

Directive Communication?

The Informational Interplay of Parliamentary Actors

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Abstract

How political actors utilize communication tools to direct attention to certain issues has been intensively studied by the literature. Under what circumstances legislators are able to make other legislators immediately react, however, has largely been neglected in previous research. We not only know relatively little about the interaction between issues raised by different parliamentary groups, we also know almost nothing about the strength and size of this relationship. Our study seeks to fill this gap by exploring the dynamics between issues raised by members of the government and members of the opposition. Using a recently developed unsupervised statistical learning model, we construct a time series dataset resting on the party press releases published during the 16th legislature of the German Bundestag (2005–2009) and analyze it using a vector autoregression model. The results point towards the existence of a dynamic relationship between the issue attention of different political actors. We show that the opposition is more capable than the government in directing attention to certain issues. Our study thus does not only demonstrate the usefulness of our data generating process but also provides further insights into the process of political communication and issue competition.

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Introduction

The concept of issue competition is well established in political science. The dynamics underlying the daily interplay of issue competition, however, remain obscure. We believe that this deficiency is due to two reasons: One is that the literature has neglected the interaction between the issues raised by different political actors. Most studies focus on the parliament as a whole instead of looking at the actual interplay between the issue attention of different parliamentary groups. The other reason is that issue agendas are usually measured by focusing on long term macro relationships. Attention to macro issues, however, remains relatively stable over time and across different parties. If we are interested in the dynamic interaction of issues raised by different parliamentary actors, it makes much more sense to look at short term micro relationships. Focusing on micro issues, however, requires meaningful data about the issue attention of legislators that are published on a frequent basis. Previous studies mostly use monthly data such as parliamentary questions and legislative speeches to measure the issue agenda of parliamentary actors. However, just like any other field of the news market, political attention to micro issues forms and changes within a matter of days, not month or years. Having daily information about the issue activity of political actors is therefore necessary in order to understand the dynamics between the issue attention of different political actors. Because the literature has mostly neglected this fact it has not been able to fully capture the direction and strength of this relationship.

The central goal of this study is to fill this gap by looking at the attention of the government and the opposition and the dynamic interplay between them. Specifically, we seek to identify the strength and direction of this relationship by looking at the conditions under which one of the groups is able to influence the issue attention of the other. In doing so, we will make use of party press releases, which provide a unique and informative data source that is available on a daily basis.

The issue agenda of the government and the opposition will be measured by constructing a dataset consisting of all parliamentary press releases published by members of both groups between 2005–2009. This collection of roughly 25,000 documents will be processed using a recently developed unsupervised statistical learning model. The model uses word choices to

infer topical categories in a set of documents and estimates the affiliation of individual documents to these topics. Using this method we are able to identify the number of documents that a group of actors has dedicated to a particular topic in a particular point in time. These time series are analyzed using vector autoregression modeling in order to determine the causality and strength of the influence relationship.

The analysis will demonstrate that members of the opposition are on average able to direct the attention of the government to certain issues. We found that to be especially true for topics dealing with welfare or domestic issues. These results do not only provide further insights into the dynamics of issue competition but also support the usefulness of our modeling decisions for future research on political communication.

Theory and Hypotheses

Selective Issue Attention

According to many theories of party competition (Budge and Farlie, 1983; Klingemann et al., 1994, e.g.), parliamentary actors try to emphasize different issues in order to gain an advantage over their political opponents. What determines the selection of those issues? The standard response from the literature has long been that parties selectively choose issues that mirror their ideological preferences (Budge and Farlie, 1983; Carmines, 1991). This behavior is closely linked to the idea of issue ownership. According to this view, parties are seen by voters as having different problem-solving capacities on different issues. Parties strategically draw attention to those issues because they will ultimately increase their electoral chances among issue minded voters. This reasoning has been widely applied in the literature on party politics (Carmines and Stimson, 1986; Petrocik, 1996; Carmines, 1991, e.g) and formed the basis for prominent works such as the Party Manifestos Project (Budge, 2001; Klingemann et al., 1994). One assumption following this argument is that most of the time different political parties could be expected to raise different issues with little or no overlap between them (Green-Pedersen and Mortensen, 2010b).

Several empirical studies (Damore, 2004; Sigelman and Buell Jr., 2004; Green-Pedersen, 2007, e.g.), however, come to a different conclusion and suggest that issue overlap between political actors happens quite frequently.

When looking at US presidential campaigns, Sigelman and Buell Jr. (2004), for example, observe that the candidates converge on a few specific issues. One explanation behind this overlap is that the selection of issues is not only determined by a party's ideological preferences but also by the electoral setting and the overall left-right structure of party competition (Green-Pedersen, 2011). For instance, when issues are very salient among the electorate parties often converge on those issues regardless of their ideological preferences (Sides, 2006). Moreover, as Walgrave et al. (2009) suggest, issue ownership is not a stable feature of the party system but a dynamic process that changes over time. Because of this, parties have an incentive to compete over issue ownership. Furthermore, an even more surprising finding of the empirical literature is that parties sometimes address issues that end up benefiting their opponents much more than themselves (Sides, 2006; Kaplan et al., 2006). From a rational choice perspective one would expect that parties only take up issues that are advantageous to them. If issues bear the risk of being potentially harmful, parties would refrain from talking about them. The question is why would parties decide to take up issues that they would usually prefer to avoid? One answer to this puzzle could be that issues are selected as a response to topics raised by a political opponent; a classical argument brought forth in the agenda-setting literature.

Agenda Setting and Issue Competition

Agenda-setting is the process by which issue salience of one group influences the issue salience of another group. The agenda-setting approach is rooted in the area of communication research. Many of those studies look at how issue salience travels between the media and the public. Looking at US presidential elections, McCombs and Shaw (1972), for instance, show that the press was able to establish issue priorities among the voters. Other authors took the idea further by looking at how issue salience travels between competing media outlets (Cook, 1998).

The political science approach to agenda-setting originated in classic works by Schattschneider (1960); Bachrach and Baratz (1962); Walker (1977); Kingdon (1984) and gained considerable attention by Baumgartner and Jones (1993)'s punctuated equilibrium theory. The basic proposition of the theory is that the overall attention to political topics remains relatively stable over time and is punctuated by sudden bursts of change. The mechanism driving

this stability of attention is that issue attention is subject to what Green-Pedersen and Mortensen (2010a) call a *party system agenda* (McCombs, 2004, see also). According to this idea, there exists a common issue agenda to which all political parties have to respond to. This common agenda is governed by a hierarchy of issues that have to be dealt with and emerges from a continuous political interaction between parties (Green-Pedersen and Mortensen, 2010a).

Oftentimes, interaction is a necessary condition for agenda-setting to happen. That is why agenda-setting processes are likely to be present in parliaments, where political actors directly communicate with each and where political actions are transparent to all groups. In fact, most research on agenda setting and political communication focuses on parliaments. However, while previous studies mostly treated parliament as a unitary actor and looked at how its agenda is influenced by external actors such as interest groups and the media (Edwards and Wood, 1999; Vliegenthart and Roggeband, 2007; Walgrave et al., 2008, e.g.), recent research has focused on agenda-setting processes within parliament itself. Vliegenthart et al. (2011), for instance, look at conditions of agenda-setting dynamics between different parties in the Belgian parliament. The authors show that inter-party agenda setting, the process of issue agenda influence between different parties, occurs quite frequently and that different parties have different agenda-setting capacities. What is still unclear, however, is why some political actors are more able to direct attention to political issues than others. One way to shed light on this question is to look at the interactions between the government and the opposition. Focusing on governmental and opposition actors creates the opportunity to study agenda-setting dynamics between two groups that differ substantively in their role and their position in parliament.

Hypotheses

Existing research on the agenda-setting relationship between the government and the opposition suggests that agenda-setting influence is strongly dependent on the allocation of power (Bräuninger and Debus, 2009, e.g.). In most parliamentary systems the opposition plays an important part in the legislative process. It can initiate and amend bills and is able to control and to criticize the government. De facto, however, it is the governmental majority that has the authority to change laws and therefore has the final say on

policy. If politics matters, as many scholars often seem to believe (Klingemann et al., 1994, e.g.), then holding power is the prerequisite to exert any agenda-setting influence. Moreover, through its ministries the government also has a large bureaucracy at its disposal, giving governmental actors access to considerable resources. Since issue attention is largely influenced by the amount of resources available (Jones and Baumgartner, 2005), this gives the government a clear advantage over members of the opposition. Due to its disadvantaged position, the literature oftentimes ascribes the opposition little or only indirect agenda-setter influence.

