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German 'LexIconSpace': Policy Positions and their Legislative Context

THOMAS KÖNIG and BERND LUIG

This article presents a new approach for estimating the policy positions of political actors in the German multi-party policy space. The approach consists of two steps, 'smart tagging' in the data generation process and Bayesian factor analysis in the estimation process. 'Smart tagging' relates the statements of political parties and governments to the keywords of German federal legislation, which we use to estimate the policy positions in portfolio-specific n-dimensional policy spaces. Our G-LIS approach (German 'LexIconSpace') provides several advantages for scholars evaluating policy-seeking theories, in particular by providing context-related variation of policy positions across portfolios and over time. Our findings for the portfolio of 'labour and social policy' reveal a two-factor solution which unfolds a latent 'resource' and 'value' dimension in Germany during the period from 1961 to 2009. We find changes in the policy positions of German political parties and governments, which existing approaches can hardly identify in n-dimensional spaces under the specification of the error term for each dimension and actor.

POLITICAL CONTENT AND CONTEXT

Competition among political parties is central for studies on parliamentary democracies and legislatures. Political parties represent and campaign for the interests of their voters, they have a mandate for government formation, and they support or reject legislative bills which implement the interests of their voters. As in other parliamentary democracies, the analysis of political competition in Germany – whether this analysis is about voting in elections, forming coalitions, distributing government portfolios or legislative decision making – requires the identification of the policy positions of the political actors. In the German multi-party system, this identification is a challenge because the positions of the political actors are often located in n-dimensional policy spaces, which can vary across portfolios and over time. A typical example for such variation is the recent development in the German multi-party system, in which the location of an increasing number of political parties is decisive for government formation. But even in times of stable coalition government, we find variation in policy making across portfolios, i.e. when the second Red–Green government (from 2002 to 2005) was able to make significant policy change in the 'labour and social policy' portfolio, while the reform of finance policy failed under the same conditions of different majorities in the German Bundestag and Bundesrat. This suggests that the positions of political actors vary across portfolios and also over time.[1]

For Germany, we currently find several data sources for estimating the policy positions of political parties and governments.[2] Apart from surveys and expert judgments,[3] which are often based on political scientists' evaluation on a priori defined policy scales, several approaches exist for measuring political actors' positions more reliably by document analysis, which range from hand-coding procedures (i.e., Comparative Manifestos Project (CMP))[4] to computer-based analyses (i.e., 'Wordscores'[5] and 'Wordfish').[6] Compared to expert survey estimates, which are sensitive to the period under investigation and only cover a selected set of policy scales with limited variation over time, these procedures have several advantages, such as greater reliability of estimates and more variation on these scales over time. Nevertheless these approaches also use expert insight for estimating policy positions: the CMP approach affords hand-coding expertise by trained coders, while 'Wordfish' requires dividing up the manifestos, 'Wordscores' analyses use expert scores or rely on CMP scores for reference texts in order to estimate the policy positions in 'virgin' manifestos. Most importantly, although the 'Wordscores' and 'Wordfish' techniques refer to word counts extracting statements from the same documents, they differ considerably in their ordering of the political actors in Germany, particularly with regard to the Liberals (Free Democratic Party, FDP). So, a closer inspection of the computer-based approaches is warranted.

On closer examination of the data generation process, existing techniques remain remarkably context-free when gathering data on the statements of political parties and governments.[7] Although the variation in the textual length of these documents already indicates that these statements may serve different purposes, current procedures take into account each programmatic statement in party manifestos and government declarations. This context-free data generation process is particularly surprising because the location of policy positions is mainly interpreted and applied in a policy-seeking framework which assumes that political parties act 'as if' they are committed to implementing their policy positions in parliament. But when making inferences by these policy positions on forming coalitions, distributing government portfolios and legislative decision making, considering all statements regardless of political content and judgmental context may risk severe selection bias.

