Relating social and symbolic relations in quantitative text analysis. A study of parliamentary discourse in the Weimar Republic☆

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ABSTRACT

Social relations between actors and symbolic relations between concepts or ideas are interwoven in discourse. We conceptually distinguish three approaches that construct relations between symbols with different connections to social structures. These three approaches are illustrated empirically with automated text analyses of the parliamentary proceedings of the Weimar Republic in Germany (1919-1933). First, *cultural relations* between symbols, as reconstructed from co-occurrences of terms in large text corpora, are supposedly widely shared in a social context. In this sense, we analyze a set of key terms in Weimar political discourse around the central term "Volk" ("people"). These fall into five word communities, each of them representing a different way of conceiving politics. Secondly, symbolic practices are related to actors positioning themselves through them in *socio-symbolic constellations*. We reconstruct such a constellation from the usage of key terms of Weimar parliamentary discourse by the eight major political parties in their speeches, with different parties signaling their ideological positions through these terms. Thirdly, the use of symbols in interaction characterizes *social relationships* between actors. In this vein, the ties between the Weimar parties show distinct patterns of hostility or support in their interjections and reactions to each other's speeches. The second and the third analyses reveal a two-dimensional patterning of the Weimar political landscape, with the traditional Left-Right dimension complemented by an opposition of forces supporting or rejecting the republic. Also, the similarities in word usage by parties correspond fairly well to the support or hostility in their interjections and reactions.

1. Introduction

Network research starts from the basic idea that diverse phenomena can be subjected to the same graph theoretical models, with nodes linked by ties. This approach has fruitfully analyzed social phenomena with regard to networks of social relationships. Over the last 25 years, the approach has been extended to networks of links between symbolic forms (cf. Carley, 1994; Mohr, 1994, 1998; Tilly, 1997; Light, 2014; Rule et al., 2015). A symbol, say: a concept, is here seen as affected by its links to other symbols (concepts), just as an actor is influenced by the web of relationships to others. The recently advanced analyses of socio-semantic networks push this principle further: They examine patterns of social relationships between actors in conjunction with the networks of symbols deployed by them (Basov & Brennecke, 2017; Lee & Martin, 2018; Roth & Cointet, 2010). The guiding idea is the duality of actors and their

practices (Breiger, 2000; Lee & Martin, 2018): symbolic relations between signs or practices, and social relationships between actors, are similar and can be subjected to the same analyses, even included in the same model.

In this paper, we attempt to disentangle various kinds of symbolic and social relations. Even if we only consider relations between symbols, or only relations between actors, they already differ profoundly depending on their construction. The relations between actors and symbols are still another matter. Against a purely formal and structuralist understanding, we admonish holding these kinds of ties separate conceptually and in our analyses. We distinguish three different approaches to symbolic relations, with their distinct constructions and connections to social relationships:

a) *Cultural relations*: Symbolic forms may be systematically connected to each other in discourse, and these connections are supposedly shared by most actors in a social context.
b) *Socio-symbolic relations*: Actors can be related to each other through the different symbolic forms they use, e.g. ideologies, as in a two-mode network of actors and symbols. Conversely, symbols relate to one another through their common or differential usage by actors.
c) *Social relationships*: The relationships between actors are characterized by the interaction taking place, that is: by the symbols processed in the ties.

The three approaches are not mutually exclusive. Rather, they examine different kinds of structures forming in the process of communication, and guiding it in turn: culture, socio-symbolic constellations, and social relationships. In line with Breiger and Bourdieu, "relations" between symbols (symbolic or cultural) or between actors (social) rest on the similarity of usage: symbols are related if systematically used together; actors are related when using the same symbols. This usage of symbols constitutes one aspect of communication – called "practices" here. Social "relationships", in contrast, consist of actors communicating with each other (with certain symbols) and developing specific expectations in this regard (Azarian, 2010; Fuhse, 2013). We term this particular aspect of communication "interaction" or "symbolic interaction".

The paper is divided into three big sections, each dealing with one of the three approaches. They are in turn reflected upon theoretically, then briefly reviewed with regard to exemplary studies, and illustrated empirically at the example of discourse in the federal parliament of the German *Weimar Republic* (1919-1933). After World War I, a frail multi-party democracy was established in Germany with a large number of parties and with unstable governments against strong opposition from both Left and Right. We conduct automated text analyses of the proceedings of the Weimar federal parliament with regard to the cultural relations of word usage, the socio-symbolic constellation of political parties and ideologies, and the social relationships of interaction between parties.

We first examine shared *cultural relations* between symbolic forms, with a study of the systematic relations of political terms in the Weimar parliament (section 2). Then we discuss the *socio-symbolic constellations* of how actors and symbols are tied to each other. This is illustrated by way of the reconstruction of ideological party positions from the co-usage of prominent political terms in the Weimar speeches (3). Finally, we consider symbolic forms as characterizing the *social relationships* between actors. In this case, the relationships between parties can be reconstructed from the reactions and interjections from one party to the speeches by another (4).

2. Cultural relations

2.1. Theory

First, relations between symbols can be reconstructed on the basis of whether they systematically appear together. This view builds on de Saussure's (2013) conceptualization of language as a web of terms. Words here are arbitrary signs that acquire their meaning through their systematic connections to other words. However, de Saussure's work is mainly concerned with the language as "langue" – a general system of meanings as in a dictionary. In contrast, our interest, and that of recent advances in quantitative text analysis, lies on "parole" – language-in-use. The recent surge in automated text analysis has led to a number of methods for studying relations between symbols in their usage in text. Most importantly, systematic connections between words are discerned through their frequent *co-occurrence* in large text corpora (Evans & Aceves, 2016). For example, the word "chair" should frequently appear in connection to terms like "sit" and "table", and this would tell us something about its meaning. If, however, "chair" co-occurs often with "professor", it acquires a different meaning. Whether in text units like sentences, paragraphs, articles, letters, speeches, or in "moving windows", co-occurrence is based on a "bag of words" approach: Words are lumped together without regard to their precise sequence and their grammatical functions (Mohr, 1998).

Breiger (1974) formulates the classic duality: that actors and groups co-constitute one another. Individuals are defined and shaped by the groups they belong to. And groups are defined by their individual members, making the groups similar (or different) to the extent that the same actors take part in them (or not). The "bag of words" approach in automated text analysis adopts a similar kind of *duality*: Words and text units (sentences, paragraphs, articles, speeches) are seen as dual. The meaning of a unit of text is determined by the words used in it. And units of text are seen as similar if containing the same words. Conversely, the meaning of a word is set by the units of text it appears in (and by the other words in them).

The reliance on co-occurrence is not confined to studies deploying conventional methods of network analysis like blockmodel analysis (Mohr, 1994; Tilly, 1997) or community detection (Rule et al., 2015). Probabilistic topic modeling similarly builds on co-occurrence in units of text (DiMaggio et al., 2013). Other techniques go beyond the "bag of words" approach to take grammatical structure into account, dissecting subjects, predicates, objects etc. (Franzosi, 2004: 41ff). The basic approach remains similar in that links between symbols are reconstructed from their usage in texts, here: in sentences.

How is this network of symbols connected to the social relations between actors? We term this first kind of symbolic relations

"*cultural*" because it is supposed to be relatively constant throughout a population. The same symbolic ties should hold across various speakers, listeners, writers, and readers in the context at hand. This approach falls in line with the concept of culture in the tradition of Parsons and Geertz, as well as the sociology of knowledge by Berger and Luckmann. Culture (or knowledge) is seen as the repertoire of symbolic forms (and the connections between them) shared between actors within a group or society, thus alleviating the general uncertainty of interaction (Berger & Luckmann, [1967] 1991; Geertz, 1973; Kroeber & Parsons, 1958).

Parsons and Berger & Luckmann locate culture or knowledge in full-scale societies, Geertz in smaller tribal groups or villages. At the various levels, the concept always implies consensus and sharing of symbolic forms. Foucault (2002) takes a similar perspective. His academic or intellectual "discourses" are constrained and prescribed by inherent rules of what can and should be said or written, with little attention to different positions and perspectives in discourse. While societies can harbor a number of Foucault's discourses, each of them is seen as relatively homogeneous in symbolic forms and in the relations between them.

In network theory, this translates into White's concept of the "domain" of cultural forms hosted by a network (Mische & White, 1998). The "network" part here stands for a social context with repeated interaction and a dense web of social relationships. This context could be an organization, a village, a tribal or ethnic group, an academic or intellectual discourse, a trade network, a bureaucratic state structure, but also a full-scale national society. Network-domains can be scaled to all levels, as long as the context at hand is more densely connected internally than to the outside world. Specific symbols and meaning emerge in the dense and repeated interaction in such a network. They circulate and diffuse in the internal interaction and become institutionalized as part of the symbolic repertoire of the group (Berger & Luckmann, [1967] 1991). Now White's theory assigns actors to different symbolic positions (identities) in networks, and it allows actors to combine different symbolic repertoires in "switchings" between network-domains (Godart & White, 2010; Mische & White, 1998; White, 1992). In contrast to Parsons, Geertz, Berger, Luckmann, and Foucault, White considers cultural forms only as *relatively* homogeneous by social context, and the concept of "domain" as an analytical device to capture this.

Every domain (and every network context) thus features its distinct pattern of cultural relations. Within the network-domain, the common cultural repertoire facilitates understanding and collaborative social relationships. According to Parsons (1977: 169), two actors have to draw on a wider culture in their interaction and follow the institutionalized scripts and rules, to facilitate understanding and coordination. Conversely, coordination and positive relationships are harder to establish across cultural contexts. Also, in this view, culture envelops and constrains actors by prescribing ways of thinking and acting. Geertz (1973: 5) sees the human actor "suspended in webs of significance" and defines these as "culture". This immersion in the culture of their social contexts makes actors do what they do and think what they think.