Most of this research, however, has been conducted by looking at activities that emerge directly from legislative processes such as bills, speeches or parliamentary questions. What is often neglected, are activities such as press releases that are less bound to legislative formalities and where opposition parties are not disadvantaged to politicize issues. In fact, it is much more reasonable to expect that most agenda-setting occurs in this area. Laws are only enacted every now and then, often follow a concrete plan of action (e.g. a coalition agreement), and thus provide much less opportunity to influence issue prioritization. Press releases are not only published two, three times a day but also provide an immediate way to communicate information to the public. Analyzing party press release is therefore a good way in order to understand the issue response dynamics between the government and the opposition.

When words became the primary method of politicizing an issue, the opposition has much more opportunities to exert influence upon the issues attention of the government. For instance, opposition parties are not held responsible for realizing policy solutions. Therefore members of the opposition can constantly raise problematic issues that they feel the government should be dealing with. The problem for the government is that it cannot simply ignore these issue because it is held accountable by the public. If the government does not respond, it appears as if it is unable to deliver expected policy solutions. Therefore, governmental parties often have to talk about issues that they would otherwise have ignored.

The government could of course try to turn the tables by raising issues that the opposition would rather ignore. The problem, is that opposition parties are not forced to respond to those issues. They can keep talking about their preferred topics because they know that they will not be held

accountable for not offering solutions. Moreover, when raising certain issues, the government again has to offer policy solutions. Because the government cannot foresee the future, however, it is reluctant to propose solutions which could potentially cause undesired side effects (Green-Pedersen and Mortensen, 2010a).

In sum, the government's ability to focus its attention on its own issues is circumscribed by the issue agenda-setting power of the opposition. Because it wants to avoid electoral repercussions, the government is willing to respond even to unpreferred issues. Nevertheless, this agenda-setting dynamic is likely to differ according to the type of issue that is being debated on. For example, issues that deal with public expenditures or generally involve some form of redistribution provide more opportunities for opposition parties to influence the issue attention of the government than other issues. They are generally highly salient among the public, which means that they cannot simply be ignored by the government. Moreover, because they oftentimes involve complex policy solutions that usually leave a certain fraction of the public worse off, the government also is much more reluctant to raise the issue on its own. Prominent examples for such issues are unemployment, taxes, health care, and pension policies. The government, in contrast, is much more likely to lead the discussion on foreign policy issues. Although those issues are also often highly salient, they require a lot of inside information, which the opposition is unlikely to possess because it is usually not involved in foreign relations. Moreover, foreign policy decisions are often decided among a group of different countries (i.e. the NATO), meaning that the government is less accountable and thus can avoid blame from the public.

Based on the discussion of these arguments we formulate the following two hypotheses:

H_1 : There is a relationship between the information emission of the government and the information emission of the opposition with respect to a certain topic. This relationship is on average dominated by the opposition.

H_2 : The opposition is more likely to set the issue agenda on welfare and domestic issues, while the government is the prominent issue agenda-setter on foreign policy issues.

Case Selection and Data

In order to test the hypotheses above, we collected data on the communication activity of the five parliamentary parties of the German Bundestag.

The most fundamental factor determining a structure of communication is the constellation of actors involved, i.e., in our case the parties represented in parliament. In this respect comparative research has identified numerous types of parliaments rooting from differences in social structure, electoral systems, or formal legislative and parliamentary procedures. However, these differences have very little repercussion on the structure of communication between parliamentary actors.

Therefore, in principle, all democratic parliamentary system would have served for our analysis. We decided to choose Germany, however, because it offers a combination of a stable multi-party system with little extremism and a high degree of factional discipline. In addition, Germany is also characterized by a strong divide between the ruling and the opposition parties. If a dynamic interaction in the issues attention between the government and the opposition exists, then Germany presents a good case to generalize our findings to other political systems.

To analyze the dynamic structure of communication between government and opposition, we furthermore require a suitable measure of issue attention. The following section discusses why press releases are a particularly good approximation for such a measurement. Specifically, press releases exhibit two characteristics making them an outstanding indicator of attention: An unconstrained availability on the side of political actors and a high level of relevance within the communication process between legislators, the media and the electorate. We thus clarify some properties of press releases and move on to present the application of an unsupervised learning model we employ to generate count data time series from our sample of press releases.

Press Releases as an Indicator of Issue Attention

An important feature distinguishing the communication via press releases from other forms of communicating lies in its constant availability. We contend that a constant and timely availability to employ a medium of communication is the basis for measuring and interpreting dynamic processes in its use. Unlike plenary speeches, press releases can be issued every day and

throughout the year. In our data we find that on about 96% of the days in our sample period one or more press releases have been published by the parliamentary factions. Thus even on weekends and during the parliamentary summer recess—in the case of the Bundestag July and August—we find factions continuously publishing press releases.

Besides the absence of temporal restrictions, there are almost no constraints for composing press releases. While the content and length of plenary speeches is bound to the parliamentary agenda and the speech time allocated to the factions, press releases are unrestricted in respect to both aspects. Factions can in general chose freely when to communicate on what issues. Similarly, the availability of communication is only restricted by the input of labor required. As a consequence smaller factions should be relatively less disadvantaged to larger ones than they might be by parliamentary laws.

In addition to the availability of press releases, the descriptive statistics of our sample also point toward a high relevance of press releases. We find all of the factions regularly publishing press releases, whereby the opposition factions—FDP, Bündnis 90/Die Grünen and Die Linke—issued a larger number of press releases. Keeping in mind that issuing press releases is costly and might be in competition with legislative activities, we can nevertheless conclude that press releases constitute an important part of all factions' communication strategies.

The variance over time is another factor exemplifying the importance of press releases. This points toward a temporal structure where factions do not constantly issue a fixed number of press releases, but instead concentrate their efforts on certain days. Table 1 summarizes the overall number of press releases published on a daily frequency.

The relevance of press releases also depends on their reception by the mass media and the electorate. In this respect the issuing of press releases constitutes a major and in fact the only written component of the indirect means of communication available to party factions, i.e. those that are geared to reach the electorate through the mass media (Schulz, 2008, chap. 7). Concerning the communication of U.S. Congressional offices, previous studies have observed that regional and national newspapers take the factions' press releases into account (Schaffner, 2006; Grimmer, 2010). For national newspapers in Germany Fröhlich and Rüdiger (2006) have found

Table 1: Descriptive Statistics of Daily Press Releases

Parliamentary Faction	N	Mean	SD	Min	Max
<i>Government</i>					
CDU	4,225	4.40	3.06	1	17
SPD	3,899	4.07	2.96	1	20
<i>Opposition</i>					
FDP	5,702	4.80	2.98	1	17
Bündnis 90/Die Grünen	5,610	4.98	3.14	1	18
Die Linke	3,624	5.55	4.10	1	17
In total	23,060	18.94	13.96	1	63

correlations between messages in press releases and media content. Overall, we expect that press releases have a high standing in parties' communication strategies.

Identifying Issues in Press Releases

Answering our research question requires a method that is capable to distribute our collection of press releases into topical categories. The analysis of large collections of text is not a novel task to political science and has mostly relied on manual coding of texts. Such efforts created some of the most influential and fruitful data collections like the Comparative Manifestos Project (Budge and Farlie, 1983) or the Policy Agendas Project (Baumgartner and Jones, 1993). Though manual coding enables the researcher to apply a well adjusted coding scheme, it is costly in terms of human labor and requires a high degree of *a priori* knowledge about the desired categorization.

To circumvent these obstacles we chose to apply a recently developed unsupervised learning model that does not require any previously created categories or manually categorized sets of training documents. Within this quickly growing field of methods (Quinn et al., 2010; Blei et al., 2003; Blei and Lafferty, 2006, e.g.) we chose the Expressed Agendas Model that has been developed and applied to measure topical attention and home styles in the communication of U.S. Congressmen (Grimmer, 2010).