On closer inspection of the estimation process, existing procedures also make strong assumptions on the portfolio-specificity and ideological dimensionality of the policy space in the German multi-party system. For example, the CMP procedure relates the party manifestos to 56 a priori defined categories, from which some categories are often reduced to a single left–right scale as a kind of randomly selected dimension for German politics across all portfolios.[8] Similarly, researchers using 'Wordscores' and 'Wordfish' define the number of policy dimensions exogenously and then relate the estimates of these scales to respective portfolios. The 'Wordfish' technique requires manually dividing up manifestos (horizontally) into policy sections in order to provide estimates for each section, while the 'Wordscores' technique (vertically) applies expert scores on different ideological policy scales to the whole manifestos. Because of the a priori restrictions of the portfolio specificity on the one hand and the ideological dimensionality on the other, these approaches actually present one-dimensional and incomparable solutions. In our view, these restrictions of the policy space in the German multi-party system are particularly relevant for

testing policy-seeking theories because the 'winset' comprises all alternatives which can provide for majorities in coalition building and policy change.

To sum up, both the data generation process and the estimation process of current computer-based techniques risk distorting the explanatory power of theoretical approaches relating to 'making and breaking governments'[9] and 'gridlock analysis'[10] in Germany. Our G-LIS (German 'LexIconSpace') approach relies on a dictionary-assisted contextual procedure which is particularly suited for testing policy-seeking theories of coalition politics and legislative behaviour. To enhance the data generation process, we therefore propose to link the extraction of statements in party manifestos and government declarations to the keywords found in the portfolios of the German legislative database. This 'smart tagging' procedure considers the purpose for which these statements are made, which will improve the ability to make legitimate inferences from the operationalisation to the theoretical construct on which this operationalisation is based. In addition to enhancing the data generation process, we also propose an alternative estimation procedure, which distinguishes between the jurisdictional and ideological perspective. While the jurisdictional perspective classifies the statements according to the 'department principle' (ministerial responsibility) into 14 German portfolios, we introduce five cleavages, by which we account for the ideological statements of political parties and governments. Finally, we estimate the policy space of portfolio-specific positions by these ideological statements which can vary across portfolios and over time.

LEGISLATIVE KEYWORDS AND THEMATIC PORTFOLIOS

For a context-related data generation process, G-LIS starts with the specification of the legislative context for each portfolio and searches for the statements in party manifestos and government declarations. For Germany, we collected information from the manual and electronic documentation systems for parliamentary affairs of the German Bundestag which contain the characteristics of each legislative initiative, independent from initiator and success. Our period of study starts with the 4th (from 1961) and ends with the 16th legislative term (to 2009). Because the amount of legislative activities may influence the likelihood of finding statements in the documents, a brief summary reveals that legislative activities significantly increased after German reunification, while they were unsurprisingly lower during the 15th legislative term due to the breakdown of the coalition government (similar to the 9th legislative term). Note that the documentation of the legislative activities in the current 16th legislative term is still incomplete. Table 1 lists the number of proposals and the source of information.[11]

The variation in legislative activities does not necessarily distort the G-LIS procedure, which relies on legislative keywords. We extracted the keywords from the texts of the title and the content summary as well as the respective main and secondary notions of each legislative proposal, which we transcribed or (for most cases) downloaded from the online services (DIP) and transformed into text files.[12] Using the 'Document Conversion Wizard' from 'Simstat/WordStat'[13] we translated these files and extracted the textual variables. Thereby, we can distinguish between the portfolio (Sachgruppe) and the thematic classification (Sachgebiet),[14] the legislative term and the GESTA number for each proposal.

