic voting. In models with three candidates or parties in majority systems, voters are assumed to vote for one of the main candidates rather than for a third candidate with a low probability of winning the majority (e.g. Forsythe et al., 1996, Forsythe et al., 1993, Blais et al., 2001, Myatt, 2007). Even if the third candidate is the preferred alternative, voters should vote for the second-best alternative so as not to "waste" their vote and allow the least preferred candidate to win. The voting strategy is most often discussed in the context of first-past-the-post systems and presidential elections with a small number of candidates and parties. Strategic voting is contrasted with sincere voting. In sincere voting, voters always vote for the most preferred candidate. Kawai and Yasutora, 2013 illustrate this in their study of the general japanese election. Thus, they find that voters with equally liberal attitudes are more likely to vote for the centrist candidate in conservative districts, but for the liberal candidate in liberal districts.

Alvarez and Nagler, 2000 summarize results for the U.S. and the U.K. in particular. While strategic voting behavior has been demonstrated across studies, the magnitude of the effect differs considerably in some cases. They attribute this mainly to methodological inaccuracies, such as measuring person-based decisions with macro data and neglecting district effects. The measurement method of strategic voting is furthermore relevant. In particular, the post-election period and self-report of strategic voting leads to an overestimation of strategic behavior. In their adjusted model, they still find a 7.2% share of strategic voting.

The strategy has also been applied to mixed electoral systems. With respect to the German electoral system, this is an interesting and appropriate application. Mixed electoral systems (see chapter 2.1.2) allow voters to decide strategically whether to give their votes to the same party or to split them. For a strategic voter, it should be reasonable to cast the direct vote for the majority party and the proportional list vote for the minority or niche party. The voter can communicate two strategies: First, he

expresses his preference for a coalition, and second, he avoids voting for the minority candidate who is likely to lose the direct mandate. Geschwend, 2007 showed the behavior for the 1998 federal election for *CDU* and *FDP* votes. With the increasing importance of smaller parties in the last two decades, the electoral strategy might have become more important. Moreover, it would be interesting to see whether voters choose parties based on issue proximity or whether traditional positions on the left-right continuum determine strategic voting decisions.

Although the various voting rules have been discussed separately, most studies agree that rarely a single voting rule will be applicable and decisive for an election. Instead, voters should be expected to have different preferences and motivations for voting. Nevertheless, it is important to know which rules are prevalent in an institutional setting and among different voters.

2.2.2 Psychological Effects

Psychologists have a variety of assumptions about the processing of information. With respect to the electoral strategies mentioned above, interpretation of information, character attributes of candidates, and evaluation of past political performance are relevant to future electoral decisions. This dissertation involves direct voter communication by the parties, thus the processing of this information, or at least assumptions about how the communication might influence voter decisions, is important.

Kahneman and Tversky, 1979 criticize the dominance of expected utility theory in decision theory. They show that several choice problems are inconsistent with expected utility theory. Cognitive psychology has demonstrated that rationality is bounded by both memory and cognitive ability. Moreover, judgments and decisions made are sometimes inconsistent with rational choice. Early findings of prospect theory evaluate decision making under risk for consumer behavior and entrepreneurs (Kahneman and Tversky, 1979, Kahneman and Tversky, 1984, Tversky and Kahneman, 1986, Kahneman et al., 1982). Quattrone and Tversky, 1988b applied the findings of prospect theory to political choice theory. They confirmed that many of the observations on voter and party choice described above can be partially explained by prospect theory.

While rational choice theory assumes risk aversion in all situations, prospect theory analyzes risk aversion as a function of the reference point. The reference point

allows politicians to formulate statements to influence voters with respect to their risk preferences (Quattrone and Tversky, 1988b). The study showed that voters are risk-averse for gains and risk-seeking for losses when policy outcomes are framed in terms of other countries. This finding is consistent with incumbency theory. Loss aversion explains and loss avoidance helps to understand the incumbent's advantage in good economic times and the challenger's advantage in bad times. These aspects could also influence party communication, especially the opposition versus ruling parties. Governing parties try to focus on achievements during their legislature, while opposition parties focus on failures and losses. Depending on their relevance to voters, the wording of these statements can influence voting decisions. Indeed, voters' views on crime have been shown to vary depending on the wording. If parties formulate that a certain percentage of citizens of minority and majority groups are criminals, voters perceive that minority groups are more criminal than objectively measured. However, when the statement is phrased in terms of noncriminal citizens, voters perceive less difference in crime rates. The same observation was made with unemployment and employment data. The same statistic leads to different evaluations in society. (Quattrone and Tversky, 1988b) In terms of rational choice theory, this observation violates the assumption of invariance. The formulation of statements should not change the outcome of the choice, as shown in Quattrone and Tversky, 1988b. Another important assumption of expected utility theory is the weighting of opportunities. Voters should vote for the party with the highest expected utility. A final important finding is that voters cannot distinguish between causal effects and correlation of events. This result is particularly important for explaining voter turnout. According to prospect theory, voters who vote expect that voters with similar ideology or political views will vote as well. However, they overestimate the effect as causal rather than a simple correlation of events. The same effect could apply to important events that are relevant to the voting decision.

In terms of political communication framing of statements and the weighting of chances can change the voting decision. In addition, psychologists found the memory and perceptions are prone to distortions, errors and the use of heuristics in order to reduce complexity.

Steenbergen, 2010 summarizes the existing literature on information processing in the political context in a chapter on New Political Psychology. He describes information processing as a 4-step process. In a first step, the voter's attention is drawn to the information. The basic assumption is that the voter is neither able nor willing to use

all information available to make the voting decision. Therefore, simplifications or heuristics are used. The probability that information is actually taken up increases e.g. with new information or issues (Fiske and Taylor, 1991), personally interesting issues (Krosnick, 1990), or such information that is close to one' s own opinion (Lazarsfeld, Berelson, and Gaudet, 1968).

In the second step, the information has to be processed, i.e. the content has to be interpreted and integrated into the already existing knowledge. It is important to note that the content can be interpreted differently by different voters. Empirical evidence, mainly based on laboratory experiments, suggests a strong influence of preconceived opinions on the processing of new information. Information processing theory states that predefinitions are based on values, ideology, and experience (Le Yaouanq, 2018, Rabin and Schrag, 1999a, Sunstein, 2001). Education, racial, and religious backgrounds influence these. Early experiments (Lord, Ross, and Lepper, 1979) showed that preconceived opinions on complex topics lead to biased interpretations of empirical evidence. Lord, Ross, and Lepper, 1979 examined the effects of positive and negative evidence on the effectiveness of the death penalty on popular evaluations. They found that prior opinions are actually reinforced (see, for example, Munro and Ditto, 1997, Plous, 1991, McCright and Dunlap, 2011). In addition, studies show that voters who have received negative messages about a party in the past are more likely to perceive negative messages in the future (Sweeney, Gruber 1984).

The final two steps involve storing information and remembering it. Briefly, this involves memory performance. Stronger links can be retrieved more quickly and the information can be stored more effectively.

Heuristics are supported by some socio-economic variables, like party affiliation (Rahn, 1993), among others origin, gender, age, occupation (Harteveld et al., 2017, Webster and Pierce, 2019, Ayu, Alfianti, and Arfiandani, 2021, Johns and Shephard, 2007, McDermott, 2005), family imprint (Holmberg, 2007) or ideology (Sniderman et al., 1986) can influence the processing of information.

Cowen, 2005 concluded that voters do not know their cognitive limits, but rather believe they know the truth. Moreover, political communication leads to polarization rather than convergence of opinions (Bénabou and Tirole, 2016, Cowen, 2005).

For the demand side of politics, the introduction of "imperfect self-knowledge, imperfect will, and imperfect memory" (Tirole (2002, p. 643)) can serve as a viable theoretical basis for voter decisions. In their joint work, Bénabou and Tirole, 2006,

Bénabou, 2008, Bénabou and Tirole, 2011, and Bénabou, 2015 discuss a number of cognitive constraints that occur (1) when evaluating information about the efficacy of markets versus the state, (2) during political ideology formation, and (3) due to network effects on worldviews.

This, however, only depicts the demand side of politics. The "single-minded focus on voter behavior is misguided" (Ashworth and Bueneo de Mesquita (2014, p. 565)) because it is impossible to make predictions about election results without studying the interaction of voting behavior and politicians' behavior, which is directly influenced by voters. The following chapters summarize the supply side (party) and the measurement of political competition.

2.3 Politicians

In general, political economy addresses the question of how politicians are selected and how they find their political platform. Scholars also address the question of political parties' births and deaths (e.g. Laver, Sergenti, and Schilperoord, 2011). The internal process of parties or the selection of politicians is not the main topic of this thesis, but a broad understanding of parties and political platforms in particular is necessary to interpret the communication of parties in Social Media and to understand why they focus on certain issues or why they change their orientation.

Three perspectives will be briefly discussed: first, the different views on the intentions of politicians; second, the question of why representative democracies favor the formation of parties; and third, a debate on whether parties are endogenous or exogenous to the analysis. The debate includes parts of political campaigns and competition, but does not focus on the core working mechanisms in democratic debates.

As mentioned earlier, the political system consists of a complex system of actors. In addition to voters, politicians as individual actors are also involved in political competition. In many cases, politicians are considered exogenous variables, but the endogenous inclusion of politicians and parties is an essential part of understanding political competition.

Initial considerations, e.g., by Downs, 1957, assumed that politicians have a primary interest in securing their power and reelection or electoral success, i.e., assume an opportunistic model of politics. In contrast, candidates are modeled with a political

orientation. Hibbs, 1975, Hibbs, 1977 and Alesina, Mirrlees, and Neumann, 1989 established a partisan political paradigm, assuming that candidates have a specific political agenda to be implemented through electoral victory. The approach considers the political agenda as a means to an end for electoral success, while the partisan political paradigm assumes the opposite. Politicians see electoral success as an opportunity to implement their political ideas institutionally. Wittman, 1977 criticizes the principle of vote maximization as it makes politicians the only agents in the contest who have no interest in politics. In his view, this misconception results from transferring economic considerations about private goods to public goods (state responsibility). He concludes that, in the case of choice-maximizing behavior, voters alone influence the outcome of the election with their preferences. However, if politicians also have their own preferences, which are incorporated into their utility function, politicians play a decisive role in political competition and policy design. In both models, however, politicians remain an exogenous factor in political competition.

The citizen-candidate model is a new and innovative analysis in this respect. Whereas in previous considerations politicians had no connection to the electorate, apart from the electoral decision, politicians are now recruited from the ranks of the electorate[8]. The endogenous view of politicians allows us to draw conclusions about which citizens become politicians and which characteristics they have to fulfill. It also provides information about preferences within the population with respect to elected representatives and their political position. In the original model, only the political orientation of voters is relevant. However, it is also possible to take into account a number of other differences among voters, in particular their socio-economic characteristics. Politicians run for election in the model on their preferred policy and can only implement the announced policy after the election. Politicians cannot offer policies that go beyond their preferences. An individual politician can only cover a very limited range of policy issues, and because he or she is limited to his or her personal preferences, he or she cannot make electorally relevant policy proposals on other issues. The model in its original form does not allow to simulate repeated elections or the endogenous emergence of parties. In particular, party emergence allows individual candidates in the party organization to credibly design a program

[8]The selection of politicians from the ranks of the electorate can be based on various characteristics. Personal characteristics, education, and political issues all play a role. In addition, costs and benefits play a role in voter self-selection in the citizen candidate model. For a comprehensive literature review, see Braendle, 2014.

from the Pareto set of members. Levy, 2004 extends the citizen candidate model by adding the institution of parties. Parties can set their programs, which are then implemented after the election. While candidates without organization in a party can only cover a very limited range of policy issues and ideological orientations, implementing endogenous party evolution can help simulate a better picture of policy tradeoffs and changes in consensual programs.

Since parties bring together candidates with similar political views and programs, which need not be congruent, methods are necessary to find negotiated solutions within this group of individual actors. Levy, 2004 explains bargaining resolution in the context of party congresses and the development of party programs that reflect the majorities of the various fractions within the party. He sees the party program as a set of contracts between party members, official party representatives and ministers, who are bound by party discipline to make decisions. In addition to being able to credibly represent a broader range of issues, it is the task of the parties to limit the existing conflicts and issues in society to a low dimension. Limiting the high dimensions is an important function of parties. In the democratic process, the population depends on reducing the complexity of issues and being able to choose from this low-dimensional context. The endogenous inclusion of political platforms has two main advantages for the analysis of political competition. First, it allows for a better and more realistic analysis of the impact of internal decision-making processes on voters. Second, endogenization allows modeling of long-term adjustments in political orientation, e.g., due to changes in voter will.

Voters' will or the mobilization of voters during the election campaign is the other central task of candidates or parties. In addition to deciding whether a voter will go to the polls or abstain, voters have several alternatives to choose from. For the parties and candidates, it is not only a matter of implementing and executing their political program, but also of winning the election. Accordingly, they try to convince as many voters as possible and influence the outcome of the election. The closer the election outcome is expected to be, the more resources the parties are willing to invest in influencing the outcome in their favor. (Shachar and Nalebuff, 1999)

In addition to interacting with voters, parties in multiparty systems have expectations about coalitions. Basically, coalition theory goes back to Riker, 1984. Essentially, it is a question of which coalition is formed, whether the coalition is stable, and what benefits the individual participants in the coalition receive. In the political context, this is a two-stage negotiation. Before the election, politicians, candidates, and thus

voters can form a coalition. After the election, there is usually no clear majority in systems with proportional voting. The need for coalition governments is the second step in the negotiation process. Here, parties negotiate the implementation of their specific programs. A detailed literature review on post-election coalition negotiations can be found in Bandyopadhyay and Chatterjee, 2006, Debus, 2008, Laver and Schofield, 1998, and coalitions in the sense of party formation are discussed in detail in Laver, 1989. The specific mechanisms of coalition theory are not discussed in detail in this thesis, but the effects of party political choices and strategic decisions of voters who prefer and specifically support certain coalitions are of concern. More relevant to this thesis is the consideration of the strategic orientation of parties, i.e., the selection of policy positions from the pareto set of members.

2.4 Measuring Political Competition and Election Campaign

The previous chapters considered the individual actors, i.e. voters and politicians, as well as the institutional framework of political competition. This chapter is devoted to the supply-side actor relevant to this work, the parties. Political competition among parties proceeds in two stages. Between elections, during the legislative period, parties should try to align their communication within the framework of their ideological position. In direct election campaigns, the focus of political strategy formation is on convincing voters with defined political goals. An all-encompassing representation of all relationships and strategic choices is not possible in a single model. The multiple relationships and the inclusion of all relevant variables for an overall model would reduce its explanatory power and not lead to an adequate result. However, the goal should be to evaluate the actors as independently as possible. The following chapter focuses on measuring political competition and the issues discussed in the election campaign, including their orientation.

In addition to the actors, the institutional framework in political competition has implications to be named for the long-term evolution of policy content within and between parties in relation to voters' expectations and assumptions. Whereas in majoritarian electoral systems a few strong parties compete for the electoral votes, in proportional representation parties can be expected to be more differentiated. In particular, smaller parties on the edge of the party spectrum have a chance in proportional representation to obtain a sufficiently large number of votes to gain political

power in coalition negotiations and to push through their content (Reynolds, Reilly, and Ellis, 2008). In terms of campaign strategies, the potential coalition negotiations have an additional influence. In addition to the direct approval or rejection of certain coalition constellations, the electoral program is an indirect indicator for voters in terms of which parties have realistic prospects for successful coalition negotiations. Thus, in addition to the political content, the signal effect is also a criterion for the voter.

In addition to formal descriptions of political competition and assumptions about political strategy formation, empirical evidence and various approaches are presented to measure the political content of parties. The underlying institutional assumptions are particularly challenging to analyze; by their very nature, they are often based on a presidential system or majority rule. The reason for this imbalanced attention to electoral systems is that, as explained in chapter 2.1.2, fewer states have a proportional representation or mixed electoral system. However, the above illustrates the relevance of electoral systems and the effects that proportional or mixed electoral systems in particular can have.

2.4.1 Party Strategies in Electoral Competition

"This imposes insurmountable obstacles to the candidates, who are then forced to estimate the perceptual translation from the candidate's issue space into each voter's issue space."(Enelow and Hinich (1984, p. 56))

Parties are forced to evaluate both, the issue space of the electorate and the individuals' positioning within the political spectrum. The assumed seven point scale from left to right in the ideological space is unique for each individual. Therefore, each voter interprets the issue position of candidates' in terms of her unique ideological position. (Enelow and Hinich, 1984)

The election campaign is the central building block of political competition, enabling voters to obtain information about parties and their goals. In addition, parties can strategically determine the focus and issues of their campaign (e.g. Aldrich and Griffin, 2003, Budge and Farlie, 1983, Druckman, Kifer, and Parkin, 2009; Laver and Hunt, 1992, McCombs, 2005; Ward et al., 2015). The importance of single issue influence and thus its relevance in voter perceptions has been demonstrated in many studies (e.g., Druckman, Jacobs, and Ostermeier, 2004; Iyengar and Kinder, 1987, Riker et al., 1996).

The studies are based on Riker et al., 1996 theory of dispersion and the dominance principle and on Petrocik, 1996 issue ownership theory. Riker et al., 1996 state that neither party will invest resources in an issue where neither party has an advantage, and drop issues where opposing parties have an advantage. Petrocik, 1996 developed an approach to why parties own certain issues. This may be attributed to the fact that they are considered more competent in the issue domain. On the other hand, idelogical differences between parties may also cause them to address different issues and thus be seen as more competent in the issue space. Politicians, therefore, have the opportunity to push issues. In addition to the choice of issue, the salience of an issue is also a criterion for the electoral decision. If politicians and parties see a strategic advantage in an issue, they can try to change the salience weights of voters and, thus, the majority ratios (Feld, Merrill, and Grofman, 2014). While political opinions adjust very slowly, the salience of issues can be subject to substantial fluctuations in between two elections. The change in salience weights is also studied as voter priming (e.g. Iyengar and Kinder, 1987, Krosnick and Kinder, 1990, Druckman, Jacobs, and Ostermeier, 2004).

Saliency theory is not only applied in the field of political decision making, Bordalo, Gennaioli, and Shleifer, 2012 complement theoretical findings on the "saliency theory of choice under risk" and thus represent an alternative to rational choice theory. In their definition, they refer to the psychological foundations of saliency. Accordingly, saliency is defined as the shifting of attention from one subject area to another, with information encompassing that subject area being disproportionately incorporated into decisions (see, among others, Taylor and Thompson, 1982). Kahneman, 2011 formulates it as the mind's ability to focus on unfamiliar and odd things and turn them into the focus of decision making. For parties, influencing the issues relevant to voters is therefore a component of strategy formation in political competition. Influencing in terms of its own competencies can give a party an advantage in winning votes. Budge, Farlie, et al., 1977, Budge and Farlie, 1983, and Robertson, 1976 have used saliency theory in theoretical analyses and employed it as the main explanation for political competition. Dolezal et al., 2013 tested the hypotheses in the case of Austria. They conclude that salience cannot be considered as the main component explaining political competition. However, the analysis confirms that parties focus on their own issues. The fact that parties ignore the issues of other parties cannot be confirmed.

Another important component of party competition is issue ownership. Issue ownership usually goes along with the perception of competence. Parties try to focus their election campaigns on issues that voters assign to them (Denter, 2020). Green and Hobolt, 2008 find that the ideological convergence of parties has made their issue competence more important for campaigning. While traditional deterministic voter choice theory (Downs, 1957) assumes a convergence of issues in the median voter's range, e.g. Geys, 2006, Amorós and Puy, 2013, Glazer and Lohmann, 1999, and Meguid, 2005 find that issue divergence is observed. The divergence of issue focus is not synonymous with an exclusive focus on their own issues. Rather, the same issues are covered with different orientations (Damore, 2004, Holian, 2004, Sigelman and Buell, 2004, Kaplan, Park, and Ridout, 2006, Sides, 2006, Green-Pedersen and Mortensen, 2010, Green and Hobolt, 2008, Vliegenthart, Walgrave, and Meppelink, 2010, Tresch, Lefevere, and Walgrave, 2013).

Parties also differ in size and ideological orientation. Majority and minority parties set different priorities to exploit their advantages in the election campaign. Small parties have a smaller specific range of issues due to their size and are usually characterized by their peripheral location or focus on specific issues. Therefore, these parties will place more emphasis on controversial aspects of their competence issues, while majority and governing parties tend to emphasize consensus issues and their successes. Ruling parties, even more than opposition parties, cannot limit themselves to their own issues; they must respond to the opposition's strategy (Green-Pedersen and Mortensen, 2010).

In addition to political agendas, parties also have a desire to be reelected. This desire requires interaction with voters and responses to shifts in preferences. Study results show that parties on the right of the left-right continuum are more responsive to changes in public opinion than parties on the left (Adams, Haupt, and Stoll, 2009). In contrast to issue ownership theory, this strategy argues for riding the wave. This can be observed in both public opinion and opposing parties (e.g., Klüver and Sagarzazu, 2015, Ansolabehere and Iyengar, 1994).

In summary, parties have four starting points for their election campaigns. The selection and design of issues, the ideological orientation of the party, the focus on issues with high party competence, and issue saturation and thus manipulation of the issue agenda in public perception. The design of the party's political strategy in political competition and its effect on voter perceptions and election outcomes is the central element of this study.

2.4.2 Measurement of Party Strategies

Measuring political competition is a challenging research topic. While the voters' preferences can be measured, especially via polls and election results, political competition on the supply side cannot be quantified directly. Different approaches are applied to analyze the political position of parties and politicians. Most empirical studies use coded party manifestos and the resulting issues, as well as classification on the left-right continuum. In addition, survey-based data are used to determine the orientation of parties from the perspective of voters.

Party Manifestos

Party manifestos are the most widely used source for conducting research on party competition. A large number of studies focus on competition and political positioning in party manifestos (e.g. Wagner and Meyer, 2014, Zulianello, 2013, Guinaudeau and Persico, 2013, Dolezal et al., 2013). Dolezal et al., 2012, in contrast, focus on the elaboration, relevance, and dissemination of party manifestos. They describe the process as a "manifesto life cycle" from the formulation of the program with a focus on party elites, to the party's decision, to the program's external impact. The readership of party manifestos is described in Dolezal et al., 2012 as rather elitist and with a strong political interest. One of the reasons for this could be the low readability index. This reinforces the assumption that few voters engage in depth with the actual content of election manifestos. The Comparative Manifesto Project (CMP) is the most widely used database; since 2009, the program has transitioned to Manifesto Research on Political Representation (MARPOR) (Burst et al., 2021). The data set covers 44 states and coded party manifestos since 1945. Consistent coding over a long time horizon and a large number of states are the main advantages of the data set. The reliable coding of more than 3000 party programs makes the CMP the only data set that allows cross-state and intertemporal analyses. Party manifestos are coded as quasi-sentences to cover multiple topics in one sentence. Party programs are mapped to more detailed topics in 7 main categories. In addition, more subcategories have been added in version 5. However, compared to survey-based data sets, some of the categories differ significantly. States are mostly classified into abstract categories. The higher-level categories are shown in table 2.3[9]. The survey content on a state's voter preferences and major issues and the CMP categories are hardly comparable in this respect. The central use of the CMP is to rank parties on the left-right continuum; the

[9] A comprehensive list of all topics is provided in Appendix A table A.3.

TABLE 2.3: Domains: MARPOR Codebook

Domain	Topic
Domain 1	External Relations
Domain 2	Freedom and Democracy
Domain 3	Political System
Domain 4	Economy
Domain 5	Welfare and Quality of Life
Domain 6	Fabric of Society
Domain 7	Social Groups

Source: Lehmann et al., 2022.

thematic coding makes it difficult to combine with voter data. Spatial voting models, however, rely on the distance between the voter's position and the party, making the database rather unsuitable for this purpose.

Additionally, the sample frequency differs between voter and party. While monthly data are available for voters, party programs are published once per legislative cycle. Short-term changes or external shocks are thus not traceable on the basis of party programs.

Survey

In addition to the CMP or alternative election manifesto data, survey data are used to analyze voter preferences. Data on party positions are typically generated by asking four questions. Survey respondents are asked for their own assessment of where they stand on the left-right spectrum and what they see as the biggest issues. Further, they are asked about how politicians and parties fit into the left-right spectrum. Respondents are in addition requested to identify which parties have the highest level of competence in various issue areas.

Voters' self-positioning is a helpful indicator to identify a possible location bias in evaluating political statements. A person who leans more to the left of the spectrum will evaluate a political statement from the right spectrum differently than a person with a self-positioning in the right spectrum (Enelow and Hinich, 1984). There are two critical aspects to using these indicators. First, radical political assessments in particular tend to be underreported for various reasons (Hooghe and Reeskens, 2007). Second, the assessment of political parties depends on the voters' own classification and is therefore biased. In a research question on changes in voter preferences through party communication, the supply-side variable from survey data cannot be used for reasons of endogeneity.

Expert

Another strategy is to conduct expert surveys on the classification of parties in the left-right spectrum. Classification based on a specific set of criteria leads to a comparable assessment of the parties. However, permanent tracking of communication and the relevance of individual issues over a longer period of time is not possible with this strategy and is not usually carried out even when parties are classified once. Therefore, a thematic classification of parties beyond a few data points is not possible. An analysis of a short-term change in voter preferences is not possible with this strategy and does not correspond to the structure of voter surveys.

Media

A number of studies address the extent to which news coverage changes political preferences (e.g. Druckman, 2005, Hopmann et al., 2010, Vreese and Semetko, 2004, Dilliplane, 2013, Druckman, 2004, Dewenter, Linder, and Thomas, 2019). Information can influence voters' preferences, and individual news outlets play a role in determining what information is available to voters. Providing information is the central responsibility of media and crucial for informing voters on abstract issues (Page and Shapiro, 2010). Especially in the weeks and months leading up to elections, political coverage is a particularly important part of the information spectrum. Coverage includes information about politics, political candidates and events. In addition to the quantity of information, the quality of the coverage is equally crucial (Johann et al., 2017). Informed voters are more capable of evaluating political issues and dealing with complex contexts. Moreover, voter turnout is positively influenced by better knowledge of political issues (Matsusaka, 1995, Palfrey and Poole, 1987). However, many studies also note the asymmetric coverage between politicians and political parties (Banducci, Giebler, and Kritzinger, 2015, Duggan and Martinelli, 2011).

The impact on voter preferences is measured by the likelihood that information will influence voting decisions. The probability is influenced by the importance of the issues and the tone of the coverage. It is assumed that the visibility of parties and thus the knowledge of their issues has a positive effect on changing the voting decision in favor of the party (Hopmann et al., 2010). Tonality can change the effect in the same or opposite direction (Hopmann et al., 2010, Dewenter, Linder, and Thomas, 2019). In addition, the quality of a medium is relevant for the likelihood of a change

in voter decision. The higher the quality of the media, the more likely voter choice is to be adjusted.

Most studies use hand-coded media reports to assess probability. In most cases, articles with keywords (e.g., names of politicians, party names) are filtered and coded over a predetermined period of time. The studies mainly code the occurrence of a politician or party and whether the mentioned has a positive or negative connotation. In this way, the awareness of parties and politicians and their perception can be examined. However, questions about issue salience and its influence on voting decisions cannot be answered with this methodology. As more and more populist parties gain votes with comparatively negative coverage, simply focusing on a party's name recognition seems to only partially explain election results.

Ideological position

Classification on the left-right continuum is a common measure of parties' position. Left and right-wing policies are associated with concrete ideas, which can be particularly clearly differentiated in areas such as social policy, trade and economic policy. A differentiation of ideological orientations has been proven in many ways and could be traced for different countries. The ideological classification is used in spatial models to generate the distance between party/candidate and voter. The traditional models assume that the parties or candidates approach the median voter on the left-right continuum. Empirical studies, however, show that voters are very slow in adjusting their assessment of parties and that accordingly little variance can be observed in the classification between two elections. Surveys as well as the CMP classify on a scale of e.g. -100 to 100 or -1 to 1, usually an aggregated indicator covering all issues is created. This indicator is then used as "super issue" to show the proximity or distance of voters to the party.

The unique selling point of the CMP with coded party programs since 1945 becomes problematic. The classification of left and right has changed over time and makes a comparable classification over the long term difficult. In addition, the formation of a time series with the use of party programs is difficult. Due to the long intervals between the publication of party programmes, comparatively few data points are available even over a long period of time. While voter data are collected regularly and allow a close examination of voter preferences, supply-side data on election programs are less available. The use of an aggregated "super issue" poses a further problem for the analysis of the effect of party strategic decisions on voter preferences.

However, the ideological orientation between issues may differ and, moreover, not all issues are of identical importance to voters. Therefore, the use of the aggregated indicator specifically for issue voting is not feasible.

Social Media

Social Media and microblog data are comparatively new and thus not suitable for long time series. This data has the decisive advantage that it can provide real-time information from both the supply and the demand side. Supply-side data in particular are difficult to generate from other sources. The existing studies largely refer to the U.S. market. This is because most of the studies use the microblogging service Twitter, which has already been heavily used in the U.S. in the past. More recent studies also refer to elections for the European Parliament and in other European countries.

Because Social Media and digital communication are a comparatively new form of political discourse, the advantages are also offset by uncertainties regarding users, scope of use and direction of use. While Twitter, for example, has a significantly higher market penetration in the U.S., this has not yet been observed with the same intensity in Germany. In addition, political actors first had to familiarize themselves with the new medium of voter communication. The first studies were conducted between 2009 and 2012, so there was only a very short period of time available for data collection. When it comes to the use of platforms, a distinction must be made between voters and political actors. Some studies note, particularly for the use of Twitter, that it is not a representative reflection of the population. Participants tend to be younger and male (for Germany in 2017 see Koch and Frees, 2017). In German-speaking countries, however, the use of Facebook is more prevalent than that of Twitter. For all platforms a constant change in usage can be observed - therefore, looking at diverse Social Media over a longer period of time is a reasonable goal. On the part of political actors, the main question is the type of use; do politicians want to formulate and disseminate their political positions and issues or personalize their election campaign? (Enli and Skogerbø, 2013)

In addition to the user group, the evaluation of the large amount of data also causes processing difficulties. Particularly in early studies, the amount of use (measured in posts) (Štětka, Macková, and Fialová, 2014) and, in some cases, the sentiment of the posts were therefore used (Bene, 2018, Sandoval-Almazan and Valle-Cruz, 2018). Other studies use the number of likes and emotions (Effing, van Hillegersberg, and

Huibers, 2016). In addition, studies differ in the selection of posts. In particular, Twitter data are often filtered by keywords (party names, politician names, etc.). As a result, the data include both supply-side and demand-side tweets. Recent studies focus on the posts of political parties and their members. Text analytic evaluation allows conclusions to be drawn about communication behavior and topic selection.

In a comprehensive literature review, Jungherr, 2015 presents the state of research on the use of Twitter in political competition. For the present research question, the use of the medium by politicians and political parties is of interest. However, only a comparatively small number of studies have looked at the actual impact of Twitter activity by parties on the resulting electoral success. It has been shown that recognition and a sense of connection are more likely to be triggered by direct contact than by the use of traditional media (e.g. Lee, 2013; Lee and Oh, 2012). A mixed picture emerges for effects on electoral success, with both no effects (Vergeer, Hermans, and Sams, 2011) and existing effects (LaMarre and Suzuki-Lambrecht, 2013; Bright et al., 2019; Safiullah et al., 2017). However, the studies only use the number of tweets, i.e., activity. The content of the tweets, i.e., whether there is policy relevance or if other topics are tweeted and the underlying tone of the tweets, is not considered.

Grover et al., 2019 use a text-mining approach to evaluate the tweets in the election campaign between Clinton and Trump. They were able to relate the topics to voter interaction. Establishing a link with electoral success was not part of the study. Gerbaudo, Marogna, and Alzetta, 2019 merge the approaches and use both a text-mining approach and a measurement of emotions to study the 2017 United Kingdom (UK) election. They find positive effects on voter engagement for both positive and negative emotions depending on the issue. Moreover, they obtain plausible and meaningful results using the text-mining approach on Facebook.

Overall, research on Social Media in the context of elections and voter behavior does not yet present a clear picture. First, there are methodological difficulties to be mentioned, second, the use of Social Media is still a comparatively new field and the period of investigation is thus short. Most studies are to be understood as case studies and are only suitable for generalization to a limited extent. Nevertheless, there is agreement on the growing importance of Social Media and the need to better understand their mechanisms of action. This is where this paper contributes to the research, using the power of text mining, debate tone, and survey results to examine voter response over the course of the legislative session.

2.5 Voting Models

In the proceeding chapters, the various actors and their strategies have been examined in more detail. Voting models attempt to link these actors in a model and to understand their interactions. Basically, two different schools of thought can be distinguished, on the one hand a social psychological approach according to Campbell et al., 1980, which assumes voting behavior that is rather unconscious and cannot be influenced by the voter. On the other hand, the class of Spatial Voting Models with the assumption of two rational actors with self-interest, which find their origin in Hotelling, 1929 and the first important contributions of Downs, 1957 and Black, 1948. While the first approach considers the forces surrounding the voter and analyzes their influence on the voter, the second approach aims at evaluating the actors' reactions to the other side.

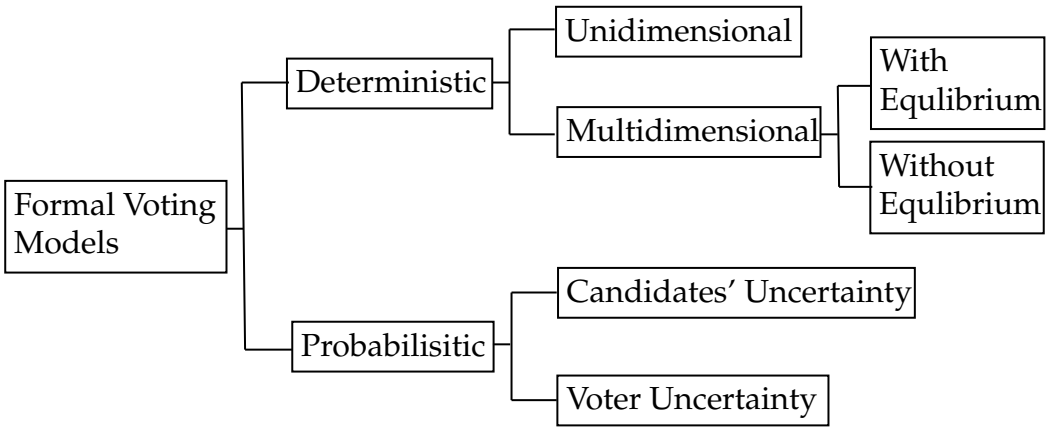
This thesis is based on the spatial voting models school of thought and the economic assumption of a rational actor according to his preferences. Initially, the theory of spatial voting was mainly interested in the reaction of actors on the supply side. Voter response to changes in policy supply has received less attention in the literature. Some studies (e.g. Seeberg, Slothuus, and Stubager, 2016, Petrocik, 1996, Kendall, Nannicini, and Trebbi, 2015) have focused mainly on voter response based on case studies. Overall, there has been less empirical consideration of this theory compared to the rich literature on theoretical spatial voting.

All spatial voting models involve two actors, the voter and the candidate or party. In addition to the actors, institutional conditions also play a role in the political decision-making process. Both actors have an interest in choosing or implementing policy issues that are closest to their own preferences. Accordingly, the voter has an interest in the outcome of the election and, as a rational actor, will match the policies and issues of the candidates with his or her range of opinions and vote for the candidate who is closest to him or her. The candidate or party uses this knowledge of the links between its chosen policies and voting behavior to generate as many votes as possible and to ensure electoral success. The first models assumed a two-party candidate system. For analytical purposes, these systems have the advantage of a comparatively simple majority voting system. The development of models with multiple candidates enabled them to be applied to other electoral systems. In addition to the number of candidates, the models also differ in the number of issues. Reducing the issue space to one issue allows for the generation of well-defined and stable equilibria;

when expanding to a multiissue space, the formation of equilibria is bound by strict assumptions.

A further distinction is made between committee elections and mass elections. While committee elections assume a small, well-informed electorate, in large-scale elections it is irrational for voters to obtain detailed information about the election programs of candidates and parties. Instead, voters use proxies to assess candidates' positions. Downs, 1957 refers to this as a "system of information gathering". The origin of the theory dates back to a time when information was costly. In addition to the time constraint, the monetary factor made information gathering less attractive. More recent models have increasingly implemented the power of information and the framing of political content. Riker, 1990 already recognizes rhetoric as an important factor in political competition. Social Media with the cheaper and more present availability of information might lead to more informed voting decisions up to issue voting. Therefore, a detailed analysis is a relevant expansion to the existing literature.

FIGURE 2.3: Deterministic and Probabilistic Voting Models. Following Burden, 1997.



A crucial element in the choice of an empirical model is the distinction between deterministic or probabilistic assumptions (see figure 2.3). The early considerations of a voting decision with certainty are reflected in deterministic models and are of interest primarily in terms of their relevance in the process of developing voting models. Probabilistic models with uncertainties of both voters and candidates or parties are the more relevant group of election models to this thesis, especially with respect to the influence of information and issue focus. Ordeshook (1986, p. 179-180), for instance, argues that "probabilistic assumptions are reasonable if we consider that candidates are rarely certain about voter preferences and who will

vote," yet "deterministic assumptions yield cleaner predictions, and are better suited to uncovering fundamental forces that operate in politics."

2.5.1 Assumptions and Implications of Spatial Voting Models

A comprehensive review of the literature is hardly possible and is not the claim of this thesis. The chapter does not claim to cover the tradition of voting models in its entirety, nor to be too detailed.[10] After the very brief introduction to spatial voting models, advancements in spatial voting are discussed in terms of their relevance for the empirical problem in chapter 6. Early models assume a one-dimensional case with two candidates and strict assumptions to ensure equilibrium outcomes. Those include a proximity assumption, that voters will cast their vote for the nearest party. Additionally, voters and parties are assumed to be fully informed.

The application of Hotelling, 1929 competitive analysis to a political sphere by Downs, 1957 was groundbreaking for political economy. The median voter theorem has since been one of the most influential and widely cited works. The positioning of parties on the ideological left-right scale allows for a continuous analysis of parties. Parties are arranged on the left-right continuum in such a way that all voters agree with this arrangement. When parties are arranged on the left-right continuum, voters are assumed to have single-peaked preferences such that:

$$\begin{aligned} x^* &\in \{x_1, ..., x_N\} \\ x_m < x_n \leq x^* &\Rightarrow x_n \succ x_m \\ x_m > x_n \geq x^* &\Rightarrow x_n \succ x_m \end{aligned} \tag{2.2}$$

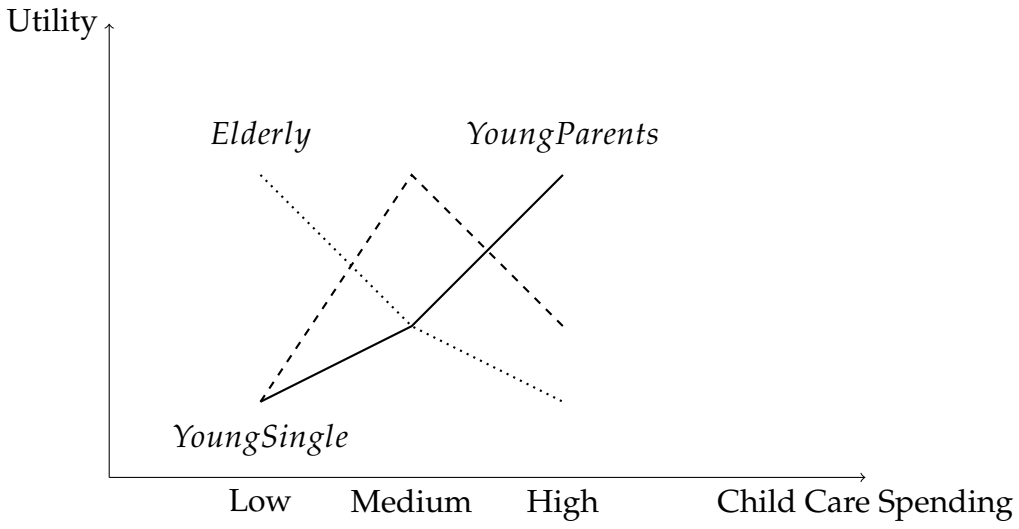
Which implies that voters have an ideal point and can rank all possible alternatives. If all voter preferences have a single local maximum and voters rationally decide to vote for the parties closest to their preferences, the median voter will decide the election such that:

$$\begin{aligned} x_{median} &\in \{x_1, ..., x_N\} \\ x_1 < ... < x_{median} &< ... < x_N \end{aligned} \tag{2.3}$$

[10] A comprehensive review of the literature and the development of election models can be found e.g. in Enelow and Hinich, 1984, Enelow and Hinich, 1990 etc.