Collecting and Processing Textual Data

Our textual data comprises a collection of all press releases that have been published by the Bundestag's parliamentary groups within its 16th legislative

period. The press releases were either collected on line from each parliamentary group’s web presence or in cases of limited archive access were provided by the factions directly. In this manner we were able to collect all press releases issued by the five parliamentary factions CDU, SPD, FDP, Bündnis 90/Die Grünen and Die Linke.

To apply our data generating method a set of preparatory steps needed to be performed on the textual data. These steps are well established within the literature on text mining (Manning et al., 2008; Weiss, 2005) and also form the foundation for other forms of computerized content analysis that have been used in political science (Laver et al., 2003; Slapin and Proksch, 2008, e.g.). These steps include the removal of numbers, additional white spaces, punctuation and a conversion to lower case. Subsequently, the German language version of the Porter stemming algorithm was employed, reducing each word to its basic building block or stem.² Furthermore an extensive list of stop words was removed from the text corpus together with all word stems that appeared in less than 0.5% of a groups press releases.³ After tokenizing and counting terms we collected term occurrences in a Term-Document-Matrix containing our 26,684 documents with a vocabulary of 5,261 unique stems. Though not preserving the original structure of the text, the Term-Document-Matrix comprehends all the information on the occurrence and co-occurrence of all word stems included in our textual data.

The Expressed Agendas Model

Topic models rely on the general idea that different topical contents are associated with distinctive choices of words to describe this topical content (Blei et al., 2003). Thus texts conveying this topical content are also characterized by these distinctive words. Expanding on this notion the Expressed Agenda Model incorporates information about the authors of the texts to improve classification results over models that do not employ additional information. Similar approaches (Quinn et al., 2010; Blei et al., 2003) make use of information on the day in which a document was authored instead of information

² The Porter stemming algorithm stems words by repeatedly applying a set of pre-defined rules. The resulting stems represent a common representation for different grammatical forms of one word and are not necessarily equal to the word’s stem in linguistic terms.

³ The removal of sparse terms was applied separately for each factions’ documents to guarantee an even distribution of stems over the parliamentary groups.

on who authored it.

We contend that a model based on information about the authorship of documents is more suitable for our purpose for two reasons. Firstly, we intend to measure shifts in the amount of attention several groups devote to a set of common topics. While an approach based on a dynamic structure is well suited to measure shifts in attention over time within one group, it is less suitable to distinguish between different actors (Grimmer, 2010, 5). Secondly, we employ a topic model to construct a time series dataset with the aim to analyze the inherent dynamic structure of our collection of press releases. Though a data generation based on a dynamic structure may enable a valid clustering of documents and seems to be a reasonable assumption for our data, we conclude that using the dynamic structure of documents as an *a priori* information might introduce a bias in our subsequent analyses.

A second denoting property of the Expressed Agendas Model is the requirement for documents to be mono-thematic, i.e., to exclusively belong to a single category. Approaches differing in this respect allow documents to be mixtures of different topical concepts (Blei et al., 2003). While this seems appropriate for more complex texts such as legal documents or scientific articles, press releases are written as short statements intending to communicate an actors position on one issue. The mono thematic structure of press releases is also reinforced by the availability of press releases mentioned above—whenever multiple issues are at stake in one day, we find a corresponding number of separate press releases.

Deriving count data time series with the Expressed Agendas Model

Based on the information about the occurrence of different terms or stems in our collection of documents, the Expressed Agendas Model simultaneously estimates the topics contained in our press releases, measures the attention that different authors allocate to these topics and assigns each press release to one of the identified topics. The only additional input provided by the researcher determines the number of topics to be identified by the model and the authorship of the original documents.

With respect to the former we chose to perform several reruns of the model allowing the number of identified topics to vary from 25 to 100. A lower number of topics generally results in more coarse categories capturing relatively general concepts which connect distinct policy discussions by

common actors or procedural attributes. For both extremes clusters are either too general or too issue specific to interpret. In particular we found that a model specification with 25 to 30 topics closely resembles the committee structure of the Bundestag, which comprised 22 committees in our sample period. In contrast a higher number of topics will give more fine grained clusters representing issues instead of general topics. As we are interested in dynamics on a level that is not too specific, but still does distinguish different policy discussions within a field, we chose to apply the model with 50 topics. This specification offers well interpretable clusters, while we found that varying the number of topics to be identified does not impact the results of our subsequent analyses too much.⁴

To incorporate the information about the authorship of documents mentioned in the previous section, we chose to group documents by parliamentary groups. Though we are interested in dynamic relationships between government and opposition, we do not want to predetermine the structure of communication towards this end. We thus use information on which faction published which document as an input for the Expressed Agendas Model and aggregate the results obtained from the model to gather information on the dynamic structure between government and opposition.

Having generated the topic clusters we still need to label each cluster. For this task we rely on the method introduced by Quinn et al. (2010, 217). Using the information the Expressed Agendas Model provides on the link between words and topics this enables us to determine which words distinguish documents on a given topic from documents on other topics. Specifically we calculate the r -statistic, which gives us an index how distinctive word w is on topic q :

$$r_{w,q} = \frac{\beta_{w,q} - \bar{\beta}_{w,-q}}{\sigma_{w,-q}}, \quad (1)$$

whereby $\beta_{w,q}$ represents how frequently word w appeared in documents of topic q , $\bar{\beta}_{w,-q}$ is the average over all topics excluding topic q and $\sigma_{w,-q}$ is the corresponding empirical standard deviation. Thus the r -statistic will produce its highest values for those words that appear often on one topic

⁴ Specifically we computed the Calinski-Harabasz index (Calinski and Harabasz, 1974) to compare model applications with differing numbers of topics and did not encounter considerable deviations. We also performed our time series analysis based on different models without impairing our findings.

while being infrequent with a low empirical standard deviation in all other topics. Ranking of the words according to r_q yields the labels presented in table 2. For each topic, the table exhibits the two words with the highest r -statistic. The Expressed Agendas Model sorts the press releases into the identified topics. Combining this information with the press releases' publishing dates enables us to construct time series with daily count data for each actor on each topic. Table 2 also shows the descriptive statistics of these 50 time series for each actor.