TABLE 1
GERMAN FEDERAL LEGISLATION

Legislative term (LT)	Number of proposals (with available data)	Source
LT 4 (1961–65)	548	'proceedings'/manual coding
LT 5 (1965–69)	639	'proceedings'/manual coding
LT 6 (1969–72)	512	'proceedings'/manual coding
LT 7 (1972–76)	702	'proceedings'/transcription
LT 8 (1976–80)	512	DIP/GESTA
LT 9 (1980–83)	280	DIP/GESTA
LT 10 (1983–87)	617	DIP/GESTA
LT 11 (1987–90)	689	DIP/GESTA
LT 12 (1990–94)	907	DIP/GESTA
LT 13 (1994–98)	1019	DIP/GESTA
LT 14 (1998–02)	1013	DIP/GESTA
LT 15 (2002–05)	763	DIP/GESTA
LT 16 (2005–09)	803 (31 Dec. 2008)	DIP 21 (GESTA 22 Aug. 2007)
From LT 4 to LT 16	Sum: 9004	

For each legislative term, we stored the textual information in the respective port-folio. We thereby removed duplications and items contained on a standardised list. This exclusion list contains all words with little semantic content (i.e., articles, pronouns, prepositions, junctors, numeralia, quantors etc.) and little ideological meaning (i.e., proposal, measure, implementation, etc.). Based on frequency, we exclu-sively stored each word into a single thematic portfolio. Furthermore, all the remaining portfolio words received wildcards in order to expand the thematic wordbook by means of prefixes and suffixes. An alternative procedure would be a probabilistic storage of words and exclusions by means of 'WordNet'[15] and 'GermaNet',[16] which we will con-sider in the future. Table 2 illustrates both the compilation and the application of the thematic portfolio wordbook.

The 'labour and social policy' portfolio includes several themes ('Sachgebiete') which refer to the respective ministerial responsibilities, i.e. labour law, social welfare, etc. These thematic classifications define the subcategories of the portfolio wordbook, in which each word is directly assigned to the thematic classification (including a residual classification). Compared to the share of 'labour and social policy' proposals which accounted for 11 per cent of all legislative activities in the 16th legislative term, the respective legislative keywords cover more than 20 per

TABLE 2
THEMES, EXEMPLIFIED BY THE 'LABOUR AND SOCIAL POLICY' DOMAIN (LT16)

'Labour and social policy'

– labour law/labour protection – employment promotion – social law
– social welfare – basic social care – social insurance
– unemployment insurance – state pension insurance – state accident insurance
– other categories

Percentage of legislation	Percentage of text sentences
LT 16: 11.0	LT 16: 21.8

cent of the text sentences found in party manifestos and government declarations. In other words, more than one-fifth of the set of all sentences contain at least one 'labour and social policy' keyword.

The text documents comprise all election programmes of the Christian Democratic Union/Christian Social Union of Bavaria (CDU/CSU, Union),[17] the Social Democratic Party (SPD) and the Free Democratic Party (FDP) until the ninth legislative term. For the period beginning in 1983, we included the Greens (since reunification Alliance'90/The Greens),[18] and after 1990 we also considered the Party of Democratic Socialism (PDS, now 'The Left'). Seventeen grand government declarations – which are usually presented by the Chancellor after elections[19] and of which 13 were made at the beginning of legislative terms – complete the list of text documents.[20] For the textual analysis of these documents, scholars find different sources of information, namely the original party texts (respectively their scans) which are usually stored by the party foundations' archives, word files (resulting from optical character recognition (OCR) scans) provided by the Data Archive for Social Sciences (GESIS – Leibniz Institute for Social Sciences), and text files (with considerable changes) from the Social Science Research Centre Berlin (WZB). The WZB files are already standardised for qualitative exploration, while the GESIS files (collected in collaboration with the VU University of Amsterdam, NWO project 480-42-005) contain digitalised originals with some OCR-reading deficiencies.