This conceptualization was often objected to. But there can be little doubt that people use different symbolic repertoires, speak different languages, accord different meaning to symbols by the social contexts they are embedded in. The notion of culture entails comparing different contexts with regard to systematic patterns of attitudes, values, rules, or other symbolic forms. Focusing on the relations between symbols allows us to reconstruct and assess these differences quantitatively, whereas many cultural sociologists insist on the qualitative interpretation of meaning and culture.

2.2. Exemplary studies

This first approach has predominated in quantitative text analyses in sociology (Evans & Aceves, 2016; Mohr, 1998). Large quantities of text across many authors are examined to reconstruct common symbolic patterns. For example, Carley (1994: 299ff) argues that the meaning of robots in science fiction literature changes from the 1950s to the 1980s with different associations to other terms. Yeung (2005) finds that urban communes in the US differ in their "network cultures" with regard to the meanings associated with "love". Mohr and Duquenne (1997) reconstruct the changing symbolic patterns in the treatment of needy people in New York City around 1900. These reflect the different meanings and moral evaluations of social categories as the predominant "institutional logics" of the welfare field. In line with neo-institutionalism, Mohr and Duquenne formulate that behavior in a field follows coherent institutionalized routines (Friedland & Alford, 1991). Their work aims at reconstructing these institutional logics before and after the change of classifications and evaluations. Here, cultural relations are compared over time (as in Carley's study), whereas Yeung compares between social contexts. All three studies assume cultural relations – the "network culture" or the "institutional logics" – to be characteristic of the social context at hand – be it the respective urban commune or the welfare discourse or the science fiction literature at the time.

Turning to political discourse, Light (2014: 121ff) examines long-term changes in the inaugural speeches of U.S. presidents from 1789 to 2005 in the kinds of issues addressed. Similarly, Rule et al. (2015) identify a large degree of continuity in the themes discussed by the State of the Union addresses of U.S. presidents 1790-2014. Both studies rely on the detection of densely connected communities in the network of words to identify issue areas.

Topic modeling also looks for regions of associated words in the matrix of co-occurrences but allows for overlap between them. In an exemplary study, DiMaggio et al. (2013) analyze the discourse on arts funding by the U.S. government in newspapers from 1986 to 1997 with regard to the change in topics. They find a shift towards more criticism of public arts funding, in particular through the National Endowment for the Arts. Barron, Huang, Spang, and DeDeo, (2018) build on topic modeling for their analysis of the transcripts of speeches in the national parliament in the French Revolution, focusing on the extent to which speeches differed in their word patterns from those held before.

All of these studies (except Light, 2014) treat symbolic patterns of symbols as institutionalized and shared in the context at hand, mostly examining changes over time. The cultural network is constructed and partitioned (into issue communities or topics) without differentiation by actors. Speakers or authors are then located in this cultural network by whether they deploy nodes of the network more often than others. In a sense, this runs counter to the approach to culture by Parsons, Geertz, and Berger & Luckmann who see actors as constrained to enact widely shared cultural scripts, and to Foucault's vision of discourse as following its rules of inclusion

and exclusion of utterances. Here, the two aims of reconstructing a shared cultural space, and of identifying the relative positions of actors in cultural space seem to contradict. As we argue below, this second aim leads to the second approach ("socio-symbolic constellations") and would benefit from using the methods associated with it (see 3.).

2.3. Political vocabulary in the Weimar Republic

We illustrate the three approaches to symbolic relations by applying them to the parliamentary discourse of the Weimar Republic in Germany from 1919-33. After World War I, a multi-party democracy was established in Germany. Plagued by multiple economic, political, and cultural crises, the republic featured instable governments and a large number of relevant political parties (Kolb, 2005; Peukert, [1987] 1992). It descended into a semi-authoritarian regime in 1930 and into the autocratically organized Third Reich in 1933.

Our study focuses on the parliamentary discourse of the Weimar Republic as reflecting inner tensions and conflicts that played an important role in its fatal trajectory. The proceedings of the federal parliament, called "Reichstag", were transcribed by stenographers and represent the debates fairly accurately (Mergel, 2002: 34ff). We include all protocols from the constitutional assembly in 1919 to the appointment of Adolf Hitler as chancellor in January 1933. In total, our corpus comprises roughly 32 million words. We identify 67.747 individual speaking turns, including full speeches by MPs and procedural speech by the house speaker (see the online appendix for an example of the documents and for details on our analyses).

We first analyze the symbolic relations of and around the notion of "Volk" as perhaps the most defining term of Weimar parliamentary discourse (Mergel, 2002: 260ff, 451ff). This can roughly be translated as "people" and is a central term in modern political philosophy as well as modern democratic discourse, even more prominently in German than in English (and with slightly different connotations; Gschnitzer et al., 1992). All parties in the Weimar parliament claimed in one way or another to make policies for "the people". Examining the terms associated with "people" in the Weimar parliament should shed light on this polysemy of the term, with different meanings by the terms linked to it. However, "Volk" is not a neutral term in political discourse, as our analysis in 3.3 shows. Therefore, we do not claim to cover the full array of political culture(s) in the Weimar parliament.

To construct the network of terms associated with "people", we first lemmatize the words in the corpus with an encompassing dictionary for German. This treats declinations, conjugations, and other inflected forms of a word as a single term. Words are identified as co-occurring when appearing together in moving windows of 40 words in the individual speaking turns (cf. Jurafsky & Martin, 2018: 10; see appendix). This results in a symmetric co-occurrence matrix between terms with cell entries C_{ij} for the number of times words i and j co-occur in a window. We remove stopwords (like articles and prepositions) and rare words (with a relative frequency < 0.005%). Subsequently, we calculate symmetric association values A_{ij} between two words as the number of co-occurrences C_{ij} divided by the overall frequencies of the two terms F_i and F_j:

$$A_{ij} = \frac{C_{ij}}{F_i F_j}$$

Finally, we extract the sub-matrix of the 40 terms with the highest association values to "people" $A_{people,j}$. "People" is itself among these terms because it frequently occurs more than once in a moving window. The 40 terms appear between 691 ("ideal") and 74,307 ("German") times in the corpus and have 166,711 co-occurrences among them (see appendix for the original terms and our translations). Fig. 1 gives a graph of this weighted symbolic network. The positions of the terms in space are determined by multi-dimensional scaling of the negative association values (-A_{ij}) without manual adjustments (see appendix). Terms frequently co-occurring are placed close to each other, whereas terms rarely appearing together are located further apart. However, the first two dimensions cover only about 11.5 percent of the variation in the association values, leaving almost eight ninths of the variation unrepresented in Fig. 1. The top 10 percent association values A_{ij} are represented as lines connecting the two terms in this figure, with the width marking the strength of association. For example, "love" and "hate" frequently co-occur. But "fatherland" is only strongly associated with "love", not with "hate".

The network graph points at the different ways in which "people" is invoked in Weimar politics. To ease interpretation and to uncover structural properties, we employ a Louvain community detection algorithm (Blondel et al., 2008). This iterative procedure identifies densely connected subgraphs by aggregating network areas with high "modularity" into larger compounds (see appendix). The algorithm detects five communities of strongly connected terms. We interpret and illustrate these communities by recourse to close reading of exemplary passages from the original text (see Basov et al., 2018 for a more comprehensive treatment):

(1) The largest "word community" (marked with black pyramids) on the bottom right comprises terms like "enemy", "militarism", "triumph" ("siegen"), and "hate", but also "peace", "peaceful", "respect", and "love". This cluster refers to the meaning of the "people" as an entity in the context of international politics and comes close to the English notion of nation. For instance, the League of Nations, a predecessor of the United Nations, was commonly referred to in German politics as the "league of peoples" ("Völkerbund"). The German "people" is here seen as enmeshed in conflictual relations with other nations (as a *nation among nations*), frequently in connection to World War I. Many parliamentarians bemoaned the perceived injustices of the Versailles Treaty while expressing desire for peace. Representative Friedrich Naumann of the moderate-liberal German Democratic Party (DDP) exemplifies this view:

"We ourselves are willing to take the thought: 'People among the peoples in the community of mankind!' to heart. […] From our German Volk, from the hand of the greatest our our thinkers, from the hand of Kant, came the plan, the well-reasoned idea of the
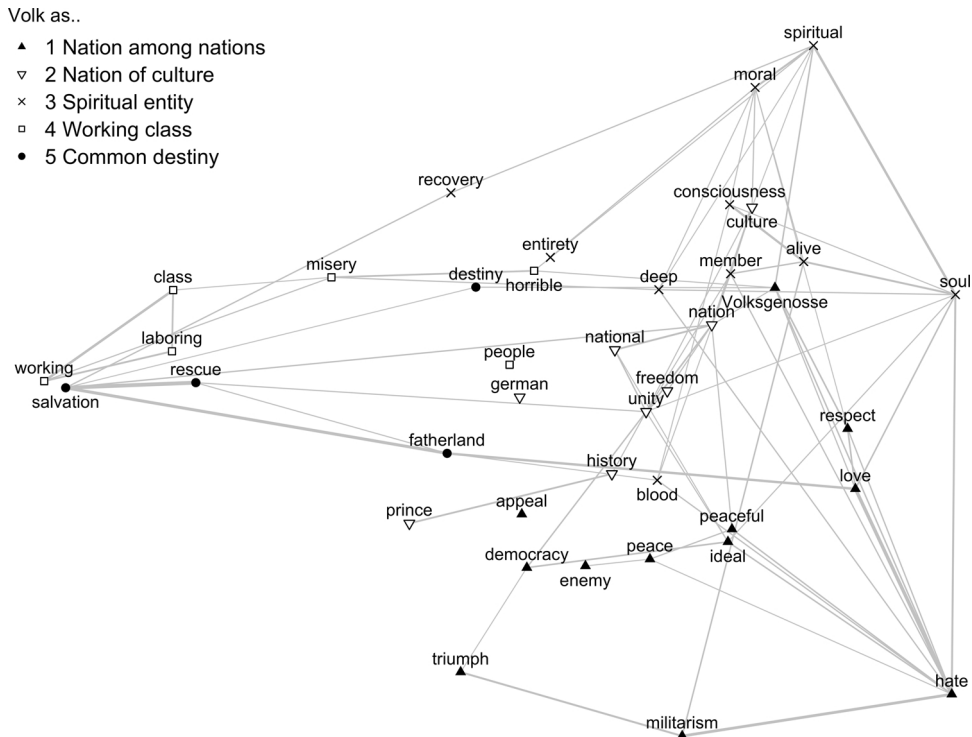
Fig. 1. Cultural relations around "Volk" ("people") in the Weimar parliament.