Table 2: Descriptive Statistics of the 50 Topics

Topic	Top Words	Actor	N	Mean	SD	Min	Max	Skewness	Kurtosis
1	unternehmen unternehmensteuerre	Gov.:	1450	0.12	0.40	0	4	3.96	22.70
		Opp.:	1450	0.25	0.54	0	3	2.28	8.28
2	patient arzt	Gov.:	1450	0.02	0.15	0	2	7.71	68.01
		Opp.:	1450	0.04	0.23	0	3	6.60	57.79
3	bundesnachrichtendi haftbefehl	Gov.:	1450	0.00	0.04	0	1	26.84	721.50
		Opp.:	1450	0.02	0.13	0	1	7.74	60.93
4	wahlbeteil prozent	Gov.:	1450	0.09	0.32	0	3	4.54	28.49
		Opp.:	1450	0.18	0.44	0	3	2.54	9.87
5	gesetz kapitalgedeckt	Gov.:	1450	0.15	0.49	0	5	4.31	26.37
		Opp.:	1450	0.31	0.61	0	4	2.36	9.59
6	erneuerbar energi	Gov.:	1450	0.13	0.39	0	4	3.64	19.52
		Opp.:	1450	0.17	0.43	0	3	2.68	10.37
7	gewohn irgendwann	Gov.:	1450	0.01	0.07	0	1	13.34	178.88
		Opp.:	1450	0.02	0.13	0	1	7.57	58.31
8	nahrwertkennzeichn verbraucherinforma	Gov.:	1450	0.31	0.70	0	5	2.68	11.22
		Opp.:	1450	0.17	0.45	0	3	2.98	12.97
9	putin georgi	Gov.:	1450	0.04	0.22	0	3	6.30	51.18
		Opp.:	1450	0.13	0.41	0	4	3.76	20.64
10	lebensgrundlag regierungsfuhr	Gov.:	1450	0.24	0.56	0	4	2.69	11.07
		Opp.:	1450	0.26	0.54	0	4	2.32	8.90
11	merkel bundeskanzlerin	Gov.:	1450	0.00	0.03	0	1	38.00	1445.00
		Opp.:	1450	0.15	0.39	0	3	2.73	10.63
12	landlich raum	Gov.:	1450	0.04	0.20	0	2	5.44	34.40
		Opp.:	1450	0.07	0.28	0	2	4.03	19.84
13	postexpertin spataussiedl	Gov.:	1450	0.32	0.65	0	4	2.35	9.21
		Opp.:	1450	0.46	0.75	0	4	1.83	6.48
14	sunnit irak	Gov.:	1450	0.02	0.15	0	2	7.87	70.92
		Opp.:	1450	0.06	0.27	0	3	4.79	29.96
15	isaf oef	Gov.:	1450	0.04	0.21	0	3	6.68	58.08
		Opp.:	1450	0.21	0.50	0	4	2.78	11.91
16	sicherheitsstaat uberwachungsstaat	Gov.:	1450	0.01	0.08	0	1	12.56	158.78
		Opp.:	1450	0.40	0.69	0	4	1.94	7.17
17	neu ostdeutschland	Gov.:	1450	0.22	0.52	0	4	2.66	10.97
		Opp.:	1450	0.42	0.73	0	5	1.92	7.04
18	milliard neuverschuld	Gov.:	1450	0.04	0.21	0	2	5.07	29.33
		Opp.:	1450	0.25	0.56	0	4	2.60	10.63
19	behinder werkstatt	Gov.:	1450	0.18	0.48	0	4	3.42	17.79
		Opp.:	1450	0.18	0.44	0	3	2.47	9.58
20	steuerbasis soll	Gov.:	1450	0.30	0.63	0	4	2.37	9.04
		Opp.:	1450	0.22	0.51	0	3	2.35	8.16
21	palastina hamas	Gov.:	1450	0.04	0.22	0	3	6.23	50.04
		Opp.:	1450	0.21	0.54	0	4	3.03	13.51
22	serbi europa	Gov.:	1450	0.37	0.71	0	4	2.26	8.49
		Opp.:	1450	0.47	0.80	0	5	1.97	7.11
23	schul kultusministerkon	Gov.:	1450	0.03	0.17	0	2	6.19	42.49
		Opp.:	1450	0.13	0.40	0	3	3.49	17.16
24	land federalismuskommi	Gov.:	1450	0.15	0.44	0	5	3.62	21.67
		Opp.:	1450	0.35	0.68	0	5	2.37	9.69
25	weiblich frau	Gov.:	1450	0.17	0.49	0	5	3.75	21.18
		Opp.:	1450	0.17	0.47	0	5	3.73	22.18
26	wehrpflcht mehr	Gov.:	1450	0.07	0.26	0	2	3.87	17.70
		Opp.:	1450	0.52	0.79	0	4	1.61	5.56
27	verandert gentechn	Gov.:	1450	0.04	0.23	0	2	5.86	40.06
		Opp.:	1450	0.14	0.42	0	3	3.17	13.79
28	auslandseinsatz sicherheitsund	Gov.:	1450	0.08	0.33	0	3	4.52	25.89
		Opp.:	1450	0.19	0.50	0	4	3.11	14.56
29	gross koalition	Gov.:	1450	0.03	0.20	0	3	6.93	63.32
		Opp.:	1450	0.56	0.96	0	8	2.25	9.68
30	gdl gdba	Gov.:	1450	0.03	0.21	0	3	7.08	63.77
		Opp.:	1450	0.16	0.45	0	3	3.24	14.38
31	deutschland hochqualifiziert	Gov.:	1450	0.30	0.61	0	4	2.16	7.70
		Opp.:	1450	0.45	0.72	0	4	1.67	5.74
32	union handschrift	Gov.:	1450	0.12	0.38	0	3	3.76	19.34
		Opp.:	1450	0.18	0.45	0	3	2.57	9.68
33	urteil entscheid	Gov.:	1450	0.11	0.39	0	3	4.18	22.90
		Opp.:	1450	0.25	0.61	0	5	3.02	14.01
34	saisonbereinigt arbeitsmarktdat	Gov.:	1450	0.16	0.61	0	5	4.58	25.42
		Opp.:	1450	0.21	0.55	0	4	3.00	12.92
35	rentnerinn jahr	Gov.:	1450	0.03	0.18	0	2	5.92	40.00
		Opp.:	1450	0.49	0.77	0	5	1.70	6.17
36	kinderzuschlag betreuungsgeld	Gov.:	1450	0.24	0.61	0	5	3.36	17.31
		Opp.:	1450	0.34	0.66	0	4	2.06	7.15
37	neumann enquetekommission	Gov.:	1450	0.19	0.50	0	3	3.01	12.95
		Opp.:	1450	0.05	0.24	0	3	5.26	36.27
38	clinton hillary	Gov.:	1450	0.05	0.24	0	3	5.85	43.89
		Opp.:	1450	0.11	0.38	0	4	4.24	25.86
39	sozial sozialstaat	Gov.:	1450	0.06	0.27	0	2	4.82	27.75
		Opp.:	1450	0.26	0.53	0	4	2.14	8.25
40	bundesregier antwort	Gov.:	1450	0.05	0.24	0	3	6.23	52.09
		Opp.:	1450	1.26	1.46	0	9	1.29	4.43
41	exzellenzinitiativ durchlass	Gov.:	1450	0.18	0.51	0	4	3.37	15.71
		Opp.:	1450	0.10	0.35	0	5	4.92	41.21
42	alkoholkonsum ausbildungspakt	Gov.:	1450	0.11	0.35	0	3	3.68	18.32
		Opp.:	1450	0.17	0.46	0	3	3.11	13.61
43	bundestag presseggesprach	Gov.:	1450	0.16	0.45	0	3	3.06	13.04
		Opp.:	1450	0.37	0.71	0	4	2.18	8.00
44	bank bad	Gov.:	1450	0.02	0.16	0	2	7.56	65.30
		Opp.:	1450	0.12	0.41	0	4	4.04	23.07
45	chines olymp	Gov.:	1450	0.13	0.38	0	3	3.20	13.74
		Opp.:	1450	0.16	0.44	0	3	3.10	13.76
46	fremdenfeind rechtsextremismus	Gov.:	1450	0.03	0.18	0	2	6.26	44.79
		Opp.:	1450	0.11	0.35	0	3	3.65	18.24
47	stoib ruttg	Gov.:	1450	0.00	0.05	0	1	21.89	480.34
		Opp.:	1450	0.02	0.13	0	1	7.74	60.93
48	million abgesenkt	Gov.:	1450	0.18	0.59	0	9	5.78	56.54
		Opp.:	1450	0.19	0.46	0	4	2.68	11.63
49	spd spitzensteuersatz	Gov.:	1450	0.11	0.35	0	3	3.44	15.86
		Opp.:	1450	0.33	0.62	0	5	2.12	8.53
50	kommunal kommunalpolit	Gov.:	1450	0.09	0.33	0	3	3.87	19.33
		Opp.:	1450	0.07	0.28	0	3	4.31	24.68

Exploring Semantic Validity

To validate and visualize the results of our application we chose to further investigate the meta-relationships between the 50 topics derived above. Based on the matrix containing the $\beta_{w,q}$ -values we can judge how frequently any word in the vocabulary appears in any of the press releases.

We can thus investigate how closely related documents are regarding their vocabulary and group them accordingly (Quinn et al., 2010). Doing so provides further insights into the structure of the 50 topics and simultaneously a validation. Finding plausible categories of topics indicates that our application of the Expressed Agenda Model has well captured the issues contained in our textual data.

We employ a hierarchical agglomerative clustering using Ward’s method on the matrix containing the $\beta_{w,q}$ -values.⁵ In this way we obtain a tree like structure that indicates how closely related our topics are. Very similar topics are merged on a very low height while with increasing height less similar clusters are merged. Figure 4 graphically exhibits this structure.

What we find supports the validity of our data. In general we can identify three large branches of major themes: *public spending*, *domestic policy* and *foreign policy*. However we do find several clusters within these three categories that seem to be wrongly classified. Anyhow, these misclassification’s do not necessarily indicate a defect in generated time series but can be explained by thematic cross relations of the press releases.⁶ It is also notable that the clustering algorithm locates the major theme *foreign affairs* on a separate limb, while *domestic policy* and *public spending* are merged on an own limb but one level below *foreign affairs*.