We used these OCR files but removed their main deficiencies.[21] Regarding the grand government declarations, the WZB files required extensive manual reconstruction. Since G-LIS uses the sentence of each text as the unit of the computer-assisted analysis, we also had to eliminate all special characters which do not limit a sentence (abbreviations, dates, etc.). Furthermore, we had to drop headers and footnotes without content as well as preambles and indices. Like the legislative content, we transformed the party election programmes and government declarations into the dBase format (DBF) by using 'Simstat/Wordstat', which also allowed for checking the correct spelling of each word according to the German spelling reform of 1996. Appendix I lists the 68 analysed text documents and their length, which is the best standard for comparison.[22]

THE POLICY SPACE – PORTFOLIOS AND CLEAVAGES

Our goal is to identify the policy positions of political parties and governments in n-dimensional portfolio-specific policy spaces, which can change over time. In n-dimensional policy spaces, such changes can have two reasons, a change in the portfolio-specific ideological statements and in the relevance of the dimensions, on which these statements are made. Our procedure is intended to produce disambiguation in the literal sense when accounting for programmatic statements.[23] We therefore distinguish between a jurisdictional (portfolio-specific) and an ideological (cleavage-related) perspective.[24] The jurisdictional perspective differentiates the thematic portfolios under ministerial responsibility. In Germany, we find 14 portfolios that correspond to the competencies of the federal ministries in the 16th legislative term.[25] Furthermore, we define a priori five cleavages according to which actors make ideological statements in each portfolio.[26] In addition to the consideration of their relevance, a major reason for this

distinction is that we are interested in the variation of policy positions over time (within each portfolio) which requires the use of a constant element in our analysis.

Theoretically, as opposed to using a single left–right cleavage, we consider five cleavages for the characterisation of the German multi-party system.[27] This cleavage structure has often been described in macro-political analyses of modern party systems, i.e. Lipset and Rokkan explain the origins of modern party systems by historical cleavages, such as centre versus periphery, church versus state, urban versus rural and capital versus labour.[28] For the German multi-party system, these cleavages follow the central characteristics of the post-modern 'democratic constitutional state' in the Western world. These characteristics concern collective decision making on matters of internal sovereignty (state), external orientation (Western world), civil freedom (constitution) and distribution (democracy). Considering the most recent cleavage on the quality of life, we can overall identify five cleavages which characterise the ideological structure of legislative decision making in Germany:[29]

- having the internal organisation of the state as its focus, the first cleavage distinguishes between a centralised and decentralised structure (organisational cleavage, oc);
- the second cleavage refers to the nationhood and external relations of the state which can vary in the degree of Western orientation/integration (national cleavage, nc);
- the third cleavage concerns budgetary affairs and distinguishes between expansive and restrictive public financing (budgetary cleavage, bc);
- the degree of civil freedom relates to the fourth cleavage which discerns between a progressive and a conservative orientation in that respect (societal cleavage, sc);
- the fifth cleavage refers to the quality of life and distinguishes between consumptive and sustainable orientations (consumption cleavage, cc).

The impact of this cleavage structure may differ from portfolio to portfolio and vary over time as the relative importance of these cleavages changes due to the number of actors' statements available, which we seek to unfold by using Bayesian factor analysis.[30] Hence, although G-LIS classifies ideological statements according to five a priori-defined cleavages, it neither predetermines the number of dimensions of the policy space, nor the relevance of each cleavage over time. As a result, two components will affect the identification of policy positions, the portfolio-specific ideological statements and the relevance of each cleavage, both within each portfolio and over time. Table 3 summarises our specification of the portfolios and the ideology in the portfolios for the 16th legislative term (LT). The cleavage shares result from dividing the number of an actor's ideological statements on one cleavage by the total of ideological statements per portfolio, calculated by the mean across all actors.