In the case of politics, for example, one could think of voters with a preferred tax rate, which could also be in the form of preferences for redistributive policies. Each voter has an ideal preferred tax rate that matches the preferred redistribution rate. Any tax rate above or below it is less preferred - under the assumption that there is no selective voting, i.e., every eligible voter votes and will vote for the closest party. The ideological position of voters serves as a guide for parties and candidates. Suppose that the most important voting issue (one dimension) is the provision of child care. Society consists of three distinct groups: young parents, young single households, and the elderly, who have different preferences regarding the level of government spending on child care. Figure 2.4 illustrates the preferences, assuming that each group is equal in size and that the median voter is the group of young single households. The winner will be a policy with median spending on child care. Policies to the left or right of this equilibrium have no chance of electoral success. Supply-side policies are assumed to have no ideological preferences, but are only interested in maximizing votes. Therefore, the best position to win the election is the position of the median voter.

FIGURE 2.4: Voter Preferences of Child Care Spending



The above example shows that the basic assumptions of the median voter theorem apply to majority voting systems (two parties) without ideological positioning. The assumptions that are supposed to guarantee equilibrium are strict and indicate that they do not hold in many cases. The existence of pure strategy equilibria for two or more candidates is rare (see Plott, 1967, Davis, DeGroot, and Hinich, 1972, Kramer, 1973, Enelow and Hinich, 1990).

Extensions were first made for committee elections (see, e.g., Aumann and Maschler 1964, Wilson, 1971, McKelvey, Ordeshook, and Winer, 1978). With Romer and Rosenthal, 1978 introduction of agenda theory, the strategic component of politics and electoral choice became relevant. Agenda setters have several options to strategically change the order of policies, change the bundle of policies, and decide which policies to vote on in the first place.

The development of choice theory was advanced with the publications of Hinich, Ledyard, and Ordeshook, 1972 and Coughlin and Nitzan, 1981. Probabilistic assumptions are the main feature of these developments. "Viewing the vote as a nondegenerate random variable, instead of as strictly determined by policy preferences, marked a fundamental departure in election theory." (Enelow, Hinich, and Arrow (1990, p.3)) The main features of probabilistic election theory include the possibility of abstention and the inclusion of non-political characteristics. With respect to the following case study, multi-candidate, multi-issue and applications with uncertainty are of interest. The following chapter briefly summarizes some main findings, which were published mainly in a period after 1994. Green and Shapiro, 1994 note that up to this time hardly any empirical studies have emerged.

2.5.2 Empirical Applications and Probabilistic Voting

The following consideration is brief and intends to contextualize the model introduced in chapter 6. For a more comprehensive analysis of empirical results, the reader is referred to Adams, 2012[11] and for two candidate models to Jessee, 2012.

The empirical studies can be divided according to the actors; first, the reaction of the parties is considered, and second, the reaction of the voters is analyzed. While for parties the results of the theoretical Spatial Voting Models are confirmed, the evidence for voter reactions is very dependent on the study object.

For parties, the theoretical model assumes that they respond to voter adjustment on the left-right spectrum, that they use past election results to realign themselves, that they respond to direct competitors, and that their valence image plays a role. All four criteria could be substantiated in empirical studies. Some selected studies are explained in the sequel.

[11] Adams, 2012 concentrates, in contrast to this thesis, on empirical findings based on the left-right-placement of parties.

According to studies, the response of parties to voters depends on various factors. The change in voter attitudes must differ sufficiently from the party position to motivate an adjustment (Adams and Merrill, 2009). Moreover, niche and mainstream parties differ; while mainstream parties can and do adjust, niche parties are even penalized for adjusting (Adams et al., 2006). Moreover, mainstream parties appear to be responsive to the median voter, while niche parties are responsive to adjustments by their supporters (Ezrow et al., 2010). In addition to adjustments in voter opinion, election outcome is a variable that can cause a change in party line. Somer-Topcu, 2009 find that parties adjust mainly in the face of losses and that adjustments decrease with the temporal distance from the previous election. Direct competitors are used as a guide and can thus induce party adjustments (Adams and Somer-Topcu, 2009).

A final relevant variable of party adjustment is the treatment of valence issues. Valence issues include those issues that all voters would agree with, such as reducing crime and growth (see Ansolabehere and Snyder, 2000). Parties are assigned specific competence in the area of valence issues. In their comparison of theory and empirics, Schofield and Sened, 2005 were able to show that high valence parties (high competence) maximize their votes in the center, while low valence parties maximize their votes at the margins.

For voters, study evidence is less clear. In particular, there is little or weak empirical evidence regarding ideological or left-right alignment. As discussed earlier, adaptation in the left-right spectrum by voters is rather slow. However, evidence can be found on the salience of policy dimensions, the change of basic principles, and the shaping of priorities.

Tavits, 2007 distinguishes between pragmatic and principle issues. While in pragmatic issues an adjustment by the parties is accepted or even appreciated by the voters, in principle issues a lower electoral success is to be expected. Principle issues concern basic values, such as human rights, morality or religion. The work of Meguid, 2005 shows that it is not the positioning of the party itself, but the salience of issues and the ownership of issues that contributes to the electoral success of mainstream and niche parties. While left-right positioning causes little empirical evidence of adjustment among voters, issues can have an effect either through their dimension or through salience and ownership. In the remainder of this thesis, I examine the latter two options, namely salience of issues and issue ownership. They are considered over the course of an entire legislative period.

Chapter 3

Topic Modeling

3.1 Automated Text Retrieval

The advantage of structured data in statistical form, surveys, tabular presentations or other quantitative surveys is obvious. The data is already available in machine-readable form, ready for use without time-consuming preparation, and comparable. Comparability can be achieved at the national or international level, intertemporally, and between different socioeconomic groups, depending on the data set used.[1] In addition, the collection of quantitative data is comparatively cheap and requires minimal human resources. Particularly macroeconomic core data is collected in a standardized manner and is available to a broad group of people.

In addition to the advantages, quantitative data is also subject to some shortcomings. Many economically and socially relevant data is collected in aggregates and with a time lag. In particular, macroeconomic variables such as growth, inflation, consumption or unemployment are only available with a time lag. Therefore, only ex-post changes or developments in the past can be observed. Forecasts of leading indicators such as stock markets, construction activity or credit can therefore be used to predict future developments (Hymans et al., 1973, Estrella and Mishkin, 1998, McMillan, 2021).

To compensate for the delay, elaborate surveys are carried out, for example on consumer behavior. In some cases, these give an ex ante impression of behavioral developments. These survey-based studies are cost-intensive and require a considerable amount of human resources as well as the cooperation of the respondents.

[1] This is only true under the condition that data sets have been generated under consideration of an adequate and unbiased survey method. For example, data from individual states under authoritarian regimes may be subject to potential biases.

Moreover, structured, quantified data represent only a small part of reality and of the data actually available. Due to the spread of the Internet and the existence of mobile devices, it can be assumed that a significant proportion of the data generated is in unstructured form. An exact estimate of the proportion is difficult, although the figure of 80% is frequently quoted (e.g. IBM, 2020). However, a methodically clean survey of this value is not available. The unstructured data includes both text and image data in a variety of contexts. Text and image data is not only relevant for macroeconomic forecasting, but also accumulates large amounts of data in political, social, and economic contexts. Big Data represents a great opportunity for researchers and policymakers, but also challenges them to analyze the data in a complex way, to comply with data protection guidelines, and to ensure the reproducibility of the results.

Unstructured data is generated in the form of image or text data. Text data is particularly important in economic research. The data is generated by various actors in social, community and economic relationships. This includes companies, politicians, journalists, but also citizens. Historical data is mainly of formal character, including official speeches, journalistic articles, press releases or interviews. Based on this data, the first computer-aided methods were developed. With expanding Internet usage and the proliferation of social networks, informal information is taking an increasingly large share of the total data. Social Media, comment columns or personal websites have increased the amount of information about individuals and the relevance for economic and political contexts. Furthermore, there are three fundamental advantages of text-based data generation:

1. Data is available on an ad-hoc basis. There is no time lag between the generation of the data and its usability.
2. Social Media such as Twitter and Facebook or Google queries often represent opinion expressions of conscious and / or unconscious nature.
3. Collection is less expensive than surveys.

The real-time availability of data is one of the biggest advantages over traditional statistics. Traditional data originates from various sources and has to be processed for the preparation and calculation of indices moreover it is sometimes available with delay. Text data is available as soon as it is published. Depending on the methodology, the data can thus provide real-time information on changes in opinion and economic activity. In addition, direct statements from stakeholders are available through Social

Media messages. By means of direct statements of opinion, developments can not only be followed in a timely manner, but can also be predicted. Research on financial market developments has evolved intensively following central bank statements and provides very good results (Benchimol, Kazinnik, and Saadon, 2022, Bruno, 2016, Bholat et al., 2015, Tobback, Nardelli, and Martens, 2017, Hansen and McMahon, 2016). This methodology can also be applied to statements made by consumers, political parties and voters to predict behavior and developments. The analysis methods also allow to analyze implicit content such as psychological motives or moods. By using implicit content, the direct statements of party official actors become even more interpretable.

By contrast, the use of text data requires extensive preparation of the documents. Documents or text segments are individual, self-contained text units that are used for the subsequent analysis method. Depending on the method, this can be entire documents, sentences or groups of words. The preparation of text data is significantly more comprehensive and time-consuming than in the case of official statistics. In particular, the use of informal text data, which have not gone through an editorial process, require considerable processing. On the one hand, there are linguistic errors, and on the other hand, the text modules may contain topics in an unstructured form.

Another sensitive aspect of computer-aided text analysis is the reproducibility of the results. When using algorithms with fixed parameters or supervised approaches with precoded data, these must be unambiguously recorded and presented to allow for reproduction.

Analysis

There are a growing number of algorithms for evaluating unstructured text data. It is impossible to cover all algorithms because they are spread over different research areas and coexist. The number of algorithms grows with the application areas. Basically, the analysis methods are distinguished according to the criteria supervised and unsupervised, and there are also methods of content analysis or Natural Language Processing (NLP). Quinn et al., 2010 listed the costs and data sets required. With the exception of text reading and automated topic modeling, all methods require a very good knowledge of the underlying texts. The cost of the pre-analysis phase is therefore high. Coding the texts, or creating an accurate dictionary, or complete manual coding requires processing parts or the entire corpus of texts.

Supervised methods based on a training data set teach the model criteria that can later be used on unknown data to make predictions about content or behavior. The categorizations are assigned to the training data set, and the algorithm subsequently learns the features of the categories and assigns them to the categories. Supervised methods are considered more accurate, especially for in-depth content and psychological text analysis. The advantage of giving the algorithm a predetermined categorization is obvious compared to the clustering method of unsupervised methods. There are two aspects to be considered when choosing a method: First, there is the possibility of overfitting the model. If the algorithm has analyzed the training data set too detailed, the result of the new data may be poorer. The detailed features of the training data set do not have to appear in the new data set and therefore cannot be captured by the algorithm. Second, supervised methods require more data, a sufficiently large training data set that fits exactly, and the data that is actually being analyzed.

The model learns the topic mixture for each document in the training data set. Two major issues hinder wider application. It is not possible to assign a probability to previously unseen documents. Additionally, the number of parameters to be estimated increases linearly with the number of training documents, which increases the risk of overfitting.

Deerwester et al., 1990 developed one of the first approaches, the Latent Semantic Analysis (LSA), which provides automated indexing and is an extension of the simpler Vector Space Models (VSM) (e.g., Salton, Wong, and Yang, 1975). LSA uses document term matrices that contain information about the semantic structure. Dimensionality reduction using Singular Value Decomposition (SVD) has two main advantages. The idea is that it is easier to find similarities between documents in the latent space than in the original document term matrix and it reduces computational power substantially. SVD is a concept from linear algebra that uses the basic properties of $m \; x \; n$ matrices to produce two matrices that relate terms to concepts, documents to concepts, and a diagonal matrix whose diagonal elements are singular values of the original matrix. The singular values indicate the relative importance of the concepts in the latent semantic space. Only a predefined number of k topics remain, which reduces computation time. The smaller vector space still adequately represents the similarities between documents, indicating a possibility for noise reduction.

Early applications have used LSA to improve search queries to solve the problem of language diversity, i.e., detecting synonyms and words that refer to a concept.

However, this approach has some major drawbacks. Since the model has only a basic statistical foundation, its application remains limited. Probabilistic latent semantic analysis (pLSA) is an extension by Hofmann, 1999 that partially addresses this limitation. For example, the application of this model is able to learn text categories from a training set and predict the categories depending on the learned parameters from previously unseen documents. Basically, pLSA conditionally introduces independent documents and word labels for a given topic. Unlike the previous models, this allows for the possibility that a document contains more than one topic.

The model learns the topic mixture for each document in the training data set. Two major issues hinder a broader applicability. It is not possible to assign a probability to previously unseen documents. Furthermore, the number of parameters to be estimated increases linearly with the number of training documents, which increases the risk of overfitting.

Latent Dirichlet Allocation (LDA) solves several of these limitations (Blei, Ng, and Jordan, 2003). The main advance is that the documents to be studied are a random mixture over latent topics and each topic has a specific distribution over words. Unlike pLSA, which uses the computed parameters in the training set to evaluate the test set, LDA computes the topic distribution based on a Dirichlet prior. LDA assumes that a topic is distributed over a specific vocabulary and that each document consists of topics with different proportions.

Due to the advancement described above, the following analysis uses LDA to identify topics in political communication, the following section refers to the work of Blei, Ng, and Jordan, 2003. Subsequently, some other possible algorithms are briefly presented and advantages as well as disadvantages are named.

3.2 Topic Models

3.2.1 Latent-Dirichlet Allocation

The objective of this method is to process data such as texts in large quantities. The basic correlations should be preserved and for instance be utilized for classification or summarization of the texts (Blei, Ng, and Jordan, 2003). Using this method, the texts are allocated to topics, whereby in this context the topics are to be understood as a probability distribution of word lists. The topics are latent, i.e., not directly observable, and are generated via a clustering-like procedure. In the present case,

the goal is to classify the constantly high number of party political status messages and to have them accessible in a machine-readable form for further use in empirical models. The following descriptions largely refer to the explanations of the method by Blei, Ng, and Jordan, 2003.

LDA can be described as a three level hierarchical Bayesian model. The corpus is the first level, containing all documents, which form the second level. Each document is a randomized selection of latent topics, which is determined as the distribution of words within the document. The following graphical representation figure 3.1 (Blei, Ng, and Jordan (2003, p.997)) depicts the generative probabilistic model. Here, the corpus is represented as a collection of the M documents, the documents are a mixture of N words. The words are the actual observable number of discrete data, which are all part of the total vocabulary of the corpus.

The probabilistic generative process is defined as follows.

For each topic:

$$\beta_{\mathrm{k}} \sim Dir_{\mathrm{V}}(\eta) \tag{3.1}$$

For each document:

$$\theta_{\mathrm{d}} \sim Dir(\alpha) \tag{3.2}$$

For each word:

$$Z_{\mathrm{d,\,n}} \sim Mult(\theta_{\mathrm{d}}), with Z_{\mathrm{d,\,n}} \in 1, ..., K \tag{3.3}$$

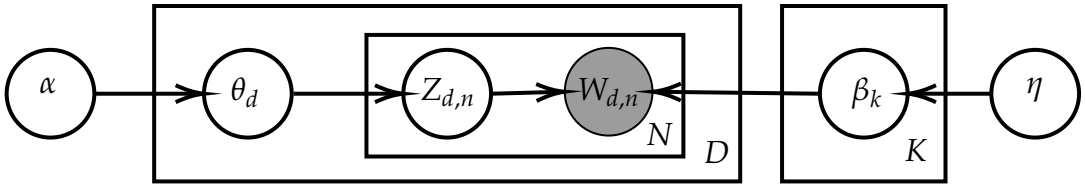
$$W_{\mathrm{d,\,n}} \sim Mult(\beta_{Z_{\mathrm{d,\,n}}}), with W_{\mathrm{d,\,n}} \in 1, ..., V \tag{3.4}$$

In a first step, the documents are converted into a word list. The sequence and grammatical form of the words are irrelevant. This is ensured by shortening the words to their basic form (stemming). Additionally stop lists are applied. These contain in any case conjunctions, filler words or general words, which occur in almost all documents. In the present application, all politician names or party names are filtered out as well. The overall goal is that only words that accurately reflect the topics remain in the vocabulary.

The vocabulary is divided into topics using the process described below (see figure 3.1). The number of topics is determined in advance. The determination is made after checking the presumed number of topics based on the function ldatuning (Murzintcev and Chaney, 2020). For consideration, the methods of Griffiths and Steyvers, 2004, Cao et al., 2009, and Arun et al., 2010 are used.

LDA uses two Dirichlet random variables. One is the topic β_{k}, as a distribution over the vocabulary W (with topics 1 to K) and the other is the topic assignment per document θ_{d}. The Dirichlet distribution uses fixed parameters η and α to affect the topic distribution over words and the document distribution over words, respectively. Topic assignment per word $Z_{\mathrm{d,n}}$ is the third hidden variable that defines the underlying latent structure of the corpus. $W_{\mathrm{d,n}}$ is the observed variable that contains information about the vocabulary used in the corpus (Blei and Lafferty, 2009).

FIGURE 3.1: Graphical Representation of LDA



Notations: Words are an element of the vocabulary $(1, ..., V)$. A document is denoted by $w = (w_1, ..., w_{\mathrm{N}})$, where N is the nth word of the document. The corpus is a collection of the M documents $D = (w_1, ..., w_{\mathrm{M}})$.
Source: Own Figure.

The graphical representation is equivalent to the following inference problem.

$$p(\beta_{1:\mathrm{K}}, \theta_{1:\mathrm{D}}, Z_{\mathrm{d,n}}, W_{\mathrm{d,n}} \mid \eta, \alpha) = \prod_{k=1}^{K} p(\beta_{\mathrm{k}} \mid \eta) \prod_{d=1}^{D} p(\theta_{\mathrm{d}} \mid \alpha) \prod_{n=1}^{N} [p(Z_{\mathrm{d,n}} \mid \theta) p(W_{\mathrm{d,n}} \mid Z_{\mathrm{d,n}}, \beta_{1:\mathrm{K}})] \quad (3.5)$$

Two prior parameters can be specified. The prior parameter α is relevant for modeling short messages. It is defined as the concentration parameter. For mainly short messages, it is set smaller than 1, which indicates that a document contains mainly one topic. In contrast, if it is greater than or equal to 1, the texts are more likely to contain more than one topic. For the analysis in this paper, it is set equal to 0.2. The second parameter defines the distribution of words per topic and is automatically set by the algorithm in this approach.

Crucial for the evaluation of the hidden variables is the corresponding posterior distribution, i.e. the conditional distribution of the latent content depending on the observed documents. Figure 3.1 shows all possible conditional dependencies. The posterior distribution is intractable due to the structure of the hidden variables. LDA solves the problem by approximation. Several methods have been proposed; hereafter we use Gibbs sampling, which is a form of Markov Chain Monte Carlo.[2] The idea is to estimate the conditional probability of assigning a word to a given topic given the topic assignments to all other words. The algorithm starts by assigning each word to a random topic and re-evaluates the assignment at each iteration step. Therefore, it is critical that the number of iterations is sufficient for the estimate to converge to the posterior distribution.

LDA is limited by the use of the Dirichlet distribution as it is unable to capture correlations between topics (Blei and Lafferty, 2006a). The strong independence assumptions of the Dirichlet distribution do not allow for subject correlations. Less rigid logistic normal distributions can solve this problem. However, LDA provides good results for the data at hand. Therefore, and because LDA is well established, it is reasonable to use it here.[3]

3.2.2 Topic Models – Based on LDA

Based on LDA, a number of other algorithms have been developed. At this point, four algorithms are discussed, which could be used for the analysis of political statements. The following list is neither complete nor comprehensive, the Correlated Topic Model (CTM), the Structural Topic Model (STM), the Dynamic Topic Model (DTM) as well as an overview of approaches for short texts are exemplarily explained and the use of the LDA approach is critically reflected. For a more comprehensive overview of the use of LDA based topic models see e.g. Chauhan and Shah, 2022.

The chosen algorithms address the key weaknesses of the LDA approach. For example, based on the Dirichlet distribution, no correlation between topics can be mapped. The CTM uses a logistic normal distribution instead. The DTM replaces the assumption that texts are interchangeable in order; moreover, the distribution function is adjusted. Via STM, covariates can be included in the evaluation of the

[2] For a more in depth description of the Gibbs sampling procedure, see, for example Steyvers and Griffiths (2006).

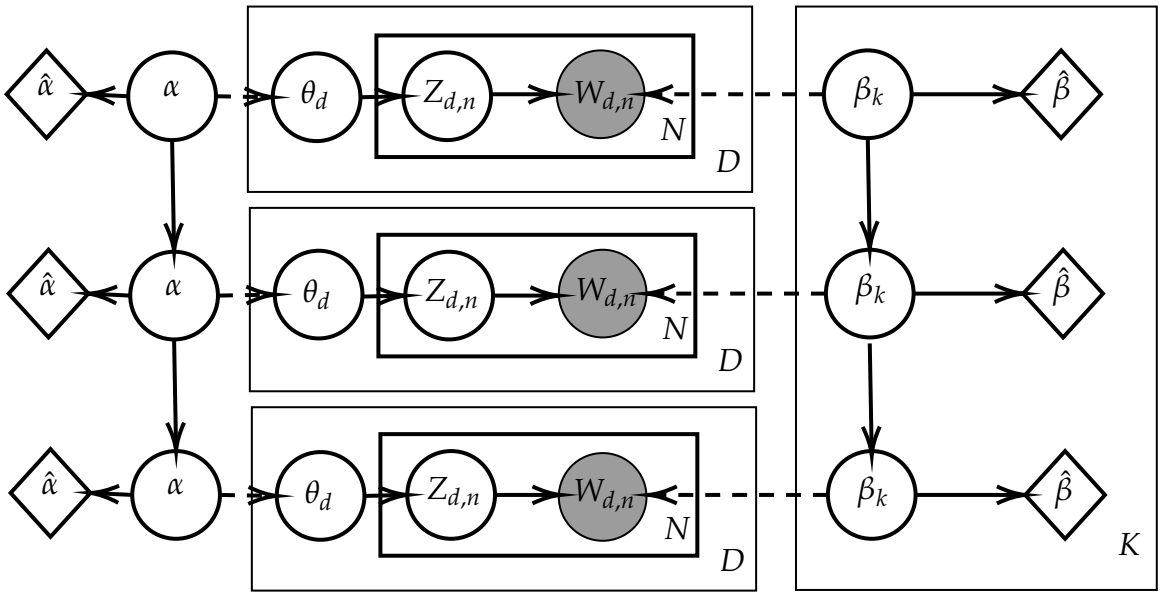
[3] The foundations of the implemented code go back to Wiedemann and Niekler, 2017.

texts. The problem of short texts is mainly due to the rare co-existence of single words. Therefore, the assignment of words to topics becomes more difficult.

The covariance of topics can provide a good insight into the linkage of topics. More likely and less likely constellations can be identified. In the present application, for instance, it would be reasonable to assume that socio-political topics are linked to topics on migration, whereas it is less likely that socio-political topics are linked to terrorism. The CTM approach allows for covariance via the use of logistic normal distribution. The assumption when using the Dirichlet distribution that the issues are independent precludes correlation of the issues. Blei and Lafferty, 2006a pursue the goal of using the CTM to achieve a more realistic representation of the interconnectedness of individual topics. The generative process of the CTM is identical to the LDA, except for the use of the logistic normal distribution instead of the Dirichlet distribution.

Since comparatively short texts are used for analysis in the case of Social Media usage, correlation within individual messages plays a rather minor role. Therefore, the approach with LDA was preferred to the CTM.

FIGURE 3.2: Graphical Representation of DTM



Source: Own Figure, following Blei and Lafferty, 2006b.

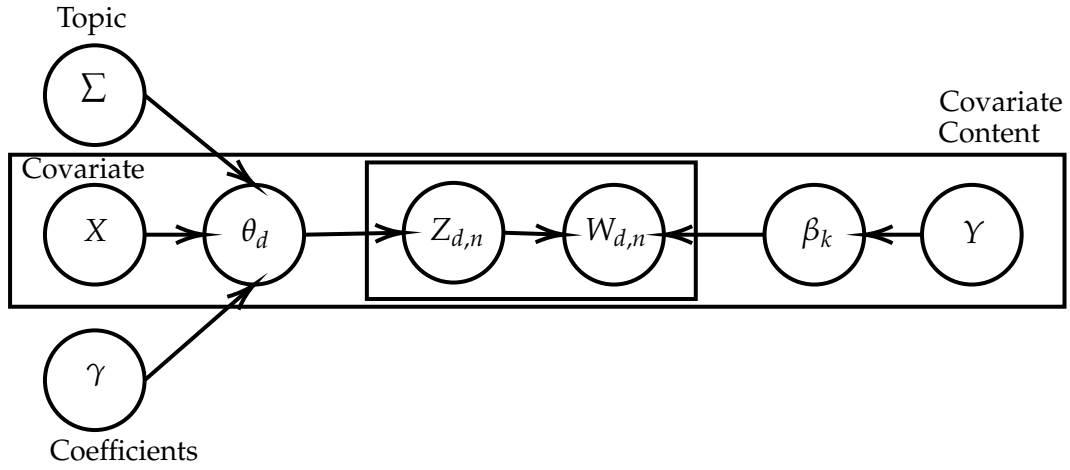
The DTM (Blei and Lafferty, 2006b) replaces the assumption that documents are interchangeable. In the DTM, the data set is divided into time periods. The assumption is that the topics of time t evolve from the topics of time period $t-1$. As in CTM,

the topic proportions are drawn from a logisitic normal distribution rather than a Dirichlet distribution. Figure 3.2 depicts the process of the DTM.

The exemplary analysis of political statements covers only one legislative period; it can be assumed that the topics have undergone less change, especially with regard to the strong thematic focus on migration. Future analyses that go beyond the case study evidence should include a dynamic topic model as a central building block.

STM (Roberts, Stewart, and Airoldi, 2016) uses covariates as an additional source of information. The goal is to better capture the structure of the text corpus. The model was tested on a corpus about China in different newspapers. The newspaper and the date were used as covariates. Methodically, a logistic normal distribution is used for the approach as well and the approach is extended by a matrix of covariates in comparison to the CTM and DTM. Figure 3.3 shows that the covariates have an influence on the document-topic distribution on the one hand and on the word-topic distribution on the other hand.

FIGURE 3.3: Graphical Representation of STM



Source: Own Figure, following Roberts, Stewart, and Airoldi, 2016.

This case study circumvented the use of covariates by separating the data set by party. An individual corpus was created for each party to ensure an adequate representation of the different topic focus.

A general problem in analyzing corpuses consisting of short texts is the fit of approaches designed for longer texts. The brevity of the texts means that the vocabulary and thus the co-occurrence of words within a topic is low. In particular, this problem occurs when looking at user texts in, for example, comment columns or general

tweets. Some algorithms have been developed specifically for use in short texts (e.g., Cheng et al., 2014, Kim and Shim, 2014, Paul and Dredze, 2014).

However, the communication of top politicians and the party pages differs significantly from general communication in some respects. The texts are editorial in nature and the topics are focused on the political agenda, which is communicated with a homogeneous vocabulary. The random check of the generated topics, for the present database (see chapter 4), with LDA with the original messages shows a good fit.

Chapter 4

Party Communication on Social Media Channels

Political communication is no longer limited to personal campaigns or media reports. Modern technologies and their extensive usage allow parties, politicians and voters to interact on online platforms. Recent examples such as the Arab Spring show that Social Media channels can influence and enlarge political movements. The influence grew with the extensive availability of mobile terminals. While the use of Social Media and digital content increased throughout the last decade, the reverse trend is observable for print media. In the beginning, Social Media was targeted at private use - by now, commercial and professional usage increases. Additionally, the number of platforms continues to grow and use varies widely across countries. In contrast to other countries, Facebook still is the most popular platform in Germany. The federal election in 2017 was the first with a general prevalence of Social Media across wide parts of the population. Table 4.1 shows the prevalence of Facebook, Twitter and Instagram. While the influence of Facebook is shrinking, platforms such as Instagram or YouTube gain importance. The methods to retrieve meaningful results, though, differ between text based platforms as Facebook and picture or video based platforms as Instagram and YouTube. In addition, the text based communication is more similar to long known mechanisms of party communication and can therefore be compared with former findings. The following case study is, therefore, based on party communication of parties and politicians on Facebook.

However, there exist contrasting opinion that direct party communication is less important and media coverage is more relevant for voter choice. These approaches claim that information seeking is too costly for voters and that they rely on condensed and summed up media reports (see e.g. Nooy and Kleinnijenhuis, 2013, Tresch,

TABLE 4.1: Users of Social Media Channels in Millions (Germany)

	2013	2014	2015	2016	2017	2018
Facebook	27.4	23.9	24.7	23.5	22.9	21.7
Twitter	3.5	2.8	2.8	2.8	2.1	2.8
Instagram	0.0	0.0	4.9	6.2	3.3	2.8

Source: Krupp and Bellut (2018)
Notes: Question "Which social media channel do you use at least weekly?"

Lefevere, and Walgrave, 2013). The proliferation of Social Media and algorithm-based exposure of voters to political content can potentially change these assumptions. The search costs decreased and private and official communication become indistinct. While Social Media and direct communication is not a substitute for media coverage, it becomes more important. Additionally, using direct communication allows to study the strategic agenda of parties and its effect on voting behavior.

The following chapter provides an explanation of the underlying data and the model, followed by a comprehensive chapter on the analysis of the resulting topics. With regard to the parties, the chapter focuses on the aspects of topic ownership and agenda setting. Subsequently, the relevance of the temporal evolution of the topics is discussed. A final section deals with the discourse of the topics and the extent to which the individual parties can be identified by their focus.

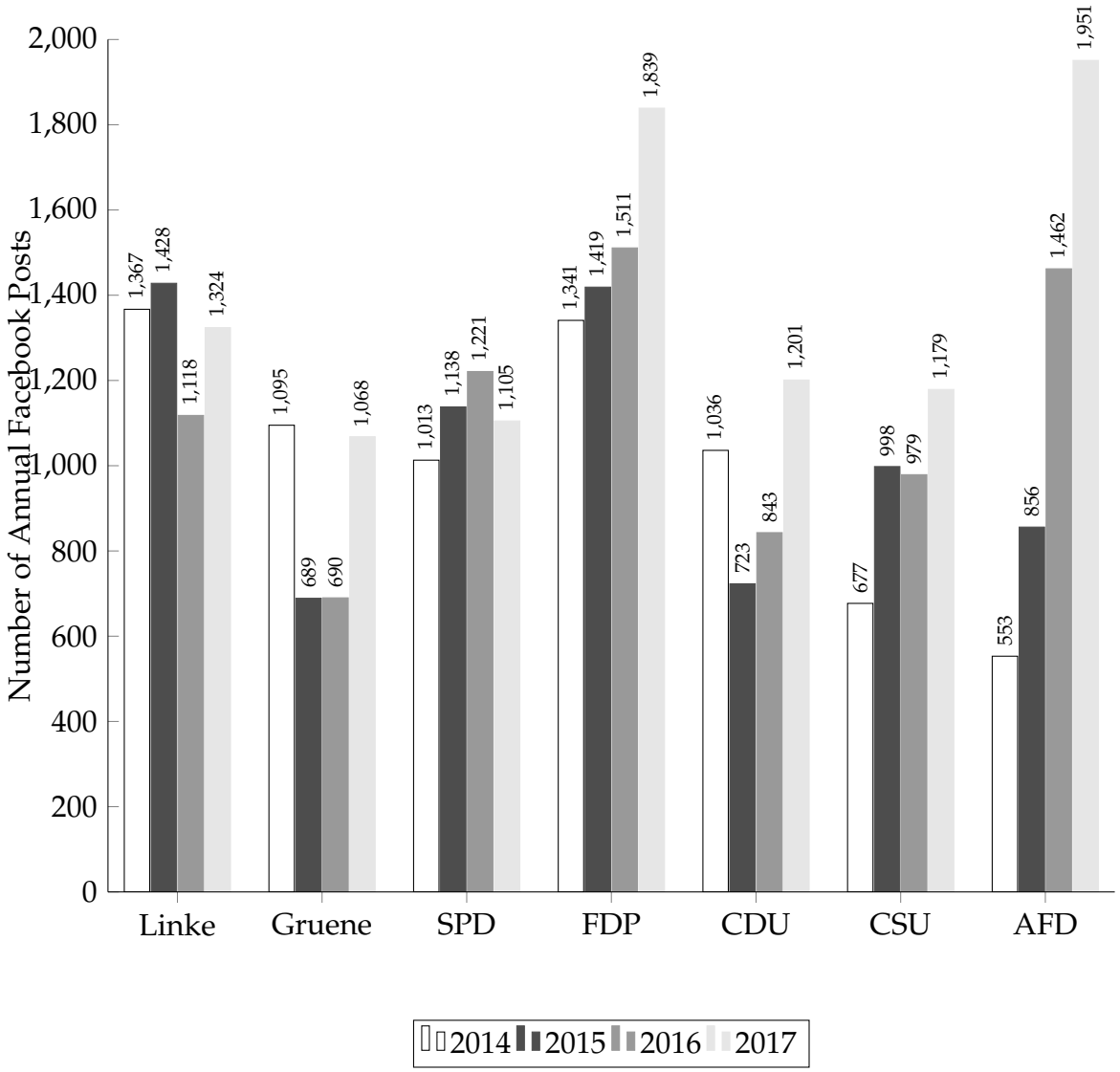
4.1 Preparation of Data

4.1.1 Data

The collected data includes Facebook accounts on the federal level. Party positions and issue focus differ for the federal and the Federal States level. The text mining algorithm is based on a clustering approach that is domain sensitive. Specifically, this implies a decreasing precision of results for more individuals. Therefore, to cope with both domain sensitivity and the projection of party positions, the data set includes the official parties' Facebook pages and the party leader and general secretaries. The covered parties are all member of parliament after the federal elections of 2017.

The following analysis is based on Facebook status messages at the federal level. No politicians at the Federal States level are included, due to differences in party positions and for issue focus, the distinction is relevant. Specifically, it includes

FIGURE 4.1: Facebook Messages by Party and Year



information on all seven parties that are members of the German Bundestag (Lower House) who were elected in September 2017. Ordered on the left-right continuum beginning on the left, the data set includes the Left Party (*Linke*), the Greens (*Gruene*), the Social Democrats (*SPD*), the Liberals (*FDP*), the Conservatives (*CDU*), the local Bavarian Conservatives (*CSU*) and the Alternative for Germany (*AfD*). The *Linke*, the *Gruene* and the *AfD* divide the office of the party leader. Therefore, both party heads are selected for the data set instead of the single party leader and general secretary, in the case of the other parties.

The distribution of messages (see figure 4.1) displays some first differences between

TABLE 4.2: Party Leaders and General Secretaries

	1. Party Leader	2. Party Leader	General Secretary
Linke	Katja Kipping (2012 - 2021)	Bernd Riexinger (2012 - 2021)	-
Gruene	Cem Özdemir (2013 - 2018)	Simone Peter (2013 - 2018)	-
SPD	Sigmar Gabriel (2009 - 2017)	-	Hubertus Heil (06.2017 - 12.2017)
FDP	Christian Lindner (since 2013)	-	Nicola Beer (2013 - 2019)
CDU	Angela Merkel (2001-2018)	-	Peter Tauber (2013 - 2018)
CSU	Horst Seehofer (2008 - 2019)	-	Andreas Scheuer (2013 -2018)
AfD	Frauke Petry (2013 - 2017)	Jörg Meuthen (2015 - 2022)	-

the parties. Obviously, the parties are not equally active on Facebook. Various factors explain the discrepancies: Especially *Gruene* and *Linke* tend to be more active on Twitter rather than Facebook, established parties such as *SPD*, *CDU* and *CSU* (incumbents) are in general less active on Social Media platforms and lastly, the *AfD* increased their Social Media presence gradually. However, the stark increase stems from the growing importance of the chosen *AfD* politicians, especially the 2. party leader Jörg Meuthen who holds office since mid 2015. As mentioned above, the text mining approach is domain sensitive, therefore, I use the party leader / general secretary who held office during the federal election in September 2017 (see table 4.2). Except for the SPD general secretary Hubertus Heil, all party officials held office for the longest time or complete legislation period. Heil, though, was vice party leader from 2009 - 2017 and campaign manager for the federal election in 2017. Therefore, it is reasonable to assume a continuous public presence even before mid 2017. The selection of politicians does neither represent the overall amount of party communication nor all possible opinions held. However, the obligation to vote in accordance with party policy emphasizes the importance of the general party position.

The data was gathered by the Facebook Application-Programming-Interface (API) which is a program interface downloading pre-defined information from user profiles. All profiles are publicly available and are officially used for the communication with voters and a wider public audience. The gathered information do not contain any

TABLE 4.3: Number of Posts by Party before and after the Cleaning Process

	Count before cleaning	Count after cleaning
Linke	5332	5306
Gruene	3551	3486
SPD	4452	4423
FDP	6128	6054
CDU	3757	3701
CSU	3861	3810
AfD	5012	5009

private user characteristics (see table 4.4 for the information gathered). The only user information are the quantities of post likes, comments and shares. Although, no personal characteristics are included, these indicators can give information about resonance and circulation of posts. In addition, the data includes the exact date. The analyses, however, are accumulated on a monthly basis to match the voter data and to reduce the noise.

The raw data is characterized by a huge number of words, grammatical differences and punctuation marks. In order to receive meaningful results a comprehensive data cleaning is necessary. The data cleaning includes stemming (i.e. keeping the root word), lower case and excluding punctuation characters. In addition, stop words are excluded. Two separate lists are used, one includes common stopwords such as filling words, conjunctions, pronouns or un/definite articles. The other list includes policy specific words, such as party or politicians names and other characteristics that define parties apart from policy issues (see Appendix B table B.1). After the cleaning process some messages are left empty or without signifying content. These posts are deleted afterwards. Table 4.3 shows the total number of messages by party.

TABLE 4.4: Exemplary Facebook Profile Data

Party	Text	Date	Like	Comment	Share
Linke	"This is shabby: talking about aid for Greece and then making billions from it. Our party leader Bernd Riexinger demands: "The German government must give up its resistance to debt relief so that a self-sustaining recovery can develop in Greece. The profits from Greece's aid must benefit the people in Greece and not embellish Schäuble's black zero."" [1]	12.07.2017	808	107	260
Gruene	"In Antarctica, an iceberg twice the size of the Saarland has broken off. We lose large parts of the polar ice from year to year. We must act now to prevent it from continuing to melt rapidly. If you want to support us in the fight for more climate protection, share the picture." [2]	12.07.2017	245	145	350

Continued on next page

[1] "Das ist schäbig: Von Hilfe für Griechenland sprechen und dann Milliarden daran verdienen. Unser Parteivorsitzender Bernd Riexinger fordert: "Die Bundesregierung muss ihren Widerstand gegen Schuldenerleichterungen aufgeben, damit in Griechenland ein selbst tragender Aufschwung entstehen kann. Die Gewinne aus den Griechenlandhilfen müssen den Menschen in Griechenland zugute kommen und nicht Schäubles schwarze Null verschönern.

[2] Ïn der Antarktis ist ein Eisberg mit der doppelten Größe des Saarlands abgebrochen. Wir verlieren von Jahr zu Jahr große Teile des Polareises. Wir müssen jetzt handeln, damit es nicht rapide weiter schmilzt. Wenn Ihr uns im Kampf für mehr Klimaschutz unterstützen wollt, teilt das Bild."

Table 4.4 – continued from previous page

Party	Text	Date	Like	Comment	Share
SPD	"The minimum wage is a question of justice and respect for people's lifetime achievements. We are proud to have enforced it." [3]	12.07.2017	1155	160	290
FDP	"The discussion about the introduction of a Financial Transaction Tax is becoming a posse. While the tax was still praised as a panacea by the CDU/CSU and SPD at the beginning of the legislative period, the enthusiasm has now faded. Instead of continuing to bet on it, the federal government should rather work towards an end to the negative interest rate phase, Volker Wissing demands. #FTT #PoliticsCalculationCan #FDPcontents" [4]	12.07.2017	309	24	34

Continued on next page

[3] "Der Mindestlohn ist eine Frage der Gerechtigkeit und des Respekts gegenüber der Lebensleistung der Menschen. Wir sind stolz darauf, ihn durchgesetzt zu haben."