This clustering provides not only some kind of external validity but it will also be useful to get a better understandig of our regression results below.⁷

⁵ Hierarchical agglomerative clustering methods compute distances between clusters, merge the most similar clusters, then compute distances with the merged clusters again and repeat this process until only one cluster remains. Ward’s method joins clusters so that their merger minimizes the increase in the sum of the distances from each individual document to the centroid of the cluster containing it (Grossman and Frieder, 2004, 109).

⁶ For instance we find communication on the dispatch of German soldiers to Afghanistan being grouped with domestic issues. This might result from a then ongoing discussion about inland military deployment in Germany.

⁷ For this purpose we will make use of a refined clustering by manually regrouping unintuitive categorizations.

Analyzing the Informational Interplay

Empirical Model

For analyzing the interplay of governmental and oppositional parliamentary agents regarding a certain topic, we make use of a vector autoregression model (VAR). VAR models allow for mutual endogeneity of the actors' press release publications. In our case this means that the publication of a press release regarding the national budget by the governmental block may not only be influenced by their own publication behavior, but also by the oppositions' publication behavior concerning this topic in the past. The same applies vice versa. Therefore, in this context the VAR consists of two equations for each topic k to capture the governmental ($i = 1$) and the oppositional ($i = 2$) behavior. Following Lütkepohl (2007), a VAR model that considers this relationship with one time lag can be written as

$$y_{k,1,t} = c_{k,1} + \phi_{k,11}y_{k,1,t-1} + \phi_{k,12}y_{k,2,t-1} + \epsilon_{k,1,t} \quad (2)$$

$$y_{k,2,t} = c_{k,2} + \phi_{k,21}y_{k,1,t-1} + \phi_{k,22}y_{k,2,t-1} + \epsilon_{k,2,t}, \quad (3)$$

where $y_{k,i,t}$ are ergodic stationary random variables, $\phi_{k,ij}$ are autoregressive coefficients and the $c_{k,i}$ intercept coefficients for $E[y_{k,i,t}] \neq 0$. Additionally, $\epsilon_{k,i,t}$ represents white noise process such that $E[\epsilon_{k,i,t}] = 0$ and $E[\epsilon_{k,1,i}\epsilon_{k,1,i}] = \sigma_{k,i}$ for all t such that $t = t$ and 0 otherwise. For analyzing the informational interplay, especially the cross parameters, in the equations above $\phi_{k,12}$ and $\phi_{k,21}$, are interesting, since they capture the actors' dynamic relation. To simplify the notation for further discussion, equation 2 and 3 can be written in matrix notation

$$\mathbf{y}_{k,t} = \mathbf{C}_{k,0} + \mathbf{\Phi}_{k,1}\mathbf{y}_{k,t-1} + \mathbf{e}_{k,t} \quad (4)$$

and generalized to lag structures of higher order (p):

$$\mathbf{y}_{k,t} = \mathbf{C}_{k,0} + \mathbf{\Phi}_{k,1}\mathbf{y}_{k,t-1} + \cdots + \mathbf{\Phi}_{k,p}\mathbf{y}_{k,t-p} + \mathbf{e}_{k,t} \quad (5)$$

Accordingly, $\mathbf{y}_{k,t}$ is a (2×1) random vector, $\mathbf{C}_{k,0}$ the (2×1) intercept vector and $\mathbf{\Phi}_{k,p}$ is a (2×2) parameter matrix for every lagged time period p . Furthermore the error, $\mathbf{e}_{k,t}$, is the corresponding (2×1) vector white noise

process. Within this notation, the cross parameters are the off-diagonal elements of the $\Phi_{k,p}$ matrices.

A crucial question for computing an adequate VAR(p) model for each topic is the lag length p , so that there is no autocorrelation left in the residuals. To obtain precise parameter estimates, it is important that the VAR specification captures all the autocorrelation in $\mathbf{y}_{k,t}$. This can be achieved by considering theory and econometric fit. Nevertheless, it is important to note that the number of parameters in the VAR models increases exponentially in the lag order p . For this reason it is efficient to select relatively small lag orders to obtain parsimonious parameter specification. All coefficient matrices, $\mathbf{C}_{k,0}$ and $\Phi_{k,p}$ for all p , can be estimated using OLS.

Time series properties and lag length selection

Each time series captures the number of press releases with respect to the topic during a day on a daily frequency. When the governmental and oppositional actors use press releases to influence the public information level with respect to their competitors, it is reasonable to assume small lag orders of $p = [1, 2, \dots, 7]$ days, since publishing press releases is a fast moving business. Therefore we chose an average lag order of 4.

To ensure that the time series follow a stationary process, we test them using the Augmented Dickey-Fuller test (ADF). The ADF tests the null hypothesis that the time series exhibits a unit-root and is therefore non-stationary in levels ($I(1)$). For the data of this analysis, the ADF indicates that all time series are clearly stationary in levels and can therefore be included in the VAR model.⁸

To determine the optimal lag length for the VAR(p) model there are several selection criteria. Our benchmark is the Schwarz-Bayesian (BIC) information criterion, as it is known to be the most parsimonious and still provides a good model fit (Lütkepohl, 2007, 157). The optimal lag length for the topics differs between one and seven lags but for the majority of pairs the BIC indicates a lag order of 4. So, apart from the theoretical argument for 4 lags, most of the time, it provides also empirically a good fit.

Since we are interested in the joint behavior of a huge number of time series pairs, the estimated parameters themselves are hard to interpret be-

⁸ With respect to the distribution of the data this rather unsurprising (cf. table 2).

cause they do not fully reflect the systems' dynamics. Hence, following the literature, we interpret the results of the VAR(4) models by using Granger-causality tests (Lütkepohl, 2007, 41). With respect to our data structure, we are only interested in the qualitative effects whether there are relationships or not. Therefore, we do not discuss each impulse response functions (IRF) separately but show one as an representative example.

Results

Granger Causality

To investigate the question whether it is the government or the opposition that emits new information to which the other side just responds, we apply Granger causality tests on each estimated VAR(4) system (Granger, 1969). The concept of Granger causality builds on the assumption that the past can cause the future but not the other way around. Therefore Granger's notion of causality focuses purely on time causality and not so much on causality in a common sense. A variable y_1 is said to Granger-cause y_2 when it helps to forecast y_2 , given a certain level of significance. This is exactly the kind of relationship we want to explore: Is it the governmental or the oppositional side which responds to the other sides information emission? The null hypotheses is that the lagged estimated parameters ($\mathbf{C}_{k,0}$ and $\mathbf{\Phi}_{k,p}$) do not influence the hypothesized exogenous variables. Figure 1 summarizes the results of the Granger causality test of the 50 topics at a 5% significance level.⁹

One can define four possible kinds of relationships: (1) Those where both actors influence each other simultaneously. (2) Relationships where there is no mutual influence at all. (3) Those relationships where the governmental MPs influence the opposition or (4) where it is the other way around. Figure 1 shows the number of relationships along this thematic categorization. With respect to the number of Granger-causal relationships, in most of the topics—19 altogether—it is the opposition that triggers the governmental actors to respond. In other words, oppositional MPs write press releases and one day later, MPs from governmental parties respond to this new emitted information. While the opposite happens less frequently. This results sup-

⁹ Detailed results of the 50 Granger causality tests can be found in table 3 in the appendix.