perpetual <u>peace</u>; this [idea] is essential to the German intentions. But then we also have to feel that the rest of the world, the world of the victors, harbors feelings of decency, humanity, and noblesse towards us." (February 13, 1919)

(2) The second cluster of terms (white triangles) in the middle is somewhat interwoven with the first one. With the terms "German", "history", "nation", "culture", and "unity", it reflects the German tradition of defining a "people" as a *nation of culture* (Johann Gottfried Herder). This links from the early 19th century onwards to bourgeois-liberal thought and to calls for German unity across the various fiefdoms. Heinrich Rönneburg, also of the DDP, argues in this vein:

"We want to imprint on these adolescent souls [...]: You are members of a great <u>people</u> with great <u>history</u>, with infinitely rich language, with ancient, high <u>culture</u>. [...] Our starting point and final goal when dealing with the issue of education can only be the <u>nation</u>." (March 17, 1926)

(3) At the top of the graph, the third word community (x-crosses) shows even more emphatic references to "people". Terms like "soul", "consciousness", "moral" ("sittlich"), and "spiritual" ("seelisch") spring from a conservative Hegelian idealist tradition. The "people" is supposed to be a *spiritual entity* with a "soul" or a "spirit" of its own, and it has to be considered in its "entirety" ("Gesamtheit"). As Johannes Bell from the Catholic Center party argues:

"In the struggle for the <u>spirit</u> of the <u>people</u> will prevail those who bring back its <u>spiritual</u> home, who fulfill its longing for <u>moral</u>, religious, and patriotic ideals. The loss of the German <u>spirit</u> was the most hurting forfeit of the World War." (May 10, 1932)

(4) The fourth semantic community on the left (white squares) consists of words like "working", "laboring", and "class" ("Schicht"). This signals a tendency to equate "Volk" with the *working class*. The connected terms "misery" and "horrible" refer to their socio-economic conditions. Social Democrat Gustav Hoch advances a typical argument, contrasting the common people with economic elites:

"That is the picture of our time: on the one side the great masses of the suffering, starving <u>people</u>, and on the other side the small heap of those making the most outrageous profits from the <u>misery</u> of our <u>people</u>." (October 7, 1919)

(5) The smallest community (black balls) covers only four terms: "fatherland", "destiny", "rescue", and "salvation". These refer to a very particular framing of "people" that was often used by parliamentarians in times of crisis (Mergel, 2002: 261): the Germans share a *common destiny*. Often invoked in this context was the concept of the German Volk as a "community of destiny" ("Schicksalsgemeinschaft"). This justifies sacrifices for the community, as exemplified in a statement by finance minister Matthias Erzberger, again from the Center party:

"Through the war, we have regained the awareness that the <u>people</u> is a community of <u>destiny</u> ["Schicksalsgemeinschaft"]. During the war, this community of <u>destiny</u> has been sealed with the blood of hundreds of thousands, with the tears of millions and with the

sufferance of the whole <u>people</u>. This community of <u>destiny</u> continues to exist in times of peace with the material repercussions of the war, and therefore the whole <u>people</u> has to carry, alleviate, and remedy these hardships as a unified body." (August 12, 1919)[1]

The terms "German" and "people" are allocated to the second and fourth community here, but about equally connected to all five word communities, as indicated by their position in the center and by their lack of strong connections to other terms.

As is common in network research, ties are absent in Fig. 1 if falling under the threshold of the top 10 percent association values (see above, and see appendix for the distribution of the association values). This for the most part just signals that two terms do not co-occur systematically. However, the MDS representation tends to pull terms that rarely feature together spatially apart. Term pairs like "spiritual – militarism" (never) and "working – soul" (once) seldom occur. It would be just as worthwhile to explore such "cultural holes" (Breiger, 2010) as the ties of frequent co-occurrence.

Overall, the word communities map intuitively plausible groupings of words that can be validated in qualitative analysis. Our choices of parameters like the number of terms around "people" and the size of the moving window used for this analysis are somewhat arbitrary, but informed by our qualitative knowledge of the Weimar parliamentary discourse. As we show in the appendix, the identified communities are quite robust to varying parameters and constitute meaningful classifications of the semantic environment of "people". They are based on the patterns of co-occurrences in the overall corpus of speeches in the Weimar parliament, without regard for their political affiliation. But are we really dealing with a network of symbols that maps a common culture, language, or discourse, in the sense of Parsons, Geertz, Berger & Luckmann, de Saussure, and Foucault? Maybe the five communities represent different "political languages" (Mergel, 2002) invoked by the various political actors with their respective ideological positions. This suggests taking the actors into consideration in the analysis, as in the second approach.

3. Socio-symbolic constellations

3.1. Theory

The second approach to relations between symbols brings the actors in, bypassed in the first approach. It starts from the concept of a field of mutual orientation and positioning by actors, following Pierre Bourdieu (Bourdieu & Wacquant, 1992: 71ff). Unlike in neo-institutionalism, a field is not primarily characterized by institutionalized symbols and rules. Rather, the field is structured by the relations between actors in it, and these carve and signal their positions by way of their symbolic practices (as defined in the introduction). This means conceptualizing the connection of symbols to social structure very differently than in the first approach. Here, the actors (be they individuals or organizations) are the bearers of symbols, not in the sense of carrying ideas in their heads, but of deploying them visibly to others. This contrasts with the first approach where the network of actors connected to the domain, or the full population of a field, is seen as sharing and bearing symbolic forms.

After the first duality between words and units of text, this turn implies a second *duality*: *Actors* relate to each other through *symbolic practices*, just as practices are linked to each other through their usage by actors (Breiger, 2000, building on Bourdieu). The *relations between symbols* are then constructed on the basis of them jointly being held and used by actors. For a contemporary example, tax-cuts for the wealthy, aggressive foreign policy, and opposition to abortion do not connect by logical necessity. But if a party joins these three demands in its political rhetoric, they become connected and part of a recognizable position in political discourse. In effect, the actor constitutes the link between symbols (Fig. 2, marked with the grey triangle connecting an actor to two symbols). Conversely, a symbol links two actors to each other when jointly held and deployed by them (marked with the dotted triangle). This is what Breiger terms "duality": The nodes on one plane of relations project to relations between the nodes on the other plane: Actors link symbols, and symbols link actors.

Social relations here consist of no more than using the same symbols. In a field of mutual observation, such as politics, this makes for two or more actors being seen as similar to each other – and as dissimilar from everybody who does not share these practices. For example, a conservative party is seen as toying with right-wing politics when expressing concern over immigration (van Atteveldt et al., 2017). Symbolic practices here serve as markers of vicinity or distance in the field, relating the actors to each other through their co-usage of symbols.

We speak here of *socio-symbolic constellations* to stress the simultaneous positioning of actors and symbols relative to each other. As in constellations of stars, socio-symbolic constellations feature a set of connected nodes, and they are characterized by their relative spatial positions, rather than by absolute coordinates. This contrasts with Bourdieu's reconstruction of positions in social space or in social fields that supposedly follow the distribution of economic, cultural, and symbolic capital. Other scholars use the term "network" here (e.g. in "socio-semantic networks", see below). But this obscures that we rarely observe the nodes of one kind (actors or symbols) as directly tied to each other.

Theoretically, this second approach suggests that social relationships between actors are reflected, or instantiated, in the similarity of symbolic orientations or practices in the field. This resonates with the symbolic interactionist assertion that repeated interaction breeds similarity in orientations and behavior (Crossley, 2011: 28ff). Similarity in orientations and the common usage of symbols, including words, would spring from a positive tie between the actors involved. However, this obviously need not be the case. Not everybody who rejects abortion is connected by interaction and social relationships. The precise operationalization and the context at hand determine the plausibility of these assumptions. In some cases, e.g. in co-voting patterns, the practices observed constitute the actual relationship: an alliance between political actors (Breiger, 2000; Slez & Martin, 2007).

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[1] The grammatical treatment of "Volk" (people) as singular is telling here and quite correct in German.
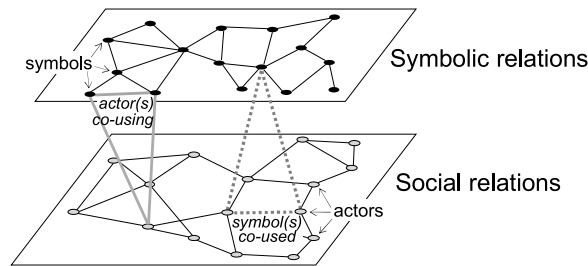
Fig. 2. Interweaving of social and symbolic relations in socio-symbolic constellations.

In other cases, most notably when it comes to common word-use or the similarity of subjective orientations, symbolic practices may or may not reflect interaction patterns. People with liberal worldviews and drinking lattes may do so out of interaction and social relationships between them (Mark, 2003; DellaPosta et al., 2015). Or they might worry about social inequality and enjoy fancy coffee drinks independently. Generally, similar symbolic practices are a bad proxy for social relationships in large populations.

We suggest that it makes sense to construct social relations on the basis of practices in *fields* of mutual observation, where actors position themselves vis-à-vis each other by the stances they take. For example, in the political field or in an academic dispute, voiced agreement on an issue, or disagreement, constitute a relation between the actors involved. In the relatively confined discourse in such a field, we would argue that the identities of actors are constructed on the basis of the texts and ideas attributed to them (Foucault, 1998: 221f) and on the basis of the stories told about them (Somers, 1994).