[4] "Die Diskussion über die Einführung einer Finanztransaktionssteuer entwickelt sich zur Posse. Während die Steuer zu Beginn der Legislaturperiode von Union und SPD noch als Allheilmittel gepriesen wurde, ist die Begeisterung mittlerweile abgeebbt. Statt weiter darauf zu setzen, solle die Bundesregierung lieber auf ein Ende der Negativzinsphase hinarbeiten, fordert Volker Wissing. #FTT #PolitikDieRechnenKann #FDPInhalte"

Table 4.4 – continued from previous page

Party	Text	Date	Like	Comment	Share
CDU	"With our government programme we want to promote home ownership: We want to introduce a child benefit for house building for young families in the amount of 1,200 euros per child and per year. This is to be paid over a period of ten years. For a Germany in which we live well and happily." [5]	11.07.2017	406	171	157
CSU	"Families first! We put families at the centre of politics: more relief, more freedom of choice, more support and a more family-friendly country. #Bayernplan" [6]	18.07.2017	827	372	144

Continued on next page

[5] "Mit unserem Regierungsprogramm wollen wir Wohneigentum fördern: Wir wollen für junge Familien ein Baukindergeld in Höhe von 1.200 Euro je Kind und pro Jahr einführen. Dieses soll über einen Zeitraum von zehn Jahren gezahlt werden. Für ein Deutschland, in dem wir gut und gerne leben."

[6] "Familien zuerst! Wir rücken Familien ins Zentrum der Politik: Mehr Entlastung, mehr Wahlfreiheit, mehr Unterstützung und ein familienfreundlicheres Land. #Bayernplan"

Table 4.4 – continued from previous page

Party	Text	Date	Like	Comment	Share
AfD	"+++ Share and discuss!+++ It sounds unbelievable, and yet it is completely logical: Out of 408,000 asylum seekers whose applications were processed by the Federal Office for Migration and Refugees (BAMF) in the first half of 2017, only 2,177 are entitled to stay. At least if one were to take the Basic Law into account. Since almost all asylum seekers have already crossed safe third countries to reach Germany, the basic right to asylum laid down in Article 16a does not exist under any circumstances. And thus it becomes clear why only 0.5% of asylum applications should be granted, at least if the current law in Germany had not already lost all meaning. [...]" [7]	15.07.2017	2978	443	3057

Notes: The profile posts are only exemplary for the structure and general logic of messages.

[7] "+++Teilen und diskutieren!+++ Es klingt unglaublich, und doch ist es völlig logisch: Von 408.000 Asylbewerbern, deren Anträge das [...] BAMF im ersten Halbjahr 2017 bearbeitet hat, sind nur 2.177 bleibeberechtigt. Zumindest dann, wenn man das Grundgesetz berücksichtigen würde. Da nahezu alle Asylbegehrenden bereits sichere Drittländer durchquert haben, um nach Deutschland zu gelangen, besteht das in Artikel 16a festgelegte Grundrecht auf Asyl keinesfalls. Und somit wird auch klar, warum eigentlich nur 0,5% der Asylanträge positiv beschieden werden dürften, zumindest dann, wenn geltendes Recht in Deutschland nicht bereits jede Bedeutung verloren hätte. [...]"

4.1.2 Model

In contrast to other publications I do not use a single corpus for all parties, but one for each party. This has two major advantages. First, due to the domain sensitivity the approach works better with less persons / parties. Second, the topics generated for each party separately better identify the characteristics and focus of their communication strategy.

The resulting topics, though, should not be interpreted as the only party topics. It is possible that several other topics are communicated, however, with less frequency or less distinguishable vocabulary. Therefore, those topics are not recognized by the clustering approach. This does not decrease the explanatory power as these topics are not of primary importance.

4.2 Topics

The following chapters depict the Social Media communication of parties. In addition, it is shown that the Social Media communication is similar to known party communication on traditional channels. Specifically, the chapter covers ownership of topics across parties, agenda setting and the differences in behavior of incumbent and challenger. Additionally, the approach allows to evaluate topic coverage over time, which is a new option compared to traditional research designs. While discourse and sentiment are later quantified, the data allows a more detailed glance at the kind of discourse in the form of diction of the topics.

Illustrations in sub-chapter 3.2.1 describe the result's structure. Each topic consists of a list of words which can be coded as topic. The coded topics can be used for different purposes. The general category such as social policy, migration or budget and growth define the overall topic coverage. The subcategories are the specific policy areas which are than further splitted in policy characteristics. Those characteristics can be interpreted as party identification.

The analysis resulted in a total of 30 to 40 topics identified per party (see table 4.5). Seen individually, the number of topics is not a measure for the holistic view of a single category, e.g. while the *Linke* covers 5 out of 6 topics in the category social policy, *Gruene*, *FDP*, *CDU*, *CSU* and *AfD* cover at most 2 topics.

TABLE 4.5: Number of Topics by Party

	Linke	**Gruene**	**SPD**	**FDP**	**CDU**	**CSU**	**AfD**
Nr. of Topics	35	35	30	40	35	35	40

However, these topics are highly subdivided. In order to obtain interpretable results, a codebook was developed (see table 4.6). It was possible to extract 39 topics in 16 categories from the more detailed topic list by party.[8] The general category of policy areas, in this example social policy, is a very broad identification and is later used to show which policy areas are most important for the parties' agenda. For the detailed agenda the topical structure is suited best. By accurately identifying the target audience, the relevance of a party's agenda to different segments of the population can be analyzed. The sub-topical structure reflects the discourse.

TABLE 4.6: Codebook: Social Policy

Category	Topic	Sub-Topic
Social Policy	Job Market	a. Unemployment b. Wages c. Unemployment benefit (Hartz IV) d. Basic level of social protection e. Labor law (working hours, working contracts, ...) f. Unions g. Start-ups
	Pension Policy	a. Pension plans b. Old-age poverty
	Familiy Policy	a. Work-life balance b. Mother pension c. Child care allowance d. Child poverty
	Nursing Care Policy	
	Living Space Policy	
	Education Policy	a. Schools b. Kindergarten

Notes: For the entire codebook see Appendix B table B.2.

[8]The entire list of topics with the first eight words is to be found in Appendix B table B.4.

4.2.1 Main Topics

For an overview of topical structure it is useful to compare the parties' focus topics and other relevant topics. Table 4.7 is the most condensed representation of the Social Media communication. The representation results from the 30-40 issues generated per party. The focus topics already indicate the priorities of the parties. In addition, the niche issues can be identified and a first impression of the left-right classification of the parties can be gained. The topics are ordered on the basis of two criteria: the topics with the highest prevalence and those that can be classified as being owned by a party. The other relevant topics still have a wide distribution but are less frequently discussed. For some topics only certain years are relevant, e.g. EU and Migration (*Gruene* and *FDP*). For the mentioned years the topics were strikingly increased compared to the remaining research period.

TABLE 4.7: Main Topics in Party Communication by Party

	Linke	**Gruene**	**SPD**	**FDP**	**CDU**	**CSU**	**AfD**
Main Focus	Social Policy	Energy	Social Policy	Social Policy	Job Market	Migration	Migration
	Energy	Society	Growth, Free Trade	Budget, Free Trade	Budget, Free Trade		Criticism Parties
	Society	(Equality Rights)	Digitization	Digitization	Digitization		
				Party	Party	Party	EU (2014 / 15)
Other Relevant Topics	Party	Party	Party			Party	
	EU (2015)		EU (2014)	EU (2014)	EU (2014)	EU (2014)	
						Security	Security
		Extremism (right)	Extremism (right)				Extremism (left) / Terror
	Society		Society				
		Migration (2014/15)		Migration (2015)			
		Budget, Growth, Free Trade					
	International Conflicts						

One topic needs to be discussed in more detail as it is unusual compared to other channels of party communication. The category *Party* comprises all party specific communication without specific policy content. Though, not being used for the further analyses which concentrates on policy relevant issues, the topic could be interesting in terms of political apathy. It is conceivable that voters may feel less represented and the number of swing voters or non-voters may increase if the parties become too self-absorbed. The Party topic is an example of a topic that all parties pay considerable attention to. This is not surprising considering that the topic Party includes issues such as party programs, election campaigns, public debates and congratulations to party members. Such as,

> CSU: "On the European Election special web pages you will find a compact summary of important information about the European Election, the European candidates and the plan for Europe by the CSU." (04.2014)[9]
>
> or
>
> SPD: "Here we go. Directly after his speech at the SPD congress Martin Schulz gave us a short statement. Now it's all our turn. Fight! Pass it on! The European Election is on May 25th!" (03.2014) [10]

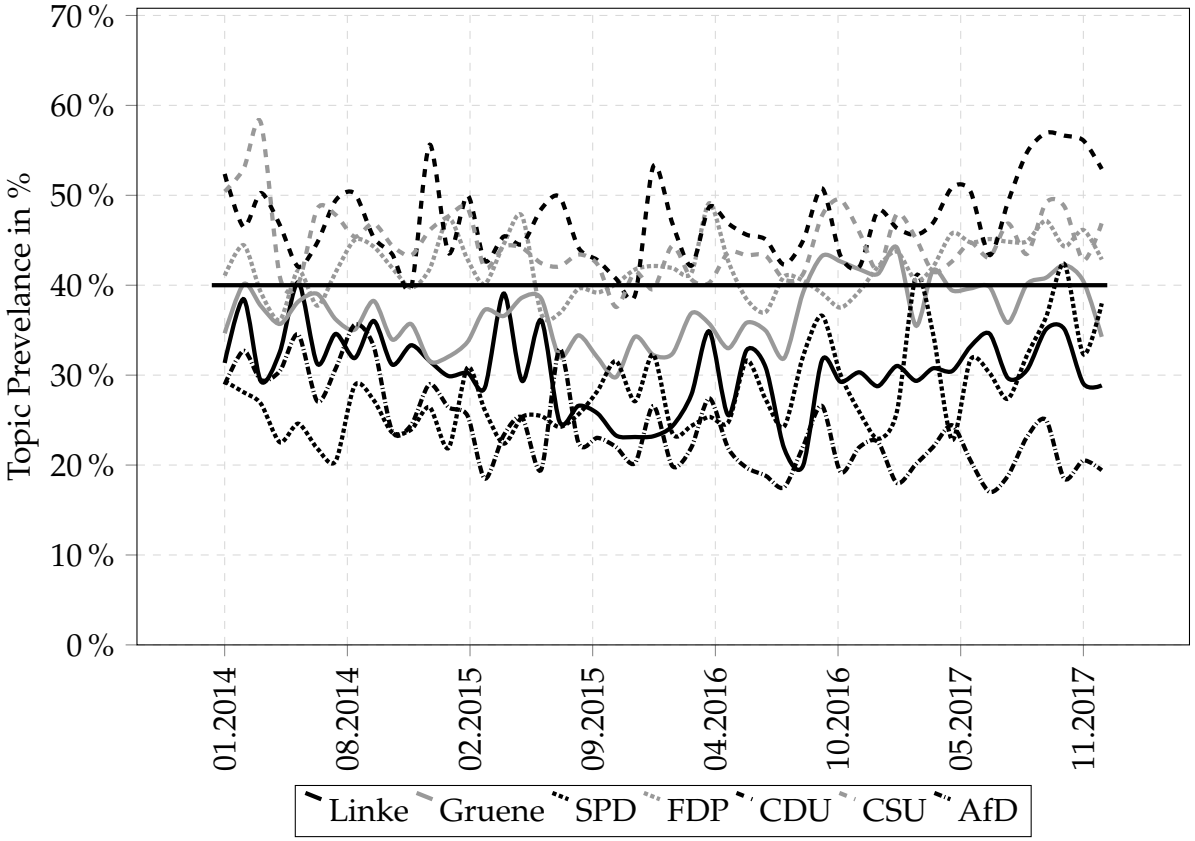
However, the Party topic is set as main topic for *CSU*, *CDU* and *FDP* and as other relevant topic for all other parties. Figure 4.2 shows, in contrast to the other topics, a comparatively unambiguous dividing line at 40% topic salience. The separation has no theoretical basis, it is merely a subdivision. It is chosen because of the few cases where individual parties cross this line one way or another. The *FDP* and *Gruene*, however, are borderline cases, as they slip below / above the 40% line for a number of cases. However, for both parties the spikes are above / below the 40% line; therefore, the allocation of the parties to the respective categories is reasonable. Spikes are mostly observed during party events, when there have been newly elected party leaders and during election campaigns at both the Federal States and federal level. The focus is on party programs, party venues and election campaign. While the issues include policy issues, the policy issues are mixed, undifferentiated, and a summary of relevant party issues. *CDU* and *CSU* are in long-term government

[9] Äuf den Europawahl-Sonderseiten findet Ihr kompakt zusammengefasst wichtige Infos zur Europawahl, zu den Europakandidaten und zum Europaplan der CSU."

[10] "Jetzt geht es los. Direkt nach seiner Rede auf dem Kongress der SPD hat uns Martin Schulz ein kurzes Statement gegeben. Nun sind wir alle dran. Kaempfen! Weitersagen! Am 25. Mai ist Europawahl!"

responsibility with relatively stable election results. Therefore, it is meaningful, that they concentrate more on success stories and refer to the success stories in election programs, venues and election campaigns.

FIGURE 4.2: Party Specific Communication by Party



In contrast to the party topic, regarding subject matter, the parties differ both in focus and in topic proportions. To show that the results are meaningful but multifaceted, I provide some examples of the policy changes of parties, the focus on niche topics, the visibility of important incidents and differentiated levels of focus on the same topic across parties. An overview of covered topics is presented in table 4.8.

TABLE 4.8: Overview of Covered Topics by Party

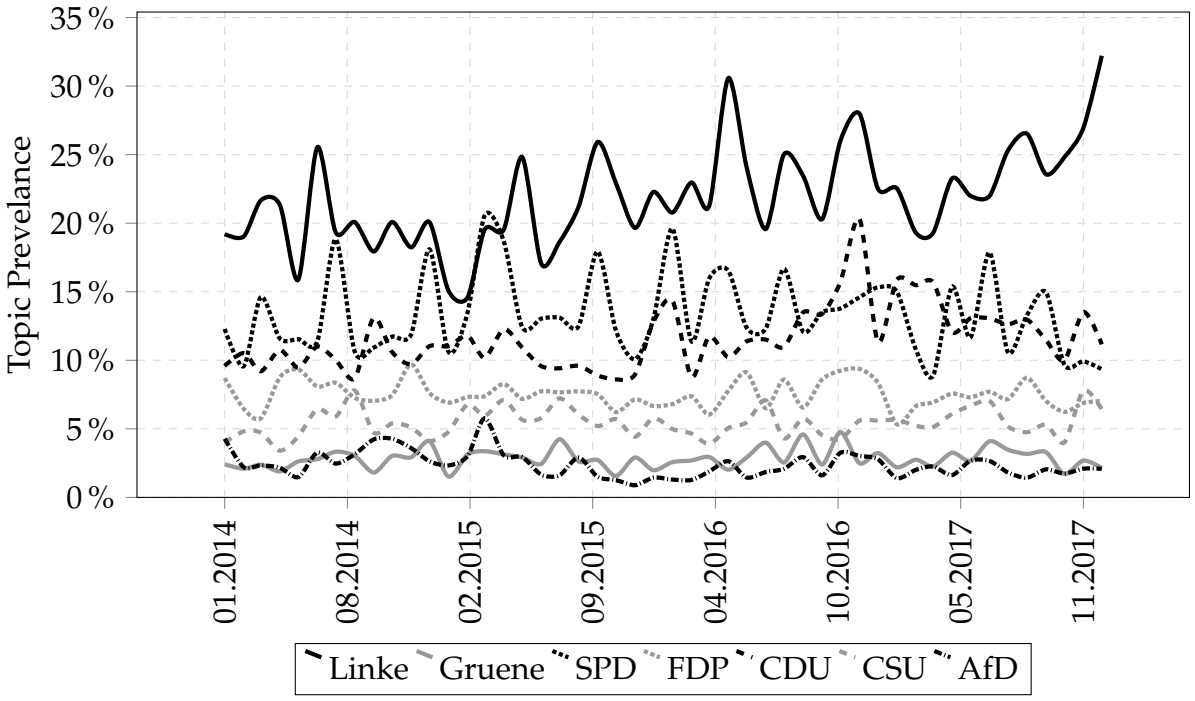
Category	Nr.	Linke	Gruene	SPD	FDP	CDU	CSU	AfD
Party	1	✓	✓	✓	✓	✓	✓	✓
	2	✓	✓	✓	✓	✓		✓
	3	✓	✓	✓	✓	✓	✓	
	4	✓	✓	✓	✓	✓	✓	✓
	5	✓	✓	✓	✓			✓
EU	6	✓	✓	✓	✓	✓	✓	✓
	7	✓			✓		✓	✓
Migration	8	✓	✓	✓	✓	✓	✓	✓
Security	9	✓		✓	✓	✓	✓	✓
Social	10	✓		✓	✓	✓	✓	
Policy	11	✓			✓			
	12	✓	✓	✓		✓	✓	
	13	✓						
	14	✓		✓				
	15			✓	✓			✓
Society	16	✓		✓	✓	✓	✓	✓
	17	✓		✓	✓	✓	✓	
	18		✓	✓		✓	✓	✓
	19	✓	✓	✓				
Extremism	20		✓	✓				✓
Terror	21	✓		✓	✓	✓	✓	✓
Budget	22		✓		✓	✓	✓	✓
Growth	23	✓						
Develop.	24		✓	✓				✓
	25	✓	✓	✓	✓	✓		✓
	26			✓	✓	✓		
	27					✓	✓	
Transport	28		✓		✓		✓	✓
Energy	29		✓	✓	✓			
Climate	30		✓					
	31	✓	✓					
Jurisdiction	32	✓						✓
Media	33	✓			✓			✓
Data	34				✓			
International	35	✓	✓		✓		✓	✓
	36	✓		✓	✓			✓
	37			✓				
Criticism	38				✓			✓
Mixed	39	✓						✓

Notes: The checkmarks do not necessarily add up to the number of topics in table 4.5 as these are calculated for the sub-topic structure.

4.2.2 Ownerships of Topics

Previous, mostly theoretical, studies show that niche parties concentrate on a focus topic, a unique position feature. Most smaller German parties, i.e., *Linke*, *Gruene*, and *AfD* discuss these niche topics, though with different intensities. The *FDP* is an exception because their topic portfolio depicts a large variety of topics without a striking outlier. The *Linke* focus on social policy, which is interesting in terms of the differing focus settings of the parties (see figure 4.3). A variety of different aspects of Social Policy are covered, the focus lies on an employee perspective, distributional aspects as well as social security. In contrast, the Conservative parties take a more employer-friendly perspective and focus on success stories, such as reducing unemployment. Moreover, the topic is communicated with less differentiation.

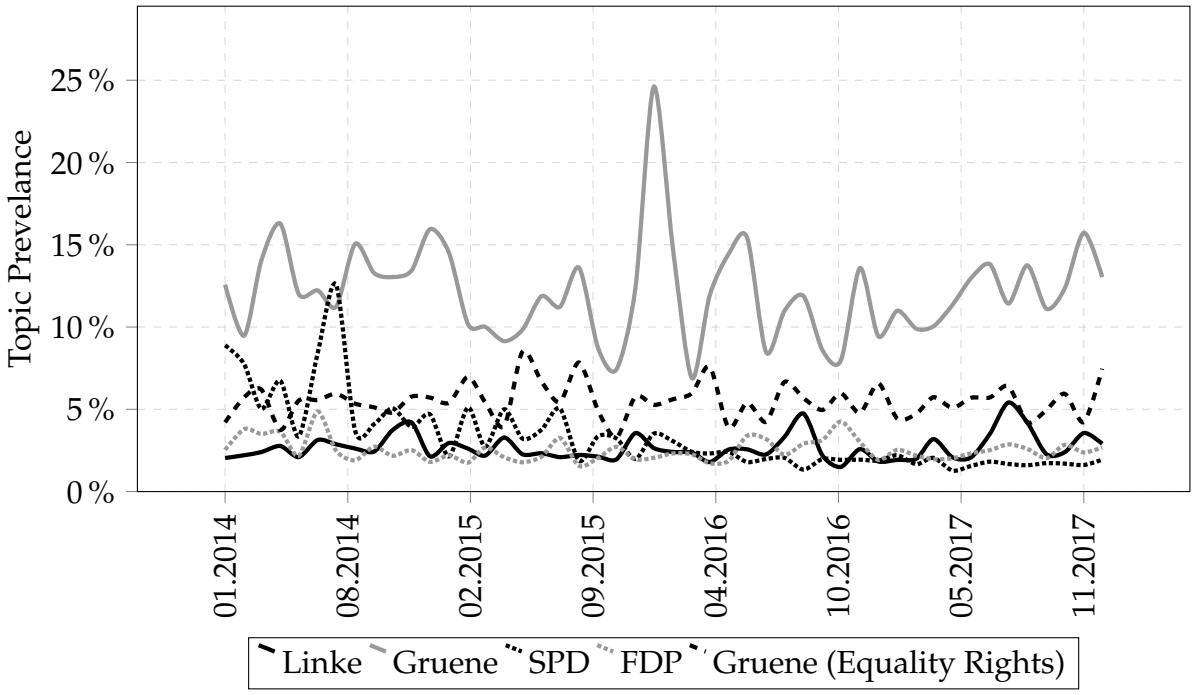
FIGURE 4.3: Issue Salience: Social Policy



The *Gruene*, as the ecological party, naturally focus on energy and climate issues and traditionally on socially relevant topics, mainly equal rights for the LGBT community. Although the percentage they devote to equal rights is not high, it is constantly between 5 to 10%, which is higher than that of all other parties.[11] Figure 4.4 shows that both issues are continuously relevant in party communication across the legislature period. The spike in 2015 stems from the Paris climate agreement. The topics

[11] For the salience of *Equality Rights* across parties see Appendix B table B.3.

FIGURE 4.4: Issue Salience: Energy, Ecology and Agriculture and Equality Rights (Gruene)



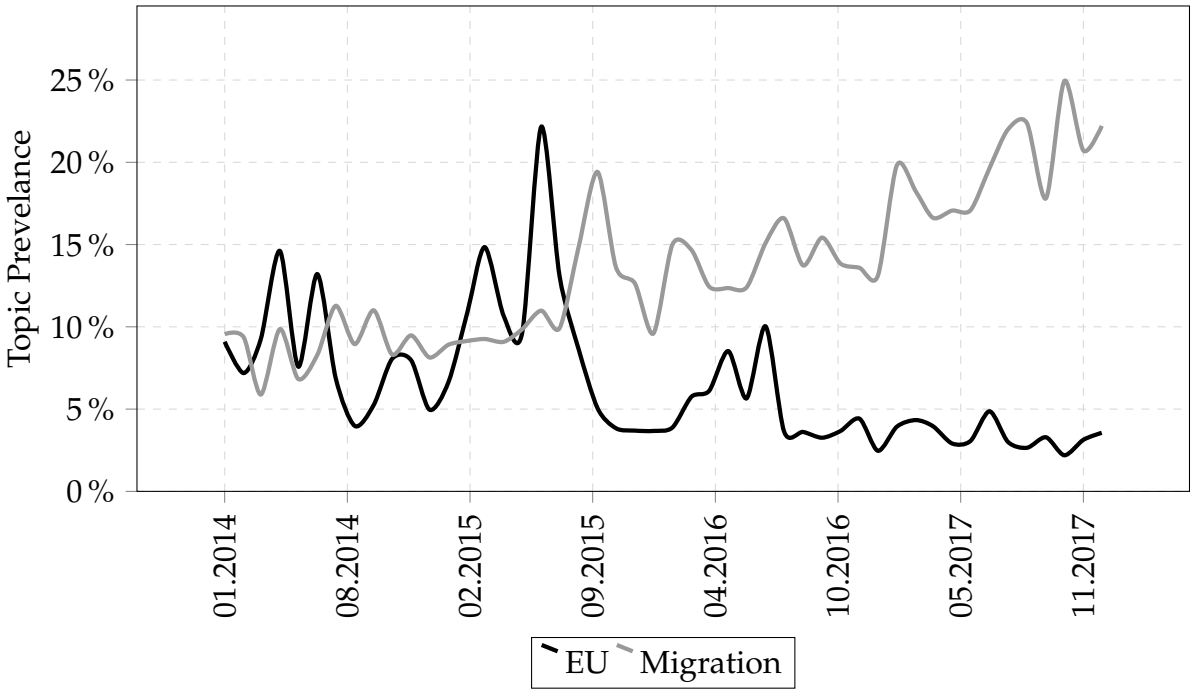
additionally show that the *Gruene* had a different perspective on the topic than other parties. They tended to controversially discuss and criticize policy decisions as insufficient, where the ruling coalition was more concerned with the success of increasing the supply of renewable energy. The SPD's July 2014 spike was due to a declared political success. On July 7, 2014, the German Federal Council approved the Renewable Energy Fee. The Federal Ministry of Economics and Energy (led by the SPD) accompanied this issue directly and with various announcements. This result supports, on the one hand, previous considerations of the niche party strategy and, on the other hand, findings that ruling parties prefer to emphasize success rather than controversial topics. For the *AfD*, as shown in figure 4.5, migration is the primary election campaign topic.

The parties cover expectable issues within their Social Media channels. First, ruling parties do not have a single characteristic topic but focus on success stories during their legislation period. Second, the topics covered correspond with the communication of parties in other channels and their party programs.

4.2.3 Agenda Setting

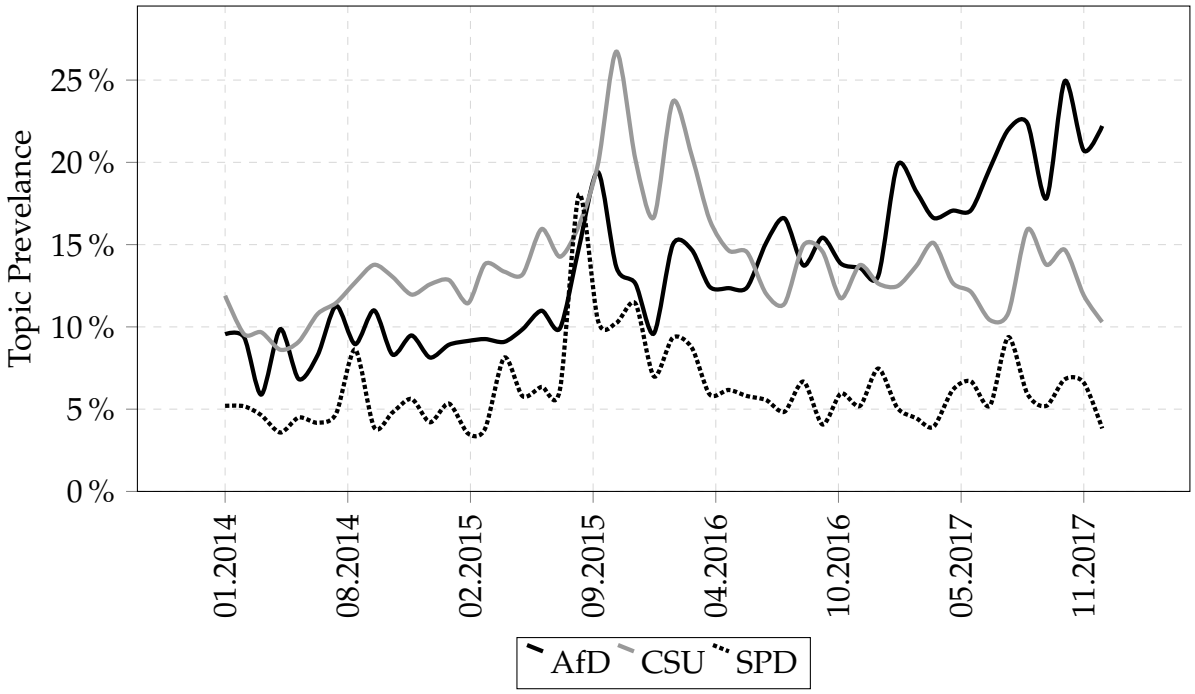
Agenda setting and especially the focus over time is a critical factor in analyzing parties. While in depth content analysis are conducted on a regular base, these can only cover a relatively small amount of the communication. Time and resource constraints prevent a full census. The automated text mining approach is not a substitute for hand coded and interpreted text data, but a complement. It allows to evaluate a larger amount of data and allows an in time tracing of changes in focus setting. Using Social Media data, it is possible to follow strategy and focus setting on a daily basis, or reasonably, on the aggregated monthly level. The goal is to understand the underlying mechanisms of voting behavior and the inter-temporal change of voter choice. However, if the frequency of voter polls and data on party positions fall apart it is more difficult to obtain a good understanding.

FIGURE 4.5: AfD Policy Change



The importance of the frequent update of the party's strategy is evident when looking at the change in the party leader of the *AfD* in June 2015, as shown in Figure 4.5. While the party was founded as the Euro critic's party, the change in leadership shifted the attention to migration-related issues. Surely, the spike in migration-related statements was not only due to the change in leadership as the summer months of 2015 were also those with the highest number of refugees crossing the German border. Nevertheless, in contrast to other parties, the continuing large

FIGURE 4.6: Issue Salience: Migration by AfD, CSU and SPD



number of statements regarding migration indicate a policy change. For other parties we observe a short spike during August and September 2015, however it was flatter and the interest decreased quickly. The *AfD* though kept the topic until the elections in 2017 with increasing intensity. Simultaneously, the *AfD* gained support in election polls. This emphasizes the potential of Social Media data in tracking the policy and focus changes of parties. Figure 4.6 depicts the issue salience for *Migration* for the *AfD*, *CSU* and *SPD*. Some relevant results can be derived from this. The *AfD*'s increased communication of the migration issue leading up to the federal elections is observed. Furthermore, the *CSU*'s initially high coverage of the topic is visible, although the intensity decreases towards the Bundestag elections. The *SPD* exemplifies the other parties that show similar communication patterns. The spike in August 2015 is also visible. However, it is weaker than for the *CSU* and the communication towards the federal election is not related to the topic of migration.

4.2.4 Topic Salience over Time

For a relevant interpretation of results it is essential that the data represents important incidents across time. These incidents are generally among the most important topics for the population. Additionally, they are exogenous shocks that show a regular update of the parties' Social Media pages.

During the observation period several terror attacks in European countries occurred. Terror attacks are well suited for the analysis as they are, first, relevant for both voters and parties. Second, they can be described as exogenous as neither voters nor politicans know about them before. Therefore, a spontaneous reaction is observed and the relevance decreases relatively quickly. The clear-cut appearance of the incident facilitates the detection. In particular, the data reflect the increasing number of terror attacks in Europe and Germany. I use the topics *Terrorism* and *Extremism* as both topics include statements about attacks. The assignemnt of statements to one or the other topic depends on the framing of the issue and if the party differentiates between the topics. By adding up both topics, not all statements directly refer to terror attack. These messages, though, do not eclipse the outliers of terror attacks. The topic *Extremism* is especially coverd by *SPD* and *Gruene*, who focus not only on the attack but as well the democratic foundations of the society.

FIGURE 4.7: Topic Salience: Terrorism and Extremism - Detection of Terror Attacks

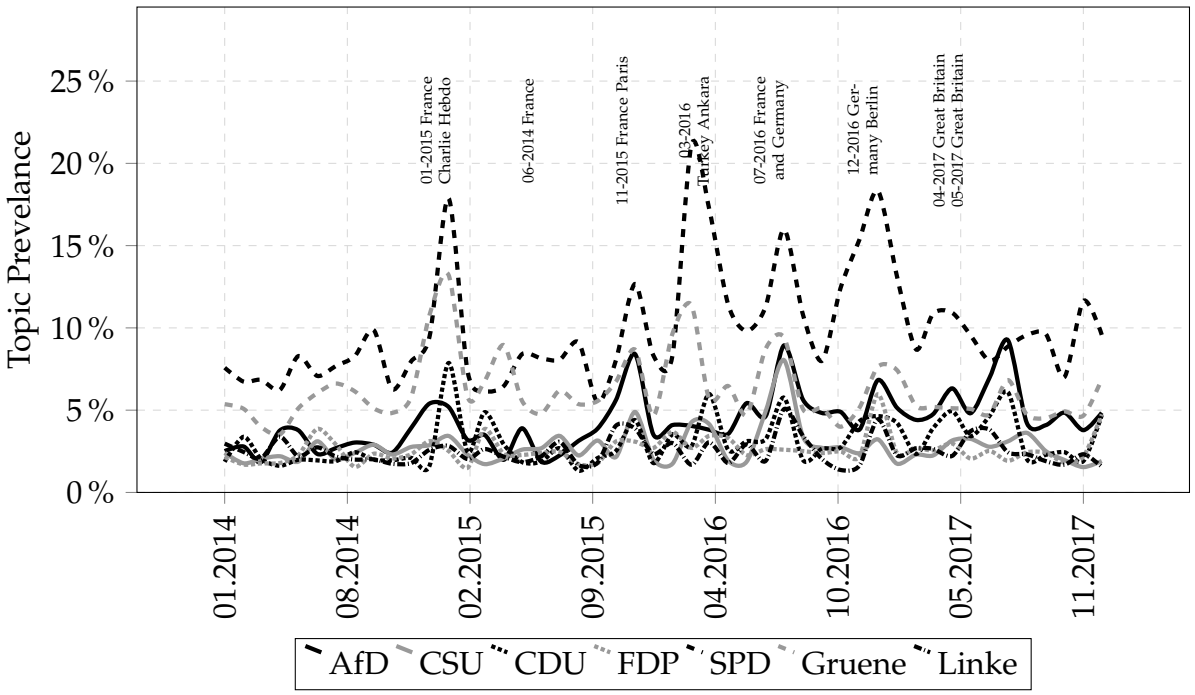


Figure 4.7 depicts the topics that are associated with terror attacks by party. The spikes can be assigned to specific attacks, for example, in January 2015, the attack on Charlie Hebdo, the Paris attacks in November 2015, two smaller attacks in July 2016 in southern Germany and the Christmas market attack in December 2016. The issue salience is smaller than in other relevant topics, e.g. migration / refugees or climate and energy. An explanation is that the relatively short attention on terror attacks and the accumulation of data on a monthly base lead, in combination, to the apparently low salience. On a daily base the spikes reach 50% up to 80%. Therefore, it is reasonable to take the spikes into account. In addition, the parties differ in terms of the debate focus. While most parties concentrated on expressions of sympathy for the victims, the *AfD* highlighted the Islamic background of the attacks and security risks.

4.2.5 Discourse and Coding of Topics

Although, the topic names give an overview of differences between parties and focus setting. The framing of topics, however, is even more specific. It shows not only the topical focus that represents the political orientation, but allows to draw conclusions of differences between incumbent and opposition. In addition, the framing of topics is used for coding purposes. Most topics can be clearly allocated in the coding scheme due to the words chosen.

Social policy and migration are specific for the different parties. In the field of social policy, specifically the labor market (Table 4.9), the differences are primarily between the political camps and the incumbents and opposition. While parties on the left of the spectrum work in particular on the employee perspective, the *CDU / CSU* tend to have an employer or labor market perspective. The focus is on past success stories, e.g., falling unemployment, positive development of the labor market. Like the *Linke*, the *SPD* talks about trade unions and minimum wages, but focuses primarily on the successes achieved in the past legislative period. The *Linke* can be described as the owner of the social policy issue on Facebook. This is reflected on the one hand in the number of different topics, and on the other hand in the frequency of communication. While the *SPD* deals with 5 topics (*AfD*: 1, *CDU*: 2, *CSU*: 3, *FDP*: 3, *Gruene*: 1), the *Linke* deals with 9 topics, almost twice as many. One sub-topic, on the other hand, is dealt with exclusively by the *FDP*, which is primarily concerned with start-ups and the reduction of hurdles for founders. Overall, the discourse reflects the political spectrum well and corresponds to the expectation for the communication of the

TABLE 4.9: Framing - Labor Market

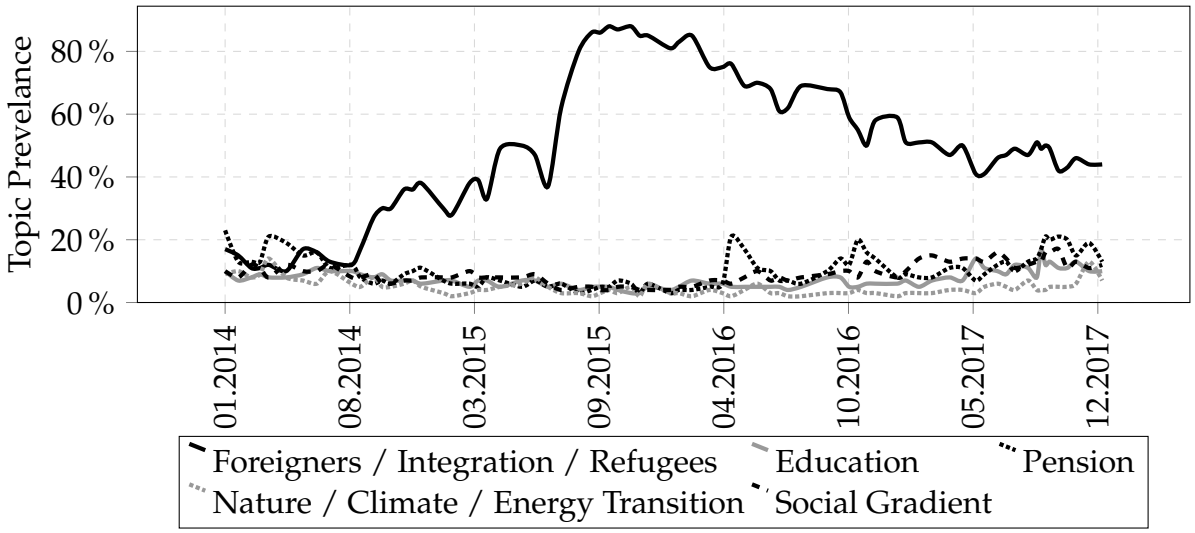
	Linke			
	Labor Law	**Unions**	**Wages**	**Unemployment Benefit**
1	Work	Employed	Euro	Hartz (unemployment benefit)
2	Good	Union	Minimum wage	Sanction
3	Subcontracted employment	Good	Million	Affected
4	Employed	Work	Year	Abolish
5	Human	Verdi (German Union)	Billion	Basic right
6	Living	Support	Company	Job Centre
7	Temporary (employment)	Strike	Number	Sanction free
8	Job	Salaries	Exception	Minimum social security
9	Precarious	Amazon	Low	Federal government
10	Same	Metal	Demand	Andrea

	SPD	**FDP**	**CDU**	
	Wages / Union /Start-ups	**Start-ups**	**General**	**Unemployment**
1	Minimum wage	Better	Self	Germany
2	Pension	Germany	Strong	Good
3	Work	Work	Germany	Human
4	Human	Founder	Inside	Economy
5	Good	Idea	Economy	Year
6	Year	Company	Work	Unemployed
7	Law	Bureaucracy	Keep	Number
8	Percent	Demand	Prosperity	Work
9	Employee	Just	Labor Market	Percent
10	Andrea	Need	Time	Labor Market

parties and their political priorities and positions. This is further strengthened when the other topics in the field of social policy are included in the analysis. Once again, the *Linke* stands out with significant topics such as poverty among the elderly, child poverty and the lack of housing (see Appendix B table B.4).

Migration (table 4.10) is communicated differently, especially between the political groups. In table 4.10 all parties are listed, since the topic was one of the most important topics for the electorate over almost the entire legislative period (see figure 4.8), while the *AfD* and the *CSU*, as expected, rather talk about the difficulties and problems as well as the reduction of immigration. In contrast, the *SPD* and the *Gruene* are mainly concerned with integration, voluntary work and the reasons for flight. The choice of words differs in some respects considerably and is often rather negative in the case of *AfD* and *CSU*, whereas *SPD* and *Gruene* communicate more positively and migrant-oriented. As already mentioned above, almost all parties communicate at most in 2015 at the peak of refugee immigration. Only the *AfD* has a peak in mid-2015 and then increases its communication again in the run-up to the 2017 federal elections, thereby also exceeding the level of 2015. It is thus obvious that the *AfD* has chosen the topic of migration as its election campaign theme. The result is not surprising, as it largely corresponds to the election program of the parties.

FIGURE 4.8: Most Important Topics (Politbarometer Voter Survey)
Source: Forschungsgruppe Wahlen, 2014-2017



CSU and *AfD* do communicate in a similar manner and additionally, the *CSU* tend to increase their communication with a month lag in comparison to the *AfD* (see figure 4.9). This claim holds for the relevant time slots of the highest refugee inflow and the election campaign. The correlation coefficient is 0.5 for the period 06.2015 and 04.2016 and 0.4 for 12.2016 and 10.2017. During the first time period all parties devote a high percentage of their communication on migration, therefore, the correlation is relevant for *CDU* and *Linke* as well. However, during the election campaign the migration was a considerable topic for *CSU* and *AfD* only. Additionally, the comparability of the agenda setting suggests the correlation to be more relevant.