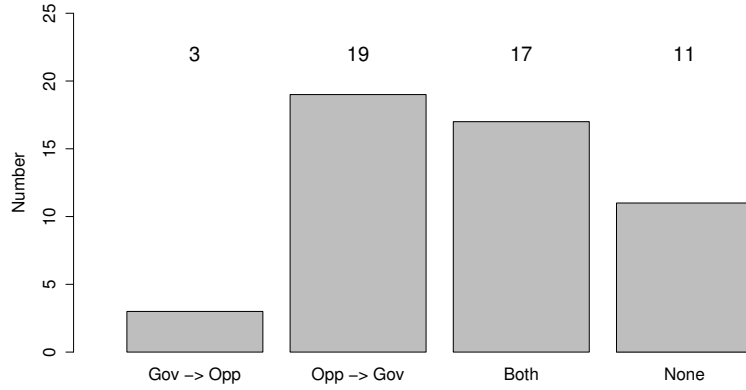


Figure 1: Number and type of topic influence

port our conjecture of H_1 . In only three topics, governmental MPs make the political opponent react. Interestingly, in 17 of the topics both actors influence each other simultaneously. Accordingly, for many topics the *actio-reactio* behavior happens intra-day.¹⁰

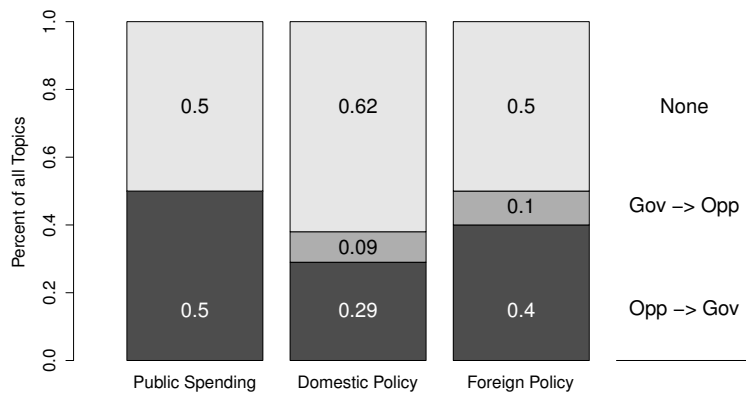


Figure 2: Number and type of topic influence

Looking at the exclusive influence, that is where one sides solely influences the other, the results also show the dominance of the oppositional

¹⁰ Even if we change the lag order to some other value between 1 and 7 days, the results remain robust. The thematic categorization of each topic is shown in table 3 of the appendix.

block. As described above and shown in figure 2, we automatically group the topics into three broad categories: Domestic issues that are primarily monetary intensive, are captured by the umbrella term *public spending*. Topics that cover domestic issues, which might have some monetary implication in the future but are more of regulatory nature, are labeled with *domestic policy*. The third category *foreign policy* covers all topics that are related to non domestic issues (cf. 4). In comparison to the governmental actors, the opposition composes the majority of topics impulses. Nevertheless, there is also a large part of topics that cannot be explained by press release publication of the corresponding competitor exclusively. In those topics either both blocks Granger-cause themselves mutually to publish press releases or they do not respond at all. So, these results indicate that in the majority of topics the opposition influences the government, which is in line with H_1 .

Exemplary for many of the analyzed topic pairs, figure 3 shows the response function (IRF) to an impulse of one standard deviation in one of the sides.

On the right hand side, the parameterized difference equation system of the governmental actors is shocked with one standard deviation of the oppositions' influence—the emission of foreign policy information. Both error bands at a 5% level of significance lie above the abscissa during the the first two periods (the first two kinks of the graph). Thus, they react subsequent to the oppositions' influence since the governmental actors do not react simultaneously in step zero. The other way around, this is not true. The IRF of the governmental block on the opposition, however, reacts simultaneously and is furthermore nowhere significant.

Apart from the strong influence of the oppositional block, with respect to the total number of topics as well as to their dominance over all thematic categories, especially the results in the category *public spending* must be emphasized. If it is true that the governments' budget constraint deters them additionally from initially emitting spending issues into the public realm, we should observe an even smaller influence of the government here. This is what figure 2 indicates. The complete abstinence of the governmental block with regard to public spending issues supports hypothesis H_2 . It is the opposition that tends to call for public spending issues.

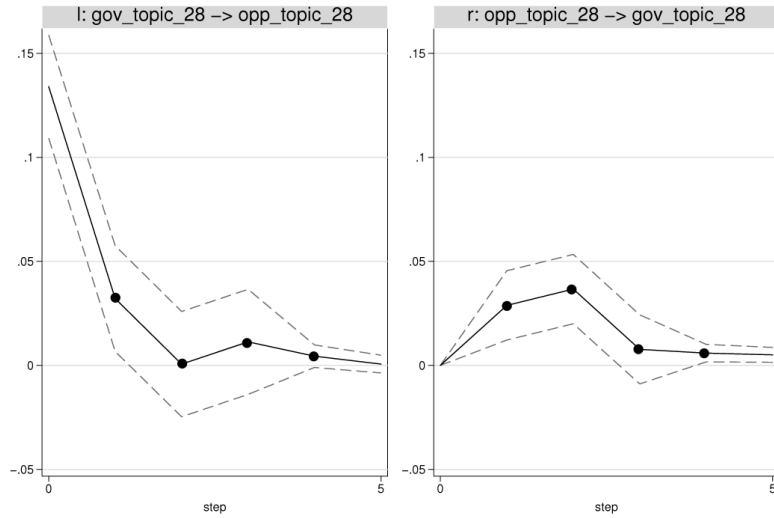


Figure 3: Generalized IRF Topic 28: *Foreign Policy*

Conclusion

The goal of this study was to get a better understanding about the dynamics between the issue attention of two different political actor groups. Drawing on recent advances in both the literature on issue competition and agenda setting, we defined an influence relationship model that provides a basic explanation for the interaction between issues raised by members from governmental and opposition parties. In contrast to previous studies, we have been able to model the issue attention of both groups on a daily basis, using a comprehensive collection of parliamentary press releases. Moreover, by applying an automated classification technique we managed to circumvent some of the potential drawbacks of manual coding.

Altogether, our results provide support for our hypothesis that it is the opposition that on average dominates the issue attention relationship. As expected, this domination is especially apparent for public spending and domestic policy topics. Moreover, the few times that the government was able to get the issue attention of the opposition was mainly for issues falling into the foreign policy category. In contrast to our initial expectation, however, the opposition was also able to set the governmental agenda on those issues. This could be due to several reasons. For instance, a lot of the foreign policy discussion during the 16th legislative period revolved around issues such as

the war in Afghanistan, where opposition parties, especially the extreme left-ist Die Linke, constantly tried to criticize governmental policies. Although the government would have preferred to ignore the critique, the high salience of the topic among voters made it nearly impossible not to respond to it.

An even more surprising result is that we found many issues where neither the government nor the opposition was able to set the issue agenda. We believe that this lack of influence relationship might be due to a simultaneous intra-day relationship or the existence of an external issue agenda setter. In order to identify the existence of such an actor, however, we will gather additional data. Although press releases are a well suited source for measuring the daily issue attention of parliamentary actors, they lack any meaningful information about the issue attention of external actors such as the media. Having additional information about the attention of the media could help to control for external shocks on the political arena. Furthermore, it might also be useful to have information about how salient certain topics are among the public. This could be done by including an indicator such as the most important topic question into the analysis.

Finally, what is still missing, are more studies that look at the actual consequences of issue agenda setting. Does it pay off to direct the attention of other political parties to certain issues? If we want to fully understand the dynamics between the issue attention of different political actors it is necessary to provide answers to this question as well.

In any case, studying the dynamics between the issue attention of political actors is a fruitful avenue for future research and the model and its extensions presented in this article provide a good starting point for doing so.

References

- Bachrach, P. and Baratz, M. (1962). Two faces of power. *The American Political Science Review*, 56(4):947–952.
- Baumgartner, F. R. and Jones, B. D. (1993). *Agendas and instability in American politics*. University of Chicago Press, Chicago.
- Blei, D. and Lafferty, J. (2006). Dynamic topic models. In *Proceedings of the 23rd international conference on Machine learning*, pages 113–120. ACM.
- Blei, D., Ng, A., and Jordan, M. (2003). Latent dirichlet allocation. *The Journal of Machine Learning Research*, 3:993–1022.
- Bräuningner, T. and Debus, M. (2009). Legislative agenda-setting in parliamentary democracies. *European Journal of Political Research*, 48(6):804–839.
- Budge, I. (2001). *Mapping policy preferences: estimates for parties, electors, and governments, 1945-1998*. Oxford University Press, USA.
- Budge, I. and Farlie, D. (1983). *Party competition: Selective emphasis or direct confrontation? An alternative view with data*. Sage, London.
- Calinski, T. and Harabasz, J. (1974). A dendrite method for cluster analysis. *Communications in statistics*, 3(1):1–27.
- Carmines, E. (1991). The logic of party alignments. *Journal of Theoretical Politics*, 3(1):65–91.
- Carmines, E. and Stimson, J. (1986). On the structure and sequence of issue evolution. *The American Political Science Review*, pages 901–920.
- Cook, T. (1998). *Governing with the news: The news media as a political institution*. University of Chicago press, Chicago.
- Damore, D. (2004). The dynamics of issue ownership in presidential campaigns. *Political Research Quarterly*, 57(3):391–397.
- Edwards, G. and Wood, B. (1999). Who influences whom? the president, congress, and the media. *American Political Science Review*, pages 327–344.
- Fröhlich, R. and Rüdiger, B. (2006). Framing political public relations: Measuring success of political communication strategies in Germany. *Public Relations Review*, 32(1):18–25.
- Granger, C. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica*, 37(3):424–438.