3.2. Exemplary studies

A number of studies now adopt the second approach, but with widely differing methods. For example, discourse network analysis constructs ties between actors in political discourse (parties, lobby groups, protest movements) if voicing the same political demands (Leifeld, 2013). The pattern of actors and their claims are first constructed as a two-mode network. However, the analysis of two-mode networks and the interpretation of results are tricky, because links do not represent interaction and influence, but affiliations. Therefore, two-mode networks are frequently reduced to one-mode networks, as in discourse network analysis. But this tends to inflate ties between actors based on singular instances of common claims or of co-affiliation. It produces overlapping clique structures that share little more than once taking part in the same event, or than co-membership in one organization. For example, pretty much all US senators would be tied to each other, if a tie is defined as ever co-voting in a legislative period. James Moody's technique of "contour sociograms" elegantly tackles this problem by constructing a landscape of connections between actors, with hills, rims, and valleys based on the number of co-affiliations (Moody, 2004). While this gives us better insights into the relative positioning of one mode of network nodes (e.g. actors) based on their multiple affiliations, it still loses information on the second mode of nodes (affiliations, events, political claims etc.).

Technically, a two-mode network of actors and their affiliations does not differ from the case-attribute matrices commonly used in statistics. This allows using techniques like multiple correspondence analysis that locate actors in a multi-dimensional space by the similarity or dissimilarity of their symbolic practices (Breiger, 2000: 99ff; Faust, 2005). Slez and Martin (2007) work with a similar technique (non-metric multi-dimensional scaling) in their study of shifting constellations between state delegations in the US constitutional assembly. The scaling techniques used by political science to locate parliamentarians or political parties adopt a related approach (cf. Slapin & Proksch, 2008). They position actors – often in a one-dimensional space assumed to map the Left-Right continuum – relative to each other by way of their discursive practices: the words used in party manifestos or in parliamentary speech.

These methods get away from constructing network *ties* between actors (or between symbols), instead representing relations as *distances* in lower dimensional space. Here they differ from the construction of ties between actors as on or off based on their usage of symbols, as depicted in Fig. 2. But they follow a similar logic: The relations between actors are constructed based on their relative similarity or dissimilarity in symbolic practices, only not as dichotomous ties, but as relative vicinity or distance. The space is often two-dimensional in order to allow visualizing them in paper-based publications.

The recent turn towards "socio-semantic networks" arrives at a fuller picture. The symbolic practices of actors are analyzed here in conjunction with their social relationships (as derived from socio-metric surveys or from the observation of actual interaction; Roth & Cointet, 2010; Basov & Brennecke, 2017). This allows studying the extent to which networks of social relationships correspond to socio-symbolic constellations, e.g. with people in densely connected groups using the same symbols or displaying similar cultural orientations.

3.3. Ideological positions in the Weimar parliament

The national parliament of the Weimar Republic is a field of mutual observation where actors position themselves vis-à-vis each other by the stances they take in their speeches. This allows examining the constellation of political actors on the basis of symbolic practices in the Reichstag. The roll-call votes studied by Hansen and Debus (2012) can be regarded as one such form of symbolic practice. They find that voting in the Weimar parliament was structured along an economic Left-Right dimension from Leftist-socialist forces to economically conservative parties. On a second dimension, Leftist and Rightist anti-system forces (Communists and

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Nationalists) are jointly pitted against the moderate parties supporting the Republic. But roll-call votes reflect the symbolic config-uration of a political field imperfectly (Proksch & Slapin, 2015: 134). Voting in parliament frequently involves strategic considerations such as compromise, coalition bargaining, or limited options. To investigate ideological positions, the spoken word is superior to voting.

To illustrate the second approach, we use the semantic environment of "people" from section 2.3 to ask: What is the relative frequency with which individual parties deploy these symbols in their speeches? We limit ourselves to the 40 terms identified in the previous section because we want to highlight the interlinkage between the different approaches (for large scale approaches to ideological scaling of political communication see Slapin & Proksch, 2008; Lauderdale & Herzog, 2016). The Weimar Republic was quite unsettled with numerous elections and small, ephemeral parties. We restrict our analyses to parties with more than three percent of the seats in at least three of the eight legislative periods. This leads to a matrix in which the rows correspond to the eight major parties and the columns to the 40 words with strong associations to "people". Cell entries represent the centered and stan-dardized relative frequencies with which the 40 words were used by parties

For the reasons outlined above (3.2), we opt against a two-mode network representation and analysis of the party-term matrix, but also against the reduction to a one-mode network of parties. We want to keep the information on parties *and* terms, and we are interested in the relative positions of both by the varying degrees of word usage. This leads to geometric techniques like multiple correspondence analysis. Our method of choice here is principal component analysis (PCA). Like the closely connected correspondence analysis, this technique identifies the main dimensions underlying a space of cases (here: political parties) and attributes (relative frequency of word usage). PCA as well as multiple correspondence analysis (MCA) and latent semantic analysis (LSA; Deerwester et al., 1990), commonly used in analyses of text data, all rest on the same technique of linear algebra. They factorize a matrix into its components using a singular value decomposition, only with different matrices used for the decomposition. Where PCA uses a corre-lation matrix, LSA employs a weighted matrix of word frequencies. LSA serves the purposes of information retrieval very well because of its scalability and the relative ease with which different documents can be compared. But PCA comes with rotation techniques that facilitate the interpretation of underlying dimensions. In contrast to Bourdieu's preferred method of multiple correspondence analysis, we can analyze proportions of word usage with PCA, rather than having to binarize our data with the resultant loss of information.

Our PCA represents the distribution of relative usage of the 40 terms by the eight parties well on two dimensions, cumulatively accounting for 65% of the variance (see appendix). We apply a varimax rotation to these two components to facilitate interpretation. Fig. 3 shows the biplot of terms and parties. Axes represent the loadings for the words as well as the scores of each party standardized

Fig. 3. Core terms used by political parties (2 PCA dimensions, varimax rotation).

Table 1
Main political parties in the Weimar Republic.

Name (abbr.)	Synonyms	Broad Label	Characteristics	Role in Weimar Republic	Electorate
KPD	Communists		Communist, links to Soviet Union	Principled opposition, seeking regime change	9-17%
SPD	Social Democrats	Left	Moderate Left, pro-democracy & welfare-state	Supports Republic, mostly opposition	20-30%
DDP	German Democrats		Individualist, slightly left of center, liberal professions	Supports republic, frequently in government	5-8% (20s), 1-4% (30s)
DVP	German People's Party	Liberals	Conservative, individualist, bourgeois, big industry	Supports republic, frequently in government	9-14% (20s), 1-4% (30s)
Zentrum	Center Party		Moderate conservative, pro-welfare-state	Supports republic, frequently in government	12-14%
BVP	Bavarian People's Party	Catholic	Regional Bavarian, Conservative	Supports republic, allied with Center	3-4%
DNVP	German Nationals		Conservative, authoritarian, nationalist, agrarian	Mostly in opposition, reactionary	14-20% (20s), 6-9% (30s)
NSDAP	National Socialists, Nazis	Nationalists	Fascist, nationalist, authoritarian	Principled opposition, seeking regime change	3-7% (20s), 20-35% (30s)

by the maximum absolute value among all parties on the respective dimension. The ratio of width and height reflects the covariance captured by the two dimensions. The symbols mark the word communities detected in section 2.3.

This representation of Weimar's socio-symbolic constellation follows practice theory by Bourdieu and Breiger in that it relates words and actors to each other through their patterns of co-usage (see 3.1): parties are placed close to each other if frequently using the same terms, while terms are located next to each other if used by the same parties. In this sense, the spatial distances in Fig. 3 reflect both the relations between symbols and those between actors – with a loss of information due to the two-dimensional representation. For the reasons outlined in 3.2, we find these spatial differences more informative than the construction of ties between actors on the basis of their joint usage of symbols, as depicted in Fig. 2. Rather than considering ties as only on or off based on some arbitrary cut-off, we include the relations between *all* actors by their similarity in terms used. The basic procedure still follows Fig. 2 in relating nodes of one mode (actors or symbols) by virtue of their connections to nodes of the other mode (symbols or actors).

In line with the political science literature, we interpret the relative placement of the parties as their "ideological positions" – determined by the relative frequency of words in the speeches of their parliamentarians (Slapin & Proksch, 2008). Ideology here stands for an observable pattern of communication rather than for underlying subjective orientations. The two dimensions are driven by the two ideological extremes of the Communists (KPD) and the National Socialists (NSDAP; aka "Nazis"). These are located at the polar extremes on the left and at the top with their own clouds of words typical for their speeches. Also, they share a common vocabulary between them in words like "triumph", "blood", "history", and "salvation".

Technically, the PCA places all the other parties close to the middle because (a) they share a fair amount of vocabulary, and (b) their number (six out of eight cases) pulls the center towards them. The ideologically extreme Communists and National Socialists stand out against the other parties, all of which supported the Republic (apart from the DNVP in the 1930s) and participated in a coalition government at least once. Table 1 gives an overview of the main parties with their ideological leanings, their electoral success and roles in the Weimar Republic, and the synonyms used in the text.

Furthest away from the Communists and the Nazis in Fig. 3, we find the parties involved in most governing coalitions: Zentrum and Bavarian People's Party (BVP) are both parties of political Catholicism, with the BVP the slightly more conservative, Bavaria-based ally of the bigger Zentrum. They lie close to the two "liberal" parties German Democratic Party (DDP) and German People's Party (DVP) – "liberal" in the European sense of the term stressing individual liberties against the state, following the tradition of John Locke and John Stuart Mill. The DDP and the DVP were both individualist and bourgeois, with the DDP slightly more left-leaning and the DVP emphasizing economic liberties. The German Nationals (DNVP) with their ambiguous and changing role in Weimar politics are placed close to the center, but slightly towards the Nazis. The Social Democrats (SPD) are located halfway between the center and the more radical Communists.