FIGURE 4.9: Agenda Setting Migration - AfD and CSU

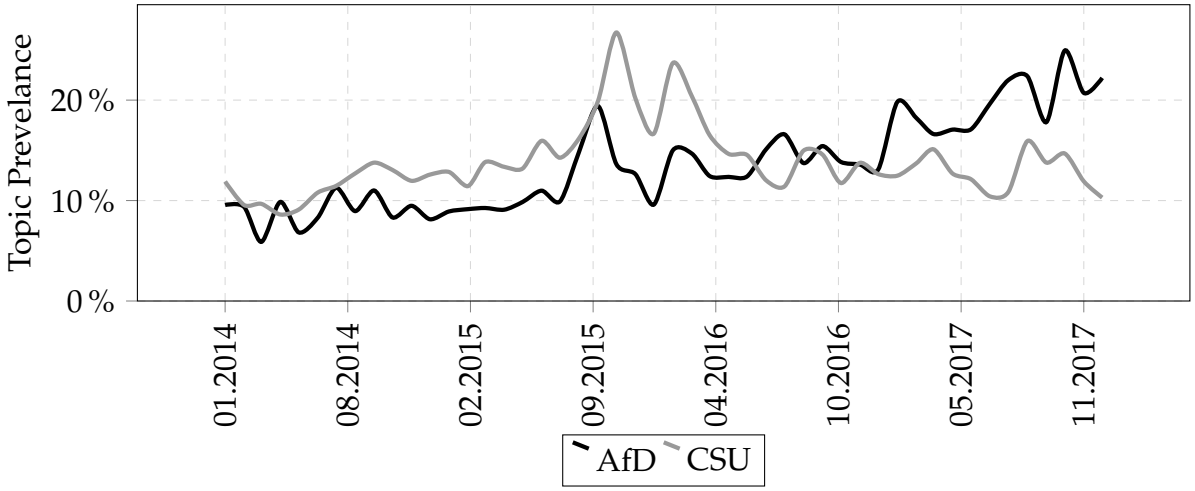


TABLE 4.10: Framing - Migration

	AfD					
	General	**Social Security**	**Deportation**	**General**	**Criminality**	**Boarder Control**
1	time	refugee	Germany	German	woman	boarder
2	Germany	Germany	asylum seeker	Germany	cologne	Austria
3	country	immigrant	deportation	country	age	Europe
4	year	family reunion	refugee	people	perpetrator	migrant
5	woman	human	political	language	police	illegal
6	citizen	social system	denied	interest	city	Italy
7	read	asylum seeker	asylum	human	young	Germany
8	world	country	Government	live	men	countries
9	nice	migrant	article	foreigner	victim	countries
10	illegal	integration	self	harm	country	refugee
11	government	migrant	world	citizenship	man	open
12	exactly	migration	government agency	diversity	crime	Italian
13	German	illegal	consequently	long	year	own
14	article	work	state	sentence	Germany	political
15	"Chancellor Performer"	German	deported	countries	live	state
16	namely	refugees	repatriation	own	time	control
17	picture	upper limit	year	culture	asylum seeker	German
18	day	Hartz (unemployment benefit)	fast	identity	old	secure
19	finally	specialist	illegal	part	underage	European
20	long	society	possible	double	cities	boarder control

	CDU	**FDP**		**Gruene**		**Linke**
	Integration	**General**	**General / Integration**	**Cause of Escape**	**Support**	**General**
1	refugee	Germany	refugee	Germany	refugee	refugee
2	integration	refugee	self	Syria	Europe	human
3	won	finally	countries	human	human	refugee (geflüchteter)
4	strikingly	countries	government	Iraq	boarder	Germany
5	stay	urgend	integration	allow	finally	government
6	asylum	government	federal	Russia	European	Europe
7	law	need	communal	Ukraine	Mediterranean	countries
8	minister for inner affairs	communal	right / law	ISIS	self	boarder
9	help	better	support	refugee	support	to be fleeing
10	goal	necessary	situation	war	humanitarian	refugee policy
11	number	refugees welcome	Afghanistan	state	fast	self
12	countries	long	place	show	refugee policy	isolate oneself
13	fast	to act	refugee policy	million	sea rescue	deportation
14	human	put	solution	humanitarian	to be fleeing	European
15	Bundestag	federal government	claim	conflict	day	political
16	state	action	need	live	refugee (Geflüchteter)	country
17	article	point	deportation	urgent	lie	human right
18	protection	problem	protection	sorrow	solidarity	asylum
19	refugee policy	fast	stay	help	need	Afghanistan
20	decided	refugee crisis	abolish	solution	travel	law

	CSU				
	Integration	**Upper Limit**	**Boarder Control**	**General**	**Deportation**
1	German	restrict	boarder	Germany	self
2	dominant culture	immigration	boarder control	distinct	important
3	integration	upper limit	refugee	country	fast
4	live	need	European	refugee	asylum seeker
5	value	integration	refugee crisis	people	get
6	woman	refugee	solution	again	state
7	rules	family reunification	Austria	would	denied
8	need	keep	Government	interview	asylum law
9	stop	keep order	to act	position	country of origin
10	demand	inflow	action	human	deportation
11	constitution	necessary	refugee policy	problem	consequently
12	apply	asylum package	Germany	opposite	step
13	claim	make it	need	picture	follow
14	ready	finally	important	asylum seeker	expand
15	society	in need of protection	demand	additional	state of origin
16	language	year	external boarder	responsibility	proposal
17	multi cultural	migration	national	financially	cope with
18	million	refugee policy	week	week	asylum abuse
19	direction	demand	decide	million	fight
20	naturally	maximum load	effective	violence	decided

	SPD	
	Integration	**Support**
1	refugee	human
2	Germany	Germany
3	need	refugee
4	integration	help
5	year	war
6	boarder	support
7	fast	acknowledgments
8	challenge	country
9	refugee policy	place
10	together	help
11	number	volunteering
12	task	home
13	keep order	allow
14	confidence	child
15	big	million
16	political	share
17	actions to be taken	search
18	countries	large
19	immigrant	gladly
20	country	project

4.3 Summary

The relevance of Social Media applies both in the private sphere and increasingly in the political and commercial spheres. The above analysis was able to show that the parties' chosen issues display expected focal points.

In particular, the main topics correspond to the basic theories in political competition. Thus, it could be shown that niche parties, on the one hand, set priorities corresponding to their assigned competence and, on the other hand, take up controversial topics. In contrast, governing parties focus on communicating success stories and cover the range of political discourse with less specific emphasis.

Moreover, parties can be shown to react to short-term events, and even politically unstable periods of a party can be captured and the change of focus can be documented.

In addition to the quantitative recording of communication, the discourse can be tracked via the word lists. However, it should be noted that a change in framing of issues is not trackable. This would require, for example, a DTM.

In summary, topic modeling provides a good and compact overview in quantifiable form for subsequent analysis steps. The generated data will subsequently be used to first generate the tonality of communication as a further indicator and, in the final step, to obtain evidence about the effect on voting behavior.

Chapter 5

Tone of the Debate

Explicit, i.e. verbal, content is relevant for communication and the decision of voters. However, implicit parts of the communication play a decisive role for information processing procedures. In the following two different approaches of measuring implicit content are presented. First, it is possible to calculate the implicit value or connotation of words within political communication. This results in a sentiment score, representing either positivity or negativity of the content. Second, a psychological approach is applied using deeply embedded motives. The motive structure can be interpreted as pattern voters can feel attached to. Both approaches are evaluated according to their usage by parties and to their explanatory power to differentiate between parties. In terms of methodology both unsupervised (sentiment) and supervised (implicit motives) methods are taken into account. Therefore, the chapter is not only presenting an additional variable but contributes to the ongoing discussion which methodology fits best to evaluate Social Media texts.

5.1 Sentiment Analysis

The field of sentiment analysis or opinion mining is growing and dynamic. Since the early 2000s and advances of Social Media platforms various approaches try to explain diverse observations using sentiments. The applications range from stock market volatility or consumer choice to political and social problems. (Liu, 2012)

The field aims to evaluate if a text / sentence / aspect is described in a positive or negative way. Due to diverse research areas techniques are manifold. This explanation is not entitled to give a broad overview of various approaches, for a comprehensive summary of techniques in the field of sentiment analysis and opinion mining see Liu, 2012.

The tone of the debate indicates the influence of party communication on voter choice. For the evaluation, a simple sentiment analysis using a dictionary approach counting positive and negative words is applied. The method has some limitations, especially as the dictionary does not contain some of the specific words used in the policy debates that are connoted either highly positive or negative.

5.1.1 Methodology and Measurement

While most approaches are similar, the differences are to be found in detailed questions on the data collection process, the dictionaries used and the calculation of indexes. Some influential approaches are presented in the following, concerning both methodology and results. Subsequently, the methodology and approach within this thesis is presented.

Tumasjan et al., 2010 present one of the first studies that aims to evaluate the correlation between Twitter messages and elections results including sentiment analysis. They evaluate the general election in Germany in 2009 by scrapping tweets in the month before the election that include party names and some specifically chosen politicians. The sentiment score is calculated based on the Linguistic Inquiry and Word Count (LIWC) dictionary. With no German alternative they automatically translated the Tweets into English, which potentially leads to biased results. The 12 dimensional result is transferred into a distance measure of profiles, with lower numbers signaling smaller distances. They conclude that the volume of Tweets is a good predictor of voting - however, this does not need to be true, in all times. If thinking about for example bots (Metaxas, Mustafaraj, and Gayo-Avello, 2011), the number of Tweets can automatically be changed and might therefore no longer be the best measure.

Additionally, they find the profiles of politicians / parties generated by public Tweets based on LIWC classifications correspond closely with profiles of election programs or media outlets. The results can at least be interpreted as the public is listening to political news.

Chen et al., 2010 use a complex method to evaluate opinions. They implement a combination of functions to get an impression if a text is an opinion, which topic is referred to and opinion scoring elements including verbs, adjectives and adverbs. In general they calculate a LDA based model to receive topic distributions. In the following the co-occurrence of adjective / verbs / adverbs with the topic distribution

is calculated. Chen et al., 2010 aim to get an impression about the authors' opinion by the co-occurrence. In a last step they train a linear regression model and a support vector regression model to combine the functions. They test the model by using statements of U.S. senators. However, the model is more interested in finding hidden associations of words, rather than to quantify the implicit sentiment.

O'Connor et al., 2010 suggest a relatively simple approach. On basis of twitter stream and API data the authors exclude those Twitter messages including *economy / job / jobs* for consumer confidence, *obama* for presidency approval and *obama / mccain* for elections. They use a predefined lexicon for subjective speech, however, they exclude the negativity / positivity value and restrict the analysis. In addition, they do not account for the number of positive or negative words but claim that a message can be both positive and negative if it includes at least one word of both manifestations. In a last step the authors calculate a sentiment score defined as the number of positive words divided by the number of negative words for each topic. Due to volatility of sentiment scores across days they suggest smoothing by using a moving average across a window of k days. They find that the sentiments seem to be a leading indicator for polls. Within their model they fit text-poll correlation i a variable linear least-square model and introduce a time lag for polls. Despite the simplicity of the approach, the authors find promising support for the hypothesis that sentiment and Social Media data captures at least parts of public opinion.

Bermingham and Smeaton, 2011 test their approach for the Irish General Elections in 2011. The analysis includes the volume of messages as well as sentiments and volume of positive and negative messages. Just like the previous studies they use the public's texts on Twitter. They find that the volume of positive and negative messages is more relevant than the sentiment score. In contrast to previous studies, they manually annotated messages to receive a fitting vocabulary. They find that the combination of a volume-based approach and an annotated sentiment score is predictive for both voter polls and general elections.

Sang and Bos, 2012 only rely on counting tweets that include exactly one party naming. Despite the simplicity, election results were reproduced with a surprising accuracy compared to polling results. Nevertheless, the results rely on an unknown user base and captures only explicit content in a simple form.

Ceron et al., 2013 show the attainable accuracy of Social Media data in combination with sentiment analysis. The authors provide evidence for several elections.

Three major results are found, first, though not being representative for the whole population, the Social Media activity shows high accuracy with polling / election results. Second, major parties are better represented by a simple sentiment analysis, for smaller parties weighting the Social Media users can significantly improve the results. Third, Social Media preferences react on news or political campaigns and are correlated with mass survey results.

Burnap et al., 2016 conduct a study which aims to predict voting outcomes in Great Britain using a *party-sentiment* and a *party-leader-sentiment-score*. After calculating the sentiment score based on a dictionary that includes values from -5 (very negative) to +5 (very positive), the authors exclude those messages with a score lower than -1. They assume that only messages with a value between -1 and +5 are to be seen as voting intention. With the approach it was possible to predict the ordering of party results correctly but it failed to come sufficiently close to the true seat shares.

Aragón et al., 2013 show in their case study for the Spanish National Elections in 2011 that the major parties tend to use Twitter as a one-way communication medium. They use a Twitter data set scrapped by using hashtag codes for parties, popular references and general election hashtags. The data set includes the pre-election month and the following days. The emotional load is calculated using an annotated dictionary. The results confirm that parties involved in a particular topic can be filtered using volume and emotional load of general Twitter messages. Particularly, they find sentiments and emotional load of messages to improve the analysis.

Ceron, Curini, and Iacus, 2014 are aware of the issues mentioned in for example Gayo-Avello, 2013. They improve the methodology for sentiment analysis and show that at least for the chosen cases in the U.S. and Italy nowcasts or forecasts are possible. For the analysis they use a method suggested by Hopkins and King, 2010. The process is two-fold, in a first step human coding of a sub-sample is conducted. Assuming a homogeneous sub-sample the distribution of the writers' opinion dependent on the word profile can be calculated and introduced as observed variable for the application. They prove the method to be significantly more accurate for U.S. elections and for an Italian application. Specifically, the method improves the information in terms of an now- or forecasting of election results using Tweets by the general public.

This method solves some major concerns of sentiment analysis. Both the two-fold process and the statistical application consolidate the analysis on profound methodological grounds.

Bakliwal et al., 2013 basically use a sentiment lexicon, however, they test different approaches, including supervised learning. Essentially three major aspects were found to produce classification errors. Negation, which is known to be problematic, is tackled by negate the sentiment / emotional word. Domain specific words are introduced in the lexicon to avoid miss-classifications. The last and most difficult problem to solve is the absence of sentiment words. While a human coder can interpret information as negative or positive without being explicitly named, a un- or semi-supervised approach relying on some kind of dictionary won't find a polarization of messages.

Except for promising results, some concerns keep to be relevant for especially unsupervised techniques. As well as in terms of data collection and population sample.

Some additional studies (Larsson and Moe, 2011; DiGrazia et al., 2013; Skoric et al., 2012) rely only on volume based measures, the results are promising, though, they might be very responsive to changes in user behavior or technological innovations.

Gayo-Avello, 2013 conduct a meta-analysis of Social Media data studies that aim to explain voting behavior. For sentiment analysis they find three major shortcomings, first, the characteristics of political language are often missed by dictionary based approaches. Second, the performance is poor or not reliable. Third, the errors in classification processes are likely not to cancel out in aggregated data sets as they vary across politicians. In sum, they conclude that the prediction of voting results based on Tweets does not come up with reliable results, as it is too dependent on the choice of parties and politicians in the data set, results are unstable and error terms are high and that promising results could be only by chance.

Jungherr, Jürgens, and Schoen, 2012 respond to the findings of Tumasjan et al., 2010 criticizing the results. They focus mainly on the selection of parties and claim that the results do not hold for including the Pirate Party. Additionally, they find that the timing of messages has a significant impact on results and the collection of data was not declared sufficiently.

Chung and Mustafaraj, 2011 criticize the results by O'Connor et al., 2010 and Tumasjan et al., 2010, for their data set (U.S. Massachusetts special election 2010) the methodology suggested by the authors does not predict the election results significantly better than pure chance. They conclude that simple methods of calculating sentiment do not yield generally reliable results and forecasts.

For the present study some concerns are less relevant, others are still to be taken care of. In contrast to all studies described, this study does specifically not use messages by arbitrary users, but focuses on public messages by relevant politicians and parties. The selection bias might occur as only party leader(s) and general secretaries are included, however, within parties we should observe a more pronounced homogeneity than among arbitrary users.

Second, the main interest of this study is not to predict voting results in general, but aims to evaluate if voters are listening to party competition and election campaigns. Thus, the study focuses on issues and uses sentiments as implicit and unconscious variables which are unnoticed by voters. In contrast to other studies, the focus is not to use the mere volume of messages or the sentiments to predict the voters will, but to evaluate the impact of parties and politicians on changes in voter will across time. Still, the inappropriate dictionaries might negatively affect the explanatory power of the analysis.

Third, the timing of data scraping is criticized, e.g. Jungherr, Jürgens, and Schoen, 2012. The present study conducts a continuous approach across a total election cycle and the following coalition negotiations. Therefore, it should be possible to capture differences in volume and sentiment and to come up with a broader understanding of the dynamics in Social Media election campaigns.

As mentioned before, the sentiment score is calculated in an unsupervised approach, contrasting the results obtained by the supervised evaluation of implicit motives. Sentiment scores are calculated based on a lexicon developed for German language by Heyer, 2010. The lexicon bases on hand-coded sentiment words from very negative (-1) to very positive (1), for each message a mean sentiment score is evaluated:

$$S_{ij} = \frac{\sum w_{pos_{ij}} - \sum w_{neg_{ij}}}{\sum w_{total}} \tag{5.1}$$

with S_{ij} being the sentiment score S for party i in message j and $\sum w_{pos_{ij}}$ and $\sum w_{neg_{ij}}$ being the sum of all positive and respectively negative words in message j devided by the total number of words $\sum w_{total}$. The resulting fracture can be interpreted as the positivity or negativity of a single message.

Following the procedures of O'Connor et al., 2010 a smoothing of monthly or monthly topic related aggregation is conducted.

The topics are coded as 1 if it is the most coded topic for one Facebook post relying on the topic model results. The sentiment scores are later aggregated on a monthly-party basis, on a monthly-party-topic basis and on a party-topic basis.

The correlation coefficients are calculated as point biserial correlation due to the dichotomous variables for parties and topics. The point biserial correlation as special case of the Pearson correlation are as well given between -1 and +1.

5.1.2 Hypothesis

The sentiment analysis is implemented in order to evaluate underlying, unconscious and implicit content in Facebook messages. Therefore, the interest of this chapter is to find differences and structures rather than to explain sentiments by party. However, due to the noisy coding, which can be explained by the variance of topics, authors, missing words in the dictionary and external effects influencing sentiments, the focus lies on monthly aggregates to find systematic differences.

Based on the assumptions in section 2.4.1 it can reasonably be assumed that there are observable differences between ruling and opposition parties. On the one hand, ruling parties are assumed to focus on their success stories and neglect controversial issues. On the other hand, opposition parties should focus on those controversial issues in order to be more attractive for voters and show failures or highlight grievances of the ruling parties.

Hypothesis 1: The communication of opposition parties should be coded with a significantly lower sentiment score than that of the ruling parties.

Within the German party spectrum two parties can be considered to be placed at the corners, i.e. the *AfD* on the right and the *Linke* at the left. With these parties representing the extreme positions either of left or right voter preferences, they should be considered to communicate more negative compared to the other parties. Following assumptions on voter preferences and their psychological background it can reasonably be assumed that these voters are less attracted or feel less represented by the ruling parties, therefore, it is plausible that *AfD* and the *Linke* try to win these potential voters by an anti-government communication, e.g. more negative communication.

Hypothesis 2: The communication of *AfD* and *Linke* should be significantly more negative than that of the other parties.

The parties use Facebook for two different purposes, first, they discuss internal issues (Party topics) and second, they communicate policy relevant issues representing their political profile. While internal issues should represent the unity of the party, external issues are essential to differentiate from the political competitors. Despite internal conflicts, e.g. inner-party power struggles, the party topic in general should show higher positive sentiment values. In contrast, the policy topics can be considerably more negative especially for the opposition parties.

Hypothesis 3: The internal party topic should be coded positive for all parties, the policy topics should show more positive coding for ruling parties than for opposition parties.

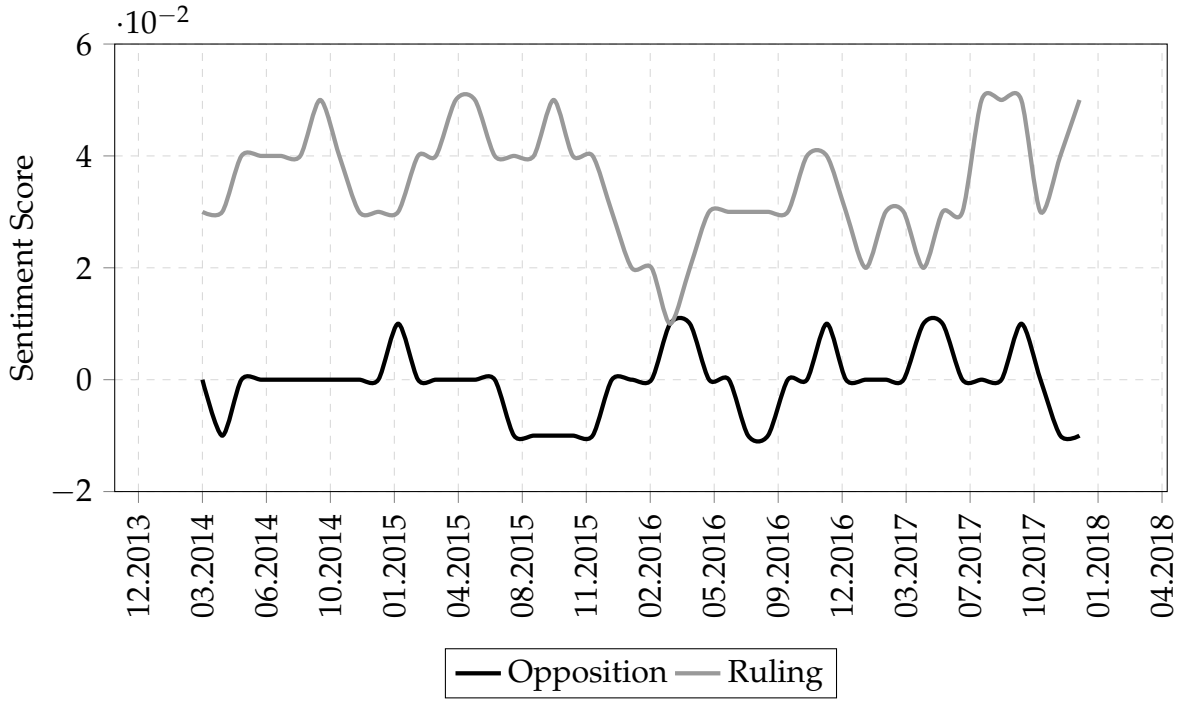
5.1.3 Analysis

The first hypothesis claims that opposition parties should communicate in a more negative way than ruling parties. Graphically this relationship can be shown using a three month rolling average for opposition and ruling party mean sentiments (see figure 5.1). Additionally, the graph shows some significant break points in 07/2015, 01/2016 and 09/2017. These can be traced back to external effects. In July and August 2015 Germany observed the peak of the refugee influx with a high participation of political actors in Social Media activities. In January 2016 the incidents of sexual assaults during New Years Eve in several German cities were discussed highly negative. Lastly, after the elections in September 2017 the former coalition partners *CDU*, *CSU* and *SPD* are coded with a more negative sentiment score. A possible explanation could be the preparation of coalition negotiations which turned out to be difficult and ended up with a renewal of the Grand Coalition.

The point biserial correlation coefficient supports the optical impression. With a strong and significant correlation coefficient of -0.64 the hypothesis that opposition parties communicate in a more negative manner can be supported (see table 5.1).

The second hypothesis expects that *AfD* and the *Linke* as parties at the political edges should show a more negative communication than all other parties. Table 5.1 displays the correlation coefficients for monthly mean sentiments and parties. The results confirm the differences between opposition and ruling parties. However, the *CSU* as

FIGURE 5.1: Mean Sentiment - Ruling vs. Opposition



smallest ruling and regional party has the lowest positive effect on sentiment scores. For the opposition parties, confirming hypothesis 2, the relationship is stronger for *AfD* and *Linke*. Graphically figure 5.2 supports the correlation results.

TABLE 5.1: Correlation Sentiment and Parties

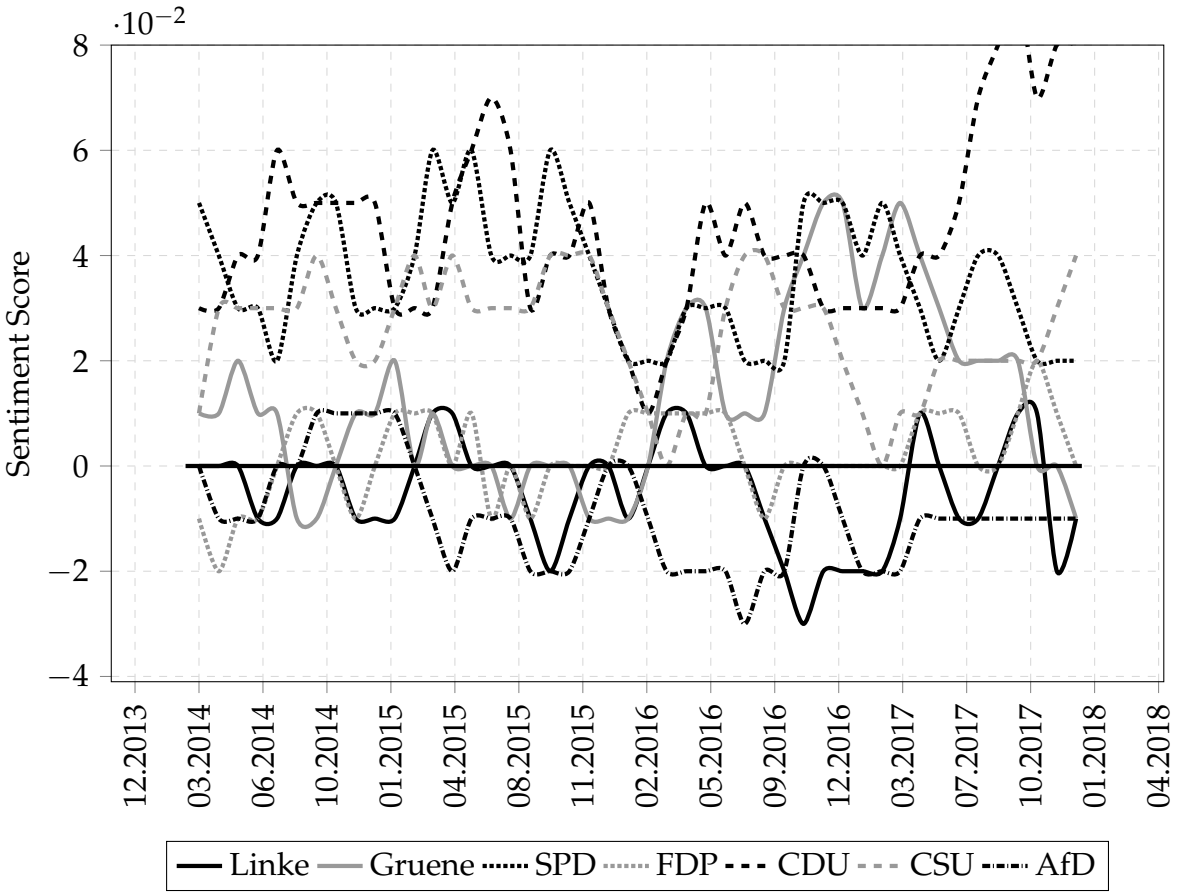
Party	Correlation
AfD	-0.353*
CDU	0.449*
CSU	0.145*
FDP	-0.206*
SPD	0.321*
GRUENE	-0.052
LINKE	-0.304*
Opposition	-0.648*

Notes: * $p < .1$.

The *Gruene* are the only party showing a small and non-significant relationship. The reasons could be manifold, first, the party has a significant and unique topic that is rarely addressed by other parties. Additionally, the *Gruene* are considered as most competent and might not have any need to communicate the topic in a negative way. Second, it could be possible that the party tries to establish itself as potential ruling

party during the upcoming legislation period and communicates therefore differently compared to other opposition parties. The second explanation is supported by figure 5.2 displaying the 3 month rolling average of monthly mean sentiments by parties. The *Gruene* show a shift in sentiment scores during the legislation period. While showing similar scores than the other opposition parties till 02 / 03 - 2016, the communication from this point till the election day is more similar to the ruling parties.

FIGURE 5.2: Mean Sentiment - by Party



In summary, *AfD* and *Linke* show the strongest negative relationship with sentiment scores, however, *FDP* is similarly negative correlated. All ruling parties are positively correlated with sentiment, supporting that ruling parties show off success stories rather than controversial topics. The shift of the *Gruene* shows either a strategy change or possibly a focus on their signature topic.

The third hypothesis claims that the internal party issue should show a positive correlation with the sentiment scores. Political topics are expected to differ in magnitude

and direction across political parties. The following analysis evaluates the correlation coefficients for the percentages of topics in Facebook messages (see Table 5.2). Topics are highly volatile, especially in terms of frequency along the timeline. The measured correlations are very small. Therefore, they should be interpreted with caution.

TABLE 5.2: Correlation by Topics and Party

Topic	Party	Coeff	Party	Coeff	Party	Coeff
Migration	AfD	-0.036*	LINKE	-0.042*	GRUENE	-0.035 *
Social Policy	AfD	0.027*	LINKE	-0.042*	GRUENE	0.072*
Climate	AfD	0	LINKE	-0.026*	GRUENE	-0.031*
Extremism	AfD	-0.077*	LINKE	-0.022*	GRUENE	-0.061*
Party	AfD	0.134*	LINKE	0.119*	GRUENE	0.096*

Topic	Party	Coeff	Party	Coeff	Party	Coeff
Migration	CDU	0.006	CSU	-0.063*	SPD	0.018
Social Policy	CDU	0.02	CSU	0.027*	SPD	0.024*
Climate	CDU	0	CSU	0	SPD	0.013
Extremism	CDU	-0.104*	CSU	-0.059*	SPD	-0.099*
Party	CDU	0.001	CSU	0.024	SPD	0.033*

Topic	Party	Coeff	Party	Coeff
Migration	FDP	-0.018	Total	-0.025
Social Policy	FDP	-0.009	Total	0.086*
Climate	FDP	-0.013	Total	-0.028*
Extremism	FDP	-0.021*	Total	-0.056*
Party	FDP	0.103*	Total	0.065*

Notes: * $p < .1$.

As expected, the topic of *Internal Party* issues is positively correlated with the sentiment scores. This applies to both ruling and opposition parties. The plausibility of the results can be tested using the issue of *Extremism*. Since *Extremism* has a fundamentally negative connotation and hardly any room for positive statements, it should have a negative correlation with sentiment scores. This can be observed for all the political parties.

The positive representation can also be read across topics for the governing parties. For *CDU* and *SPD*, members of the grand coalition in 2013-2016, all topics except *Extremism* are positively correlated. For the *CSU*, there is an additional negative portrayal of the topic of *Migration*. This observation supports the findings from the issue analysis. *CSU* and *AfD* were especially intense in their discussions.

In the case of niche parties, it can be observed that there is a negative correlation between the issue they own and the sentiment scores. For migration, this applies to all parties except *CDU* and *SPD*, not just the *AfD*. The result for the *Linke* is particularly striking with regard to *Social Policy* issues. While the other parties tend to have a positive connotation, the *Linke* has a highly significant negative correlation with sentiment scores.

In general, the topics are less specific than the overall differences across parties. The reasons could be manifold, however, the most reasonable explanation is that the differentiation is more between the parties rather than within each party's political communication. In other words, the parties appear to be quite consistent within their Social Media communication.

Nevertheless, the minor changes and especially the differences between the parties might affect voter choices. The results above are not surprising but confirm the findings of the results regarding the issues extracted by the topic model. Considering both approaches, the results provide a complex overview of party communication and agenda setting.

5.2 Implicit Motives

Implicit or unconscious elements of human behavior help to understand part of the transmission of information. The common approach is to use sentiment scores. This is a practical way to measure the underlying "invisible" parts of the observed communication. However, a coded dictionary is required, which impedes measuring newly generated words, newly coded words or specific, context related vocabulary. The usage of psychologically proven implicit motives is an alternative. These motives, deeply anchored in the individuals' personality, can automatically be retrieved by trained algorithms. For this work they will serve as an additional measurement of the tone of the debate.[1]

Political economy has long argued from the theoretical premise of homo economicus. According to this theory, voters base their votes on the ideological distance between themselves and the parties. Vote allocation and electoral success are determined by the smallest distance in Euclidean space. Psychological contributions show that

[1]The chapter was written in cooperation with Niklas Scheffer and Zahurul Islam and is in large parts published in Straubhaar, 2021. Chapter 5.2.3.2 is re-positioned within the chapter.

the rationality assumptions of homo economicus are untenable, especially in the formation of political decisions. For example, the presentation of information is a relevant factor in decision making. Schnellenbach and Schubert, 2015 highlight the growing importance of behavioral and psychological approaches in political economy. Purely rational cost-benefit considerations cannot explain communication and voting behavior, emotional or seemingly "irrational" components seem to have a significant impact on voters and politicians.

It is this more subconscious aspect that this chapter focuses on. Social media offer a unique opportunity to analyze the interaction between parties and voters. More than 30,000 Facebook posts of the parties represented in the German Bundestag are analyzed with respect to the three basic emotional or implicit motive dimensions of power, affiliation, and achievement using machine learning trained algorithms. Analyzing motivational patterns allows us to draw concrete conclusions about political actions which do not seem to be rationally explained but rather emotionally driven. For example, studies by Winter, 1993, Winter, 2004 and Winter, 2007 have shown that a certain motive pattern - power high and affiliation low - heralds crises or even armed conflicts that defy all rational cost-benefit considerations and thus make them predictable. It is of interest to find out how parties and politicians communicate with their voters beyond rational logic and whether emotionally anchored motive patterns can be assigned to certain parties.

In addition to the motive dimensions, the messages are differentiated according to the basic thematic focus of intra-party communication and policy-relevant communication on the basis of an unsupervised topic model (see chapter 4). By combining the measurement methods, we aim to obtain interpretable results that are relevant for further research.

In the following chapter, the "Big Three" implicit motives are introduced and their measurement is explained. This is followed by the algorithm and machine learning. The underlying data and hypotheses are described. Possible interpretations and policy relevance of the results are discussed in the following sub-chapter. A discussion closes the chapter.

5.2.1 "The Big Three" Implicit Motives

Since the 1950s psychologists are aware of the different systems of human brain. They distinguish several systems of (un-)conscious perception, processing and saving

of information. Humans recognize only a small percentage of these systems and processes consciously. (Schultheiss and Brunstein, 2010) Implicit motives play a major role in how our behavior is initiated, maintained and stopped (McClelland, 1999). They orient, choose and activate our behavior primarily through emotional impulses anchored in old parts of the brain (Schultheiss and Brunstein, 2010).

A motive is understood as a stable individual disposition to react particularly strongly emotionally to certain stimuli in our environment. A person with a strong motive directs his behavior towards directly seeking (or avoiding) certain stimuli in order to achieve satisfaction through their fulfillment (Schultheiss and Brunstein, 2010). No motive operates the entire time, but certain stimuli or goals always activate the motives. Individuals differ, however, in how quickly they are addressed by a particular motive. Motives are thus both stable individual personality traits (traits) and variable across time and situations (states) (Winter, 2007).

There is a dispute over the exact number of motives. Murray, 1943 catalogue by 1938 comprises almost 20 motives. Large parts of present-day research assume three fundamental dimensions of human motivation: power, affiliation and achievement. The power motive is defined as the need to influence or control others or to have an effect on a person, group or the whole world (Winter, 2007). The affiliation motive is defined as the need to establish, maintain or restore a positive relationship with another person or group (Pang, 2010). The achievement motive is defined as the need to do better or to meet a certain standard of performance (McClelland, 1999).

In addition to these three dimensions, there are needs such as hunger, thirst, hygiene, sex, assertion, integration, security and knowledge as well. Some of these needs, however, show strong overlaps with the "Big Three" motives. The reduction to three basic motives, therefore, has the background of being able to explain as much behavior as possible with as few motives as possible (McClelland, 1999; Schultheiss and Brunstein, 2010). The following study, as most of the motive research, is based on these three main motives.

The results can not only be applied to individual behavior but hold true for collective behavior. Scheffer, 2001 claims that the collective motive can be seen as aggregation of individual motives and yields a similar behavior pattern. For the further analysis the collective motives are of interest. It is reasonable to assume that party motive patterns attract voters with similar patterns and that aggregated party and voter motives have explanatory power for voting behavior and outcomes.

5.2.2 Measurement

Murray (1935) was the first psychologist to attempt to systematize the motive research. Based on Freud's method of free association, he developed the Thematic Apperception Test (TAT) (Murray, 1943, Weinberger, Cotler, and Fishman, 2010). Murray replaces Freud's spontaneous and unstructured results with a set of ambiguous images. Each of the 20 pictures should evoke a particular motive. The subjects view the pictures, make up short stories fitting the pictures and write them down. Experts evaluate the stories in terms of a fixed number of almost 20 motives (McClelland, 1999).

The first strictly empirically designed study in motive research traces back to McClelland and Atkinson, 1948. They split the group into a stimulated test group and a control group without stimulation. Both groups complete the TAT and the study compares the test and control group's results. Still, this method is the foundation for measuring motives. Later studies were able to confirm the first results using the same study design (Shipley Jr and Veroff, 1952; Steele, 1977). The results suggest that although motives vary according to the situation, they are basically stable over time within the TAT results. Psychologist conclude that motives are time stable personality traits (Fodor, 2010).

In the second half of the 20th century, researchers applied the results to a collective, social level and proved the relevance and explanatory power of the "three big" motives on a collective level (McClelland, 1961). For the achievement motive, for example, the correlation of achievement-related content in textbooks and later economic growth demonstrates a meaningful interpretation (McClelland, 1961). Winter showed that a high collective power and low collective affiliation motive appeared in Great Britain, 1603 – 1988, always one year before the start of a war (Winter, 1993). For political crisis, the same motive-content pattern is present for the communication of political decision makers (Winter, 2004; Winter, 2007).

The results show a broad applicability of motive research. Studies convincingly demonstrate the possibility of using content analysis methods to predict concrete behavioral patterns of individuals and collectives.

5.2.3 Model

5.2.3.1 Machine-Learning Model

So far, psychologist hand-coded implicit motives in the TAT or comparable test procedures in time-consuming processes (Kuhl, 2013, Winter, 1991). Advances in computer-assisted analysis procedures today allows evaluating written text automatically. Schultheiss, 2013 has presented a first approach based on the Linguistic Inquiry and Word Count (LIWC) (Pennebaker, Francis, and Booth, 2001). The study confirmes the hypothesis of marker words which measure motives.

However, the study uses only a small sample for Germany and the USA, and the cross-cultural agreement is not convincing. The following analysis uses data analyzed by a machine-learning model, developed on a significantly larger data basis. The method presented by Johannßen et al., 2020 uses a supervised learning model, in other words, the algorithm learns to assign text features to motive categories on its own.

To train the algorithm, two training data sets were used. These include expert evaluations, according to Kuhl, 2013 Operant Motive Test (OMT) manual, of short stories for 15 pictures by the test subjects (Johannßen, Biemann, and Scheffer, 2019; Johannßen et al., 2020).

The training data set, based on the coded OMT answers, is cleaned with regard to punctuation and function words. The simplification of the language reduces the "noise" as well as the required computing power. For this purpose, the texts are broken down into their logical units (tokens) and programming as well as spelling errors are automatically eliminated (Zheng, Casari, and Lotze, 2019).

In the following step, those features are extracted from the training data for which the algorithm develops the best predictive power (Zheng, Casari, and Lotze, 2019). The evaluation is based on bag-of-words (BoW) feature extraction. The BoW method resolves the order of text tokens and indicates the frequency of words within a text. Memory vectors are generated that contain the number of words across all documents (Zheng, Casari, and Lotze, 2019).

From the dictionary generated by the BoW feature extraction, a series of feature lists were created taking into account the threshold values. A feature list with frequency 10 thus contained all content words that were used at least 10 times in the training data. To determine the classification quality of each feature list, a Naive Bayes classifier

was used. The aim was to determine the feature list that was expected to have the highest predictive power (Johannßen et al., 2020).