- Green-Pedersen, C. (2007). The growing importance of issue competition: The changing nature of party competition in western europe. *Political Studies*, 55(3):607–628.
- Green-Pedersen, C. (2011). A giant fast asleep? party incentives and the politicisation of european integration. *Political Studies*.
- Green-Pedersen, C. and Mortensen, P. (2010a). Issue competition and election campaigns: Avoidance and engagement. Working Paper.
- Green-Pedersen, C. and Mortensen, P. B. (2010b). Who sets the agenda and who responds to it in the danish parliament? a new model of issue competition and agenda setting. *European Journal of Political Research*, 49(2):257–281.
- Grimmer, J. (2010). A bayesian hierarchical topic model for political texts: Measuring expressed agendas in Senate press releases. *Political Analysis*, 18(1):1–35.
- Grossman, D. and Frieder, O. (2004). *Information retrieval: Algorithms and heuristics*, volume 15. Springer Verlag, New York.
- Jones, B. and Baumgartner, F. (2005). *The politics of attention: How government prioritizes problems*. University of Chicago Press, Chicago.
- Kaplan, N., Park, D., and Ridout, T. (2006). Dialogue in american political campaigns? an examination of issue convergence in candidate television advertising. *American Journal of Political Science*, 50(3):724–736.
- Kingdon, J. (1984). *Agendas, alternatives, and public policies*. Harper Collins, New York.
- Klingemann, H., Hofferbert, R., Budge, I., Keman, H., Bergman, T., Pétry, F., and Strom, K. (1994). *Parties, policies, and democracy*. Westview Press, Boulder.
- Laver, M., Benoit, K., and Garry, J. (2003). Extracting policy positions from political texts using words as data. *American Political Science Review*, 97(2):311–331.
- Lütkepohl, H. (2007). *New introduction to multiple time series analysis*. Springer Verlag, Heidelberg.
- Manning, C., Raghavan, P., and Schütze, H. (2008). *Introduction to information retrieval*. Cambridge University Press, Cambridge.
- McCombs, M. (2004). *Setting the agenda: The mass media and public opinion*. Polity, Cambridge.
- McCombs, M. and Shaw, D. (1972). The agenda-setting function of mass media. *Public opinion quarterly*, 36(2):176–187.
- Petrocik, J. (1996). Issue ownership in presidential elections. *American Journal of Political*

Science, 40(3):825–850.

- Quinn, K., Monroe, B., Colaresi, M., Crespin, M., and Radev, D. (2010). How to analyze political attention with minimal assumptions and costs. *American Journal of Political Science*, 54(1):209–228.
- Schaffner, B. (2006). Local news coverage and the incumbency advantage in the US House. *Legislative Studies Quarterly*, 31(4):491–511.
- Schattschneider, E. (1960). *The Semi-Sovereign People*. Holt, New York.
- Schulz, W. (2008). *Politische Kommunikation: Theoretische Ansätze und Ergebnisse empirischer Forschung*. VS Verlag, Wiesbaden.
- Sides, J. (2006). The origins of campaign agendas. *British Journal of Political Science*, 36(3):407–436.
- Sigelman, L. and Buell Jr., E. (2004). Avoidance or engagement? issue convergence in us presidential campaigns, 1960–2000. *American Journal of Political Science*, 48(4):650–661.
- Slapin, J. and Proksch, S. (2008). A scaling model for estimating time-series party positions from texts. *American Journal of Political Science*, 52(3):705–722.
- Vliegenthart, R. and Roggeband, C. (2007). Framing immigration and integration. *International Communication Gazette*, 69(3):295–319.
- Vliegenthart, R., Walgrave, S., and Meppelink, C. (2011). Inter-party agenda-setting in the belgian parliament: The role of party characteristics and competition. *Political Studies*, 59(2):368–388.
- Walgrave, S., Soroka, S., and Nuytemans, M. (2008). The mass media’s political agenda-setting power. *Comparative Political Studies*, 41(6):814–836.
- Walgrave, S., Zicha, B., and Vliegenthart, R. (2009). Towards a general theory of agenda-setting. how preferences, information, and institutions drive agenda-setting.
- Walker, J. (1977). Setting the agenda in the us senate: A theory of problem selection. *British Journal of Political Science*, 7:423–445.
- Weiss, S. (2005). *Text mining: predictive methods for analyzing unstructured information*. Springer Verlag, New York.