On the left side of the first dimension, Communists and Social Democrats frequently talk about socio-economic conditions and conflicts with the words "laboring", "working", "misery", and "class". The right pole features lofty words referring to culture and ideas: "spiritual", "moral", "ideal", "culture", and "soul", but also "peace", "recovery", and "unity". The Catholic Center and the two liberal parties offer a vision of the polity as a spiritual and cultural entity that has to "recover" in "peace", stressing "unity" ("Einheit") against internal divisions.

The second dimension is marked by words from the nationalist vocabulary used mostly by the National Socialists at the top of the diagram, and to a lesser degree by the DNVP. This includes terms like "enemy", "blood", and "nation". The two key terms "people" and "German" are also placed here, due to their frequent usage by the nationalists. This confirms the suspicion that "Volk" is not a neutral term in Weimar political discourse, and that some actors have more affinity to the term (see 2.3). At the bottom, the terms "culture", "peaceful", and "unity" stand in direct opposition to the nationalists' vocabulary and are most often used by the two Catholic parties and by the Left. They invoke "culture" or "class" as guiding political ideas.

Importantly, the relative spatial locations of the words are not based on their direct symbolic relations, e.g. as frequently co-occurring in sentences or speeches. Rather, they result from their deployment by the political parties. The close proximity of "enemy", "history", and "destiny" does not signify semantic affinity, only that they are frequently used by the National Socialists – and less often by the other parties. As argued above, the actors connect the symbols here, just as the use of these symbols makes for the distances between the parties. Consequently, we speak of a "socio-symbolic constellation", rather than a symbolic network or a social network.

The results therefore differ from those in section 2.3. Three of the five communities cluster somewhat in space, in line with our suspicion that these represent political languages spoken by different actors in parliament. Notably, the "working class" community (white squares) prevails on the left of the diagram, near the Communists and Social Democrats. The "spiritual entity" community (x-crosses), identified as conservative idealist in 2.3, is used relatively often by the Catholic parties and the Liberal parties. The fifth community relating to a "common destiny" (with black balls) is more prevalent in the top of the graph, indicating that especially National Socialists used such language.

The remaining two word communities – "nation among nations" (black pyramids) and "nation of culture" (white triangles) – are scattered widely. Each political camp offers its own perspective on Germany's relations to other nations, and invokes the extremely general words connected to the "nation of culture" unevenly. Both word communities seem to be linked to specific topics – foreign policy for the "nation among nations", and abstract ideas of culture, freedom, and history for the "nation of culture". Apparently, the co-occurrences analyzed in 2.3 signal different sides of discourse: Some word associations result from particular actors drawing them, while other word associations spring from multiple actors sometimes connecting them for various issues. We will have to explore these suspicions in further analyses, e.g. by examining whether some of our word communities are unevenly invoked by session and policy area, rather than by actors.

Our two-dimensional representation here bears a weak similarity to the two dimensions identified by Hansen and Debus in the roll-calls of the Weimar Republic. This is revealed by rotating the two-dimensional space from our PCA. Their Left-Right dimension runs roughly diagonally from the bottom left to the top right in our diagram, with the Communists and the Nazis at the two extremes. These ideological outliers move closer to the rest when only considering voting like Hansen and Debus. We would expect the conservative DNVP and DVP further to the top right here, rather than blending with the other parties. Hansen and Debus's second dimension runs orthogonally to the first one from the top left to the bottom right here, pitting the anti-Weimar parties KPD and NSDAP against the other parties. However, this second dimension seems to be weaker and less important with regard to word usage than the first. In particular, we locate the KPD and the NSDAP quite far apart. They may have voted similarly (against the proposals by the pro-Weimar forces), but their political vocabularies and ideologies differed fundamentally.

4. Symbolic interaction in social relationships

4.1. Theory

The third approach again sees symbolic forms as inscribed in social structure. However, their processing is not located with actors (as their practices). Instead, symbols are placed and observed in the interaction in social relationships between actors. Following relational sociology, social networks are not mere structural patterns devoid of meaning. Rather, they "are composed of culturally constituted processes of communicative interaction" (Mische, 2003: 262; Fuhse, 2015). For our purposes, the main point is that social relationships are made of symbolic interaction characterizing them. This includes the use of markers for the kind of relationship at play ("love", "friendship" etc.), but also typical activities characteristic for particular relationships, such as romantic kissing, friendship hugs, respectful hand-shakes, polite chit-chat, as well as ritual displays of loyalty, enmity, or competition. All of these practices are examples of "relational work" (Zelizer, 2005) – marking particular kinds of relationships.

Types of relationships like "love" or "conflict" prescribe particular "action-profiles" for the kinds of interaction permitted and expected between the actors involved (Martin, 2009: 5ff). Social relationships are negotiated in the symbolic interaction taking place in them, and they reproduce or change in the process. For example, when two colleagues regularly go for a beer after work, this changes their relationship to "friendship". As in ethological studies of animal societies, we can reconstruct social relationships from observed behavior (Hinde, 1976). Between human actors, this crucially relies on the deployment of symbols in interaction, e.g. in the words used in letters (McLean, 1998). This approach defines social relationships as observable patterns of communication, rather than as subjective dispositions of actors.

White views social relationships as characterized by "stories" about events that define the relation between alter and ego (White, 1992: 65ff; White & Godart, 2007). This shifts the focus from the events themselves to their presentation in narratives. However, White's notion of "stories" remains undefined, and unclear in how to observe them empirically. In quantitative text analysis, our interest lies squarely in observable features of naturally occurring communication. We take social relationships to show typical patterns of communication. Theoretically, these reflect underlying "expectations" that build up in previous communication, and structure future communication (Fuhse, 2009, 2015). These expectations are again bundles of meaning, like White's "stories". We can think of communicative events as feeding into expectations, or into stories, and these to guide subsequent events. Therefore, expectations about the relating of actors tend to be relatively inert and stable, barring unforeseen events. If we accept this general interweaving of communicative events with expectations as a theoretical premise, we can reconstruct relationships and networks based on what happens between alter and ego (de Nooy, 2015; Kitts, 2014).

In the second approach, relations between actors are defined by the similarity or difference in their symbolic practices (see 3.1). The third approach now defines a *social relationship* by the symbols used in the interaction between the actors. The similarity or

difference now pertains to other relationships: A friendship is recognizable by its similarity to other friendships with regard to symbolic interaction. The same holds for love relationships, family ties, work collegiality, and ties of conflict, patronage, or competition. Conversely, relations between symbols here consist in their deployment in social ties. If they are used in the same relationships ("darling", "love", romantic kissing) they are seen as related.

These considerations build on a third kind of *duality*: that of *social relationships and symbols* (see Breiger, 2010). Symbolic forms are inscribed in patterns of social relationships, and their meaning lies partly in this structural correlate. For example, ways of addressing others (formally, informally, intimately, or derogatorily) mark social relationships, and their meaning consists precisely in the kinds of relationships so marked, and in the other kinds of interaction typically associated with these.

Methodologically, the challenge is to find criteria for discerning meaningful similarities and differences between kinds of relationships. We are helped here by the fact that, although any relationship between two actors is different, social actors use widely known labels to classify their relationships (Fuhse, 2013). They talk of "friendship", "love" etc. to define their relationships, and these labels come with prescriptions for interaction. This means that we can frequently classify kinds of relationships by these lay labels, and that patterns of interaction should by and large differ by them.

4.2. Exemplary studies

Network research has frequently resorted to measuring ties by the occurrence of events between actors (Kitts 2014: 275ff). This includes literary reviews (de Nooy, 1999), e-mails in a university (Kossinets & Watts, 2009), homicides between rivalling gangs (Papachristos, 2009), and marriages among the Polish nobility (McLean, 2011). Frequently, only one incidence (review, reciprocated e-mail, marriage) is taken as indicating a tie, whereas we consider ties as observable patterns across multiple events. Also, social relationships involve different kinds of events, as when we expect intermarried nobles to also support each other politically. In line with the considerations above, we would have to pay attention to the meaning of such events and study how different symbols are used in a set of actors.

This approach is rarely adopted in empirical studies and has not been used in quantitative text analysis yet. McLean (1998) examines the vocabulary used in patronage-seeking letters in Renaissance Florence. Here, particular role constellations make certain words likely to be used, marking the relationships between the writers and their potential patrons. Bearman and Parigi (2004) detect systematic differences in the topics discussed in types of personal relationships (marriages, friendships, between siblings or colleagues). And Gibson (2005) identifies typical patterns of turn-taking between speakers in manager meetings by their formal and informal relationships. All three studies shed light on the symbolic interactions in different types of social relationships.

This scarcity of studies may be due to the methodological challenge of observing interactive practices *between* actors. In informal conversation, in scientific publications, in mass media reports, and in parliamentary speeches, it is easier to identify the authors or speakers of text than to observe them as "relational events" taking place between individuals or organizations and relating them. Rarely do we have data like McLean's letters that are clearly written by one person and addressed at another.

4.3. Parliamentary interaction in political relations

The proceedings of the Weimar parliament offer a rich resource for studying the interaction between parties. In addition to speeches and voting, the members of parliament engaged in frequent interjections and reactions to others' speeches, and these were duly transcribed by the clerks (Mergel, 2002: 302ff). We take such parliamentary interaction to characterize political relations between parties, just as the interaction between people constitutes personal relationships (see 4.1).

Interjections and reactions violate the rigid turn-taking system of political debates with designated speakers holding the right of uninterrupted speech. However, these violations have become institutionalized as back-channels for the parliamentarians to relate to the speaker and her speech for the benefit of a wider audience, including other parliamentarians, journalists, and the mass-mediated public. The interjections and reactions in the Weimar parliament include voiced support as well as criticism and attacks. Conversation analysis has studied the situational mechanisms leading to particular kinds of reactions like applause or booing (Heritage & Clayman, 2010: 263ff). Our analysis focuses on the political constellation of support and attacks in the Weimar parliament. Adopting the basic stance of quantitative text analysis, we detect the meaning of different kinds of reactions from observable patterns in the text.