Four different algorithms were tested, Multinomial Naive Bayes (MNB), Discriminative Multinomial Naive Bayes (DMNB), Support Vector Machine (SVM) and Random Forest. The assignment bases on the DMNB. In the supervised learning process, the classification of each instance and the correct assignment can be verified. The observed alpha and beta errors are used to calculate measures of precision, accuracy and response as well as the F1 measure (validity) (Winter, 1991). To avoid errors due to random noise, several statistically independent data sets were simulated by performing a k-fold cross-validation (Zheng, Casari, and Lotze, 2019).

Very good results were obtained for the data in terms of F-score (0.72), accuracy (73.41), precision (0.73) and response (0.73) (Johannßen et al., 2020). Following Winter, 1991, the postings are broken down into individual window sizes of 50 words. Each window is then coded according to motives using the developed machine-learning model. By aggregating the results for each window, the dominant motive for each post is determined. If a window contained less than 50 words, it was added to the previous window.

The algorithms code almost as reliably as human experts in tests like the OMT. Each of the four tested algorithms achieved F-values of 0.71-0.73. This is particularly remarkable since the algorithm in its original version does not only cover 4 categories (three motives and zero) (Winter, 1991), as for example with Winter, but 16 categories. However, the following analysis uses only 4 categories. The trained algorithm is than applied on the Facebook data set and compared with the original test data set.

5.2.3.2 Empirical Model

The data set includes the communication of the parties *CDU*, *CSU*, *SPD*, *FDP*, *Gruene*, *Linke* and *AfD* on the social medium Facebook during the period from 2013 to 2017.

Table 5.3 shows the coding of the text messages according to the three motives as well as the zero (blank) coding. The representation is divided into the Facebook data set and the training data set. The table shows that the Facebook data set has an on average higher power coding than the training data set, and lower affiliation and achievement coding. We see that political communication has a stronger power motive than internal party communication in the Facebook data set. When interpreting

the results, it should be noted that the political dummy variable has a high variance of topics.

TABLE 5.3: Descriptive Statistics of the Facebook Data Set and the Training Data Set on Individual Motives.

Topic Dummy	Null	Affiliation	Achievement	Power	Total
Internal	422	1736	3330	7540	13028
	(3.24)	(13.33)	(25.56)	(57.88)	(100.00)
Political	385	1978	3782	10748	16893
	(2.28)	(11.71)	(22.39)	(63.62)	(100.00)
Total	807	3714	7112	18288	29921
	(2.70)	(12.41)	(23.77)	(61.12)	(100.00)
Test data	7988	18974	38294	75275	140531
	(5.16)	(13.31)	(26.63)	(54.90)	(100.00)

Note: Facebook data set is divided into internal party and political communication.

The data includes the thematic coding and motive coding, additionally, the date and the shared content (status, video, photo, events, music, note, link) are added as control variables.

We use a logarithmic model to examine the effect of party affiliation in different specifications of the included text messages on the power and the attachment coding, respectively.

$$P(y_i = 1) = F(\beta_0 + \sum_{i=1}^{k} \beta_i X_i + \sum_{j=i}^{n} \alpha_j Z_j) \tag{5.2}$$

With X_i defined as the text messages of parties i and Z_j defined as the control variables of the shared content j. We use three different models, first only the party affiliation is examined, in the next step the control variables are included and in a last model the data set is cleaned of outliers. In this context, outliers are to be understood as individual influential covariate patterns that are removed (Kohler and Kreuter, 2017). This allows us to check whether differences are driven by individual events or occur across the data set. The results are reported as average marginal effects (AMEs).

The locally weighted scatterplot smoother (LOWESS) is used to display the time course (Cleveland, 1979). Due to the high number of cases, a low smoothing parameter of 0.3 is applied.

5.2.4 Hypothesis

Previous parts of the dissertation show that the long-held assumption in public choice that voters allocate their votes according to rational criteria and choose those politicians or parties maximizing their individual utility has long been considered outdated. A growing number of studies show that existing opinions based on ideology, values and experiences influence the processing of new information (Le Yaouanq, 2018; Rabin and Schrag, 1999b; Sunstein, 2001). In addition, inter-subject communication supports existing opinions and group identifications (Sausgruber and Tyran, 2011). It can therefore be assumed that the tone of political communication has an influence on the information processing by voters. Motive patterns, as unconscious elements of communication, can contribute to the understanding of the effect of political communication on voters, as well as to the identification of potential voters.

5.2.4.1 Hypothesis 1

Motives direct, select and activate behavior (Schultheiss and Brunstein, 2010). They cause us to react particularly strongly, in a time and situation transcendent manner, to certain stimuli in our environment. In order to achieve satisfaction of certain stimuli, a person with strong motives directs her behavior towards directly seeking these stimuli.

Over the last 50 years, numerous studies have been conducted to find potential influences of the three motives on politics or politics-related fields. Studies showed that politicians with a high affiliation motive were more often involved in political scandals, but also showed a willingness to prevent armed conflicts during political crisis (Weinberger, Cotler, and Fishman, 2010; Winter, 2010). A high achievement motive, however, can often be associated with a less efficient administration as a result of a lack of delegation and growing frustration (Winter, 2010). In a study of U.S. presidents, from Washington to Lyndon Johnson, charismatic politician can be linked to a high power motive (Winter, 2010). Existing research thus points out a clear profile pattern of political actors.

Hypothesis 1: The aggregated power motive in the Facebook data set should be significantly higher than in the representative test data set. The affiliation motive should be significantly lower.

5.2.4.2 Hypothesis 2

A very high power motive is often associated with the need for absolute assertion of will and personal importance. In the political context, the connection between a tendency towards authoritarianism and an exaggerated power motive can be observed in combination with a low affiliation motive (McClelland, 1961). In the democratic context, the combination of these motives appears much less frequently (McClelland, 1999).

On the basis of evaluated speeches, media contributions and other communication, the *AfD* is associated with a right-wing authoritarian orientation (Thieme, 2019). Party leaders' books publications and speeches show examples (Höcke and Hennig, 2018; Die Welt, 2016; Frankfurter Allgemeine Zeitung, 2018). Häußler locates the *AfD* in a völkisch-authoritarian populism (Häusler, 2018b, Häusler, 2018a).

According to the theory, locating the *AfD* as an authoritarian party, should reveal a significantly higher power motive and a lower affiliation motive in their communication. Both internal power struggles and the confrontation with political opponents support the hypothesis.

Hypothesis 2: The *AfD* should have a significantly higher power motive than the other parties in the data set. The affiliation motive should be significantly lower.

5.2.4.3 Hypothesis 3

Political and internal party communication are the two main parts of party communication. Internal party communication contains mainly positive and communal aspects, but also conflicts within the party. Political communication, on the other hand, requires dealing with external issues as well as with political opponents.

Communication differs fundamentally in terms of target audience and objectives. Except for cases of strong internal party conflicts and power struggles, internal party communication tends to be characterized by unity and facts (dates, election successes).

The confrontation with the political opponent over the political positioning requires a more critical communication. In the overall spectrum of political actors, there is less unity in political communication.

Hypothesis 3a: Internal party communication should be coded significantly lower with the power motive than policy communication.

There are various explanations for the growing strength of the *AfD*. Two of these theories are relevant for strategic voter targeting. One prominent theory is the "modernization loser hypothesis" (Lengfeld, 2017, Rippl and Seipel, 2018). The hypothesis is that economic fears following the advancing globalization strengthen right-wing populist tendencies. The effects are stronger in population groups with low human capital and in peripheral areas. However, the theory also includes part of the middle class, which is worried about its economic decline. Another theory is the "cultural backlash" theory (Norris and Inglehart, 2016, Rippl and Seipel, 2018). In this theory, socio-psychological rather than economic reasons are seen as causal. In summary, it is assumed that part of the population feels threatened in its identity and value systems by the liberal transformation process (Norris and Inglehart, 2016).

There is evidence for both theories: the average income of voters is lowest in the *AfD* and the *Linke*, and the majority of *AfD* voters believe they are economically disadvantaged. In addition, there is a low proportion of university graduates and a disproportionate high number of voters from the new federal states and rural areas. The voters of the *Linke* have similar characteristics (Brenke and Kritikos, 2017).

The cultural backlash thesis is specifically supported by the fact that *AfD* voters are particularly concerned about immigration, crime, the end of peace and the disintegration of society (Brenke and Kritikos, 2017).

The description of the voters is in line with the explanation of the motive research on an exaggerated power motive. Studies have shown that typical characteristics of the power motive, such as the fear of losing influence, status or social standing, are particularly pronounced among people with a low or threatened socio-economic status.

The *AfD* with a völkisch-authoritarian populism and anti-immigration statements appeals to voters in precarious or threatened socio-economic circumstances. The *Linke*, on contrary, focuses on socio-political strategies and workers' perspectives. The parties have a constituency with a low or (perceived) threatened socio-economic status in common, but differ in their political focus.

A part of the hypothesis is already measured in hypothesis 2. However, since a clear differentiation of internal party and political communication can be assumed, the

pure effect of political communication should not be measurable in the overall data set. Political communication should play a greater role in voter appeal and voter decision-making than internal party communication.

Hypothesis 3b: The *AfD* and *Linke*, on the political fringes, should have a significantly higher power motive on political issues than the other parties. The affiliation motive should be significantly lower.

5.2.5 Analysis

The assumption that political actors show the motive pattern, increased power, low affiliation coding, is confirmed (table 5.4). The model confirms that communication via Social Media resembles the expected patterns from conventional communication, i.e. politicians tend to have a higher power motive.

TABLE 5.4: Logistic Model of Power and Affiliation Motive of the Test Data Set and Facebook Data Set.

	Model 1 Power motive	Model 2 Affiliation motive
Test data	0	0
Facebook Data	0.0756***	-0.0109***
Observations	170452	170452

Note: * p < 0.05, ** p < 0.01, *** p < 0.001

The assumption that the parties on the margins have a significantly higher power coding is also confirmed (table 5.5). Both the difference between *Linke* and *CDU*, *CSU*, *FDP*, *SPD* and *Gruene* and the difference in motive patterns between *Linke* and *AfD* at opposite extremes of the political spectrum remain highly significant. The results are robust for the introduction of the control variables, as well as the elimination of outliers. The significantly higher power and lower affiliation coding of the *AfD* confirms that the right-wing populist orientation is not only evident in the issue focus, but also in the motive coding.

In the next step, the results of the motive analysis are combined with the content-analytical evaluation. A distinction is made between content-related, political issues and internal party communication.

TABLE 5.5: Logistic Model of Power and Affiliation Motives by Party

	Model 3 Power	Model 4 Power	Model 5 Power
AfD	0.0265**	0.0437***	0.0562***
CDU	-0.0611***	-0.0651***	-0.0659***
CSU	-0.0874***	-0.0766***	-0.0818***
FDP	-0.0358***	-0.0388***	-0.0225*
Gruene	-0.0776***	-0.0765***	-0.0847***
Linke	0	0	0
SPD	-0.0417***	-0.0395***	-0.0355***
Date		-0.0000537***	-0.0000565***
Control variables		x	x
Covariant			x
Observations	29921	29921	28674

	Model 6 Affiliation	Model 7 Affiliation	Model 8 Affiliation
AfD	-0.0157**	-0.0274***	-0.0224***
CDU	0.0289***	0.0302***	0.0262***
CSU	0.0553***	0.0450***	0.0357***
FDP	0	0.000405	0
Gruene	0.0483***	0.0460***	0.0413***
Linke	0.00303	0	0.00289
SPD	0.0321***	0.0284***	0.0313***
Date		0.0000370***	0.0000384***
Control variables		x	x
Covariant			x
Observations	29921	29917	28004

Note: * p < 0.05, ** p < 0.01, *** p < 0.001

The assumption that the parties use less power-coded communication internally is confirmed for almost all parties (see table 5.6). Only the *CDU* shows neither a significant difference between internal party and political communication nor the anticipated negative correlation. For all other parties, the expected negative correlation is recognizable and significant.

Based on theories of cultural backlash and the modernization loser hypothesis, parties on the political fringes with an increased voter potential from precarious backgrounds or peripheral areas should address their voters with an increased power coding and lower affiliation coding.

TABLE 5.6: Logistic Model of Power Coding by Parties - Differences between Internal Party and Political Communication

	Model 9 Power AfD	Model 10 Power CDU	Model 11 Power CSU	Model 12 Power FDP
Topic Dummy	-0.0369*	0.00816	-0.121***	-0.0270*
Date	-0.00000815	-0.00000724	-0.000106***	-0.0000887***
Control variables	x	x	x	x
Observations	4908	3432	3423	5615

	Model 13 Power Gruene	Model 14 Power Linke	Model 15 Power SPD
Topic Dummy	-0.0704***	-0.0286*	-0.0461**
Date	-0.0000406*	-0.0000571***	-0.0000774***
Control variables	x	x	x
Observations	3246	5113	4174

Note: * p < 0.05, ** p < 0.01, *** p < 0.001 ; Internal communication is coded with 1.

TABLE 5.7: Logistic Model of Power Coding by Party - Political Communication

	Model 19 Power Political	Model 20 Power Political	Model 21 Power Political
AfD	0.0245*	0.0388**	0.0513***
CDU	-0.0785***	-0.0834***	-0.0665***
CSU	-0.0291	-0.0225	-0.0173
FDP	-0.0230	-0.0265	-0.00900
Gruene	-0.0555***	-0.0588***	-0.0455**
Linke	0	0	0
SPD	-0.0366**	-0.0401**	-0.0269*
Date		-0.0000596***	-0.0000605***
Control variables		x	x
Covariant			x
Observations	16586	16584	16095

Note: * p < 0.05, ** p < 0.01, *** p < 0.001

The *AfD* shows the expected strong motive pattern in political communication (table 5.7). We see a significantly higher power coding compared to the next closest party, *Linke*. The *Linke* has the second highest value, but does not differ significantly from the *FDP* and the *CSU*. The affiliation coding is less robust to the model specifications (see table 5.5). Although the *AfD's* affiliation motive coding is the lowest, it does not differ significantly from the *FDP's* base value. In contrast, the difference to the *Gruene* and the *SPD* as well as the *Linke* in the third specification is significant. Overall, the affiliation coding of the left-wing party spectrum is higher than that of

the right-wing party spectrum.

The results confirm the hypothesis, that the *AfD* with an ultra-conservative to völkisch-populist orientation has an increased power coding (table 5.7). Following the psychological literature, the results match with the electorate being susceptible to this motive pattern.

In internal party communication (table 5.8), the coding is less clear. However, it can be seen that the governing parties and the *Gruene* with a stable leadership show a significantly lower coded power motive over the period. The *AfD*, with a significant party infight during the period under observation, has the highest power coding. The affiliation coding is not robust to the model specifications.

TABLE 5.8: Logistic Model of Power Coding by Party - Intra-party Communication

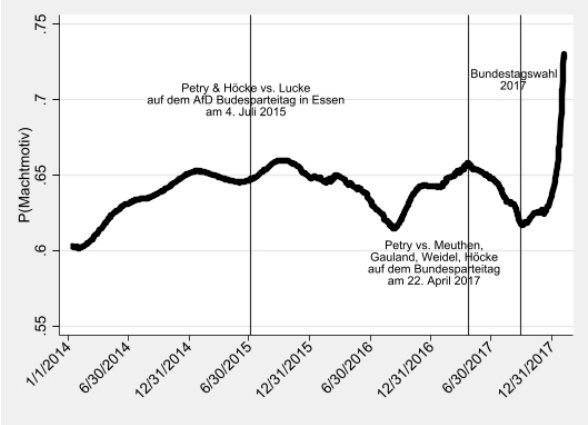
	Model 16 Power Internal	Model 17 Power Internal	Model 18 Power Internal
AfD	0.0150	0.0330	0.0427*
CDU	-0.0369*	-0.0412**	-0.0481**
CSU	-0.119***	-0.103***	-0.111***
FDP	-0.0310*	-0.0313*	-0.00768
Gruene	-0.0989***	-0.0944***	-0.0992***
Linke	0	0	0
SPD	-0.0552**	-0.0459**	-0.0512**
Date		-0.0000513***	-0.0000495***
Control variables		x	x
Covariant			x
Observations	13335	13335	12879

Note: * p < 0.05, ** p < 0.01, *** p < 0.001

Across the study period the *AfD's* power motive coding increases at times of internal party conflicts. From the data, it is possible to demonstrate individual events over time not only in content analysis, but also by coding implicit motives. Figure 5.3 shows the increase in power coding up to the party congress on 04.07.2015 and the increase towards the federal party congress on 22.04.2017 as well as a clear decrease in power coding towards the federal election in 2017.

In addition to the rough split of party communication in internal party and political communication, the most relevant topic over the legislative period was filtered out for closer examination (table 5.9). The migration issue is also the *AfD's* main issue from mid-2015 on. Compared to the other political issues, the *CDU* and *CSU* have a

FIGURE 5.3: LOWESS Plot - Course of Power Coding of Intra-party Communication for Observations of the AfD



significantly higher power coding. The *AfD*, on the other hand, has a lower power coding than in the other political issues.

TABLE 5.9: Logistic Model Power Coding by Party - Migration Compared to the Rest of Political Communication.

	Model 22 Power AfD	Model 23 Power CDU	Model 24 Power CSU	Model 25 Power FDP
Migration Dummy	-0.0467**	0.179**	0.0590*	-0.0979**
Date	0.00000120	-0.00000395	-0.000103**	-0.000105***
Control variables	x	x	x	x
Observations	3747	1466	1444	2141

	Model 26 Power Gruene	Model 27 Power Linke	Model 28 Power SPD
Migration Dummy	-0.0241	0.0325	-0.0262
Date	-0.0000721**	-0.0000493*	-0.0000951***
Control variables	x	x	x
Observations	1786	3221	2775

Note: * p < 0.05, ** p < 0.01, *** p < 0.001; Migration is coded with 1.

However, the *AfD* is the only party with an increasing power motive in the area of migration over time, although the result is not significant. With the exception of the *CDU*, the other parties show a significant temporal connection. This indicates that for the parties except for the *AfD*, the topic was less important in the course of the Bundestag elections.

5.2.6 Interpretation

The results support the hypothesis that the power coding of political communication is more pronounced on Social Media than in the comparison data set. This result is supported by the assumption that politicians generally have an increased power motive. A single motive, though, will not determine the electoral success of a party. Past studies suggest that those presidential candidates were elected who came closest to the motive pattern of the population (Winter, 2010). Initial results generated from the Social Media data set provide similar relationships as in Winter's theory. The results suggest that implicit content is particularly appealing to certain groups of voters. In the future, the study of implicit motives could therefore provide an additional component for predicting election results.

Motive patterns in Social Media result in significant differences between parties. In particular, the polarization of the party landscape and the associated significantly stronger power coding / lower affilation coding of the *AfD* in combination with a growing electoral success during the observation period indicates that the electorate feels attached to this motive coding.

In addition, a significant differentiation between political and internal party communication can be observed and is robustly negatively significant for all parties except the *CDU*. In particular, the political contributions of the *CDU* show a high degree of presenting their political successes, which would explain why an inverse relationship is observed. It could therefore be due to the *CDU's* position as "big" partner in the grand coalition and party of the Chancellor.

A more in-depth analysis of individual political issues, using migration policy as an example, yielded interesting results. An initially paradoxical pattern can be observed: contrary to the intuitive assumption that the *AfD* should have the highest power motive in its main topic, the power motive is coded significantly lower than in the other political topics. The reverse can be observed for the *CDU* and *CSU*, where the power coding is robustly 17-19% higher across the model specifications than in the other political topics. A possible explanation can be found in the conception of the motive patterns; these are to be understood as needs, if the actual value exceeds the target value in a target-actual comparison, there is no longer a discrepancy (McClelland, 1999). In the case of the *AfD*, there are hardly any target-actual discrepancies worth mentioning due to its success in determining the public discourse ("welcome culture" towards isolation) and a real reduction in immigration flows. The *CDU*

and *CSU*, on the other hand, were driven by the *AfD* and their own base during the legislative period (2013-2017). This can be understood as a threat to their position in the conservative spectrum and thus a discrepancy between aspiration and reality. This should lead to a fierce emotional reaction based on tribal old motives, which interferes with a rational cost-benefit consideration.

The extreme rise of the power motive for the topic migration in the *CDU* and *CSU* thus points to an emotional deficit: little was said about the topic, but then it was spoken about all the more emotionally, with a high coding of power, in order to assert oneself in the political competition. This form of communication can appear unbalanced, which can be attributed to the emotional and impulsive nature of motives, especially the power motive.

The results show that the assessment of psychological motives in combination with content analysis methods leads to interpretable results. Since implicit motives are involuntary, the results represent a promising alternative to sentiment scores in political analysis. The combination of techniques allows for a more in-depth analysis of informal communication with little increase in time. However, the results remain sensitive to the assumptions of the underlying algorithms.

Chapter 6

Effects of Party Communication on Voting Behavior

The following chapter consolidates the previous studies with the aim of evaluating the effect of direct party communication on voting decisions. The evaluated Social Media data is included as indicator of direct party communication. The processing of the data is explained in more detail in the first section.

Survey data from the monthly Politbarometer (Forschungsgruppe Wahlen, Mannheim, 2020) polls will be added to the already processed data. Sub-chapter 6.2 explains these first.

The last subsection covers a probit regression and the analysis of voting behavior, as well as a critical review of the method used.

6.1 Social Media Data

The Social Media data is organized in per message form. Reorganization of the data is necessary to calculate the effect of political communication on voting decisions.

The data is reorganized in five stages to make them suitable for merging with the monthly survey data. These are available in monthly form for each respondent. For the reorganization, the main topic for each message is first determined; the main category is needed for calculating sentiment values, implicit motives, as well as likes, shares, and comments in the monthly mean. The topic with the highest percentage share is used as the main topic for the message and coded as a dummy variable. The dummy variable is not used in the subsequent analysis, but is only used for calculation purposes.

TABLE 6.1: Social Media Variables

Variable	Calculation	Unit
Topics	monthly mean	Percent
Sentiment Score	mean by main topic/message	-1 to 1
Sentiment Score	mean by policy / party topic and total	-1 to 1
Implicit motives (3 motives)	mean by main topic/message	Percent
Implicit motives (power motive)	mean by policy / party topic and total	Percent
Likes, shares, comments	mean by main topic/message	Number

In a second step, a monthly percentage average is calculated for all topics, i.e. the mean salience of a topic by month and party. The average percentage of a topic is used as a variable in the subsequent analysis (see table 6.1).

The following three steps are performed in the same way. For each topic, an average sentiment score is formed, based on the coding as the main topic of a message. An average value for the coding with the implicit motives and for likes, shares and comments is built the same way. The aim of the calculation is to obtain a monthly representative average for each topic in order to take into account not only the choice of topic, but also psychological aspects and the direct reaction of the electorate.

In addition, a mean sentiment score and implicit motive (power) percentage is calculated for the subgroups of policy topics, party topics and a total mean. In chapter 5 it could be shown, that the implicit motives are best defined for the more general subgroups. Therefore, these will be used for the following analysis.

Four relevant topics are initially selected for the analysis. *Migration* is selected as the defining issue of the legislative period. Over the entire period under study, this topic is cited as the most important issue facing Germany in the polls (Forschungsgruppe Wahlen, 2014-2017). *Socio-political* issues are also dominant, and aspects of the labor market and pensions in particular are represented in the debate across the parties. The topic of *budget* (budget and growth) is a relevant representation of the conservative parties' own successes, especially for the governing parties. Lastly, the topic of climate is included. Along with migration, it is a crucial niche issue on the one hand, and a sociopolitically decisive and thus a relevant issue for the population on the other. The expected signs of the effects are shown in table 6.2. This is based on the theoretical premise that parties have electoral advantage on their own issues and that governing parties can generate votes through their success story. For issues that are not clearly partisan, voters are assumed to react in a neutral manner.

TABLE 6.2: Expected Signs Topics and Implicit Motive Power

	AfD	CDU	CSU	FDP	SPD	Gruene	Linke
Migration	+	-	+	o	o	o	o
Social Policy	+	o	o	o	+	o	+
Budget	o	+	+	+	o	o	+
Climate	o	o	o	o	o	+	o
Implicit Policy Topics	+	-	+	o	-	-	+

Notes: **+** positive effect, **-** negative effect, **o** indifferent effect on voting decision.

In addition to the thematic focus, the average implicit motive power for political issues is added to measure sentiment. Implicit motives have shown a better representation of the parties in chapter 5 than the dictionary based measurement of sentiment. Therefore, power is used as an indicator. The average power motives by issue are also available. In chapter 5, though, it was shown that the representation of issues for specific topics by power motives is not sufficiently identified. The distinction between political and internal party issues led to good and significant results. As a result, the issue-specific ones are excluded and the power coding by political issues is used as specification. The expected signs are also presented in table 6.2. In line with the explanations in chapter 5.2, it can be assumed that parties at the fringe benefit from a high power motive, while ruling parties are more likely to experience a negative effect.

6.2 Voting Data

Various surveys are available for analyzing voting intentions. For Germany, two surveys are particularly relevant, as they provide a regular picture of voting intentions. Other polls are available, but they only provide information on voting intentions without asking about other socioeconomic variables (e.g., GMS Dr. Jung Gesellschaft für Markt- und Sozialforschung, 2017, Infratest Dimap, 2023). Since socioeconomic variables have an impact on voting decisions (see Simmons, 1967), a complete database is necessary for a meaningful analysis.

To my knowledge, there exist only two regular data sets with the respondent's socioeconomic characteristics on file. The Socioeconomic Panel (SOEP) (Liebig et al., 2022) or the Politbaromater (Forschungsgruppe Wahlen, Mannheim, 2020) are available. The SOEP is collected during the year as an annually representative panel.

Since the individual months of the survey are recorded, it would be possible to consider it as a cross-section in the monthly course. However, this approach cannot ensure a representative population structure at the monthly level. The Politbarometer is implemented as a monthly representative random survey. Since 1988, the data has been collected as a telephone interview, and the oversampling of East Germany is taken into account via the overall weighting. For the following analysis, therefore, the Politbarometer is used as the basis for the voter-relevant data.

Following the approach of Dewenter, Linder, and Thomas, 2019, the variable "intended party choice" is used to determine voting behavior. In the monthly survey, the short-term voting decision is queried by the assumption: if there were a federal election now. The multivariate party choice is recoded into a binary variable, i.e. for the *SPD* the variable is coded 1 for a planned vote for the *SPD* and 0 for all other voting decisions.

The following socio-demographic variables are included in the analysis:

Personal characteristics:

- Age
- Gender
- Marital status
- Education
- Unemployment
- Christian
- Labor union
- West Germany
- Municipality size

Political characteristics:

- Political interest
- Party affiliation
- Self-classification left-right continuum

Because the data were not collected consistently for the entire period, the variables used to classify one's own economic situation and the overall German economic situation are not included. Particularly in the 2017 election year, only 46.6% of respondents were asked about their economic situation.

The selected indicators are used in this or a similar form in most analyses of voting behavior, so clear predictions already emerge regarding the sign of the influence on the voting decision. The hypotheses can already be supported by the descriptive statistics of the four years relevant to the study. All analyses are presented in Appendix C in tables C.1 to C.11.

Age is reported as a categorized variable for eligible voters between 18 to 70 and older. It can be assumed that for the *Gruene* a younger age has a positive effect, while for *CDU/CSU*, *SPD* and *AfD* an opposite effect can be observed. *Gender* is coded as a dummy variable with 1 for female voters. A positive effect of female is expected for the *Gruene*, but the opposite effect is expected for the *AfD*. *Marital status* is coded as a dummy with 1 for married couples. Registered civil partnerships are also included here, although they are expected to have an opposite tendency in the voting decision. The proportion of registered civil partnerships is very small and therefore no bias in the indicator is assumed and legal equality is chosen to allocate them in married group. The assumption is that married has a positive effect on the voting decision of Christian Democratic parties, linked also to the tendency of married couples to be older. The opposite effect is expected for the *Gruene* and the *Linke*. *Education* is coded from 1 to 5 with 1 no secondary school diploma to still in school/no indication. For the *Gruene* and the *FDP*, a positive effect of a higher education can be assumed, while for the *AfD* a lower school education is assumed. *Unemployment* is measured as a dummy; in principle, unemployment is very low. However, it can be expected that unemployment has a positive effect on the voting decision for both the *Linke* and the *AfD*. The variable *Christian* is also coded as a dummy and contrasts Christian confessions with all other religious affiliations or non-denominational. *Union membership* is expected to be a relevant indicator for parties left to center and is traditionally included. The variable *West Germany* is coded as dummy. Since reunification and all-German elections, differences in voting behavior are generally found, so the variable is included in the analysis as an important indicator. Strong negative effects on voting for the *Linke* and the *AfD* are expected. The last demographic variable included in the analysis is *municipality size*. The variable is coded from up to 2000 inhabitants to over 500,000 inhabitants.

TABLE 6.3: Expected Signs of Socio-demographic Indicators

	AfD	CDU	CSU	FDP	SPD	Gruene	Linke
Age	o	+	+	+	+	-	-
Female	-	+	o	o	+	+	o
Married	-	+	+	o	o	o	o
Education	-	+	o	+	o	+	-
Unemployed	+	-	-	-	+	+	+
Confession	-	+	+	o	o	o	-
Labour Union	+	+	+	+	-	o	-
West	-	+	.	+	o	+	-
Municipality Size	-	o	-	+	o	+	-
Party Affiliation	+	+	+	+	+	+	+
Political Interest	-	+	o	o	o	+	-
Left-Right-Continuum	+	+	+	o	-	-	-

Notes: **+** positive effect, **-** negative effect, **o** indifferent effect on voting decision.

Basically, differences in voting behavior between urban and rural areas are expected. Similar effects as for the variables age and education are assumed.

In addition, three indicators of respondents' political self-ranking are included. The strength of *political interest* is included; the variable is coded from 1 strong interest to 5 no interest. Basically, a higher level of interest is expected among the smaller parties. Another indicator included is *party affiliation*; personal and family affiliation with the party was particularly relevant for the major parties *CDU/CSU* and *SPD*. This affiliation has decreased in recent years, but it can still be assumed that party affiliation continues to play a decisive role. The variable is coded as a dummy for each party, i.e. for the *CDU*, for example, the variable 1 is coded for an affiliation to the *CDU* and 0 for none or affiliation to another party. Since affiliation has decreased, self-classification on the *left-right continuum* is included. The variable is coded from 0 (left) to 10 (right). Particularly for the parties on the political fringes, strong positive or negative effects on the voting decision can be expected.

The expected signs of the socio-demographic indicators are summarized in table 6.3.

6.3 Empirical Approach

6.3.1 Strategy

I use a classical probit model to evaluate the binary variable of interest. The approach is similar to Dewenter, Linder, and Thomas, 2019, however, instead of the media tonality the discourse of parties on Social Media is used.

$$P(Y_{vt}^i = 1) = F(\beta_0 + \sum_{p=1}^{n} \beta_i T_{t-1}^i + \beta^j S_{t-1}^i + \beta^d Z_{vt}^d + \beta^k Z_t^k) \tag{6.1}$$

with Y_{vt}^i being a voter's v voting decision for party i at time t. The data set includes the parties i, with $i = AfD, CDU, CSU, FDP, SPD, Gruene, Linke$. T_{t-1}^i includes the four topics p for the individual party i at time $t-1$ and symbolizes the discourse on Social Media in combination with the implicit motive for policy topics S_{t-1}^i for party i at time $t-1$. The communication is lagged by one period for two reasons. First, the communication is accumulated for a whole month and thus includes statements posted just before or even after the query. Second, except for specific topics it can reasonably be assumed that the discourse is taken into account with some lag by voters. Z_{vt}^d comprises the set of demographic characteristics of each voter individually. Lastly, the model includes the three macroeconomic variables in Z_t^k.

6.3.2 Empirical Issues

Chapter 2 covered in detail the reciprocal agent relationship between voters and politicians or parties. On the one hand, voters react to the parties' public image by adjusting their voting decisions; on the other hand, politicians react to changing majorities. The reciprocal relationship implies potential endogeneity for empirical analysis, which is due to simultaneity of voting decisions with explanatory thematic emphases. The problem was discussed, among others, in the paper by Dewenter, Linder, and Thomas, 2019 in relation to media coverage. Whereby there is a difference between media coverage and political direct communication. While media coverage is directly dependent on short-term sales quotas or audience ratings, the orientation of political discussion is geared toward the upcoming election decision and less toward short-term election intentions during the legislative period. Nevertheless, simultaneous dependence cannot be ruled out.

TABLE 6.4: Most Important Issues Voter and Party Topics

Most Important Issue

Issue	Voter Answers	Coding
Social Policy	Pension/Elderly	1
	Hartz IV/Social Security	2
	Housing market/Rents	6
	Income/Minimum Wages/Working Hours	7
	Strike/Unions	8
	Unemployment/Job Training	14
	Family/Children/Youth	19
	Health Care System and Policy/Nursing Care	20
	Schools/Education/Pisa	30
Migration	Refugees from Africa	51
	Foreigners/Immigration/Integration/Asylum/Refugees	54
Budget and Growth	Prices/Inflation/Interest Rates	5
	Taxes/Tax Increase/Tax Evasion	10
	Economics Situation	13
Climate	Climate Change/Environment Protection	15
	Nuclear Energy and Policy/Final Deposition	16
	Agriculture/Food	83

Second Most Important Issue

Issue	Voter Answers	Coding
Social Policy	See Most Important Issues	ibid.
	Social Gradient/Justice/Poor-Rich/Underclass	77
Migration	See Most Important Issues	ibid.
Budget and Growth	See Most Important Issues	ibid.
	Government Dept	56
Climate	See Most Important Issues	ibid.

Coding corresponds to the codes of the Politbarometer variables V33 and V34.

TABLE 6.5: Correlation Coefficients - Most Important Issues Voter and Party Topics

	Climate	Budget and Growth	Migration	Social Policy
AfD	-	-0.0017	0.1411***	0.0417***
CDU	-	0.0707***	0.2752***	-0.0112***
CSU	-	-0.0078**	0.3301***	-0.0198***
FDP	0.0092***	0.0012	0.2584***	0.0433***
SPD	-0.0312***	0.0678***	0.2680***	0.0013***
Gruene	0.0127***	0.0039	0.1404***	-0.0390***
Linke	0.0197***	-0.0178***	0.2758***	-0.0172***

Notes: *** significant on 1% level; ** significant on 5% level; * significant on 10% level.

In order to obtain a more precise assessment of the thematic focus between voters and parties, the variable "most important issue" and "second most important issue" were coded according to the codebook on party communication and the four issues were each coded with a dummy variable. This dummy variable is exactly 1 if one of the mentioned problems of the respective voter corresponds to the topic variable. The exact coding can be found in table 6.4. For the issues of social policy, climate and environment, and budget and growth, no notable correlations are found between voter mention and increased party communication (see table 6.5). For the topic of migration, which can be assumed to be the dominant topic of the legislative period due to strong immigration, a clear correlation can be found. This affects the established parties more than the *AfD*, which is gaining in relevance. This can be explained by the decline in voter interest in the topic of migration after the peak in immigration in 2015 and the countervailing increase in *AfD* communication leading up to the 2017 federal election.

The issue of migration illustrates the second potential problem of the omitted variable bias. Since external influences such as immigration are not included in the analysis, biases may arise. This could be particularly relevant in the case of aspects such as terrorist attacks, which, as external influences, directly affect communication in the short term. Moreover, voters' interest is drawn to the topic area in a spotlight. In this respect, the topic of migration was always of interest and was a relevant topic throughout the entire election period; if it is assumed that it is primarily the tone and content of the topic that play a relevance for voters, this can hypothetically be considered less of an external effect from outside. Although this cannot be ruled out.

The use of an instrumental variable approach does not seem to be purposeful for the

detailed examination of the thematic focus. In order to address this issue, I exclude, among other things, the direct election campaign period before the 2017 federal election and the highly correlated topic of migration in order to check the robustness of the other results.

6.4 Analysis

The following section begins with a short presentation of results, comparing them with the expected signs of relevant variables. The second part puts the result in context with issue voting discussed in chapter 2.2. The other voting models, namely retrospective, strategic and expressive voting will be discussed later in chapter 7.2.2.2.

6.4.1 Results

Table 6.6 shows the results for the separate probit estimations. The social media data is to be understood as the communication of the dependent party.

The major demographic variables generally coincide with the previously expected signs. However, some results are not intuitive at the first sight. It was expected, that rather older voters tend to vote for *CDU/CSU* and *SPD*. The results show that, the younger the voter, the higher the voting intention for the three parties. A closer look on the age / voting distribution shows that both *CDU/CSU* and *SPD* are generally close to the overall age distribution in the population. Additionally, the effects are rather small compared to other demographic characteristics. Gender, namely female, in contrast shows higher effects. Especially, the *AfD* voting intention coincides with strong negative effects for female voters.

Both married and confession are clearly determining for both *CDU* and *CSU*. The effect is unsurprising. Though, the confession shows additionally the East-West differences in voting behavior. With *AfD* and *Linke* having a strong voter base in East Germany, the church affiliation is strongly negative associated with a voting intention for *AfD* and *Linke*. The result is confirmed by the strong negative effect for voters in West Germany.

The difference between parties to the left and those to the right of the center is visible in membership to unions and municipality size.

In terms of the political variables, party affiliation has, as expected, a strong positive effect on the voting intention. The effect is larger than for the general demographic characteristics. The effects for the other political variables are smaller, though, have the expected signs and are highly significant.

TABLE 6.6: Probit Model: Voting Decision and Social Media Communication

	AfD	CDU	CSU	FDP	SPD	Gruene	Linke
Demographic							
Age	-0.0115 **	-0.0164 ***	-0.025 ***	0.017 ***	-0.026 ***	-0.042 ***	0.008
	(0.0047)	(0.0039)	(0.009)	(0.005)	(0.004)	(0.004)	(0.005)
Gender	-0.3878 ***	0.1011 ***	0.129 ***	-0.090 ***	0.044 ***	0.105 ***	-0.045 **
	(0.0198)	(0.0156)	(0.036)	(0.023)	(0.016)	(0.019)	(0.020)
Married	-0.0533 **	0.1160 ***	0.134 ***	0.024	-0.041 **	-0.033	-0.202 ***
	(0.0238)	(0.0185)	(0.044)	(0.026)	(0.019)	(0.021)	(0.023)
Education	-0.1248 ***	-0.0078	-0.078 ***	0.044 ***	-0.078 ***	0.121 ***	0.031 **
	(0.0123)	(0.0100)	(0.023)	(0.013)	(0.010)	(0.011)	(0.013)
Unemployed	0.1698 ***	-0.2604 ***	-0.428 **	-0.137	0.127 **	0.039	0.372 ***
	(0.0635)	(0.0584)	(0.183)	(0.103)	(0.062)	(0.080)	(0.064)
Christian	-0.2511 ***	0.2012 ***	0.309 ***	-0.015	-0.039 **	-0.055 ***	-0.372 ***
	(0.0204)	(0.0169)	(0.044)	(0.024)	(0.018)	(0.021)	(0.022)
Union	-0.0356	-0.2347 ***	-0.184 ***	-0.201 ***	0.128 ***	0.010	0.228 ***
	(0.0229)	(0.0185)	(0.045)	(0.030)	(0.019)	(0.023)	(0.023)
West	-0.2641 ***	-0.0716 ***	0.000	0.213 ***	0.049 ***	0.296 ***	-0.201 ***
Germany	(0.0188)	(0.0159)	(omitted)	(0.025)	(0.017)	(0.021)	(0.020)
Municipality	-0.0097 **	-0.0262 ***	-0.028 ***	0.006	0.017 ***	0.005	0.019 ***
Size	(0.0039)	(0.0033)	(0.008)	(0.005)	(0.003)	(0.004)	(0.004)
Political							
Party	3.0947 ***	2.1827 ***	1.593 ***	2.500 ***	2.311 ***	2.579 ***	2.661 ***
Affiliation	(0.1047)	(0.0183)	(0.047)	(0.041)	(0.018)	(0.028)	(0.032)
Policy	-0.0867 ***	0.0949 ***	0.106 ***	-0.041 ***	0.125 ***	0.022 **	-0.051 ***
Interest	(0.0120)	(0.0089)	(0.021)	(0.015)	(0.009)	(0.011)	(0.012)
Left-Right	0.0021 ***	0.0039 ***	0.004 ***	-0.001 *	0.000	-0.001 **	-0.003 ***
	(0.0004)	(0.0004)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)

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Table 6.6 – continued from previous page

	AfD	CDU	CSU	FDP	SPD	Gruene	Linke
Social Media							
Migration	-1.131 **	-1.675 ***	-0.479	-1.901 **	-0.349	-0.514	0.279
	(0.477)	(0.472)	(0.647)	(0.775)	(0.329)	(0.465)	(0.681)
Social Policy	-3.168 **	-0.342	6.215 ***	3.331 **	-1.397 ***	1.828	0.872 **
	(1.407)	(0.502)	(2.356)	(1.438)	(0.311)	(1.438)	(0.367)
Budget	-3.653 ***	0.515	-3.611 *	-1.871	-0.233	1.535 ***	-0.153
	(0.737)	(0.390)	(1.866)	(1.264)	(0.427)	(0.556)	(0.822)
Climate	0.000	0.000	0.000	-3.348	-0.291	0.116	-0.703
	(omitted)	(omitted)	(omitted)	(2.346)	(0.659)	(0.346)	(1.409)
Implicit	0.176	-0.266 ***	-0.182	0.081	-0.391 ***	-0.686 ***	0.050
Motive	(0.170)	(0.099)	(0.125)	(0.155)	(0.134)	(0.130)	(0.165)
Macroeconomic							
Unemploy-	-0.142	0.072	-0.123	0.342 **	0.177	0.089	-0.224
ment rate	(0.223)	(0.194)	(0.450)	(0.305)	(0.184)	(0.224)	(0.266)
CPI	-0.056 ***	0.021	0.024	-0.047 **	-0.016	-0.015	0.013
	(0.018)	(0.016)	(0.036)	(0.023)	(0.015)	(0.016)	(0.025)
Ifo	-0.074 ***	0.013	-0.002	0.034 ***	0.007	-0.024 ***	0.019 *
	(0.010)	(0.009)	(0.017)	(0.014)	(0.010)	(0.009)	(0.010)
Date	0.012	-0.002	-0.011	0.031 ***	0.004	0.005	-0.012
	(0.008)	(0.007)	(0.017)	(0.011)	(0.007)	(0.008)	(0.010)
Constant	6.101	-3.193	5.473	-23.311	-3.444	-1.726	4.272
	(6.392)	(5.266)	(12.375)	(8.391)	(5.198)	(6.103)	(7.114)
Number of obs	94958	83812	11146	94958	94958	94958	94958
Wald chi2(21)	2092	15477	1477	4465	16884	9618	8987
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.138	0.373	0.218	0.254	0.395	0.383	0.371

Notes: *** significant on 1% level; ** significant on 5% level; * significant on 10% level.
Standard errors in parenthesis.