Online and Referee Appendix

Table 3: Detailed Granger Causality Results

	Topic	Direction	N	χ^2	df	p-Value	Causal Actor
1	Public Spending	Opp. -> Gov.	1450	26	4	0.0000	Opposition influences Government
		Gov. -> Opp.	1450	8	4	0.1048	
2	Public Spending	Opp. -> Gov.	1450	1	4	0.8269	No relationship
		Gov. -> Opp.	1450	1	4	0.8907	
3	Foreign Policy	Opp. -> Gov.	1450	0	4	0.9981	No relationship
		Gov. -> Opp.	1450	0	4	0.9984	
4	Public Spending	Opp. -> Gov.	1450	2	4	0.7423	No relationship
		Gov. -> Opp.	1450	2	4	0.7620	
5	Public Spending	Opp. -> Gov.	1450	30	4	0.0000	Opposition influences Government
		Gov. -> Opp.	1450	7	4	0.1326	
6	Domestic Policy	Opp. -> Gov.	1450	47	4	0.0000	Opposition influences Government
		Gov. -> Opp.	1450	8	4	0.0927	
7	Foreign Policy	Opp. -> Gov.	1450	6	4	0.1860	No relationship
		Gov. -> Opp.	1450	6	4	0.1813	
8	Domestic Policy	Opp. -> Gov.	1450	4	4	0.3810	Government influences Opposition
		Gov. -> Opp.	1450	21	4	0.0003	
9	Foreign Policy	Opp. -> Gov.	1450	32	4	0.0000	Mutual influence
		Gov. -> Opp.	1450	15	4	0.0044	
10	Domestic Policy	Opp. -> Gov.	1450	18	4	0.0014	Mutual influence
		Gov. -> Opp.	1450	38	4	0.0000	
11	Foreign Policy	Opp. -> Gov.	1450	14	4	0.0089	Opposition influences Government
		Gov. -> Opp.	1450	6	4	0.1873	
12	Domestic Policy	Opp. -> Gov.	1450	15	4	0.0056	Opposition influences Government
		Gov. -> Opp.	1450	9	4	0.0670	
13	Domestic Policy	Opp. -> Gov.	1450	34	4	0.0000	Mutual influence
		Gov. -> Opp.	1450	36	4	0.0000	
14	Foreign Policy	Opp. -> Gov.	1450	12	4	0.0180	Opposition influences Government
		Gov. -> Opp.	1450	9	4	0.0653	
15	Domestic Policy	Opp. -> Gov.	1450	13	4	0.0126	Opposition influences Government
		Gov. -> Opp.	1450	9	4	0.0727	
16	Public Spending	Opp. -> Gov.	1450	3	4	0.5358	No relationship
		Gov. -> Opp.	1450	3	4	0.5488	
17	Domestic Policy	Opp. -> Gov.	1450	40	4	0.0000	Mutual influence
		Gov. -> Opp.	1450	19	4	0.0008	
18	Public Spending	Opp. -> Gov.	1450	8	4	0.1054	No relationship
		Gov. -> Opp.	1450	6	4	0.1873	
19	Public Spending	Opp. -> Gov.	1450	23	4	0.0001	Opposition influences Government
		Gov. -> Opp.	1450	5	4	0.2531	
20	Public Spending	Opp. -> Gov.	1450	35	4	0.0000	Mutual influence
		Gov. -> Opp.	1450	33	4	0.0000	
21	Foreign Policy	Opp. -> Gov.	1450	6	4	0.2024	No relationship
		Gov. -> Opp.	1450	5	4	0.2535	
22	Domestic Policy	Opp. -> Gov.	1450	46	4	0.0000	Mutual influence
		Gov. -> Opp.	1450	29	4	0.0000	
23	Public Spending	Opp. -> Gov.	1450	9	4	0.0729	Government influences Opposition
		Gov. -> Opp.	1450	33	4	0.0000	
24	Domestic Policy	Opp. -> Gov.	1450	22	4	0.0002	Mutual influence
		Gov. -> Opp.	1450	30	4	0.0000	
25	Public Spending	Opp. -> Gov.	1450	46	4	0.0000	Mutual influence
		Gov. -> Opp.	1450	22	4	0.0002	
26	Public Spending	Opp. -> Gov.	1450	36	4	0.0000	Opposition influences Government
		Gov. -> Opp.	1450	8	4	0.0783	
27	Domestic Policy	Opp. -> Gov.	1450	20	4	0.0004	Opposition influences Government
		Gov. -> Opp.	1450	6	4	0.1963	
28	Foreign Policy	Opp. -> Gov.	1450	31	4	0.0000	Opposition influences Government
		Gov. -> Opp.	1450	3	4	0.6154	
29	Public Spending	Opp. -> Gov.	1450	28	4	0.0000	Mutual influence
		Gov. -> Opp.	1450	16	4	0.0030	
30	Domestic Policy	Opp. -> Gov.	1450	6	4	0.2096	No relationship
		Gov. -> Opp.	1450	9	4	0.0596	
31	Domestic Policy	Opp. -> Gov.	1450	35	4	0.0000	Mutual influence
		Gov. -> Opp.	1450	34	4	0.0000	
32	Public Spending	Opp. -> Gov.	1450	19	4	0.0008	Opposition influences Government
		Gov. -> Opp.	1450	6	4	0.1921	
33	Public Spending	Opp. -> Gov.	1450	17	4	0.0018	Opposition influences Government
		Gov. -> Opp.	1450	3	4	0.5606	
34	Public Spending	Opp. -> Gov.	1450	7	4	0.1165	No relationship
		Gov. -> Opp.	1450	8	4	0.0807	
35	Public Spending	Opp. -> Gov.	1450	19	4	0.0007	Mutual influence
		Gov. -> Opp.	1450	10	4	0.0437	
36	Public Spending	Opp. -> Gov.	1450	19	4	0.0008	Mutual influence
		Gov. -> Opp.	1450	20	4	0.0004	
37	Domestic Policy	Opp. -> Gov.	1450	17	4	0.0016	Opposition influences Government
		Gov. -> Opp.	1450	8	4	0.0920	
38	Foreign Policy	Opp. -> Gov.	1450	8	4	0.0877	Government influences Opposition
		Gov. -> Opp.	1450	10	4	0.0398	
39	Public Spending	Opp. -> Gov.	1450	10	4	0.0453	Opposition influences Government
		Gov. -> Opp.	1450	8	4	0.0793	
40	Domestic Policy	Opp. -> Gov.	1450	30	4	0.0000	Opposition influences Government
		Gov. -> Opp.	1450	2	4	0.8213	
41	Domestic Policy	Opp. -> Gov.	1450	9	4	0.0712	No relationship
		Gov. -> Opp.	1450	6	4	0.1762	
42	Public Spending	Opp. -> Gov.	1450	21	4	0.0003	Opposition influences Government
		Gov. -> Opp.	1450	7	4	0.1247	
43	Domestic Policy	Opp. -> Gov.	1450	102	4	0.0000	Mutual influence
		Gov. -> Opp.	1450	27	4	0.0000	
44	Domestic Policy	Opp. -> Gov.	1450	21	4	0.0004	Opposition influences Government
		Gov. -> Opp.	1450	7	4	0.1213	
45	Domestic Policy	Opp. -> Gov.	1450	10	4	0.0477	Mutual influence
		Gov. -> Opp.	1450	16	4	0.0029	
46	Public Spending	Opp. -> Gov.	1450	15	4	0.0042	Mutual influence
		Gov. -> Opp.	1450	11	4	0.0280	
47	Foreign Policy	Opp. -> Gov.	1450	0	4	0.9970	No relationship
		Gov. -> Opp.	1450	1	4	0.8900	
48	Public Spending	Opp. -> Gov.	1450	22	4	0.0003	Opposition influences Government
		Gov. -> Opp.	1450	6	4	0.2327	
49	Public Spending	Opp. -> Gov.	1450	18	4	0.0013	Mutual influence
		Gov. -> Opp.	1450	13	4	0.0128	
50	Domestic Policy	Opp. -> Gov.	1450	24	4	0.0001	Mutual influence
		Gov. -> Opp.	1450	10	4	0.0386	

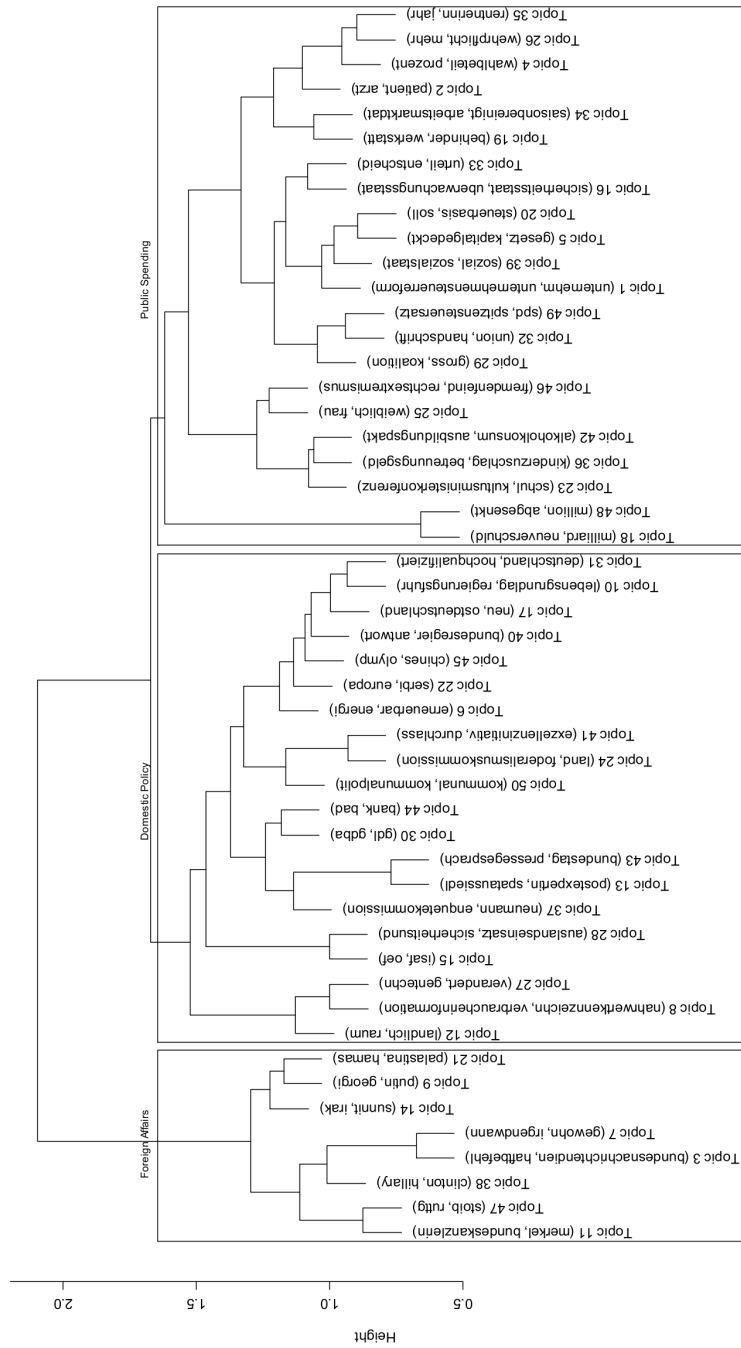


Figure 4: Dendrogram that Clusters the Topics into 3 Major Themes