Overall, the proceedings of the Weimar parliament note 282,321 interjections and reactions. We are able to classify 28.1 percent of these (79,209) as one of 15 common forms of interaction between the eight major parties. Many of them were attributed to parties in the proceedings ("Applause from the SPD."), others to individual representatives but assigned to their parties in our analysis. Among the 15 recurrent types of interjections and reactions are frequent shouts: "Bravo", "very true" ("sehr wahr"), "exactly" ("sehr richtig"). Others are descriptions of non-verbal behavior: "Laughter", "merriment", "disorder", "applause", and "clapping". In addition, the clerks sometimes classified verbal interjections as "calls", "approval" ("Zustimmung") or "objections" ("Widerspruch"). We code a range of verbally transcribed interjections as "statements". Also, designated speakers sometimes answered such statements or other interjections in "responses". The 15 types were identified automatically on the basis of words used in the protocols and assigned to the directed tie from the interjector's party to that of the speaker.

We quantify the relative amity or enmity between parties by examining the distribution of the kinds of interaction in directed dyads from the interjecting party to that of the speaker. The observed numbers of the 15 types of interaction within dyads are standardized to allow for comparisons across dyads with different amounts of activity. Then, a principal component analysis produces loadings for each type of action and scores for each dyad. The first principal component covers 52.8 percent of the covariance in the interaction between parties. Supportive interjections and reactions like "very good" and "applause" are assigned negative values on
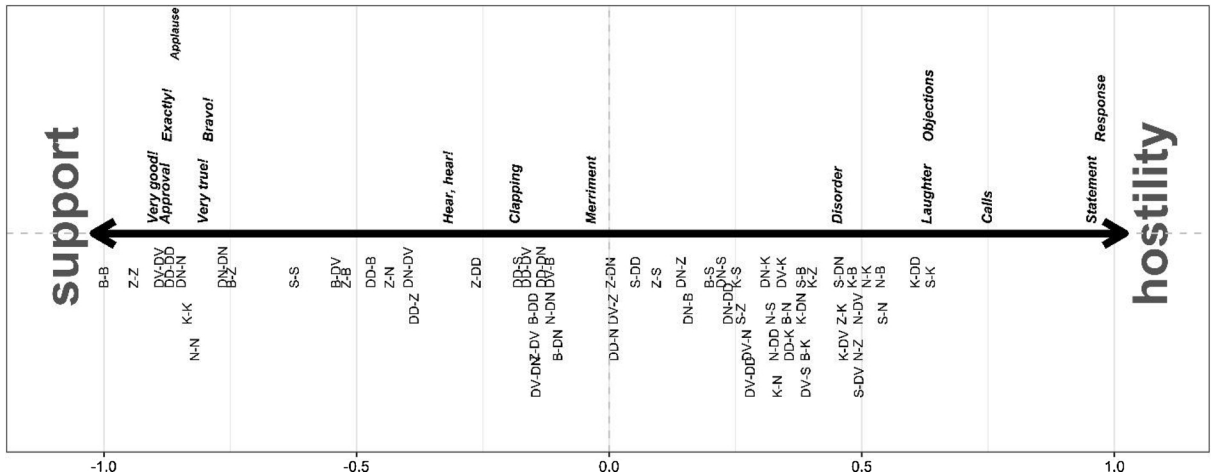
Fig. 4. Hostility scores of types of action and of party-party ties (PCA, first component).

Placement of the types of action (italicized) corresponds to their factor loadings. Placement of the party dyads (in capitals) corresponds to their factor scores standardized by the maximum absolute value of all dyads.

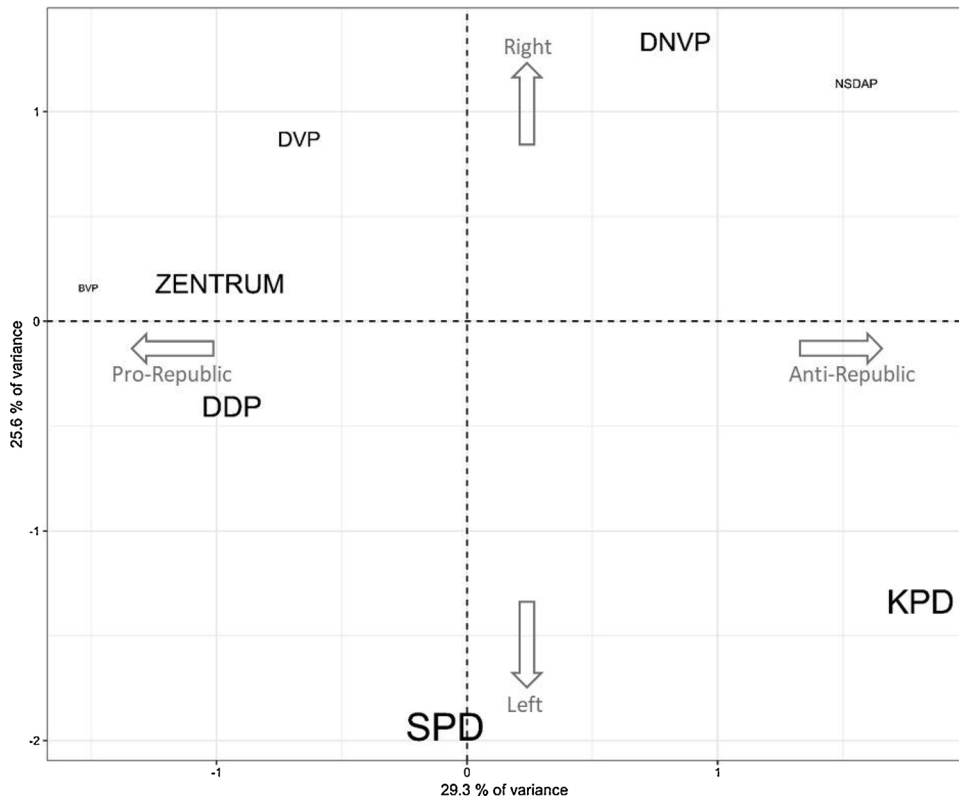B: BVP; DD: DDP; DN: DNVP; DV: DVP; K: KPD; N: NSDAP; S: SPD; Z: Zentrum.

Fig. 5. Political positions by hostility scores (two-dimensional metric MDS).

this dimension, whereas hostile interaction ("objections" and "calls") is placed near the positive pole (Fig. 4). The transcribed "statements" and speakers' "responses" receive the highest values as primarily adversarial.

The values assigned to the directed ties support our interpretation of the first principal component as a measure of hostility. The ties from the parties to themselves receive eight of the ten lowest values, with the other two running between parties ideologically close to each other (BVP to Zentrum, DNVP to NSDAP). On the opposite extreme, we find ties with intense conflict, frequently involving the extremist Communists and National Socialists. Overall, this measure for hostility can be assessed as very reliable

(Cronbach's α = 0.86). Note that this analysis captures the duality of symbols and social relationships, as introduced in 4.1: The meaning of the kinds of interruptions and reactions (interpreted as symbols in interaction here) in terms of support or hostility is discerned by their distribution across ties between parties (the social relationships). Similarly, the party-party ties are seen as characterized by the combination of kinds of interruptions and reactions in them, and assigned hostility values accordingly. Our interpretive understanding of the kinds of interaction and historical knowledge about the relations between parties only serve to validate this analysis. Our use of PCA thus parallels that in section 3.3, and the geometric analyses by McLean (1998: 63ff) and Gibson (2005: 1581ff). However, we need just one dimension to map symbols and ties, since this captures most of the covariance.

We now use the hostility scores for the party-party ties to reconstruct the political constellation of the Weimar Republic. First, we ymmetrize the ties by adding the hostility scores of the two directed ties between two parties. For example, the relation between SPD and DVP is assigned the sum of the scores for *SPD→DVP* and *DVP→SPD*. The resulting party by party matrix contains symmetric scores for the overall hostility between parties. We interpret these as symbolic distances in political space and subject them to metric multi-dimensional scaling for a simplified representation. The two-dimensional solution in Fig. 5 captures the symmetrized hostility values fairly well ($R^2 = 0.55$; see appendix). The parties are plotted in the diagram to match their relative distances with the hostility between them. The size of the party labels corresponds to the overall volume of their outgoing interjections and reactions. The SPD was the most active party, reflecting their size and importance in the Weimar Republic. The Communists (KPD) also sent a lot of interjections and reactions, in spite of their medium size. The least interaction came from the relatively small BVP and from the National Socialists – a smallish fringe party until 1930, only then jumping to prominence on the political scene. However, these volumes of interaction do not matter for the spatial positions of the parties, since these reflect the average hostility in interaction.

The first dimension covers slightly more covariance and pits the pro-Weimar forces on the left against the enemies of the Republic on the right side of the diagram. DDP, DVP, Zentrum, and BVP were all moderate parties that frequently formed governing coalitions (until 1932). They stand against the odd alliance of ideologically diverse parties opposing the Weimar Republic with different alternatives – socialism for the KPD, fascism for the NSDAP, and a conservative dictatorship or monarchy for the DNVP. The SPD is placed between these two camps – they supported the Republic, but rarely formed part of the coalition governments.

The opposition between Left and Right is captured mostly on the second dimension, from the Social Democrats and Communists at the bottom through the DDP and the Catholic parties in the middle to DVP, DNVP, and NSDAP, and at the top. The German Nationals (DNVP) and the Social Democrats are placed at the extremes here, rather than the more radical National Socialists and Communists. However, we should note that the dimensions do not have to be meaningful: The MDS is geared at representing a matrix of distances between cases in low-dimensional space. As in the socio-symbolic constellation, what matters here are the positions of the parties *relative* to each other, not their placement on seemingly absolute dimensions. Therefore, the extreme positions of the Social Democrats and the German Nationals in Fig. 5 do not really mark them as the most radical parties Left and Right.

The relative placements of the parties make for an almost perfect circle. Rather than matching the second dimension, the traditional Left-Right-continuum is bent here with the two polar extremes of Nazis and Communists moving relatively close together.[2] All the other parties align neatly by the ideological positioning attributed to them in the historical literature – with the SPD between KPD and moderate parties, with the two Catholic parties placed between the left-liberal DDP and the conservative-liberal DVP, and with the DNVP relatively close to the more extreme Nazis. In this circle, every party seems to support its neighbors while attacking those opposite it evenly.