While the size of the effect of macrovariables seems arbitrary, the direction of the effect and significance yield reasonable results. Especially, for the *FDP* as liberal and economic party macroeconomic indicators seem to be a predictor for electoral

success. This could be explained by a higher perceived competence in the field by the *FDP* and thus voters linking these indicators to their voting preferences.

The Social Media communication is partly less clear and requires a more detailed interpretation. For the *AfD* the model yields negative effects for all topics covered. Unintuitively the effect for migration is negative. However, the *AfD* started to cover the topic even more extensive during the last months before the federal election. However, the time period is accompanied by declining survey results. The short observation period and only one election cycle could be a reason. In addition, the observation period coincides with the consolidation phase of the *AfD*. In contrast, for the established *CDU* results are intuitive and explainable. The communication on migration is negative, while the communication on budget and development positively affects the voting intention, though not significantly. The difference of established and new parties becomes visible for the pseudo R^2 values. With exception of *CSU* and *FDP* the R^2 values are high. For the *AfD* the R^2 is comparatively low with only 13.8%. In addition to the previously named reasons, several other queries show that increased voting intention for *AfD* can also partly be explained by protest votes against established parties (Hambauer and Mays, 2017). The available data in the used data set do not allow to cover this aspect.

The two leftist parties *Gruene* and *Linke* have positive effects for the key topics, for the *Gruene*, though, the effect is not significant. For the *SPD*, in contrast, the effects for all topics is negative. A possible explanation could be, that the *SPD* is hold responsible for participation in government, in other words a negative incumbency effect.

For different reasons *CSU* and *FDP* are less interpretable. The *CSU* is a regional party, therefore, the number of observations is comparatively small and other regional aspects such as incumbency effects in the regional parliament could be relevant to explain voting intentions. In terms of the *FDP*, the federal election 2017 marked the reentry into parliament. The 2013 federal election marks a turning point. The *FDP* failed to pass the 5% hurdle. This was followed by a phase of reorganization. Both factors may contribute to the fact that the effects cannot be explained intuitively. In particular, the highly significant effects of sociopolitical communication are surprising.

Following the assumptions in chapter 5.2, it was expected that the effect for the Implicit Motive power should be positive for the parties at the political edges and

negative for the other parties. The results are confirmed and show significantly negative effects for the incumbents and the *Gruene*.

6.4.2 Interpretation

Four major aspects determine issue voting, the following chapter will cover proximity and single issue voting, the polarization of the party spectrum in combination with differences between mainstream and niche parties, party specific topics and lastly voter specific characteristics including the availability of information and personal beliefs. The results in the previous sub-chapter will be interpreted in the context of the aspects named.

A necessary prerequisite for issue-based voting decisions is the discriminability of parties as well as a sufficient differentiation of issues. Both chapter 4 and 5 demonstrated the distinguishability of the issues, but also of the implicit motives. The issues and implicit motives were on the one hand distinguishable across parties and on the other across various issues. The results were proven to coincide with previous findings on party communication and correspond to assumable party positions and focuses.

In spatial voting models the proximity of voter and party position is acknowledged as relevant aspect to determine voter choice. For voters the evaluation of proximity is cognitively demanding and needs high affords to receive the necessary information. On the one hand, it is questionable if proximity voting is relevant for a majority of voters. On the other hand, measuring proximity of voters and parties is barely possible. While parties discuss their positions publicly, monthly surveys cannot cover all policy positions of voters. In panel surveys this could be covered, however, for the short observation period, the database would be too small. Concerning the cognitive requirements of proximity voting and the difficulties to measure it, it is reasonable to assume single issue voting. In terms of the previously presented results, the single issues can be interpreted as an assessment of the relevance of issues by the parties. The above results show, that the parties can partially achieve a positive effect on voting intentions through individual issues. Namely, *CDU* and *Linke* can achieve positive effects. However, the results need to be interpreted in terms of the short observation period and need to be verified for further legislation periods.

The German political spectrum observes a growing number of relevant parties during the last decades and lately an increasing polarization. Both factors go hand in

hand with declining party loyalty. The reduction of party loyalty could increase the importance of issue based electoral competition. However, the effect is not measurable for a single legislation period.

The last aspect for differences in issue-based electoral competition was, that ruling and large parties set different focuses as niche parties do. The difficulties concerning the results for *AfD* and *FDP* are described above, therefore, they are excluded here. The *Linke* and *Gruene* show the expected signs, which suggest that electoral success can be generated by focusing on their owned topics. Concerning the incumbency party *CDU* Budget and Growth shows positive results and the expected negative effect for the partly unpopular migration policy. As mentioned above, the negative effects for the *SPD* could be interpreted as negative incumbency effects.

With one legislation period at hand, all results need to interpreted with caution. The effects could also be initiated by external events that are not controlled for. An alternative approach using a simulated population with each voter having a predefined probability to change her voting decision could improve the explanatory power for a single legislation period. The approach will be discussed theoretically in the following chapter. The approach can cover additional information about voter characteristics such as range of Social Media communication, interaction effects between voters and e.g. relatives, personal beliefs, which are covered in yearly surveys and are projected for the simulated population and finally the comparison of personal beliefs or positions and those of parties. Additionally, external effects can be included.

6.4.3 Robustness Checks

The above mentioned issue of potential endogeneity is further investigated within the following analysis.

In Appendix C in table C.12 the results for excluding the topic *Migration* can be reviewed. With a single exception of *Social Policy* in case of the *CDU* all results stayed robust and did not change significantly.

For excluding the election period (see table 6.7), the results are mainly robust as well. However, the R^2 for the *AfD* is decreasing while it increases or stays constant for the remaining parties. While the signs of effects are generally robust, especially in case of *Social Policy* the effects turn insignificant for *CSU*, *FDP* and *Linke*. Similarly,

the effects of an increased *Power Motive* turn insignificant for *CDU* and *SPD*. In contrast, the effects for the general demographic and political characteristics are very robust and stay mainly significant. The results could suggest that the voters react less on party communication during the legislation period than during the immediate election campaign. The observation is plausible for two main reasons. First, the parties and politicians are more present by themselves but also in media reports during the campaign. Therefore, it is reasonable to assume that voters are more frequently confronted with party communication which could lead to the increased effect. Second, voters are more interested and aware of relevant political issues that are influential for the upcoming legislation period. The topic *Migration* retains significance across the political spectrum. This supports the observation, that the issue was discussed highly emotional throughout the legislation period and not only during the campaign. However, with only one legislation period at hand, this should not be over-intellectualized.

TABLE 6.7: Probit Model: Voting Decision and Social Media Communication 01/2014 - 03/2017

	AfD	CDU	CSU	FDP	SPD	Gruene	Linke
Demographic							
Age	-0.018 ***	-0.018 ***	-0.027 ***	0.028 ***	-0.022 ***	-0.043 ***	0.006
	(0.005)	(0.005)	(0.010)	(0.007)	(0.005)	(0.005)	(0.006)
Gender	-0.385 ***	0.095 ***	0.096 **	-0.072 **	0.042 **	0.102 ***	-0.063 ***
	(0.023)	(0.018)	(0.042)	(0.029)	(0.018)	(0.022)	(0.024)
Married	-0.041	0.126 ***	0.130 ***	0.024	-0.063 ***	-0.013	-0.196 ***
	(0.027)	(0.021)	(0.051)	(0.033)	(0.022)	(0.025)	(0.027)
Education	-0.114 ***	-0.010	-0.099 ***	0.040 **	-0.063 ***	0.118 ***	0.015
	(0.014)	(0.012)	(0.027)	(0.016)	(0.012)	(0.013)	(0.015)
Unemployed	0.195 ***	-0.211 ***	-0.248	-0.169	0.100	-0.023	0.387 ***
	(0.072)	(0.068)	(0.185)	(0.128)	(0.071)	(0.094)	(0.073)
Christian	-0.250 ***	0.207 ***	0.293 ***	-0.010	-0.026	-0.088 ***	-0.355 ***
	(0.023)	(0.020)	(0.051)	(0.030)	(0.021)	(0.024)	(0.025)
Union	-0.059 **	-0.248 ***	-0.237 ***	-0.200 ***	0.129 ***	0.023	0.242 ***
	(0.026)	(0.021)	(0.051)	(0.037)	(0.022)	(0.026)	(0.027)

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Table 6.7 – continued from previous page

	AfD	CDU	CSU	FDP	SPD	Gruene	Linke
West Germany	-0.253 ***	-0.065 ***	0.000	0.207 ***	0.027	0.307 ***	-0.234 ***
	(0.021)	(0.018)	(omitted)	(0.031)	(0.019)	(0.024)	(0.023)
Municipality Size	-0.010 **	-0.028 ***	-0.031 ***	0.009	0.018 ***	0.005	0.020 ***
	(0.004)	(0.004)	(0.009)	(0.006)	(0.004)	(0.005)	(0.005)
Political							
Party Affiliation	3.067 ***	2.226 ***	1.624 ***	2.520 ***	2.351 ***	2.619 ***	2.698 ***
	(0.136)	(0.021)	(0.055)	(0.049)	(0.021)	(0.033)	(0.037)
Policy Interest	-0.108 ***	0.099 ***	0.110 ***	-0.052 ***	0.131 ***	0.017	-0.051 ***
	(0.013)	(0.010)	(0.025)	(0.019)	(0.010)	(0.013)	(0.014)
Left-Right	0.002 ***	0.004 ***	0.003 ***	-0.001	0.001 *	-0.001 **	-0.003 ***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Social Media							
Migration	-1.071 **	-1.097 **	-0.722	-2.017 **	-0.229	-0.520	0.271
	(0.536)	(0.536)	(0.720)	(0.870)	(0.341)	(0.485)	(0.818)
Social Policy	-2.585 *	0.004	3.771	1.137	-0.970 **	2.291	0.365
	(1.570)	(0.570)	(2.745)	(1.622)	(0.398)	(1.550)	(0.410)
Budget	-3.893 ***	0.568	-5.029 **	-3.319 **	-0.045	0.865	-0.149
	(0.818)	(0.414)	(2.088)	(1.468)	(0.449)	(0.584)	(0.901)
Climate	0.000	0.000	0.000	-4.414	0.400	0.226	3.526
	(omitted)	(omitted)	(omitted)	(2.737)	(0.679)	(0.418)	(2.243)
Implicit Motive	0.252	-0.158	-0.247 *	0.122	-0.132	-0.582 ***	-0.023
	(0.186)	(0.109)	(0.131)	(0.199)	(0.219)	(0.141)	(0.188)
Macroeconomic							
Unemployment	-0.172	0.039	0.941 *	-0.378	0.709 ***	-0.267	-0.516
	(0.269)	(0.220)	(0.555)	(0.384)	(0.208)	(0.246)	(0.333)
CPI	-0.047 **	-0.008	0.021	-0.073 ***	0.003	0.012	0.005
	(0.020)	(0.018)	(0.042)	(0.027)	(0.018)	(0.020)	(0.030)
Ifo	-0.071 ***	0.009	0.018	0.034 **	0.023 **	-0.029 ***	0.032 **
	(0.012)	(0.010)	(0.020)	(0.017)	(0.011)	(0.011)	(0.013)
Date	0.012	-0.004	0.027	0.006	0.024 ***	-0.009	-0.021 *
	(0.010)	(0.008)	(0.021)	(0.014)	(0.008)	(0.009)	(0.012)

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Table 6.7 – continued from previous page

	AfD	CDU	CSU	FDP	SPD	Gruene	Linke
Contant	5.604	1.181	-26.094	-0.605	-23.310	6.458	11.306
	(8.231)	(6.357)	(16.253)	(11.160)	(6.193)	(7.104)	(8.991)
Number of obs	71,523	63,188	8335	71,523	71,523	71523	71523
Wald chi2(20)	1532	12326	1105	2960	13303	7254	6982
Prob > chi2	0	0	0	0	0	0	0
Pseudo R2	0.114	0.387	0.2248	0.264	0.4046	0.389	0.381

Notes: *** significant on 1% level; ** significant on 5% level; * significant on 10% level.

Standard errors in parenthesis.

6.5 Summary

The results above are a first approach to measure the effect of parties' Social Media activity on voting intention. Following previous studies a set of demographic and political characteristics was used. Due to the changing political landscape three additional variables were added, namely, West Germany, municipality size and the individual location on the left-right-continuum. The macroeconomic variables are added to control for general trends following the economic situation of Germany. The main variables of interest are the Social Media issues and implicit motives.

The analysis shows well interpretable results for the established parties, however, contradictory results at a first glance for the *AfD*. Additionally, the R^2 for the *AfD* is very low. In combination, the results suggest, that other effects than traditional demographic characteristics and issue communication influenced the increasing success for the *AfD*. The finding coincides with general findings, that parts of the votes for the *AfD* are attributable to protests against established parties. The implicit motive, though, shows the expectable results for all parties. This could be explained by the unconscious evaluation of implicit motives by voters. No active evaluation is required, which could than lead to an directly measurable effect, in contrast to a conscious classification of issues. In general, the robustness checks showed good results and support the discussed hypotheses.

The chosen approach has some major shortcomings concerning the empirical approach and the generalizability of the findings. First, it allows to include only parts

of the social media communication. Second, endogeneity can not fully be excluded. Third, external effects that could change to role of issues for voters can not be included. Fourth, the data comprises only one election cycle, therefore, all results need to be interpreted with caution. Fifth, the approach does not have forecasting power. Due to these issues, the next chapter suggests a more flexible approach that does not have similarly strict assumptions on the required data. A simulation with a simulated population can solve several of the above discussed shortcomings and should therefore, be pursued in further research activities. Specifically, the election cycle under research includes a period of a drastic reduction of relevant issues. With one dominating topic due to an external shock existing evidence would suggest a decline of parties that remain competitive (e.g. Lowery et al., 2011). These effects are not presentable using the above mentioned approach. Chapter 7.2.2.2 offers an alternative approach to overcome some of these problems.

Chapter 7

Critical Review and Alternative Approach

The study of the political process, the electoral cycle, and the behavior of voters is a complex subject that is increasingly a question of the methods used. The dissertation includes three approaches worth discussing. Besides generating the data set using unsupervised text mining and dictionary-based sentiment scores, the econometric analysis has to be considered.

The following chapter critically examines these aspects and presents an alternative methodology for the econometric analysis.

7.1 Critical Review

The preceding analysis succeeded in indicating that political communication can affect the electoral decision. However, the scope of this thesis does not go beyond a case study character. It analyzes one legislative period as an example. In addition to the short period of time, however, this period has two special features in terms of political competition. On the one hand, the *AfD* is a new party of electoral significance, and on the other hand, a controversial and emotionally charged topic dominated the discourse for long stretches of the legislative period. As a result, the effects may not be generally applicable to other legislative periods. In order to discuss this topic, other legislative periods must be included in the discussion in the future. As already discussed in the previous chapters, it is not possible to include earlier periods in the same way, as the importance of Social Media was only relevant by the time of the legislative period in question. The inclusion of further legislative periods intensifies some of the addressed weaknesses of the chosen approach. Subsequently, these are

discussed once again in context and alternatives are presented. In addition, the use of a probit or mathematical model does not adequately capture some key aspects of political competition. These are also briefly discussed in the following and an alternative approach is presented in exemplary form as a thought experiment. First, the relevance and basic assumptions of computational modeling will be discussed, and subsequently an exemplary design of an agent-based model (ABM) for political communication and voting behavior will be presented as a thought experiment.

7.1.1 Topic Models

Text mining is seen as both an opportunity and a challenge (e.g., Wilkerson and Casas, 2017), as unsupervised methods can be unstable in terms of the convergence process. Discussing supervised versus unsupervised is the first step in deciding how to proceed. While supervised methods may have a higher accuracy of fit, they require extensive training data sets and thus may detect changes in issue focus with a time lag. Therefore, at present, I consider an unsupervised procedure with post-supervised control of the results to be preferred. Unsupervised procedures were discussed extensively in Chapter 3.

To achieve generality of results, a longer observation period is essential. Therefore, an alternative topic modeling approach would be necessary for further analysis. A dynamic approach in the form of, e.g., DTM could be used here to record the change of topics within the political discourse.

The preceding analysis includes only the evaluation of one communication medium based on Facebook data. On the one hand, individual parties (especially left-wing parties) increasingly use Twitter instead of Facebook. Biases may arise in the analysis as a result of this, for example in the number of users, likes or comments. Therefore, a cross-section of available social networks should be used for a general selection.

In a long-term approach, it should also be borne in mind that the use of Social Media is in a constant state of flux and that the media used must be evaluated on an ongoing basis. For example, the use of Facebook is declining, while Instagram is gaining importance. Instagram's rise in importance poses new challenges to the methodological approach. While Facebook and Twitter place an emphasis on the textual presentation of content, Instagram requires the inclusion of image content as a central aspect. While the methodological implementation of this challenge will not be

discussed here, it should be noted that a long-term view of political communication via Social Media faces significant obstacles.

Furthermore, it would be conceivable in extending studies to compare communication in Social Media with, for example, debates in the Bundestag. Here, it would be possible to map the more informal direct voter communication with the more formal communication and direct political discourse between parties. Two scenarios are imaginable. Political parties could take up topics of direct citizen contact in Bundestag debates if they generate increased interaction on social networks. Alternatively, the reverse route is conceivable, with parties translating formal debate into more informal, direct citizen communication and thus using Social Media as an election campaign medium.

The analysis of political communication is subject to constant methodological discourse and should be analyzed using a variety of methods in order to generate the most realistic picture possible. The present study was able to provide initial evidence that direct communication can influence voting behavior. An evaluation of communication via Social Media therefore seems to be relevant for political parties, for voters, as well as for the scientific understanding of interactions between parties and voters.

7.1.2 Tone of Debate

The analysis of sentiments or motives addresses the methodological discussion of text mining and shows different results by unsupervised and supervised approaches. In the context of subconscious communication, the supervised approach of depth psychological motives shows better results. However, subconscious communication is not subject to short-term change, such as the topics in political communication. Therefore, the applicability of a supervised approach is given.

Sentiment analysis of positive and negative representations has provided interpretable and expectable results. Since specific words of political communication are not used in the procedure, the significance and size of the effect is limited. Thus, the simple dictionary approach is only an indication that political communication corresponds to the expected differentiation of parties.

A more specific dictionary would be necessary to integrate the results into the econometric evaluation. The effects of the simple evaluation are not differentiated enough to be measurable in the econometric analysis.

Based on the circumstantial evidence, the depth psychological approach provided good differentiation between the parties. The method provided well interpretable and meaningful results, which could also increase the R-factor in the econometric analysis.

It should be noted at this point that sentiments and depth psychological motives are not to be used equivalently. While sentiments measure the direct positive or negative connotation of a text passage, implicit motives are an expression of expectation compared to reality. For example, the power motive, counterintuitively at first, was measured more strongly for the *CDU/CSU* and less strongly for the *AfD* regarding the topic area of migration. This can be attributed to the fact that the *AfD* took a position and the *CDU/CSU*, on the contrary, sought to defend its established political space. Motives therefore measure a more long-term and deeper component than sentiments do. Both aspects are relevant for interaction mechanisms in political competition. The integration of sentiments, based on a differentiated dictionary or alternative approaches, would be an useful extension for further evaluations.

7.1.3 Effects on Voting

The basic methodological issues regarding the empirical approach have already been discussed in chapter 6. At this point, the critical examination will include weaknesses in terms of the explanatory value for political competition and the integration of theoretical election models. Subchapter 7.2.2 takes up the following considerations and transforms them into an alternative approach to compensate for some of the weaknesses.

The following weak points can be mentioned:

- The probit model used does not allow for the reciprocal influence of parties and voters. As already shown in the critical analysis of topic modeling, the interaction between parties and voters can be imagined in both directions. Over a longer period of several legislative periods, voters can be expected to exert an influence on the parties' issue priorities. Therefore, for a longer observation with more universally valid statements, an alternative evaluation method is required. Otherwise, reversed causality in the empirical model could lead to biases.

- In political competition, external environmental conditions are crucial for determining the relevance and weighting of issues, in addition to the political agendas of the parties and the basic political attitudes of the electorate. In the current legislative period, the immigration of refugees is one such effect. During other periods, for example, the Fukushima disaster and the resulting change in nuclear power policy would be worth mentioning. Thus, the changes in issues do not stem from the intrinsic motivation of either parties or voters. Environmental influences can change the political agenda in the short term. Integrating environmental influences can prevent biases in the analysis as the short-term adjustment is not attributed to either parties or voters.
- Fixed-effects can be used to incorporate some aspects of regional and time differences in the probit model. The specific aspects of political opinion formation, such as more intense family influence, cannot be represented. For instance, it can be assumed that family members influence each other more strongly and account for a higher weighting in changes of political decision than strangers. In addition, it can be assumed that parties that are neighboring the previously elected party in the political spectrum are more likely to be elected in a future election than parties that are more distant. Thus, the statements of a neighboring party would also have a higher weight in opinion formation. Integrating these aspects could increase the explanatory value of the analysis.
- A final weakness is the analyzability of voting theories, e.g. strategic voting and retrospective voting are only marginally assessable in the present analysis. Especially the strategic aspect of voting in personalized proportional voting cannot be represented here. In an ABM, it would be conceivable to consider the strategic decision by separately modeling the 1st and 2nd vote.

7.2 Alternative Approach

The above weaknesses show that econometric models can only partially capture the complexity of political competition. ABMs are a possible alternative that can reduce the weaknesses.

The relevance of ABMs has been recognized in the literature. Some key studies are presented below. The studies show that the three central components of political competition can be better modeled than in econometric models. Voters, parties as

well as strategy formation are highlighted. The initial, mostly theoretical, studies indicate promising results that warrant further elaboration.

Following the brief literature review, an exemplary ABM setup is presented. The aim here is not to implement the model, but to show the structure. Based on the structure, the weak points mentioned in chapter 7.1.3 will be addressed and it will be discussed how a better illustration is achievable in the ABM.

7.2.1 Agent-Based Models in Social Science

The application of ABM, i.e. computational modeling, in contrast to mathematical modeling has advantages in terms of heterogeneous, flexible and mobile settings. Mathematical modeling with fixed assumptions is best suited for static problems, however, political competition with changing majorities and introduction of new parties does not fulfill these assumptions (see e.g. Laver and Sergenti, 2011). Introducing a realistic world setting and agents who are allowed to react on each other and on the world setting might allow to understand voting behavior in non-static situations. The implementation of ABMs is a quite new phenomenon as it requires high-level computational power. The approach is used in different disciplines, however, has its routs in ecological science. First models go back to the 1950s and 60s for solving equations of aggregation variables (see for example Club of Rome Meadows et al., 1972). These models focused on forecasting rather than explaining the mechanics of problems. While ABM was rarely used in social science before the mid 1990s, physics and informatics were ahead and developed good practices in working with ABM. In economics ABMs are also referred to as Agent-Based Computational Economics, relaxing the assumption of fully rational and informed actors in decision problems. The combination of problems in economics or social science with technical capabilities developed in informatics to autonomously solve behavior with help of artificial intelligence opens up a new field.[1]

The following chapter includes a short overview of ABM applications in social and political science and the implementation of German legislation period 2014-2017.

[1] A detailed review of ABM can for example be found in Laver and Sergenti, 2011, Kollman and Page, 2006 and Marchi and Page, 2014. The review in this dissertation will focus on the application of ABM on political competition and voter choice.

7.2.1.1 Application in social and political science

ABMs use physical and mathematical principles to simulate social behavior. The applications are not only used in social science, but are also applicable in biology, for example, to evaluate the behavior of ants (Bryson, Ando, and Lehmann, 2007). ABMs are characterized by their flexibility. In addition, because of the bottom-up approach and the focus on the individual, the models do not need to be solved analytically (see, e.g., Axelrod, 1997).

The following summary of studies does not claim to provide a complete overview of ABMs in general, nor a complete overview of studies in the political context. Rather, it highlights a selection of relevant baseline studies and important extensions to provide intuition for the use of the approach and to demonstrate its advantages over other methods.

Kollman, Miller, and Page, 1992 provide an early approach, demonstrating kind of a simulation strategy for studying the interaction of parties and voters. The approach recognizes that neither politicians are fully informed, nor do parties respond adaptively to voter decisions. In contrast, voters are perfectly informed and intensity of preferences is defined as strength. Since voters' preferences are unobservable, parties change their program, i.e., their policies, after polls or elections. They find that parties move toward centrist positions when party strategies are adaptive. This effect increases with the duration of the election campaign. In addition, they were able to confirm the role of information and ideology.

Laver, 2005 find that only ABMs are able to endogenously model the dynamic system of politics. The ABM implements party leaders and voters with intrinsic motivation and ideal points in the political space. A system of circular adjustments of support and change in policy positions is used to account for the dynamics and interdependencies of party and voter. The system is a continuous process over time, encompassing both the inter-election period and the "traditional" campaign period. Laver, 2005 employs four decision rules for politicians to explain their behavior and to examine voter responses. First, the *aggregator* tries to take the middle position of each dimension; second, the *hunter* tries to win as many votes as possible - if a shift in one direction increases the vote count, he moves one step further; third, the *sticker* does not change his policy positions even if it would optimize votes; and fourth, the *predator* moves toward the largest party when he is not the largest party. The intuition for the *Predator* is intuitive, since the location of voters is unknown,

the largest party gathers these preferences best, so it makes sense to move toward the largest party. This study examines how different decision rules affect political campaigns and voting decisions.

In an extension, Laver and Schilperoord, 2007 model the endogenous process of birth and death of parties due to dissatisfaction with the existing system. They find that a survival threshold for various adaptive rules determines the number of parties. Voter satisfaction depends on party decision rules, which affects the distance between the average voter and the party. The extension shows the variability of the methodology with respect to dynamic processes, including sharp changes in the political landscape. In light of the data discussed in the previous sections, this may be of interest in examining the impact of the *AfD* as a new party.

Laver, 2011 justify the use of ABMs by the intractability of decision problems that parties face in political competition. The resulting complexity of decision problems in multiparty and multidimensional problem spaces can be modeled with ABMs. The book uses the basic model discussed in Laver, 2005, including the four decision rules for party leaders. They define the voter preference structure and the decision rules for party leaders or parties. The assumptions and ideal points are summarized below in four categories:

- Voters: Voters are characterized as having an interest in the issue space relevant to the election period in question. In an extension, non-political characteristics of party leaders are also included. Using a type of loss function, voters' ideal points in an n-dimensional issue space are modeled. The approach allows to evaluate the distribution of ideal voter positions in the issue space.
- Parties: Party positions are defined in a coordinate system in terms of ideal voter positions, which can be interpreted as benchmarks for party policy positions. In the previous chapter, the author discussed that the total population tends to have a bell-shaped distribution of ideal points that hides the extreme points of the policy space. Using the total population to analyze party decision rules could alter the effectiveness of the decision rules. Therefore Laver (2011, p.32) define "the total population to be the sum of a well-defined subpopulations". This allows to have local maxima and to avoid the unrealistic assumption of perfectly symmetric voter preferences. While not claiming that the aggregation of the two subpopulations is the true distribution, it is consistent with empirical results.

- Evaluation of voters' ideal points: while spatial models generally assume that voters choose the closest party in the Euclidean sense, computer models such as ABM do not need to make assumptions about decision rules to produce tractable models. Assuming risk-averse voters (Laver, 2011), an quadratic loss function is used to define voters' utility for policy positions.[2] Due to the complexity of possible strategies in a multidimensional issue space, the authors retain the non-strategic assumption of voting for the closest party.
- Parties ideal points: Utilities and decision rules are also defined for parties. They follow the definition in Laver, 2005, where the utility of parties is a result of the decision rule chosen. Namely, whether they are interested in representing their own party's ideal point (*Sticker*), getting as close as possible to their supporters' ideal point (*Aggregator*), and finally maximizing the overall vote (*Hunter / Predator*).

In summary, the authors evaluate the effectiveness of the four party decision rules discussed above. They do not allow for endogenous evolution of party strategies, since party positions are defined only in relation to voters' ideal points.

Garcia-Diaz, Zambrana, and Witteloostujin, 2012 evaluate the impact of a reduction in issue space on political competition. A political shock reduces the issue space, leading to a decreasing number of political parties. They use a two-dimensional issue space proposed by Laver, 2011 with the following modifications: The voter utility function measures the distance to party positions according to the weighted block distance (in contrast to the Euclidean approach), the maximum party size corresponds to the weights of the corresponding dimensions, issue-based weights are a function of time, and the evolution of a voter into a politician is endogenous over time (Garcia-Diaz, Zambrana, and Witteloostujin, 2012 p.3). The previous chapters identified a political shock with a strong focus on migration-related issues, so ABMs could help explain party booms or losses of support.

Muis, 2010 implements two important extensions. First, the role of mass media is included and second, the models are empirically falsified by using real election results. Good results have been obtained for the Netherlands, even for politically unstable periods. In addition, the study makes some important claims about the advantages of ABMs. ABMs are able to explain mechanisms, not just the outcome. ABMs do not

[2] Quadratic loss functions are proposed, for example, by Ansolabehere and Snyder, 2000, Groseclose, 2001.

require strict assumptions about fully rational actors. However, in contrast to purely verbal descriptions, the analysis is based on a theoretical foundation of the actors' decision-making functions. Muis, 2010 uses media as an extension to implement political competition in a broader sense. In times of Social Media and decreasing relevance of traditional media, new proxies should be considered. However, the study uses only a bi-issue spectrum.

Gulati, Hadlock, and Gainsborough, 2010 developed a dynamic model of election campaigns. Information in form of media, news or party events is implemented in the model. In addition, regionally different topics can be relevant and an interaction with influential persons can be mapped. Relevant parameters in the model are the probability to vote and the probability to vote for a certain party. The study was implemented in a U.S. context and therefore includes some relevant socioeconomic factors, such as white and black community segregation, college degree, or Republican or Democratic affiliation. Three simulations reveal relevant results. First, contact with influential people was shown to be relevant. Second, the environment, in this context neighborhood diversity, is shown to influence voter turnout. A third simulation shows that campaign effectiveness depends significantly on the audience of the individual event. Overall, the study shows that it is primarily the mechanism that can be represented. Contrary to the explanation of voting behavior aimed at in this thesis, Gulati, Hadlock, and Gainsborough, 2010's study sheds light on voter turnout. Moreover, a two-party system is prevalent in the American context.

Although the number of studies using ABM to explain voting behavior is increasing, it is still mainly a theoretical thought experiment. Empirical testing is rare.

To implement party competition endogenously, direct information on changes in party competition is needed; the following thought experiment suggests an alternative approach. Previous studies have used voter preferences, e.g., obtained in polls, as a basis. In contrast, the following approach proposes using party positions as a baseline and assessing voter response. Since the implementation of a comprehensive ABM requires a multitude of both theoretical considerations (e.g., decision functions, interactions) and considerations of technical feasibility, the concrete implementation of an ABM is beyond the scope of this thesis.

7.2.1.2 Model Assumptions

The ABM on electoral competition and voter behavior includes assumptions on agents, i.e. two breeds, voters and parties, on the world, i.e. Germany on a federal level, and the issue dimension. First, the breeds need to be associated with their policy position, this is done by ordering the policy position on a spatial scale. Two assumptions are necessary, the issue space and if importance (salience) of topics or positions are relevant. Various studies claim that the larger the issue space the more parties can survive. With seven parties I assume several important issues. The signifying topics for the smaller parties are relevant for the ruling parties as well. While I assume salience to associate with the importance voters attach to the topics, the political orientation can be accounted for with a left - center - right notation.[3]

7.2.2 ABM

7.2.2.1 ABM Scheme

The design of an ABM requires a detailed framework to define actors and interaction mechanisms in the environment. The result is an algorithm that defines the basal mechanisms on which the simulation of the real-world situation can be based. In figure 7.1, the individual steps are summarized. The schematic representation in the flowchart contains all relevant elements of the potential algorithm.

The algorithm is divided into 4 phases:

1. defining the environment and creating the breeds (actors),
2. characterization of the breeds,
3. loop: monthly iteration of the election decision,
4. end of the loop and determination of the distribution of votes by constituencies.

The following brief explanation of the scheme is to be understood as a framework for the further considerations.

The definition of the environment and the formation of the breeds, i.e. the actors involved in the simulation, are based on data on voters and parties as well as on the geographical conditions in Germany. The data on voters and parties can be generated from the registers of election officials. The data on Germany is based on the NUTS-2

[3]The assignment of the orientation on topics is discussed in chapter 4 or see Appendix B.

level and uses information from Geographic Information Systems (GIS). These are converted into raster form.

In the second section of the ABM scheme (see figure 7.1), properties are assigned to breeds. Voters are assigned a set of socioeconomic characteristics specific to where they live. These include age, gender, education, occupation, and household size. Parties are assigned first-in-line election results. In addition, the parties are ranked in the political spectrum from left to right.

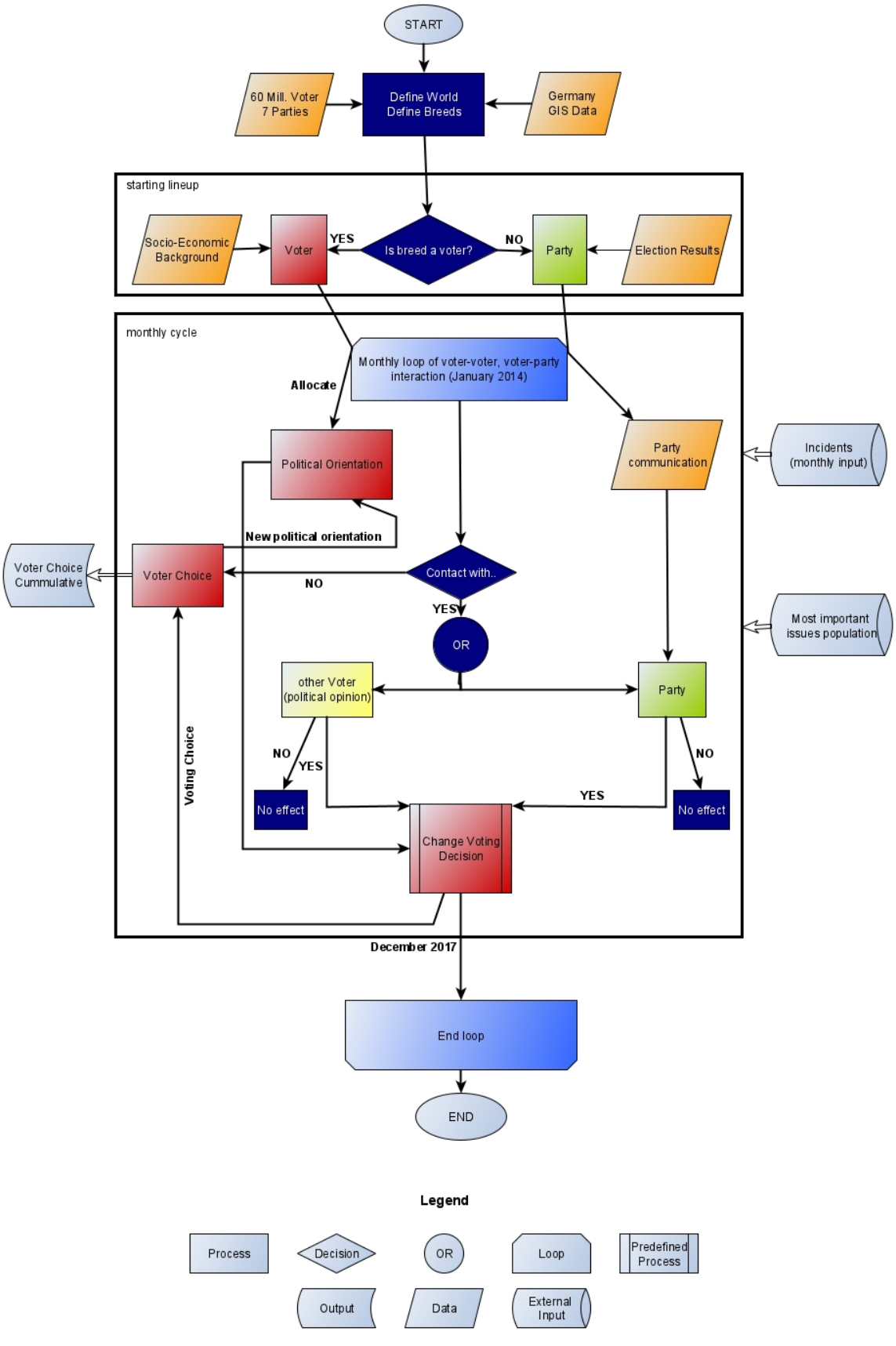
The monthly loop would start with September 2014 election results, which are assigned to voters based on their socioeconomic characteristics and are the starting point of the simulation. Each month, parties are assigned to their Social Media communications, which is analyzed using text mining. Each month, each voter has the opportunity to meet other voters and/or parties. During the meeting with other voters, an exchange of political beliefs takes place based on a distribution function. A meeting then feeds into the "change voting decision" box. Different aspects of the relationship between the two voters influence the likelihood of adjusting the voting decision, such as the closeness of the relationship or the closeness of the political beliefs. A contact with parties is also included in the "change voting decision" field. A stored function determines whether the respective voter adjusts his or her voting decision or sticks with the original decision. If neither other voters nor parties are among the contacts, no adjustment is made and the previous month's voting decision is restored. Each month's and voter's votes are collected in an output file for later analysis purposes. In addition, the voting decision is returned to the "political orientation". This is then the starting point for the next month.

In addition, two environmental states are fed in from outside each month. First, issues that fall into the category of "most important issues" in each case are weighted more heavily when the voting decision is adjusted, and second, the environmental state, especially for political parties, changes when important events occur in a month.

The algorithm concludes with the most recently recorded month, December 2017.

In the following, the scheme is used as a foundation to address the weaknesses encountered in the present analysis in the context of ABM and to show how an ABM could help to solve them.

FIGURE 7.1: ABM Scheme



7.2.2.2 ABM Scheme Application

In table 7.1, the central aspects of the probit model can once again be compared with the possibilities of an ABM. As an initial indication that direct political communication has an influence on voting behavior, the probit model justifies the consideration of a more complex approach in the form of an ABM in order to better understand the processes of political competition in particular.