The G-LIS conceives of the German multi-party policy space as having 14 portfolios and five cleavages. For the portfolio on 'labour and social policy', we identify a dominance of the budgetary cleavage (i.e., direct spending and regulation), followed by the societal cleavage (i.e., gender mainstreaming, immigrants' labour market), the organisational cleavage (federal, state and local implementation of law), the consumption cleavage (i.e., job creation) and the national cleavage (i.e., international agreements). Empirically, this cleavage structure varies across the portfolios and

TABLE 3
PORTFOLIOS AND CLEAVAGES DURING THE 16TH LEGISLATIVE TERM (%)

Portfolio		Cleavage				
		oc	nc	bc	sc	cc
1	Labour and Social Policy	10	2	57	25	6
2	Foreign Policy	18	38	33	7	4
3	Education/Research Policy	7	2	58	32	1
4	Development Policy	10	11	62	13	4
5	Finance Policy	20	1	60	16	3
6	Family Policy	3	1	52	43	1
7	Health Policy	8	1	63	23	5
8	Interior Policy	11	3	39	45	2
9	Justice Policy	10	2	35	54	1
10	Agricultural Policy	5	2	69	4	20
11	Environment Policy	9	2	31	5	53
12	Transport/Building Policy	5	1	75	2	17
13	Defence Policy	4	31	51	3	11
14	Economic/Technology Policy	7	6	66	9	12

over time. With respect to the last legislative term, we find that a single cleavage can hardly explain the overall cleavage structure, which means that a one-dimensional solution would risk providing a biased picture.

IDEOLOGICAL CONTEXT TERMS AND CLEAVAGES

To identify the ideological context terms on each cleavage, we accounted for a positive-demanding or negative-critical attitude by each statement. For example, we distinguished between 'mass purchasing power' (*Massenkaufkraft*) and 'social marginalisation' (*soziale Ausgrenzung*) for a budgetary expansive context term as well as between 'pursuit of happiness' (*streben nach Glück*) and 'levelling' (*Gleichmacherei*) for the budgetary restrictive context term. Hence, each ideological context term is characterised by a double dichotomy, a dichotomy regarding the ideological extremes and the basic type of each context term. In addition to adjectives, adverbs, verbs and nouns, G-LIS also considered verbal terms as exposing ideological context terms, while excluding words with a neutral meaning from the analysis. The identification of the context terms was done for each legislative term with respect to each portfolio. It started with the exclusion of words with a neutral meaning, then distinguished between the type of context terms (positive-demanding or negative-critical), eventually identified the conflict structure and finally registered the ideological pole.[31]

Using party manifestos and government declarations, we counted ideological statements in 'WordStat' when a portfolio word matched with a context term in the unit of analysis, the original sentence in the text documents. A simple measure for the quality of the G-LIS procedure is the degree of textual coverage which results from the share of sentences, for which either a legislative context, an ideological context term or the match (an individual preference) can be identified. Ideally, this rate is expected to be independent across both legislative terms and actors. Table 4 lists all coverage rates per legislative term (LT).

TABLE 4
COVERAGE RATES ACROSS ALL POLICY AREAS (%)

Legislative term (LT)	Portfolio wordbook	Ideology wordbook	Preferences (matches)
LT 4 (1961–65)	85	92	81
LT 5 (1965–69)	84	94	80
LT 6 (1969–72)	88	95	84
LT 7 (1972–76)	85	95	83
LT 8 (1976–80)	89	92	85
LT 9 (1980–83)	88	95	87
LT 10 (1983–87)	88	93	86
LT 11 (1987–90)	87	91	85
LT 12 (1990–94)	89	94	86
LT 13 (1994–98)	88	94	83
LT 14 (1998–02)	88	93	84
LT 15 (2002–05)	89	95	85
LT 16 (2005–09)	86	91	83

Empirically, the ideological context terms have the highest coverage rates (at least 91 per cent across all policy areas), but even the contextual matches between portfolio words and ideological words (preferences) did not fall below an 80 per cent coverage rate. In order to consider the length of each sentence (thus trying to prevent a dominant influence of lengthy sentences), we standardised the matches per sentence. This means that the impact of ideological statements is related to each sentence and a single ideological statement within a sentence has the highest value of 1.0.