Finally, we test whether the hostility in interjections and reactions corresponds to the ideological positions in word usage (from section 3.3). We use the symmetrized hostility values for the 28 undirected ties between the eight parties, as constructed above. For the similarities in word usage, we calculate Salton's cosine of the angle between the centered and scaled word vectors for all pairs of political parties across the 40 core political terms analyzed in sections 2.3 and 3.3 (Salton, 1979). The cosines can in principle vary between -1 and +1. Higher values mean that two parties make use of the same terms, and abstain from using the same terms, relative to other parties. In our case, the values range from -0.51 (KPD and DVP) and -0.45 (KPD and NSDAP) to +0.28 (BVP and Zentrum) and +0.42 (SPD and KPD), suggesting that this is indeed a plausible measure for ideological proximity. As expected, hostility scores and ideological proximity show a high negative correlation (Pearson's r=-0.57) across the 28 undirected ties (p < 0.01; see appendix). Ideological similarity and hostile interaction are two interrelated sides of political discourse with a high degree of correspondence here.

5. Discussion

Our empirical analyses examine three different layers of parliamentary discourse in the Weimar Republic:

(1) We distilled a network of central political terms, focusing on the co-occurrences between the 40 concepts most strongly associated with the term "Volk" ("people"; section 2.3). Instead of reconstructing a network of ties "on" or "off" between terms, they are related by way of association values. These indicate how often two terms appear close together (in a moving window of 40 words) relative to how often they feature in the text overall. Our multi-dimensional scaling of these association values gives a better representation of the cultural relations than the usual network graphs, since it maps them by their relative weights, rather than as 1s and 0s. However, the association values are represented quite imperfectly by the MDS, with almost 90 percent of the variation unaccounted for. This is to be expected given the complexity of the data. Relations between symbols in discourse are rarely, if ever, neatly ordered. Also, our analysis relies on the crude measuring of co-occurrences rather than delving into the intricacies of

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[2] The Communists are furthest apart from the Nazis (and from the Social Democrats) on the third dimension, not considered here (see appendix).

…

grammatical word sequences.

In this network of political terms, five distinct "word communities" signal different ways of framing political demands and of envisioning the polity. They depict the German people and polity as enmeshed in conflictual relations with other nation states ("nation among nations"), as a "nation of culture" that had to achieve unity through history (following Herder), as a "spiritual entity" endowed with "soul" and "consciousness" following the German idealist tradition, as the "working class" living in socio-economic misery and pitted against the ruling classes, or as sharing a "common destiny". The Louvain community detection algorithm identifies these five clusters quite robustly in the network of association values. But the analyses in 3.3 show that three of them mark "political languages" used by certain actors only: Mainly Communists and Social Democrats speak of the people in terms of the "working class", whereas the liberal and Catholic parties frequently invoke it as a "spiritual entity". The "common destiny" vocabulary primarily links with nationalist political positions. The other two "word communities" are more scattered and seem to relate to particular topics or policy areas: foreign policy ("nation among nations") and abstract ideals ("nation of culture").

(2) Secondly, we analyze the differential usage of these core political terms by the eight most important parties in the Weimar parliament (section 3.3). In such a "socio-symbolic constellation", actors and symbols are related to each other through usage patterns. For methodological reasons, we do not construct a two-mode network here, as in network discourse analysis. Instead we follow Bourdieu's and Breiger's practice theory by pitting parties (as actors) and political terms (symbols) in a two-dimensional geometric representation. Principal component analysis here allows us to keep information about the relative usage of political terms, and to rotate the axes to facilitate interpretation. In our analysis, the two extremist parties KPD and NSDAP deploy the most distinct political vocabularies, while the two liberal parties DVP and DDP and the two Catholic parties Zentrum and BVP occupy the ideological center. The DNVP is placed somewhat in the direction of the NSDAP, and the SPD between the center and the KPD.

This analysis builds on the various techniques from political science that scale parties by their word usage in manifestos or in parliamentary speeches (e.g. Slapin & Proksch, 2008; Lauderdale & Herzog, 2016). Our study remains relatively confined in its scope of only 40 terms here, but it can easily be scaled up to include many more terms. With its restricted focus, it mainly serves to illustrate the vicinity to the geometric analyses of Breiger (2000) and Slez and Martin (2007), and to mark the differences to the analysis of two-mode networks (e.g. Moody, 2004; Leifeld, 2013).

(3) In a third step, we reconstruct the pattern of hostile or supportive interaction between the political parties in the Weimar parliament (section 4.3). This relies on the measurement of hostility based on the distribution of kinds of interruptions and reactions to speeches across ties between parties. A principal component analysis here gives us hostility values for 15 identifiable kinds of interaction, and for the 64 ties between parties. These hostility values are then subjected to multi-dimensional scaling, again leading to a two-dimensional political landscape. The parties seem to form a circle in space, supporting their ideological neighbors and attacking those opposite them. This circle follows the traditional Left-Right-continuum, but moves the ideological extremes of Nazis and Communists relatively close to each other.

Substantially, these analyses yield two main results: First, the *Weimar political landscape* is riven by *two lines of conflict*. The first runs from the parties on the Political Left, Communists and Social Democrats, through a liberal-conservative center to the far right of National Socialists and German Nationalists. On a second dimension, the forces supporting the Weimar Republic face principled opposition from an odd phalanx of anti-Democrats: Communists, the fascist NSDAP, and the conservative-authoritarian DNVP. This second dimension plays a bigger role in the interjections and reactions in parliament than in the ideological positions by word usage. Hansen and Debus identify the same two dimensions in their analysis of roll-call votes in the Weimar Republic (2012). Their study traces the positions of individual members of parliament (and of political parties) over the sessions of the Weimar Reichstag. We yet have to analyze the development of the ideological constellation and of the hostilities in parliamentary interaction over time.

Theoretically, roll-call votes, ideological divisions (in word usage), and hostility or support in parliamentary interaction form three interrelated aspects of political discourse in parliament. Therefore, we expect them to show similar patterns, in this case: to be structured along the same dimensions. Our second main result confirms the *correspondence of ideological distances and hostility in interaction* based on their distribution across party-party ties (see 4.3). This is in line with the recent studies in socio-semantic networks. However, our approach is novel in reconstructing the network of social relationships (of hostility or support) from the symbols used in interaction, rather than from socio-metric surveys. Also, the differences between the three layers have to be explored. We expect roll-call votes to be governed by governing coalitions, with parties in government, or in opposition, voting together more often than would be expected on the basis of their ideological positions alone. The ideological (socio-symbolic) constellation in word usage, in contrast, should vary little across times of co-involvement in coalitions. Parliamentary interaction probably falls somewhere between the other two levels. All of this can be studied in more detail on the basis of the data and of the methods of quantitative text analysis presented here.

6. Conclusion

Our analyses of Weimar parliamentary discourse serve to illustrate and to support a number of theoretical and methodological arguments. We call for the careful distinction between different approaches, each constructing their own kinds of symbolic relations related to social structure in different ways (see Table 2):

- The first approach looks for systematic patterns of symbols, e.g. on the basis of co-occurrences in large text corpora, to determine *cultural relations* as shared in the social context at hand. This includes methods such as topic modeling and the detection of word communities. The first approach builds on a duality of symbols and text units (sentences, speeches, letters).
- The second approach examines symbolic practices by actors, taking these as dual. It reconstructs *socio-symbolic constellations*, e.g.

Table 2

The three approaches by theoretical background, methods, and applications.

	Cultural relations	Socio-symbolic constellations	Social relationships
Object of study	systematic relations between symbols	relations between symbols and actors	social relationships by symbolic interaction
Location of symbols	population, social context	practices by actors	interaction between actors
View of culture	Shared	contested, relating, marking field positions	marking social relationships & networks
View of actors	enveloped by culture, "following herd"	symbolic struggles by field position	forming social bonds
Duality	symbols – text units	actors – symbolic practices	symbols in interaction, social relationships
Methods frequently used	formal analysis of networks of symbols, topic models,	correspondence analysis, discourse network analysis, scaling techniques	correspondence of symbols & relationships
Weimar political discourse	political languages in parliamentary speech	ideological positions by parties	pattern of hostility between parties

in multiple correspondence analysis. The social relations here consist merely in similarity in the usage of symbols by actors, whether or not they interact with each other, just as the symbolic relations consist in the joint usage of symbols by actors.

- The third approach takes a closer look at *social relationships* proper, by the *symbols* processed *in interaction*. Here, symbols are not located in the actors, but in the ties between them – in a duality of symbols and social relationships. Ties can be studied with regard to the relative distribution of symbolic interaction across them.

All three approaches link to network theoretical considerations. The first one aims at reconstructing the inherent patterns of the "domain" (White) of cultural forms characterizing a network context. The second approach looks for the relative positioning of actors through symbolic practices in a field of mutual orientation. And the third approach investigates the social relationship at play by the kinds of symbolic interaction in them. In this light, the three approaches examine different aspects of the interweaving of networks and meaning in discourse, where networks harbor cultural forms, actors position themselves vis-à-vis others, and social ties are symbolically constructed.

The challenge lies in disentangling these aspects and isolating one of them for careful analysis. Ideally, we would tease out multiple aspects of discourse using more than one approach. But in doing so, we have to reflect theoretically on what to examine, and on the many methodological choices along the way. Such reflection might be able to lead us to an elaborated and consistent *theory of symbolic networks* to guide our explorations in quantitative text analyses. We are still far from such a theory. But at its core, we suggest, careful distinction is warranted between different ways of reconstructing different kinds of symbolic relations and their entanglements with the social world.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.poetic.2019.04.004.

References

Azarian, R. (2010). Social ties; elements of a substantive conceptualization. *Acta Sociologica, 53*, 323–338.