TABLE 7.1: Probit Model vs. ABM

	Probit	**ABM**
Voter	- Rationality assumption - Voting for closest party - Time lag (temporal effect of information)	- Function of decision mechanism - Weights of interactions and information - Individual characteristics (simulated population)
Party	- Rationality - Often exogenous	- Function of decision mechanism - Reversed interaction possible
Interaction	- One-way interaction - Indirect measurement of interaction - Identical exposure to information	- Two-way interaction - Weights for interaction (socio-economic, regional) - Strength of relationship
Environment	- Exogenous shocks rarely implemented - Bias in voter and party effect	- Exogenous shocks in form of environmental conditions - Environment changes weights of issues
Results	- Election results	- Processes of political competition

Rationality assumption

While econometric models make strict assumptions about the behavior of actors, the functions implemented in ABM allow for relaxing these assumptions. For example, Laver, 2005 have been able to model the behavior of parties in various functions and achieve a more realistic environment. Similar functions are conceivable for voter behavior, especially with respect to interaction mechanisms.

Interactions to be modeled

Interactions are implemented in the econometric model in a directed manner. There is no provision for reciprocal influence. Both theoretical assumptions and empirical

evidence suggest a two-way relationship. An ABM can accommodate this two-way relationship, reducing potential bias in the analysis.

Weights of intercation can be modeled

In the econometric model, the entire electorate is exposed to information in identical ways. While some personal as well as regional characteristics can be accounted for via fixed-effects, control for the relevance of an information to an individual voter cannot be generated. The possibility to assign different weights to the information of different parties and / or issues allows to generate a better picture of reality.

Environmental influences in the form of weightings of the topics

The relevance of environmental factors has been illustrated in the previous sections. ABMs can incorporate environmental factors in each period by changing weights. For example, in the present legislative period, a change in weights would have been applied to migration policy issues. This could vary by party, as well as by region.

Processes vs. results

The most central aspect involves the results obtained from the analysis. While the econometric model analyzes the impact of information exposure on electoral outcomes, the ABM allows for a consideration of process. That is, how politicians and voters adapt to the available information and environmental influences, and how do decision-making mechanisms change. The methodological focus is less on the final outcome and more on the process, thus allowing to generate a better understanding of political competition. The focus on processes also allows the analysis of different voter models. Thus, strategic or retrospective aspects could be included in the analysis and tracked over time.

In summary, first, the ABM is distinct from econometric models in its methodological approach; second, the representation of the electoral population in terms of a simulated total population is more detailed and closer to reality. The flexibility of an ABM is advantageous for the complexity of political competition.

In the case study context, the analysis of political competition based on a probit for one legislative period has provided good indications that direct party-voter communication is relevant. Therefore, for further consideration, it seems reasonable to address the methodological challenges of an ABM in order to implement the small-scale representation of a simulated population in further studies in a section-by-section way.

Chapter 8

Conclusion

The motivation underlying this thesis was to gain a better understanding of political competition between voters and political parties. From a theoretical point of view, the literature has developed a variety of hypotheses and models. The empirical implementation is more difficult due to, but not limited to, data availability and computational power. While voter will can be measured comparatively well by polls and election results, the strategic orientation of parties requires a far more complex measurement process. This work aimed to make the political competition of parties measurable in the form of their Social Media communication.

The key research questions addressed were:

- Can parties be differentiated by their communication through Social Media and does the communication meet expectations based on theoretical models and empirical results from party manifestos?
- Does party communication via Social Media channels have a measurable impact on electorates' electoral decisions?

To approach the questions, a comprehensive chapter first illustrated the relationship between voters and parties and contextualized it within the institutional framework. Here, the mutual influence and the need to endogenously include both actors in the model could be illustrated. On the one hand, the institutional framework demonstrates the relevance for a better understanding of democratic systems; on the other hand, it provides the basis on which a multiparty system with proportional representation is subsequently modeled.

The following subsections summarize relevant results on voters, parties, political competition and election campaigns as well as the theoretical foundation of voting

models. The decision rules for voters presented emphasize that voters, although by no means being fully rational actors, nevertheless express their preferences. In the context of this work, issue voting and psychological determinants of information processing are of particular importance.

Politicians and parties have been viewed as exogenous actors in many approaches. Following Wittman, 1977, however, the pure maximization of the number of votes would imply that parties are thus the only actors in the political competition not having a policy interest. An endogenous implementation allows to integrate the strategic component of parties. Political competition is examined in more detail in terms of parties' strategies. Here, key differences between incumbents and opposition as well as niche parties and mainstream parties emerge. These are expressed in terms of issue ownership and issue salience as well as tonality. A further subchapter provides an overview of the measurability of party communication and identifies weaknesses in the various approaches. From the analysis follows the conclusion that for a lasting consideration of the reciprocal voter-party relationship a different approach has to be chosen. Therefore, topic modeling was chosen to be able to map the time course of the interaction. The methodological approach is discussed in a subsequent section and compared with alternative algorithms.

Another subchapter briefly summarizes the extensive literature on Spatial Voting Models to lay the foundation for the empirical work in chapter 6.

The relevance to better understand political competition and especially the interaction mechanisms between voters and parties could be presented. The following chapters build the data set for the final empirical analysis.

It was possible to assign the topics generated via LDA to the parties and they reflect an expected policy spectrum. Specific topics could be assigned to the parties for which a comparative advantage of the party can be assumed. The results here are in line with expectations from previous research. Niche parties have placed a focus on their topic area and communicated this disproportionately compared to other topics. In addition, differences between incumbents and the opposition were found in the discourse.

First, the tone of the communication shows the expected direction and differences between both incumbents and opposition as well as parties close to median voters and parties on the fringe of the political spectrum. Second, the chapter contributes to the discussion on the use of supervised or unsupervised approaches. In the

present case, the supervised approach shows more interpretable results. The depth psychological motives reveal an increased power motive of the parties and can prove that differences exist within the political spectrum. The plausibility of the results could be proven by the lower coding of the power motive in the internal party issues compared to the policy issues.

The subsequent empirical analysis showed that, in addition to the effects of socio-economic and macro-economic variables demonstrated in previous studies, it was possible to identify effects due to party communication. The study addresses the areas of issue voting, issue ownership and salience and tonality of communication. The measured effects show significant and expectable results. The effect size seems small at first, but voters are not expected to change their minds every month about which party they would vote for. Therefore, the value is not particularly surprising. Rather, the magnitude of the effect is similar to that measured, for example, for information about parties in traditional media. In summary, it has been shown that parties' Social Media communication has a measurable effect on voters' electoral decisions.

In addition to some empirical weaknesses, there are further weaknesses in the approach. The concluding chapter addresses the weaknesses and points out possible solutions for further research. Regarding the use of a probit model, it is suggested to implement an ABM in the future to account for the reciprocal relationship of the agents and the dynamic and complex environment of political competition.

In summary, the study was able to suggest that political communication via Social Media corresponds to the representation of parties e.g. in party manifestos and that despite the brevity of the messages, meaningful themes as well as sentiments and psychological motives can be extracted. The subsequent case study shows good results and a good fit of the model especially for the established parties. The results suggest that the methodological use of text mining can contribute to the understanding of democratic competition. Apart from a case study character, more general statements could be made in the future. Among other things, the possibility of detecting short-term changes, such as a programmatic change of a party, allows a more immediate analysis of voter reactions.

In addition to the advantages and opportunities, the critical points of the use of automatic text analysis of Social Media should also be pointed out. In addition to the discussed weaknesses of unsupervised methods, the use of Social Media is

not necessarily representative. Communication via Social Media can therefore only be a proxy for the overall representation of the party under the assumption that this corresponds closely to that via Social Media. To achieve general validity, a comparative study of different communication channels would be necessary.

However, with a sensitive application of the methodology and modeling in a simulation environment, the results presented in this dissertation suggest that the understanding of interaction mechanisms can be improved beyond the case study character and lead to generally valid statements. Overall, the dissertation questions could be answered and confirm the expectation that parties engage with their constituencies via Social Media. That the communication corresponds to the expected pattern could be clearly shown. The effects of party communication on voter will are to be interpreted as indicative and positive case study for the reasons mentioned, namely the short observation period, only Facebook data as proxy as well as the lack of modeling of reciprocal relationships in the empirical model.

Appendix A

Appendix Chapter 2

TABLE A.1: Regime Types of Countries Worldwide - by Country

Country	0	1	2	3	4	5
Afghanistan	0	0	0	1	0	0
Albania	1	0	0	0	0	0
Algeria	0	0	0	1	0	0
Andorra	1	0	0	0	0	0
Angola	0	0	0	1	0	0
Antigua and Barbuda	1	0	0	0	0	0
Argentina	0	0	1	0	0	0
Armenia	0	1	0	0	0	0
Australia	1	0	0	0	0	0
Austria	0	1	0	0	0	0
Azerbaijan	0	0	0	1	0	0
Bahamas	1	0	0	0	0	0
Bahrain	0	0	0	0	0	1
Bangladesh	0	0	0	1	0	0
Barbados	1	0	0	0	0	0
Belarus	0	0	0	1	0	0
Belgium	1	0	0	0	0	0
Belize	1	0	0	0	0	0
Benin	0	0	1	0	0	0
Bhutan	1	0	0	0	0	0
Bolivia	0	0	1	0	0	0
Bosnia and Herzegov..	0	0	0	1	0	0

Continued on next page

Table A.1 – continued from previous page

Country	0	1	2	3	4	5
Botswana	0	0	0	0	1	0
Brazil	0	0	1	0	0	0
Brunei Darussalam	0	0	0	0	0	1
Bulgaria	0	1	0	0	0	0
Burkina Faso	0	0	0	0	1	0
Burundi	0	0	1	0	0	0
Cambodia	0	0	0	1	0	0
Cameroon	0	0	0	1	0	0
Canada	1	0	0	0	0	0
Cape Verde	0	1	0	0	0	0
Central African Rep	0	0	0	0	1	0
Chad	0	0	0	0	1	0
Chile	0	0	1	0	0	0
China	0	0	0	1	0	0
Colombia	0	0	1	0	0	0
Comoros	0	0	1	0	0	0
Congo Brazzaville	0	0	0	0	1	0
Costa Rica	0	0	1	0	0	0
Cote d'Ivoire	0	0	0	1	0	0
Croatia	0	1	0	0	0	0
Cuba	0	0	0	0	1	0
Cyprus	0	0	1	0	0	0
Czech Republic	1	0	0	0	0	0
Democratic Rep. of Congo	0	0	0	1	0	0
Denmark	1	0	0	0	0	0
Djibouti	0	0	0	1	0	0
Dominica	1	0	0	0	0	0
Dominican Republic	0	0	1	0	0	0
East Timor	0	1	0	0	0	0
Ecuador	0	0	1	0	0	0
Egypt	0	0	0	0	1	0
El Salvador	0	0	1	0	0	0
Equatorial Guinea	0	0	0	0	1	0

Continued on next page

Table A.1 – continued from previous page

Country	0	1	2	3	4	5
Eritrea	0	0	0	1	0	0
Estonia	1	0	0	0	0	0
Ethiopia	0	0	0	1	0	0
Fiji	0	0	0	0	1	0
Finland	0	1	0	0	0	0
France	0	1	0	0	0	0
Gabon	0	0	0	1	0	0
Gambia	0	0	0	0	1	0
Georgia	0	1	0	0	0	0
Germany	1	0	0	0	0	0
Ghana	0	0	1	0	0	0
Greece	1	0	0	0	0	0
Grenada	1	0	0	0	0	0
Guatemala	0	0	1	0	0	0
Guinea	0	0	0	0	1	0
Guinea-Bissau	0	1	0	0	0	0
Guyana	0	0	0	1	0	0
Haiti	0	0	0	1	0	0
Honduras	0	0	1	0	0	0
Hungary	1	0	0	0	0	0
Iceland	0	1	0	0	0	0
India	1	0	0	0	0	0
Indonesia	0	0	1	0	0	0
Iran	0	0	0	1	0	0
Iraq	0	0	0	0	1	0
Ireland	0	1	0	0	0	0
Israel	1	0	0	0	0	0
Italy	1	0	0	0	0	0
Jamaica	1	0	0	0	0	0
Japan	1	0	0	0	0	0
Jordan	0	0	0	0	0	1
Kazakhstan	0	0	0	1	0	0
Kenya	0	0	1	0	0	0

Continued on next page

Table A.1 – continued from previous page

Country	0	1	2	3	4	5
Kiribati	1	0	0	0	0	0
Kuwait	0	0	0	0	0	1
Kyrgyzstan	0	1	0	0	0	0
Laos	0	0	0	0	1	0
Latvia	1	0	0	0	0	0
Lebanon	0	0	0	0	1	0
Lesotho	0	0	0	1	0	0
Liberia	0	0	1	0	0	0
Libyan	0	0	0	0	1	0
Liechtenstein	1	0	0	0	0	0
Lithuania	0	1	0	0	0	0
Luxembourg	1	0	0	0	0	0
Macedonia	0	1	0	0	0	0
Madagascar	0	1	0	0	0	0
Malawi	0	0	1	0	0	0
Malaysia	0	0	0	1	0	0
Maldives	0	0	1	0	0	0
Mali	0	1	0	0	0	0
Malta	1	0	0	0	0	0
Marshall Islands	1	0	0	0	0	0
Mauritania	0	0	0	0	1	0
Mauritius	1	0	0	0	0	0
Mexico	0	0	1	0	0	0
Micronesia	0	0	1	0	0	0
Moldova	1	0	0	0	0	0
Mongolia	0	1	0	0	0	0
Montenegro	0	0	0	1	0	0
Morocco	0	0	0	0	0	1
Mozambique	0	0	0	1	0	0
Myanmar	0	0	0	0	1	0
Namibia	0	0	0	1	0	0
Nauru	1	0	0	0	0	0
Nepal	1	0	0	0	0	0

Continued on next page

Table A.1 – continued from previous page

Country	0	1	2	3	4	5
Netherlands	1	0	0	0	0	0
New Zealand	1	0	0	0	0	0
Nicaragua	0	0	1	0	0	0
Niger	0	1	0	0	0	0
Nigeria	0	0	1	0	0	0
North Korea	0	0	0	1	0	0
Norway	1	0	0	0	0	0
Oman	0	0	0	0	0	1
Pakistan	1	0	0	0	0	0
Palau	0	0	1	0	0	0
Panama	0	0	1	0	0	0
Papua New Guinea	1	0	0	0	0	0
Paraguay	0	0	1	0	0	0
Peru	0	0	1	0	0	0
Philippines	0	0	1	0	0	0
Poland	0	1	0	0	0	0
Portugal	0	1	0	0	0	0
Qatar	0	0	0	0	0	1
Romania	0	1	0	0	0	0
Russian Federation	0	0	0	1	0	0
Rwanda	0	0	0	0	1	0
Samoa	0	0	0	0	0	1
San Marino	1	0	0	0	0	0
Sao Tome and Principe	0	1	0	0	0	0
Saudi Arabia	0	0	0	0	0	1
Senegal	0	1	0	0	0	0
Serbia	0	1	0	0	0	0
Seychelles	0	0	0	1	0	0
Sierra Leone	0	0	1	0	0	0
Singapore	0	0	0	0	1	0
Slovakia	0	1	0	0	0	0
Slovenia	1	0	0	0	0	0
Solomon Islands	1	0	0	0	0	0

Continued on next page

Table A.1 – continued from previous page

Country	0	1	2	3	4	5
Somalia	0	0	0	1	0	0
South Africa	0	0	0	1	0	0
South Korea	0	0	1	0	0	0
Spain	1	0	0	0	0	0
Sri Lanka	0	0	1	0	0	0
St. Kitts and Nevis	1	0	0	0	0	0
St. Lucia	1	0	0	0	0	0
St. Vincent	1	0	0	0	0	0
Sudan	0	0	0	0	1	0
Suriname	0	0	1	0	0	0
Swaziland	0	0	0	0	0	1
Sweden	1	0	0	0	0	0
Switzerland	0	0	1	0	0	0
Syria	0	0	0	0	1	0
Taiwan	0	1	0	0	0	0
Tajikistan	0	0	0	1	0	0
Tanzania	0	0	0	0	1	0
Thailand	1	0	0	0	0	0
Togo	0	0	0	1	0	0
Tonga	0	0	0	0	0	1
Trinidad and Tobago	1	0	0	0	0	0
Tunisia	0	0	0	0	1	0
Turkey	1	0	0	0	0	0
Turkmenistan	0	0	0	1	0	0
Tuvalu	1	0	0	0	0	0
Uganda	0	0	0	1	0	0
Ukraine	0	1	0	0	0	0
United Arab Emirates	0	0	0	0	0	1
United Kingdom	1	0	0	0	0	0
United States of America	0	0	1	0	0	0
Uruguay	0	0	1	0	0	0
Uzbekistan	0	0	0	1	0	0
Vanuatu	1	0	0	0	0	0

Continued on next page

Table A.1 – continued from previous page

Country	0	1	2	3	4	5
Venezuela	0	0	1	0	0	0
Viet Nam	0	0	0	1	0	0
Yemen	0	0	0	0	1	0
Zambia	0	0	0	1	0	0
Zimbabwe	0	0	0	1	0	0
Total	52	28	38	38	24	12

0: Parliamentary Democracy 1: Mixed (semi-presidential)Democracy

2: Presidential Democracy 3: Civilian Dictatorship

4: Military Dictatorship 5: Royal Dictatorship

Source: Cheibub, Gandhi, and Vreeland, 2009.

TABLE A.2: Electoral Systems of Countries Worldwide (Chamber 1) - by Country

Country	Voting System
Afghanistan	Single Non-Transferable Vote
Albania	List Proportional Representation
Algeria	List Proportional Representation
American Samoa	Plurality (FPTP)
Andorra	Parallel (Segmented)
Angola	List Proportional Representation
Anguilla	Plurality (FPTP)
Antigua and Barbuda	Other
Argentina	List Proportional Representation
Armenia	List Proportional Representation
Aruba	List Proportional Representation
Australia	Alternative Vote
Austria	List Proportional Representation
Azerbaijan	Plurality (FPTP)
Bahamas	Plurality (FPTP)
Bahrain	Two-Round System
Bangladesh	Plurality (FPTP)
Barbados	Plurality (FPTP)

Continued on next page

Table A.2 – continued from previous page

Country	Voting System
Belarus	Plurality (FPTP)
Belgium	List Proportional Representation
Belize	Plurality (FPTP)
Benin	List Proportional Representation
Bermuda	Plurality (FPTP)
Bhutan	Two-Round System
Bolivia	Mixed Member Proportional
Bosnia and Herzegovina	List Proportional Representation
Botswana	Plurality (FPTP)
Brazil	List Proportional Representation
Brunei Darussalam	Not applicable
Bulgaria	List Proportional Representation
Burkina Faso	List Proportional Representation
Burma (Myanmar)	Plurality (FPTP)
Burundi	List Proportional Representation
Cambodia	List Proportional Representation
Cameroon	Parallel (Segmented)
Canada	Plurality (FPTP)
Cape Verde	List Proportional Representation
Cayman Islands	Plurality (FPTP)
Central African Republic	Two-Round System
Chad	Parallel (Segmented)
Chile	List Proportional Representation
China	Other
Christmas Island	No information available
Cocos (keeling) Islands	Alternative Vote
Colombia	List Proportional Representation
Comoros	Plurality (FPTP)
Congo (Brazzaville)	Plurality (FPTP)
Congo , Democratic Rep.	Plurality (FPTP)
Cook Islands	Plurality (FPTP)
Costa Rica	List Proportional Representation
Croatia	List Proportional Representation

Continued on next page

Table A.2 – continued from previous page

Country	Voting System
Cuba	Two-Round System
Cyprus	List Proportional Representation
Cyprus (North)	List Proportional Representation
Czech Republic	List Proportional Representation
Côte d'Ivoire	List Proportional Representation
Denmark	List Proportional Representation
Djibouti	Mixed Member Proportional
Dominica	Plurality (FPTP)
Dominican Republic	List Proportional Representation
Ecuador	List Proportional Representation
Egypt	Plurality (FPTP)
El Salvador	List Proportional Representation
Equatorial Guinea	List Proportional Representation
Eritrea	Plurality (FPTP)
Estonia	List Proportional Representation
Ethiopia	Plurality (FPTP)
Falkland Islands (Malvinas)	Block Vote
Faroe Islands	List Proportional Representation
Fiji	List Proportional Representation
Finland	List Proportional Representation
France	Two-Round System
French Polynesia	Two-Round System
Gabon	Plurality (FPTP)
Gambia	Plurality (FPTP)
Georgia	Parallel (Segmented)
Germany	Mixed Member Proportional
Ghana	Plurality (FPTP)
Gibraltar	Other
Greece	List Proportional Representation
Greenland	List Proportional Representation
Grenada	Plurality (FPTP)
Guam	Plurality (FPTP)
Guatemala	List Proportional Representation

Continued on next page

Table A.2 – continued from previous page

Country	Voting System
Guernsey	Block Vote
Guinea	Parallel (Segmented)
Guinea-Bissau	List Proportional Representation
Guyana	List Proportional Representation
Haiti	Two-Round System
Holy See (Vatican City State)	Not applicable
Honduras	List Proportional Representation
Hong Kong	Other
Hungary	Mixed Member Proportional
Iceland	List Proportional Representation
India	Plurality (FPTP)
Indonesia	List Proportional Representation
Iran, Islamic Republic of	Two-Round System
Iraq	List Proportional Representation
Ireland	Single Transferable Vote
Israel	List Proportional Representation
Italy	List Proportional Representation
Jamaica	Plurality (FPTP)
Japan	Parallel (Segmented)
Jersey	Block Vote
Jordan	Parallel (Segmented)
Kazakhstan	List Proportional Representation
Kenya	Plurality (FPTP)
Kiribati	Two-Round System
Korea, Democratic People's Rep. of	Alternative Vote
Korea, Republic of	Parallel (Segmented)
Kuwait	Block Vote
Kyrgyzstan	List Proportional Representation
Lao People's Democratic Rep.	Plurality (FPTP)
Latvia	List Proportional Representation
Lebanon	Block Vote
Lesotho	Mixed Member Proportional
Liberia	Plurality (FPTP)

Continued on next page

Table A.2 – continued from previous page

Country	Voting System
Libyan Arab Jamahiriya	Parallel (Segmented)
Liechtenstein	List Proportional Representation
Lithuania	Parallel (Segmented)
Luxembourg	List Proportional Representation
Macau	No information available
Macedonia	List Proportional Representation
Madagascar	Parallel (Segmented)
Malawi	Plurality (FPTP)
Malaysia	Plurality (FPTP)
Maldives	Plurality (FPTP)
Mali	Two-Round System
Malta	Single Transferable Vote
Man, Isle of	Plurality (FPTP)
Marshall Islands	Plurality (FPTP)
Mauritania	Parallel (Segmented)
Mauritius	Block Vote
Mexico	Parallel (Segmented)
Micronesia, Federated States of	Plurality (FPTP)
Moldova, Republic of	Two-Round System
Monaco	Parallel (Segmented)
Mongolia	Single Non-Transferable Vote
Montenegro	List Proportional Representation
Montserrat	Two-Round System
Morocco	List Proportional Representation
Mozambique	Plurality (FPTP)
Namibia	List Proportional Representation
Nauru	Alternative Vote
Nepal	Plurality (FPTP)
Netherlands	List Proportional Representation
Netherlands Antilles	List Proportional Representation
New Caledonia	Two-Round System
New Zealand	Mixed Member Proportional
Nicaragua	List Proportional Representation

Continued on next page

Table A.2 – continued from previous page

Country	Voting System
Niger	Parallel (Segmented)
Nigeria	Plurality (FPTP)
Niue	Plurality (FPTP)
Norfolk Islands	No information available
Northern Mariana Islands	Plurality (FPTP)
Norway	List Proportional Representation
Oman	Plurality (FPTP)
Pakistan	Parallel (Segmented)
Palau	Plurality (FPTP)
Palestine	List Proportional Representation
Panama	Parallel (Segmented)
Papua New Guinea	Alternative Vote
Paraguay	List Proportional Representation
Peru	List Proportional Representation
Philippines	Parallel (Segmented)
Pitcairn Islands	Block Vote
Poland	List Proportional Representation
Portugal	List Proportional Representation
Puerto Rico	Plurality (FPTP)
Qatar	Not applicable
Romania	Mixed Member Proportional
Russian Federation	Parallel (Segmented)
Rwanda	List Proportional Representation
Saint Helena	Block Vote
Saint Kitts and Nevis	Plurality (FPTP)
Saint Lucia	Plurality (FPTP)
Saint Vincent and the Grenadines	Plurality (FPTP)
Samoa	Plurality (FPTP)
San Marino	List Proportional Representation
Sao Tome and Principe	List Proportional Representation
Saudi Arabia	Not applicable
Senegal	Block Vote
	List Proportional Representation

Continued on next page

Table A.2 – continued from previous page

Country	Voting System
	Mixed Member Proportional
Serbia	List Proportional Representation
Seychelles	Plurality (FPTP)
	Other
Sierra Leone	Plurality (FPTP)
Singapore	Plurality (FPTP)
	Other
Slovakia	List Proportional Representation
Slovenia	List Proportional Representation
Solomon Islands	Plurality (FPTP)
Somalia	Not applicable
South Africa	List Proportional Representation
South Sudan	Parallel (Segmented)
Spain	List Proportional Representation
Sri Lanka	List Proportional Representation
Sudan	Parallel (Segmented)
Suriname	List Proportional Representation
Swaziland	Plurality (FPTP)
Sweden	List Proportional Representation
Switzerland	List Proportional Representation
Syrian Arab Republic	Block Vote
Tajikistan	Parallel (Segmented)
Tanzania, United Republic of	Parallel (Segmented)
Thailand	Parallel (Segmented)
Timor-Leste	List Proportional Representation
Togo	List Proportional Representation
Tokelau	Two-Round System
Tonga	Plurality (FPTP)
Trinidad and Tobago	Plurality (FPTP)
Tunisia	List Proportional Representation
Turkey	List Proportional Representation
Turkmenistan	No information available
Turks and Caicos Islands	Plurality (FPTP)

Continued on next page

Table A.2 – continued from previous page

Country	Voting System
Tuvalu	Plurality (FPTP)
Uganda	Plurality (FPTP)
Ukraine	Parallel (Segmented)
United Arab Emirates	Block Vote
United Kingdom	Plurality (FPTP)
United States of America	Plurality (FPTP)
Uruguay	List Proportional Representation
Uzbekistan	Two-Round System
Vanuatu	Single Non-Transferable Vote
Venezuela	Parallel (Segmented)
Viet Nam	List Proportional Representation
Virgin Islands, British	Plurality (FPTP)
Virgin Islands, U.S.	No information available
Wallis and Futuna	Two-Round System
Western Sahara	No information available
Yemen	Plurality (FPTP)
Zambia	Plurality (FPTP)
Zanzibar	Plurality (FPTP)
Zimbabwe	Plurality (FPTP)

Note: Parallel (Segmented) (PR Lists and Majoritarian constituencies)

Source:ace The Electoral Knowledge Network, 2023.

TABLE A.3: MARPOR Codebook: Topics and Subcategories

Code	**Topic**
Domain 1: External Relations	
per101	Foreign Special Relationships: Positive
per102	Foreign Special Relationships: Negative
per103	Anti-Imperialism
per104	Military: Positive
per105	Military: Negative
per106	Peace
per107	Internationalism: Positive

Continued on next page

Table A.3 – continued from previous page

Code	Topic
per108	European Community/Union: Positive
per109	Internationalism: Negative
per110	European Community/Union: Negative
Domain 2: Freedom and Democracy	
per201	Freedom and Human Rights
per202	Democracy
per203	Constitutionalism: Positive
per204	Constitutionalism: Negative
Domain 3: Political System	
per301	Decentralization
per302	Centralisation
per303	Governmental and Administrative Efficiency
per304	Political Corruption
per305	Political Authority
Domain 4: Economy	
per401	Free Market Economy
per402	Incentives: Positive
per403	Market Regulation
per404	Economic Planning
per405	Corporatism/Mixed Economy
per406	Protectionism: Positive
per407	Protectionism: Negative
per408	Economic Goals
per409	Keynesian Demand Management
per410	Economic Growth: Positive
per411	Technology and Infrastructure: Positive
per412	Controlled Economy
per413	Nationalisation
per414	Economic Orthodoxy
per415	Marxist Analysis
per416	Anti-Growth Economy: Positive
Domain 5: Welfare and Quality of Life	
per501	Environmental Protection

Continued on next page

Table A.3 – continued from previous page

Code	Topic
per502	Culture: Positive
per503	Equality: Positive
per504	Welfare State Expansion
per505	Welfare State Limitation
per506	Education Expansion
per507	Education Limitation
Domain 6: Fabric of Society	
per601	National Way of Life: Positive
per602	National Way of Life: Negative
per603	Traditional Morality: Positive
per604	Traditional Morality: Negative
per605	Law and Order: Positive
per606	Civic Mindedness: Positive
per607	Multiculturalism: Positi
per608	Multiculturalism: Negative
Domain 7: Social Groups	
per701	Labour Groups: Positive
per702	Labour Groups: Negative
per703	Agriculture and Farmers: Positive
per704	Middle Class and Professional Groups
per705	Underprivileged Minority Groups
per706	Non-economic Demographic Groups
Sub-Categories (mostly for Central and Eastern European countries)	
per1011	Russia/USSR/CIS: Positive
per1012	Western States: Positive
per1013	Eastern European Countries: Positive
per1014	Baltic States: Positive
per1015	Nordic Council: Positive
per1016	SFR Yugoslavia: Positive
per1021	Russia/USSR/CIS: Negative
per1022	Western States: Negative
per1023	East European Countries: Negative
per1024	Baltic States: Negative

Continued on next page

Table A.3 – continued from previous page

Code	Topic
per1025	Nordic Council: Negative
per1026	SFR Yugoslavia: Negative
per1031	Russian Army: Negative
per1032	Independence: Positive
per1033	Rights of Nations: Positive
per2021	Transition to Democracy
per2022	Restrictive Citizenship: Positive
per2023	Lax Citizenship: Positive
per2031	Presidential Regime: Positive
per2032	Republic: Positive
per2033	Checks and Balances: Positive
per2041	Monarchy: Positive
per3011	Republican Powers: Positive
per3051	Public Situation: Negative
per3052	Communist: Positive
per3053	Communist: Negative
per3054	Rehabilitation and Compensation: Positive
per3055	Political Coalitions: Positive
per4011	Privatisation: Positive
per4012	Control of Economy: Negative
per4013	Property-Restitution: Positive
per4014	Privatisation Vouchers: Positive
per4121	Social Ownership: Positive
per4122	Mixed Economy: Positive
per4123	Publicly-Owned Industry: Positive
per4124	Socialist Property: Positive
per4131	Property-Restitution: Negative
per4132	Privatisation: Negative
per5021	Private-Public Mix in Culture: Positive
per5031	Private-Public Mix in Social Justice: Positive
per5041	Private-Public Mix in Welfare: Positive
per5061	Private-Public Mix in Education: Positive
per6011	The Karabakh Issue: Positive

Continued on next page

Table A.3 – continued from previous page

Code	Topic
per6012	Rebuilding the USSR: Positive
per6013	National Security: Positive
per6014	Cyprus Issue
per6061	General Crisis
per6071	Cultural Autonomy: Positive
per6072	Multiculturalism pro Roma: Positive
per6081	Multiculturalism pro Roma: Negative
per7051	Minorities Inland: Positive
per7052	Minorities Abroad: Positive
per7061	War Participants: Positive
per7062	Refugees: Positive
Sub-Categories (introduced with version 5 of the Coding Instructions)	
per103 1	Anti-Imperialism: State Centred Anti-Imperialism
per103 2	Anti-Imperialism: Foreign Financial Influence
per201 1	Freedom
per201 2	Human Rights
per202 1	Democracy General: Positive
per202 2	Democracy General: Negative
per202 3	Representative Democracy: Positive
per202 4	Direct Democracy: Positive
per305 1	Political Authority: Party Competence
per305 2	Political Authority: Personal Competence
per305 3	Political Authority: Strong government
per305 4	Transition: Pre-Democratic Elites: Positive
per305 5	Transition: Pre-Democratic Elites: Negative
per305 6	Transition: Rehabilitation and Compensation
per416 1	Anti-Growth Economy: Positive
per416 2	Sustainability: Positive
per601 1	National Way of Life General: Positive
per601 2	National Way of Life: Immigration: Negative
per602 1	National Way of Life General: Negative
per602 2	National Way of Life: Immigration: Positive
per605 1	Law and Order: Positive

Continued on next page

Table A.3 – continued from previous page

Code	Topic
per605 2	Law and Order: Negative
per606 1	Civic Mindedness General: Positive
per606 2	Civic Mindedness: Bottom-Up Activism
per607 1	Multiculturalism General: Positive
per607 2	Multiculturalism: Immigrants Diversity
per607 3	Multiculturalism: Indigenous rights: Positive
per608 1	Multiculturalism General: Negative
per608 2	Multiculturalism: Immigrants Assimilation
per608 3	Multiculturalism: Indigenous rights: Negative
per703 1	Agriculture and Farmers: Positive
per703 2	Agriculture and Farmers: Negative

Source: Lehmann et al., 2022

Appendix B

Appendix Chapter 4

TABLE B.1: Stopword List - Party Communication

alice	faz.net	ahtml
weidel	alternativefuer	storch
tauber	spdlink	beatrix
peter	facebook.com	httpswwwalternativefuerdewp
angela	cl	duerr
merkel	th	cententuploadssites
horst	ii	georg
seehofer	focus	pazderski
andreas	tl	barley
scheuer	k	katarina
alexander	kloeckner	adenauer
christian	cduvorsitzende	wagenknecht
kubicki	linksfraktion	sahra
beer	gruener	alternativefuerde
lindner	merkur	spdlink
wolfgang	online	david
nicola	maybrit	bodo
katja	illner	ramelow
kipping	katrin	michael
riexinger	goering	bit.ly
bernd	goering-eckard	brandt
gabriel	maiziere	willy
sigmar	maizier	spiegel
claudia	youtube.com	faz

roth	v	henkel
cem	weber	bouffier
beck	simon	christdemokraten
oezdemir	bettina	christdemokratisch
csu	willy-brandt-haus	christdemokratische
csuder	csu parteivorstand	leyen
csudie	csu generalsekretaer	ursula
herrmann	csu bundestagsfraktion	uwe
csuhorst	jens	bit
markus	tobias	ly
soeder	hr	seehoferdirekt
sagte	josef	fragcsu
thomas	de	marcel
cdu	afd-forderungen	hubert
union	berndriexinger	ulrike
lambsdorff	stoiber	johannes
graf	edmund	vogel
fdp	weber	manuel
demokraten	spahn	jimmy
linke	cdu-bundesvorstand	dobrindtmdb
gregor	parteivorsitzende	kuhl
gysi	parteivorsitzender	julius
rosaluxemburgstiftung	hans-dietrich	philipp
spd	genscher	eckardt
gruenen	genfer	sven
gruenedie	spd-vorsitzender	giegold
fahimi	spd-vorsitzender	rebecca
steinmeier	pdf	anton
fuer	cdu-vorsitzende	schmidt
gruenegruende	cdu-vorsitzender	schroeder
ueber	cdu-vorsitzend	helmut
nrw	julia	rosa
volker	die-linke	luxemburg
btw	n-tv	christoph
astrid	csu landtagsfraktion	butterwegg
gauland	csu	liebknecht

afd	br	karl
afd	karl-liebknecht-haus	rosalux
martin	liberale	bisky
schulz	blaue-wende	lothar
frauke	k.cdu	pds
petry	c3	dietmar
maizière	gruene	bartsch
afdfraktion	afd	udo
maizièr	wp-content	spdpt
afdfrakt	spd	hendricks
schaeuble	lucke	barbara
httpwwwn	bernd	spdprogramm
meuthen	frank-walter	gerhard
joerg	fdp	thorsten
cducsu	guido	schaefer
bayer	stuttgarter-zeitung	guembel
bayerisch	dr	matthias
bayerische	fahimi	klaus
bayern	heil	hubertusontour
bayerischen	hubertus	stephan
bayerns	taz	heilmann
merkels	cdu-generalsekretaer	friedrich
frank	deutschlandfunk	naumann
walter	news_id	ulrich
steinmeier	article_id	konstantin
csutvtipp	bedford-strohm	kuhl
zdf	manuela	sebastian
ard	schwesig	sabine
oezoguz	stefan	leutheusser
maas	winfried	fdpinhalt
heiko	afd-fraktion	kohl
gruen	konrad-adenauer-haus	manfred
gruene	yasmin	bitly
buendnis	spd-generalsekretaerin	angelika
linke	dobrindt	stamm
links	hofreiter	emilia

laschet	stimmefuervernunft	melanie
armin	csu chef	gauweiler
kretschmann	strack-zimmermann	kauder
kraft	marie-agnes	guenther
rot	ilse	daniel
baden	aigner	dietrich
wuerttemberg	spdde	wolf
berlin	mcallistor	kcdu
nordrhein	httpwwwdie	meinecdu
westfalen	cdutv	konrad
gauck	cdupt	maizie
joachim	csupt	maizi
nahles	mueller	annegret
malu	strauss	kramp
dreyer	franz	karrenbauer
stegner	hans	marcus
ralf	olaf	pretzell
seehofers	scholz	waigel
welt	wwwdie	theo
https	linkeept	mc allistor

TABLE B.2: Codebook

Category	**Topic**	**Sub-Topic**
Party Specific	1. Party	a. Congratulations (Birthday, Election Success) b. Party program c. Party venues (Party Conferences, Ash Wednesday Party Venues, . . .) d. Party members and party offices (without specific topic) e. Regional (Constituency, regional party focus)
	2. Party Program	
	3. Public Debate	a. Talk Shows b. Interviews c. Debates on Facebook
	4. Election	a. Election programs b. Election announcements c. Election campaign d. Coalition negotiations
	5. German Bundestag	Debates / Votes in Lower House

Continued on next page

Table B.2 – continued from previous page

Category	**Topic**	**Sub-Topic**
European Union	6. EU Politics	a. European Union: Program b. European Union: Challenges (nationalism, Brexit) c. EU: Election
	7. Euro-Crisis	
Migration	8. Refugee Migration	a. Refugees: General b. Job market c. Social security d. Integration (primary culture) e. Criminality (specifically sexual violence) f. Upper limit g. Boarder control h. Deportation i. Support j. Causes of escape k. Criticism migration policy
Security	9. Homeland Security	a. Surveillance b. Policy and Army
Social Policy	10. Job Market	a. Unemployment b. Wages c. Unemployment benefit (Hartz IV) d. Basic level of social protection e. Labor law (working hours, working contracts, . . .) f. Unions g. Start-ups
	11. Pension Policy	a. Pension plans b. Old-age poverty

Continued on next page

Table B.2 – continued from previous page

Category	**Topic**	**Sub-Topic**
Social Policy	12. Familiy Policy	a. Work-life balance b. Mother pension c. Child care allowance d. Child poverty
	13. Nursing Care Policy	
	14. Living Space Policy	
	15. Education Policy	a. Schools b. Kindergarten
Society	16. Society	a. Demonstrations b. Problems (general) c. Youth
	17. Historical Memory	a. German Reunification b. Second World War
	18. Religion	a. Christian b. Muslim
	19. Equlity Rights	a. Women b. LGBT-Community
Extremism	20. Political Extremism	a. Left b. Right (Populism, Racism, NSU Terrorism)
	21. Terrorism	a. Islamic b. Condolences
Budget, Growth	22. Budget	a. Black Null b. Investments
	23. Property	Property Taxes
	24. Growth	a. Factors of Growth b. Prosperity
	25. Free Trade	a. TTIP b. CETA

Continued on next page

Table B.2 – continued from previous page

Category	**Topic**	**Sub-Topic**
Budget, Growth	26. Digitalization	
	27. Rural Development	
Transport	28. Transport Policy	a. Toll b. Exhaust Emission Scandal
Energy and Climate	29. Energy Transition	a. Coal Energy b. Nuclear Energy
	30. Agricultural Policy	a. Animal Husbandry b. Farming (Genetic Engineering)
	31. Climate Protection	a. Climate Conferences b. Climate Change
Jurisdiction	32. Courts	a. Decisions b. Criticism
Media	33. Media Relations	a. Newspaper / TV b. Talk Shows without Party Participation
Data	34. Data Protection	a. Data Preservation b. NSA
International	35. Turkey	a. Joining the EU b. Criticism c. Genocide
	36. International Conflicts	a. Ukraine b. Israel-Palestine c. Iraq / Iran d. Syria e. USA
	37. USA	
Criticism	38.	a. Office-holding Coalition b. Chancellor
Mixed Topics	39.	a. Filling Words b. Social Media Special

TABLE B.3: Issue Salience: Equality Rights

	SPD	Gruene	Linke
2014-01	2.54%	4.21%	2.66%
2014-02	1.72%	5.73%	2.66%
2014-03	3.96%	6.20%	4.76%
2014-04	1.60%	3.75%	2.35%
2014-05	1.99%	5.53%	2.07%
2014-06	2.77%	5.57%	2.31%
2014-07	2.52%	5.94%	1.72%
2014-08	2.26%	5.34%	1.67%
2014-09	1.79%	5.12%	2.29%
2014-10	2.59%	4.81%	1.98%
2014-11	3.29%	5.77%	2.93%
2014-12	2.88%	5.71%	1.99%
2015-01	1.36%	5.40%	2.63%
2015-02	2.62%	6.97%	3.33%
2015-03	7.84%	5.43%	5.11%
2015-04	2.72%	3.98%	1.96%
2015-05	4.69%	8.51%	2.51%
2015-06	4.07%	6.68%	1.90%
2015-07	2.54%	5.45%	1.63%
2015-08	1.67%	7.85%	2.02%
2015-09	2.97%	4.93%	2.97%
2015-10	1.78%	3.28%	1.36%
2015-11	2.18%	5.78%	3.67%
2015-12	2.48%	5.27%	2.56%
2016-01	1.94%	5.61%	5.20%
2016-02	1.82%	5.98%	3.17%
2016-03	3.45%	7.59%	4.73%
2016-04	2.57%	3.89%	2.84%
2016-05	3.98%	5.40%	3.07%
2016-06	4.43%	4.24%	1.69%
2016-07	3.47%	6.66%	2.15%
2016-08	2.91%	5.68%	1.88%
2016-09	2.36%	4.96%	1.85%
2016-10	3.23%	5.97%	1.79%
2016-11	3.33%	4.77%	3.43%
2016-12	2.86%	6.58%	2.14%
2017-01	2.74%	4.43%	1.98%
2017-02	2.54%	4.74%	3.14%
2017-03	4.73%	5.73%	3.02%
2017-04	4.27%	5.09%	2.24%
2017-05	2.42%	5.70%	1.59%
2017-06	3.02%	5.72%	1.45%
2017-07	2.96%	6.40%	1.64%
2017-08	5.19%	4.21%	2.17%
2017-09	4.42%	4.96%	1.75%
2017-10	2.58%	5.94%	1.57%
2017-11	3.12%	4.22%	2.75%
2017-12	2.12%	7.46%	2.73%

TABLE B.4: Topics by Party (First 8 Words - German)

Party	Topic	1	2	3	4	5	6	7	8
AfD	6c	europa	europaeisch	bruessel	staat	deutschland	national	kommission	frankreich
AfD	4c	polit	waehl	partei	buerg	sich	position	wahl	forder
AfD	8a	zeit	deutschland	land	jahr	frau	buerg	les	welt
AfD	2	polit	demokrati	partei	buerg	deutschland	volk	demokrat	schweiz
AfD	4c	unterstuetz	bitt	lieb	dank	freund	teil	seit	herzlich
AfD	22a	euro	geld	jahr	kost	milliard	million	steuerzahl	pro
AfD	20a	gewalt	polit	recht	hamburg	link	demokrat	angriff	linksextremist
AfD	8c	fluechtling	deutschland	zuwander	familiennachzug	mensch	sozialsystem	asylbewerb	land
AfD	8h	deutschland	asylbewerb	abschieb	fluechtling	polit	abgelehnt	asyl	bundesregier
AfD	10a	deutschland	islamist	terrorist	terror	anschlag	opf	gefaehrd	polit
AfD	38a	problem	polit	wuerd	loesung	land	regier	probl	fehl
AfD	9b	polizei	sich	polizist	buerg	inn	polit	kriminell	beamt
AfD	38b	deutschland	erklaert	vorsitz	alternativ	deutsch	kanzlerin	bundesregier	stellvertret
AfD	32a	recht	gesetz	urteil	grundgesetz	entscheid	gericht	bundesverfassungsgericht	adam
AfD	8a	deutsch	deutschland	land	volk	sprach	interess	mensch	leb
AfD	36	recht	oeffentlich	russland	interess	deutsch	ukrain	trump	deutschland
AfD	4c	wahl	waehl	stimm	landtagswahl	landtag	wahlkampf	brandenburg	erfolg
AfD	1e	sachs	saechsisch	fraktion	erklaert	landtag	fraktionsvorsitz	mut	wahrheit
AfD	8e	frau	koeln	jaehrig	taet	polizei	stadt	jung	maenn
AfD	39	facebook	seit	com	meinung	meinungsfrei	twitt	kommentar	blauew
AfD	4d	polit	zeit	waehl	umfrag	deutschland	gross	koalition	prozent
AfD	8g	grenz	oesterreich	europa	migrant	illegal	itali	deutschland	mittelme
AfD	38a	zeit	les	lieb	naemlich	buergerpartei	genau	all	teil
AfD	38a	polit	herr	herrn	tag	bundespraesident	mann	amt	partei
AfD	35a	tuerkei	erdogan	deutschland	tuerkisch	polit	deutsch	regier	tuerk
AfD	29	wirtschaft	buerg	unternehm	energiew	deutsch	eeg	strom	verbrauch
AfD	16a	kind	famili	schul	elt	gesellschaft	schuel	deutschland	sozial
AfD	7	euro	griechenland	ezb	deutsch	wirtschaft	bank	griechisch	geld
AfD	29	deutschland	jahr	zahl	prozent	studi	polit	mensch	deutsch
AfD	1c	mitglied	partei	alternativ	parteitag	polit	deutschland	bundesvorstand	bundesparteitag
AfD	38a	zeit	polit	veraender	welt	articl	deutschland	regier	focus
AfD	5	bundestag	abgeordnet	parlament	deutschland	fraktion	alternativ	partei	gewaehlt
AfD	17b	mensch	polit	buerg	land	staat	gesellschaft	freiheit	wiss
AfD	33b	uhr	veranstalt	sendung	abend	thema	freu	gast	livestream
AfD	9b	jahr	bundeswehr	wuensch	mensch	endlich	tag	einsatz	soldat
AfD	39	frag	frau	wuerd	polit	aussag	stell	antwort	gut
AfD	25a	buerg	ttip	bargeld	freiheit	lehnt	oeffent	kontroll	staat
AfD	18b	islam	muslim	deutschland	frau	gesellschaft	kultur	verbot	gehoert
AfD	4a	wahlprogramm	programm	deutschland	forder	upload	position	sit	alternativefu
AfD	33a	bild	medi	artikel	polit	journalist	aktuell	bericht	les
CDU	15a	jahr	freiheit	tag	mensch	ddr	deutsch	mau	leb
CDU	4d	thuering	gut	gross	sachs	brandenburg	zeigt	polit	koalition
CDU	1e	jahr	tag	rund	arbeit	vergang	ging	naech	mitarbeit
CDU	1e	land	buerg	heimat	polit	holstein	schleswig	gut	buergerinn
CDU	1d	mitglied	partei	ide	freu	diskussion	mitmach	cduplus	moecht

Continued on next page

Table B.4 – continued from previous page

Party	Topic	1	2	3	4	5	6	7	8
CDU	3b	interview	zeitung	les	polit	aktuell	frankfurt	welt	artikel
CDU	22a	jahr	schuld	haushalt	bundestag	schwarz	forschung	bildung	solid
CDU	26	digital	digitalisier	thema	diskutiert	chanc	wirtschaft	frag	wandel
CDU	4c	wahlkampf	tag	unterstuetzt	saarland	unterstuetz	unterweg	bundestagswahl	kandidat
CDU	3c	frag	stell	facebook	debatt	seit	kommentar	meinung	freu
CDU	4c	redaktion	bundeskanzlerin	betont	gemeinsam	vorsitz	deutschland	wert	off
CDU	6a	europaeisch	europa	bundeskanzlerin	bundestag	gemeinsam	betont	tuerkei	ukrain
CDU	3b	woch	besuch	spannend	tag	gespraech	toll	wahlkreis	fotos
CDU	1a	herzlich	jahr	geburtstag	wuensch	glueckwunsch	erfolg	gesund	gott
CDU	17c	jung	mensch	gut	unterstuetz	polit	deutschland	dank	leut
CDU	25a	ttip	spiel	team	freihandelsabkomm	usa	dfb	deutsch	mannschaft
CDU	2	zukunft	arbeit	kommission	deutschland	leb	gesellschaft	gestalt	nachhalt
CDU	4c	stimm	waehl	sonntag	niedersachs	bitt	redaktion	wahlkampf	wahl
CDU	27	gefuehrt	bundesregier	euro	gut	infos	milliard	pfleg	nachricht
CDU	15b	deutsch	deutschland	land	jahr	einheit	geschicht	zeit	gross
CDU	21	mensch	leb	opf	gedank	trau	angehoer	steh	verletzt
CDU	10b	sich	stark	deutschland	inn	wirtschaft	arbeit	bleibt	wohlstand
CDU	4d	gespraech	gross	zeit	erklaert	jamaika	video	ergebnis	gut
CDU	1c	parteitag	deutschland	bundesvorstand	praesidium	sitzung	generalsekreta	pressekonferenz	karlsruh
CDU	2	polit	sozial	partei	christlich	netzwerk	lieb	land	perso
CDU	4a	gut	deutschland	leb	gern	fedidwgugl	haus	zukunft	regierungsprogramm
CDU	6c	europa	deutschland	europawahl	mcallist	spitzenkandidat	junck	stark	gemeinsam
CDU	9b	frau	dank	land	deutschland	einsatz	dien	bundeswehr	gilt
CDU	8e	fluechtling	integration	sich	deutlich	bleib	asyl	gesetz	bundesinnenminist
CDU	10a	deutschland	gut	mensch	wirtschaft	jahr	arbeitslos	zahl	arbeit
CDU	17b	gross	land	aufgab	mensch	herausforder	problem	brauch	schaff
CDU	12a	famili	kind	schoen	wuensch	woch	bess	elt	termin
CDU	3a	uhr	liv	red	redaktion	abend	livestream	voll	gast
CDU	1e	generalsekreta	tag	rheinland	pfalz	anhalt	bild	sachsen	rein
CDU	18	deutsch	deutschland	sprach	foto	evangel	kirch	red	botschaft
CSU	27	gross	polit	zeit	gemeinsam	wichtig	herausforder	bleib	gut
CSU	3c	frag	stellt	uhr	generalsekreta	liv	facebook	abend	stell
CSU	9	sich	innenminist	polizei	inn	polizist	staat	oeffent	stell
CSU	1b	deutschland	stark	land	bleibt	bayernplan	geb	polit	stimm
CSU	9	dank	einsatz	bundeswehr	tag	unterstuetz	arbeit	ehrenamt	engagement
CSU	3b	einschalt	uhr	lohnt	gast	abend	rund	thema	muenchn
CSU	8d	deutsch	leitkultur	integration	leb	wert	frau	regeln	braucht
CSU	18a	wuensch	zeit	lieb	schoen	gesegnet	famili	brauchtumbraucht	feiertag
CSU	8f	begrenz	zuwander	obergrenz	brauch	integration	fluechtling	familiennachzug	bleibt
CSU	15a	gross	deutschland	ministerpraesident	polit	freistaat	jahrefjs	herz	leidenschaft
CSU	7	reform	griechenland	regier	endlich	griechisch	solidaritaet	entscheid	bleibt
CSU	1b	aktuell	parteivorstand	infos	mindestlohn	erbschaftsteu	arbeitsplaetz	energiew	sitzung
CSU	1a	jahr	gut	erfolg	naech	wuensch	erfolgreich	stark	augsburg
CSU	1c	polit	passau	aschermittwoch	csuam	bundeskanzlerin	jahr	grossart	woch
CSU	1e	schoen	wuensch	miasanbay	wochen	toll	blick	habt	foto
CSU	2	klartext	spricht	parteivorstandssitz	generalsekreta	beginn	ergebnis	evp	fraktionschef
CSU	12c	famili	betreuungsgeld	kind	verbot	unterstuetz	entscheid	elt	richtig
CSU	6c	europa	bess	bruessel	ministerpraesident	freu	gespraech	entscheid	perso

Continued on next page

Table B.4 – continued from previous page

Party	Topic	1	2	3	4	5	6	7	8
CSU	1e	waehl	muench	voll	stichwahl	stimmung	maerz	kandidat	stimm
CSU	28a	deutsch	maut	bundestag	pkw	gerecht	bundesverkehrsminist	endlich	autofahr
CSU	1c	klausurtag	landtag	chef	fraktion	kreuz	kreuth	landesgrupp	bayer
CSU	15a	tag	mensch	freiheit	jahr	deutsch	demokrati	gemeinsam	einheit
CSU	1c	parteitag	nuernberg	freu	red	klein	finanzminist	wichtig	inhalt
CSU	1e	deutschland	republ	verhind	gefaellt	koalition	ziel	drueckt	drueck
CSU	1a	herzlich	gratuli	geburtstag	glueckwunsch	oisguad	gut	parteivorsitz	ministerpraesident
CSU	8g	grenz	grenzkontroll	fluechtling	europaeisch	fluechtlingskris	loesung	oesterreich	bundesregier
CSU	10a/b	loewenstark	gut	best	digital	wirtschaft	prozent	arbeitslosenquot	arbeitsmarkt
CSU	17b	sozial	christlich	mensch	land	stark	gesellschaft	gemeinsam	heimat
CSU	4c	umfrag	aktuell	buerg	kur	polit	prozent	partei	bevoelker
CSU	8	deutschland	deutlich	land	fluechtling	bevoelker	nochmal	wuerd	interview
CSU	35a	tuerkei	erdogan	deutsch	tuerkisch	europa	beitritt	deutschland	geb
CSU	8h	sich	wichtig	schnell	asylbewerb	bekomm	staat	abgelehnt	asylrecht
CSU	21b	mensch	opf	gilt	angehoer	gedank	tief	schwer	trau
CSU	22b	euro	bund	jahr	laend	milliard	zukunft	schuld	bundesla
CSU	1b	diskussion	thema	spannend	generalsekreta	kurz	freu	zukunft	gesellschaft
FDP	1b	frag	denkenwirneu	stellt	fdpinhalt	loesung	video	antwort	fil
FDP	4c	hess	frankfurt	main	jung	fraktion	julis	hessisch	wichtig
FDP	29	marktwirtschaft	recht	otto	solm	hermann	eeg	reform	sozial
FDP	Turkey	tuerkei	bundesregier	erdogan	deutschland	plakat	tuerkisch	ford	team
FDP	1b	polit	land	partei	buerg	wirtschaft	verantwort	gesellschaft	deutschland
FDP	38a	gross	koalition	wuerd	klein	polit	kritisiert	zeigt	deutlich
FDP	4c	waehl	unterstuetz	dank	teil	lik	stimm	landtagswahl	spitzenkandidat
FDP	4c	brem	hamburg	suding	lenck	stein	dasdingrock	hbwahl	hhwahl
FDP	21b	mensch	famili	leb	opf	wuensch	gross	schoen	gedank
FDP	4a	liberal	content	freiheit	zeigt	wettbewerb	bundespraesident	kandidat	zeit
FDP	1d	mut	mensch	land	zukunft	freien	mitglied	stark	gestalt
FDP	1c	uhr	red	liv	bpt	livestream	live	facebookcom	profil
FDP	1a	gut	herzlich	team	dank	glueckwunsch	gewaehlt	freu	erfolg
FDP	22	steu	entlast	soli	wissing	euro	politikdierechnenkann	kalt	progression
FDP	4a	jahr	freien	ziel	steh	regier	partei	alt	vergang
FDP	15b	deutsch	bundestag	jahr	deutschland	germanmut	gespraech	einheit	hdg
FDP	25a	wirtschaft	deutsch	ttip	arbeitsplaetz	gut	gerad	unternehm	handwerk
FDP	26	deutschland	digitalisier	digital	chanc	bildung	braucht	endlich	brauch
FDP	28a	polit	maut	oeffent	euro	landtag	fussball	buchstab	egal
FDP	33a	interview	zeitung	bild	post	gastbeitrag	zeit	allgemein	googl
FDP	9b	staat	sich	moeglich	schnell	polizei	fordert	gesetz	brauch
FDP	4c	wahl	sachs	gut	tag	zastrow	holg	wiss	gemeinsam
FDP	5	bundesregier	rechtsstaat	frag	polit	offenbar	fordert	nsa	chef
FDP	33b	uhr	thema	gast	tipp	rein	video	abend	diskutiert
FDP	11a	rent	groko	generation	privat	rentenpaket	alt	gerecht	arbeit
FDP	8a	deutschland	fluechtling	endlich	laend	dringend	bundesregier	braucht	kommun
FDP	10g	bess	deutschland	arbeit	gruend	ide	unternehm	buerokrati	fordert
FDP	34a	buerg	vorratsdatenspeicher	vds	buergerrecht	dat	gesetz	novd	europaeisch
FDP	6a	europa	europaeisch	gemeinsam	staat	gipfel	brexit	partn	bruessel
FDP	7	griechenland	euro	reform	geb	fordert	FALSCH	grexit	europa
FDP	38a	schwarz	polit	groko	zeit	rot	klein	gelb	regier

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Party	Topic	1	2	3	4	5	6	7	8
FDP	4d	jamaika	generalsekretaerin	sozial	netzdg	bundestagsfraktion	sondier	heutig	christlich
FDP	2	freiheit	gesellschaft	off	wert	demokrati	gerad	rechtsstaat	meinung
FDP	17b	mensch	land	mitt	gesellschaft	wuerd	entscheid	leb	bleib
FDP	1e	anhalt	sachsen	rheinland	pfalz	wissing	prozent	sitta	laenderw
FDP	8b	deutschland	fluechtling	einwanderungsgesetz	brauch	einwander	endlich	zuwander	qualifiziert
FDP	16a	bildung	kind	schul	weltbestebild	best	weltb	lehr	laend
FDP	38a	lag	aktuell	polit	russland	beweg	interess	europa	international
FDP	1e	haus	gut	gruess	voll	tag	duesseldorf	unterweg	gerad
FDP	1b	diskussion	wahlprogramm	woch	spannend	mitglied	bundesvorstand	teil	stell
SPD	6	europa	europaeisch	gemeinsam	griechenland	europas	herausforder	staerk	brauch
SPD	24a	wirtschaft	unternehm	deutschland	deutsch	industri	jahr	arbeitsplaetz	zukunft
SPD	36	deutsch	tuerkei	polit	konflikt	gespraech	deutschland	wichtig	gross
SPD	3b	interview	chef	rheinland	ide	deutschland	gut	pfalz	polit
SPD	1a	herzlich	polit	lieb	jahr	partei	gut	glueckwunsch	vorsitz
SPD	2	gerecht	zeit	sozialdemokrat	gemeinsam	sozial	deutschland	land	zukunft
SPD	6c	europaeisch	parlament	europawahl	infos	europa	tag	wahl	spitzenkandidat
SPD	8d	fluechtling	deutschland	brauch	integration	jahr	grenz	schnell	herausforder
SPD	29	energi	energiew	wirtschaft	bundesministerium	bmwi	newslett	eeg	erneuerbar
SPD	1c	red	video	parteitag	aktuell	debatt	bundesparteitag	bundestag	thema
SPD	21b	mensch	opf	jahr	gilt	leb	terror	paris	stund
SPD	14	sozial	mensch	gesellschaft	gut	deutschland	zusammenhalt	polit	integration
SPD	4c	waehl	stimm	gut	hamburg	sonntag	septemb	stadt	wahl
SPD	12a	kind	famili	zeit	alleinerzieh	jung	beruf	bess	unterstuetz
SPD	9b	sich	staat	polizei	richtig	aktuell	inn	wuerd	stark
SPD	1e	pein	gifhorn	gemeinsam	dank	braunschweig	wahlkreis	landkreis	region
SPD	3c	uhr	liv	frag	livestream	facebook	freu	veranstalt	infos
SPD	25a	ttip	bundesregier	ceta	kommission	freihandelsabkomm	bmwi	entscheid	oeffent
SPD	16	bildung	euro	bund	kommun	laend	schul	milliard	bess
SPD	20b	mindestlohn	rent	arbeit	mensch	gut	jahr	gesetz	prozent
SPD	5	besuch	bundestag	toll	woch	dank	arbeit	spannend	gifhorn
SPD	17	gesellschaft	recht	demokrati	deutschland	preis	off	freiheit	zeich
SPD	26	digital	frag	zukunft	digitalleb	arbeit	digitalisier	diskuti	gesellschaft
SPD	20b	stimmefuervernunft	stimm	hetz	vernunft	stark	recht	hass	zeig
SPD	8i	mensch	deutschland	fluechtling	helf	krieg	unterstuetz	dank	land
SPD	37	gerad	wichtig	international	polit	weiss	zeigt	trump	staat
SPD	15	jahr	tag	wuensch	gut	schoen	zeit	deutsch	friedlich
SPD	19a	frau	maenn	gleich	deutschland	arbeit	endlich	tag	gerecht
SPD	15	gross	polit	deutsch	sozialdemokrat	sozialdemokrati	jahr	land	deutschland
SPD	20b	polit	deutschland	land	buerg	mensch	partei	demokrat	recht
Gruene	1e	jahr	gut	bess	saarland	kopf	alt	koeln	naech
Gruene	18b	recht	tag	mensch	leb	kaempf	gleich	zeigt	lieb
Gruene	1c	polit	team	spannend	freu	gespraech	stuttgart	abend	besuch
Gruene	29a	energiew	kohl	erneuerbar	energi	klima	klimaschutz	kohleausstieg	klimakill
Gruene	3c	uhr	liv	frag	los	facebook	urwahl	schaut	wahlkampf
Gruene	1e	dank	toll	stuttgart	gross	stadt	schoen	foto	urach
Gruene	4c	waehl	sonntag	stark	stimm	wahl	brandenburg	umwelt	septemb
Gruene	35c	deutsch	bundestag	jahr	geschicht	red	voelkermord	gilt	land
Gruene	20b	opf	jahr	angehoer	gedank	famili	mensch	freund	trau

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Party	Topic	1	2	3	4	5	6	7	8
Gruene	5	bild	teilt	teil	video	gross	bundestag	gern	stopp
Gruene	29b	endlich	bundesregier	deutschland	ford	jahr	laeng	verantwort	folg
Gruene	12a	kind	gut	wichtig	jung	deutschland	wuerd	mensch	schul
Gruene	1b	deutsch	gemeinsam	polit	deutschland	boell	heinrich	gipfel	international
Gruene	6	europa	gemeinsam	europaeisch	freiheit	stark	frankreich	zusammenhalt	demokrati
Gruene	4c	zeit	mitglied	brauch	teil	off	plakat	bundestagswahl	spitzenduo
Gruene	6c	greenprimary	europaeisch	europa	green	mai	mitmach	deal	harm
Gruene	30	satt	gut	massentierhalt	ess	gesund	gentechn	landwirtschaft	glyphosat
Gruene	3b	simon	partei	bundesvorsitz	polit	bundesregier	erklaert	debatt	chefin
Gruene	20b	rassismus	gemeinsam	hass	setz	weltoff	gesellschaft	zeich	gewalt
Gruene	31	klimaschutz	paris	bundesregier	deutschland	endlich	international	global	ziel
Gruene	39b	teilt	bild	unterstuetzt	bitt	video	fordert	setzt	zitat
Gruene	8a	fluechtling	sich	laend	bundesregier	integration	bund	kommun	recht
Gruene	28b	zukunft	griechenland	brauch	darumgru	setzt	luft	deutschland	nachhalt
Gruene	35c	bir	ÄŸÄ	tuerkei	armeni	deutsch	mensch	nda	tuerk
Gruene	8i	fluechtling	europa	mensch	grenz	endlich	europaeisch	mittelme	sich
Gruene	24a	gerecht	sozial	oekolog	gesellschaft	wirtschaft	weltoff	umwelt	zentral
Gruene	25	ttip	ceta	umwelt	fair	stopp	handel	handelsabkomm	usa
Gruene	19a	frau	prozent	gewalt	maenn	heisst	thema	gesetz	frauentag
Gruene	4a	zukunft	frag	diskuti	leb	land	stell	ide	antwort
Gruene	8j	deutschland	syri	mensch	irak	duerf	russland	ukrain	isis
Gruene	1a	glueckwunsch	herzlich	gut	jahr	lieb	wahl	oesterreich	snowd
Gruene	35b	tuerkei	erdogan	tuerkisch	demokrati	deutschland	land	unterstuetz	pressefrei
Gruene	1c	bdk	trump	gut	hamburg	parteitag	them	gesellschaft	liv
Gruene	18	jahr	wuensch	friedlich	froh	feiern	tag	islam	fried
Gruene	29	gross	koalition	unternehm	groko	reform	eeg	buergerinn	euro
Linke	1c	zukunft	link	woch	veranstalt	zukunftswoch	april	diskussion	buch
Linke	4c	thuering	link	herzlich	wahl	sachs	dank	gewaehlt	glueckwunsch
Linke	14	sozial	oeffent	stuttgart	bezahlbar	wohnung	miet	jahr	bildung
Linke	4c	sozial	gerecht	stimm	waehl	landtag	gut	polit	bundestagswahl
Linke	19a	frau	tag	maenn	polit	clara	international	zetkin	jahr
Linke	8a	fluechtling	mensch	gefluechtet	deutschland	bundesregier	europa	laend	grenz
Linke	11b	rent	jahr	ost	mensch	altersarmut	alt	brauch	gesetz
Linke	1c	livestream	parteitag	red	grundeinkomm	liv	link	uhr	debatt
Linke	9a	deutsch	bundesregier	sich	oeffent	bank	buerg	polit	verantwort
Linke	23	reich	deutschland	prozent	gerecht	sozial	reichtum	vermoeg	land
Linke	35b	tuerkei	hdp	tuerkisch	erdogan	demokrati	kurdisch	bundesregier	erdoÄŸan
Linke	25	ttip	ceta	stopp	polit	konzern	freihandelsabkomm	demokrati	aktion
Linke	13	pfleg	krankenhaeus	pflegekraeft	gut	personal	gesund	bess	beschaeftigt
Linke	39a	jahr	zeit	gerad	wuerd	red	gut	leb	tag
Linke	10e	arbeit	gut	leiharbeit	beschaeftigt	mensch	leb	befrist	job
Linke	4d	gross	koalition	schwarz	regier	rot	groko	zeig	bleibt
Linke	3c	uhr	kampagn	aktion	facebookcom	fest	strass	link	event
Linke	21b	mensch	lieb	genossinn	genoss	freund	opf	gilt	leb
Linke	33a	abend	dresd	gespraech	uhr	dank	diskuti	freu	tag
Linke	1d	partei	link	gemeinsam	polit	mitglied	beweg	aktiv	solidaritaet
Linke	5	bundestag	fraktion	partei	vorsitz	einzig	antrag	abgeordnet	vertret
Linke	31b	polit	wirtschaft	deutschland	mensch	staerk	notwend	jahr	gesellschaft

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Party	Topic	1	2	3	4	5	6	7	8
Linke	12d	kind	mensch	armut	leb	sozial	gesellschaft	jugend	deutschland
Linke	6	europa	europaeisch	sozial	demokrat	demokrati	neoliberal	polit	beweg
Linke	32a	gesetz	polit	entscheid	chef	bundesregier	zeigt	streikrecht	urteil
Linke	36d	krieg	terror	deutsch	syri	deutschland	bundesregier	fried	waff
Linke	17a	artikel	zurueck	presseerklaer	detail	prot	blockupy	press	bild
Linke	10b	euro	mindestlohn	million	jahr	milliard	unternehm	zahl	ausnahm
Linke	7	griechenland	europa	regier	griechisch	syriza	polit	deutsch	bundesregier
Linke	3b	interview	beitrag	aktuell	download	programm	frag	disput	wichtig
Linke	10c	hartz	sanktion	betroff	abschaff	grundrecht	jobcent	sanktionsfrei	mindestsicher
Linke	20b	recht	rassismus	pegida	rassist	polit	hetz	gewalt	fluechtling
Linke	15b	tag	jahr	mai	geschicht	gedenk	deutschland	form	deutsch
Linke	2	sozial	gerecht	land	polit	gesellschaft	mensch	demokrati	recht
Linke	10f	beschaeftigt	gewerkschaft	gut	arbeit	verdi	unterstuetz	streik	loehn

Notes: The words are presented in stemmed form as retrieved by the algorithm. The column *Topic* corresponds with the numbers indicated within the Codebook see Appendix B table B.2.

Appendix C

Appendix Chapter 6

The descriptive statistics of the socio-economic variables relevant to the empirical analysis are presented in tables C.1 to C.11.

TABLE C.1: Descriptive Statistics: Voting Intention by Political Interest in Percent

	CDU	**SPD**	**FDP**	**Gruene**	**Linke**	**AfD**	**Total**
Not gathered	1.34	1.11	0.92	1.31	1.25	1.61	1.27
Very Strong	14.93	17.22	25.59	16.88	25.02	28.45	18.51
Strong	44.56	43.96	48.82	47.76	45.07	40.32	44.74
Somewhat	32.99	31.47	20.98	29.51	23.97	23.85	29.82
Barely	4.85	4.82	3.1	3.78	3.53	4.32	4.43
Not at all	1.2	1.31	0.52	0.69	1.03	1.23	1.11
KA	0.15	0.11	0.06	0.06	0.14	0.23	0.13
Total	38126	24165	5190	11203	11404	7502	97590
	100	100	100	100	100	100	100

TABLE C.2: Descriptive Statistics: Voting Intention by Religion in Percent

	CDU	**SPD**	**FDP**	**Gruene**	**Linke**	**AfD**	**Total**
No	33.87	43.91	40.91	41.21	75.28	59.72	44.4
Yes	66.13	56.09	59.09	58.79	24.72	40.28	55.6

TABLE C.3: Descriptive Statistics: Voting Intention by Gender in Percent

	CDU	**SPD**	**FDP**	**Gruene**	**Linke**	**AfD**	**Total**
Male	50.2	52.53	62.41	45.68	56.44	72.49	53.35
Female	49.8	47.47	37.59	54.32	43.56	27.51	46.65

TABLE C.4: Descriptive Statistics: Voting Intention by Age Group in Percent

	CDU	**SPD**	**FDP**	**Gruene**	**Linke**	**AfD**	**Total**
18 - 20 Years	1.45	1.67	1.5	2.93	1.58	0.85	1.64
21 - 24 Years	1.54	1.83	2.02	2.5	1.5	1.13	1.71
25 - 29 Years	2.59	2.66	3.01	3.38	3.02	2.35	2.75
30 - 34 Years	4.08	4.08	4.18	5.78	4.03	3.99	4.27
35 - 39 Years	6.16	4.74	6.22	7.56	4.78	6.34	5.82
40 - 44 Years	7.54	6.07	7.38	10.1	4.89	7.53	7.15
45 - 49 Years	9.94	9.06	9.48	14.46	8.31	11.25	10.13
50 - 59 Years	21.76	22.42	21.66	28.74	24.31	27.02	23.42
60 - 69 Years	20.83	23.04	22.83	16.53	24.76	23.57	21.66
70 - 79 Years	24.12	24.42	21.71	8.02	22.82	15.97	21.44

TABLE C.5: Descriptive Statistics: Voting Intention by Education in Percent

	CDU	**SPD**	**FDP**	**Gruene**	**Linke**	**AfD**	**Total**
None	0.31	0.39	0.19	0.19	0.15	0.29	0.29
Hauptschulabschluss	18.44	20.98	11.48	6.86	11.46	16.04	16.37
Mittlere Reife	36.19	33.68	27.92	23.5	33.95	44.69	34.06
Abitur, Matriculation	44.48	44.37	60.02	68.56	53.81	38.52	48.67
Still in Education	0.34	0.34	0.23	0.72	0.35	0.13	0.36
KA	0.24	0.25	0.15	0.17	0.27	0.32	0.24

Hauptschulabschluss: Secondary modern school qualification;
Mittlere Reife: Secondary school leaving certificate.

TABLE C.6: Descriptive Statistics: Voting Intention by Unemployment in Percent

	CDU	**SPD**	**FDP**	**Gruene**	**Linke**	**AfD**	**Total**
No	98.95	98.27	98.94	98.31	96.51	97.45	98.31
Yes	1.05	1.73	1.06	1.69	3.49	2.55	1.69

TABLE C.7: Descriptive Statistics: Voting Intention by Union Member in Percent

	CDU	**SPD**	**FDP**	**Gruene**	**Linke**	**AfD**	**Total**
Yes, self	8.58	15.82	6.9	12.28	14.89	11.25	11.65
Yes, other family memeber	5.28	7.06	4.28	6.76	6.09	4.77	5.89
Yes and others	2.11	4.65	1.52	3.38	5.87	2.73	3.34
No	83.57	71.95	86.82	76.96	72.66	80.75	78.62
KA	0.46	0.52	0.48	0.62	0.49	0.49	0.5

TABLE C.8: Descriptive Statistics: Voting Intention by Left-Right Scale Self Classification in Percent

	CDU	**SPD**	**FDP**	**Gruene**	**Linke**	**AfD**	**Total**
0 left	2.66	4.61	2.06	3.45	15.71	2.81	4.74
1	0.98	2.15	0.62	2.5	6.73	0.75	2.08
2	2.94	8.66	2.58	12.33	18.94	1.93	7.21
3	5.55	19.66	5.11	27.37	25.24	4.39	13.74
4	7.68	18.74	8.79	23.48	12	5.21	12.6
5	42.93	32.55	43.62	21.67	15.15	37.94	34.33
6	14.47	4.83	18.75	3.93	1.6	15.1	9.64
7	10.36	2.74	10.87	2.04	1.2	15.77	6.89
8	5.23	1.74	4.32	0.92	1.03	8.98	3.62
9	0.44	0.14	0.33	0.07	0.15	0.97	0.32
10 right	1.43	0.63	0.62	0.21	0.28	2.41	0.99
KA	5.33	3.55	2.35	2.04	1.96	3.73	3.84

TABLE C.9: Descriptive Statistics: Voting Intention by East-West Germany in Percent

	CDU	**SPD**	**FDP**	**Gruene**	**Linke**	**AfD**	**Total**
East	36.03	34.03	26.71	24.06	67.12	54.08	38.68
West	63.97	65.97	73.29	75.94	32.88	45.92	61.32

TABLE C.10: Descriptive Statistics: Voting Intention by Municipality Size in Percent

	CDU	**SPD**	**FDP**	**Gruene**	**Linke**	**AfD**	**Total**
up to 2,000 Inhabitants	19.51	15.43	13.6	12.94	15.63	18.22	16.88
up to 5,000	12.5	9.74	10.08	9.64	8.83	11.12	10.82
up to 10,000	10.97	9.92	10.29	9.24	9.37	11.13	10.3
up to 20,000	12.16	11.59	12.29	11.58	10.36	12.22	11.75
up to 50,000	13.98	14.36	14.28	13.17	12.78	14.06	13.86
up to 100,000	8.13	9.45	9.23	8.77	8.61	8.08	8.64
up to 500,000	11.28	14.07	13.18	15.49	15.59	12.13	13.12
over 500,000	10.87	14.75	16.53	18.75	18.35	12.22	14.02
KA	0.6	0.69	0.52	0.42	0.48	0.81	0.6

TABLE C.11: Descriptive Statistics: Voting Intention by Married in Percent

	CDU	**SPD**	**FDP**	**Gruene**	**Linke**	**AfD**	**Total**
No	25.3	29.89	29.13	38.78	36.72	32.92	30.1
Yes	74.7	70.11	70.87	61.22	63.28	67.08	69.9

TABLE C.12: Probit Model: Voting Decision and Social Media Communication Without Migration

	AfD	CDU	CSU	FDP	SPD	Gruene	Linke
Demographics							
Age	-0.012 **	-0.016 ***	-0.025 ***	0.017 ***	-0.026 ***	-0.042 ***	0.008
	(0.005)	(0.004)	(0.009)	(0.005)	(0.004)	(0.004)	(0.005)
Gender	-0.388 ***	0.100 ***	0.129 ***	-0.090 ***	0.043 ***	0.104 ***	-0.045 **
	(0.020)	(0.016)	(0.036)	(0.023)	(0.016)	(0.019)	(0.020)
Married	-0.054 **	0.116 ***	0.133 ***	0.023	-0.041 **	-0.033	-0.202 ***
	(0.024)	(0.018)	(0.044)	(0.026)	(0.019)	(0.021)	(0.023)
Education	-0.125 ***	-0.008	-0.078 ***	0.044 ***	-0.078 ***	0.121 ***	0.031 **
	(0.012)	(0.010)	(0.023)	(0.013)	(0.010)	(0.011)	(0.013)
Unemployed	0.171 ***	-0.260 ***	-0.428 **	-0.138	0.127 **	0.039	0.372 ***
	(0.064)	(0.058)	(0.182)	(0.103)	(0.062)	(0.080)	(0.064)
Christian	-0.251 ***	0.201 ***	0.308 ***	-0.015	-0.039 **	-0.055 ***	-0.372 ***
	(0.020)	(0.017)	(0.044)	(0.024)	(0.018)	(0.021)	(0.022)
Union	-0.036	-0.234 ***	-0.185 ***	-0.201 ***	0.128 ***	0.010	0.228 ***
	(0.023)	(0.019)	(0.045)	(0.030)	(0.019)	(0.023)	(0.023)
West Germany	-0.264 ***	-0.071 ***	0.000	0.213 ***	0.049 ***	0.296 ***	-0.201 ***
	(0.019)	(0.016)	(omitted)	(0.025)	(0.017)	(0.021)	(0.020)
Municipality Size	-0.010 **	-0.026 ***	-0.028 ***	0.006	0.017 ***	0.005	0.019 ***
	(0.004)	(0.003)	(0.008)	(0.005)	(0.003)	(0.004)	(0.004)
Political							
AffiliationAfD	3.098 ***	2.182 ***	1.592 ***	2.500 ***	2.311 ***	2.579 ***	2.661 ***
	(0.105)	(0.018)	(0.047)	(0.041)	(0.018)	(0.028)	(0.032)
Policy Interest	-0.087 ***	0.097 ***	0.106 ***	-0.040 ***	0.126 ***	0.023 **	-0.051 ***
	(0.012)	(0.009)	(0.021)	(0.015)	(0.009)	(0.011)	(0.012)
Left-Right	0.002 ***	0.004 ***	0.004 ***	-0.001 *	0.000	-0.001 **	-0.003 ***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Social Media							
Social Policy	-2.386 *	0.326	6.188 ***	3.254 **	-1.421 ***	2.086	0.868 **
	(1.346)	(0.471)	(2.356)	(1.453)	(0.310)	(1.423)	(0.366)
Budget	-3.250 ***	0.636	-3.379 *	-1.187	-0.120	1.588 ***	-0.026
	(0.719)	(0.389)	(1.846)	(1.239)	(0.412)	(0.553)	(0.767)

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Table C.12 – continued from previous page

	AfD	CDU	CSU	FDP	SPD	Gruene	Linke
Climate	0.000	0.000	0.000	-3.316	-0.187	0.237	-0.629
	(omitted)	(omitted)	(omitted)	(2.363)	(0.650)	(0.331)	(1.392)
Implicit Motive	0.158	-0.174 *	-0.179	0.104	-0.426 ***	-0.673 ***	0.063
	(0.169)	(0.096)	(0.125)	(0.155)	(0.130)	(0.131)	(0.160)
Macroeconomic							
Unemployment	-0.147	0.023	-0.265	0.321	0.137	0.013	-0.172
	(0.225)	(0.194)	(0.406)	(0.305)	(0.180)	(0.215)	(0.237)
CPI	-0.075 ***	0.039 **	0.036	-0.043 *	-0.016	-0.015	0.006
	(0.016)	(0.015)	(0.033)	(0.023)	(0.015)	(0.016)	(0.019)
Ifo	-0.070 ***	0.014	-0.003	0.034 **	0.008	-0.022 **	0.021 **
	(0.010)	(0.009)	(0.017)	(0.014)	(0.010)	(0.009)	(0.010)
Date	0.010	-0.006	-0.017	0.030 ***	0.003	0.002	-0.009
	(0.008)	(0.007)	(0.014)	(0.011)	(0.007)	(0.008)	(0.008)
Constant	8.902	-2.477	8.984	-23.063 ***	-2.394	0.036	3.085
	(6.325)	(5.266)	(11.387)	(8.401)	(5.116)	(5.943)	(6.574)
Number of obs	94,958	83,812	11,146	94,958	94,958	94,958	94,958
Wald chi2(19)	2080.13	15434.75	1476.54	4433.33	16879	9614.17	8973.43
Prob > chi2	0	0	0	0	0	0	0
Pseudo R2	0.138	0.373	0.218	0.253	0.395	0.382	0.371

Notes: *** significant on 1% level; ** significant on 5% level; * significant on 10% level.

Standard errors in parenthesis.

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