Barron, A., Huang, J., Spang, R., & DeDeo, S. (2018). Individuals, Institutions, and innovation in the debates of the French revolution. *Proceedings of the National Academy of Sciences, 115*, 4607–4612.

Basov, N., & Brennecke, J. (2017). Duality beyond dyads: Multiplex patterning of social ties and cultural meanings. *Research in the Sociology of Organizations, 53*, 87–112.

Basov, N., Nooy, W. D., & Nenko, A. (2018). *Emergent meaning structures: A socio-semantic network analysis of artistic collectives.* (last accessed: 15.02.2019) https://arxiv.org/abs/1807.06623.

Bearman, P., & Parigi, P. (2004). Cloning headless frogs and other important matters: Conversation topics and network structure. *Social Forces, 83*, 535–557.

Berger, P., & Luckmann, T. ([1967] 1991). The social construction of reality. London: Penguin.

Blondel, V., Guillaume, J.-L., Lambiotte, R., & Lefebvre, E. (2008). Fast unfolding of communities in large networks. *Journal of Statistical Mechanics: Theory and Experiment, 10* P10008.

Bourdieu, P., & Wacquant, L.ïc (1992). *Invitation to reflexive sociology.* Cambridge: Polity.

Breiger, R. (1974). The duality of persons and groups. *Social Forces, 53*, 181–190.

Breiger, R. (2000). A tool kit for practice theory. *Poetics, 27*, 91–115.

Breiger, R. (2010). Dualities of culture and structure: Seeing through cultural holes. In Jan Fuhse, & Sophie Mützel (Eds.). *Relationale Soziologie* (pp. 37–47). VS-Verlag: Wiesbaden.

Carley, K. (1994). Extracting culture through textual analysis. *Poetics, 22*, 291–312.

Crossley, N. (2011). *Towards relational sociology.* New York: Routledge.

de Nooy, W. (1999). A literary playground: literary criticism and balance theory. *Poetics, 26*, 385–404.

de Nooy, W. (2015). Structure from interaction events. *Big Data & Society.* https://doi.org/10.1177/2053951715603732).

de Saussure, F. (2013). *Course in General linguistics.* London: Bloomsbury.

DellaPosta, Daniel, Shi, Yongren, & Macy, Michael (2015). Why do liberals drink lattes? *American Journal of Sociology, 120*, 1473–1511.

Deerwester, S., Dumais, S., Furnas, G., Landauer, T., & Harshman, R. (1990). Indexing by latent semantic analysis. *Journal of the American Society for Information Science, 41*, 391–407.

DiMaggio, P., Nag, M., & Blei, D. (2013). Exploiting affinities between topic modeling and the sociological perspective on culture: Application to newspaper coverage of U.S. Government arts funding. *Poetics, 41*, 570–606.

Evans, J., & Aceves, P. (2016). Machine translation: Mining text for social theory. *Annual Review of Sociology, 42*, 21–50.

Faust, K. (2005). Using correspondence analysis for joint displays of affiliation networks. In Peter Carrington, John Scott, & Stanley Wasserman (Eds.). *Models and methods in network analysis* (pp. 117–147). New York: Cambridge University Press.

Foucault, M. (1998). *Aesthetics, method, and epistemology.* New York: The New Press.

Foucault, M. (2002). *The archaeology of knowledge.* London: Routledge.

Franzosi, R. (2004). *From words to numbers.* New York: Cambridge University Press.

Friedland, R., & Alford, R. (1991). Bringing society back in: Symbols, practices, and institutional contradictions. In Walter Powell, & Paul DiMaggio (Eds.). *The New institutionalism in organizational analysis* (pp. 232–266). Chicago: University of Chicago Press.

Fuhse, J. (2009). The meaning structure of social networks. *Sociological Theory, 27*, 51–73.

Fuhse, J. (2013). Social relationships between communication, network structure, and culture. In François Dépelteau, & Christopher Powell (Eds.). *Applying relational sociology* (pp. 181–206). New York: Palgrave.

Fuhse, J. (2015). Networks from communication. *European Journal of Social Theory, 18*, 39–59.

Geertz, C. (1973). *The interpretation of cultures.* London: Fontana.

Gibson, D. (2005). Taking turns and talking ties: Networks and conversational interaction. *American Journal of Sociology, 110*, 1561–1597.

Godart, F., & White, H. (2010). Switchings under uncertainty: The coming and becoming of meanings. *Poetics, 38*, 567–586.

Gschnitzer, F., Koselleck, R., Schönemann, B., & Werner, K. F. (1992). Volk, Nation, Nationalismus, Masse. *Geschichtliche Grundbegriffe: Historisches Lexikon zur politisch-sozialen Sprache in Deutschland, 7*, 141–431.

Hansen, M. E., & Debus, M. (2012). The behaviour of political parties and MPs in the parliaments of the Weimar Republic. *Party Politics, 18*, 709–726.

Heritage, J., & Clayman, S. (2010). *Talk in action; Interactions, identities, and Institutions.* Chichester: Wiley-Blackwell.

Hinde, R. (1976). Interactions, relationships and social structure. *Man, 11*, 1–17.

Jurafsky, D., & Martin, J. (2018). *Speech and language processing.* Chapter 6, Available at: https://web.stanford.edu/~jurafsky/slp3/ (last accessed: 15.02.2019).

Kitts, J. (2014). Beyond networks in structural theories of Exchange: Promises from computational social science. *Advances in Group Processes, 31*, 263–298.

Kolb, E. (2005). *The Weimar Republic.* Abingdon: Routledge.

Kossinets, G., & Watts, D. (2009). Origins of homophily in an evolving social network. *American Journal of Sociology, 115*, 405–450.

Kroeber, A., & Parsons, T. (1958). The concepts of culture and of social system. *American Sociological Review, 23*, 582–583.

Lauderdale, B., & Herzog, A. (2016). Measuring political positions from legislative speech. *Political Analysis, 24*, 374–394.

Lee, M., & Martin, J. L. (2018). Doorway to the dharma of duality. *Poetics, 68*, 18–30.

Leifeld, P. (2013). Reconceptualizing Major policy change in the advocacy coalition framework. A discourse network analysis of German pension politics. *The Policy Studies Journal, 41*, 169–198.

Light, R. (2014). From words to networks and Back: Digital text, computational social science, and the case of presidential inaugural addresses. *Social Currents, 1*, 111–129.

Mark, N. (2003). Culture and competition: Homophily and distancing explanations for cultural niches. *American Sociological Review, 68*, 319–345.

Martin, J. L. (2009). *Social structures.* Princeton: Princeton University Press.

McLean, P. (1998). A frame analysis of favor seeking in the renaissance: Agency, networks, and political culture. *American Journal of Sociology, 104*, 51–91.

McLean, P. (2011). Patrimonialism, elite networks, and reform in late-eighteenth-century Poland. *The Annals of the American Academy of Political and Social Science, 636*, 88–110.

Mergel, T. (2002). *Parlamentarische Kultur in der Weimarer Republik.* Droste: Düsseldorf.

Mische, Ann (2003). Cross-talk in movements: reconceiving the culture-network Link. In Mario Diani, & Doug McAdam (Eds.). *Social movements and networks* (pp. 258–280). Oxford: Oxford University Press.

Mische, A., & White, H. (1998). Between conversation and situation: Public switching dynamics across network domains. *Social Research, 65*, 695–724.

Mohr, J. (1994). Soldiers, mothers, tramps, and others: discourse roles in the 1907 New York charity discourse. *Poetics, 22*, 327–357.

Mohr, J. (1998). Measuring meaning structures. *Annual Review of Sociology, 24*, 345–370.

Mohr, J., & Duquenne, V. (1997). The duality of culture and practice: Poverty relief in New York City, 1888-1917. *Theory and Society, 26*, 305–356.

Moody, J. (2004). The structure of a social science collaboration network: Disciplinary cohesion from 1963 to 1999. *American Sociological Review, 69*, 213–238.

Papachristos, A. (2009). Murder by structure: Dominance relations and the social structure of gang homicide. *American Journal of Sociology, 115*, 74–128.

Parsons, T. (1977). *Social systems and the evolution of action theory.* New York: Free Press.

Peukert, D. ([1987] 1992). The Weimar Republic: The crisis of classical modernity. New York: Hill and Wang.

Proksch, S.-O., & Slapin, J. (2015). *The politics of parliamentary debate.* Cambridge: Cambridge University Press.

Roth, C., & Cointet, J.-P. (2010). Social and semantic coevolution in knowledge networks. *Social Networks, 32*, 16–29.

Rule, A., Cointet, J.-P., & Bearman, P. (2015). Lexical shifts, substantive changes, and continuity in State of the Union discourse, 1790-2014. *Proceedings of the National Academy of Sciences, 112*, 10837–10844.

Salton, G. (1979). Mathematics and information retrieval. *Journal of Documentation, 35*, 1–29.

Slapin, J., & Proksch, S.-O. (2008). A scaling model for estimating time-series party positions from texts. *American Journal of Political Science, 52*, 705–722.

Slez, A., & Martin, J. L. (2007). Political action and party formation in the United States constitutional convention. *American Sociological Review, 72*, 42–67.

Somers, M. (1994). The narrative constitution of identity: A relational and network approach. *Theory and Society, 23*, 605–649.

Tilly, C. (1997). Parliamentarization of popular contention in Great Britain, 1758-1834. *Theory and Society, 26*, 245–273.

van Atteveldt, C. M., & Welbers, K. (2017). Being apart together: Convergence and divergence in the Field of Dutch politics. *Research in the Sociology of Organizations, 53*, 49–64.

White, H. (1992). *Identity and control.* Princeton: Princeton University Press.

White, H., & Godart, F. (2007). Stories from identity and control. *Sociologica, 3.* https://doi.org/10.2383/25960 2007.

Yeung, K.-T. (2005). What does love mean? Exploring network culture in Two network settings. *Social Forces, 84*, 391–420.

Zelizer, Viviana (2005). *The Purchase of Intimacy.* Princeton: Princeton University Press.

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