Statements calling for a decentralised state structure, Western integration, restrictive public financing, a conservative orientation and consumptive behaviour are defined as positive, while statements pronouncing support for a centralised state structure, rejection of Western integration, support for expansive public financing, progressive orientation and sustainable behaviour are defined as negative. For each cleavage, we subtract the number of negative statements from the number of positive statements, which we divided by the total number of statements. This calculation produces standardised actor-specific values for each portfolio-specific cleavage per legislative term which range between (-1) and $(+1)$. These values provide the basic information on the ideological statements which we reduce by Bayesian factor analysis for each portfolio. Our Gauss procedure relies on two-factor Bayesian statistics with possible weights within the Gibbs sampler and Varimax-rotation of the posterior distribution.[32] This enables us to distinguish between a solution without weights, a solution with consideration of the separability of the cleavages in the respective portfolio and a solution with weighting of the saliency of the cleavages.[33] The graphical representation of our findings is standardised for values from (-1) to $(+1)$ and illustrated with Stata.

THE TWO-DIMENSIONAL 'LABOUR AND SOCIAL POLICY' PORTFOLIO

Figure 1 illustrates the unweighted solution of the Bayesian factor analysis for the German 'labour and social policy' domain. The total explained variance by the two-factor solution covers 97.1 per cent. Each factor accounts for almost the same share of explained variance in all solutions. In the 'labour and social policy' portfolio the

FIGURE 1
UNWEIGHTED SOLUTION, STANDARDISED FACTOR SCORES IN POLICY AREA 1 'LABOUR
AND SOCIAL POLICY' (ALL LT)
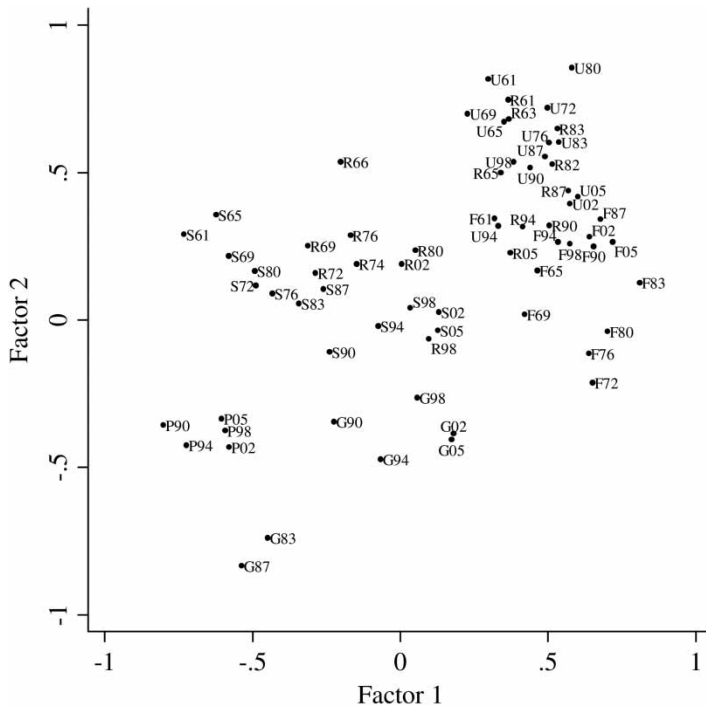
first factor is mainly influenced by the budgetary cleavage, whereas the second factor is mostly determined by the societal cleavage. Accordingly, we label the first factor as the 'resource' dimension of the policy space with a stronger/weaker state involvement on the left/right (negative/positive) side, while the second factor refers to the 'value' dimension of the policy space with a 'new'/traditional value orientation on the left/right (negative/positive) side. The 68 cases (51 party election programmes and 17 grand government declarations) are listed by U = Union, S = SPD, F = FDP, G = 'The Greens', P = former PDS and the federal government = R, in combination with the election year or the year of the government's inauguration respectively.[34]

For the German 'labour and social policy' domain, we can generally identify regional clusters of political parties over time with some variation in their cohesiveness. The PDS positions are located close together with negative scores on both dimensions, pointing to the party's stable ideological isolation in the political spectrum. Compared to the PDS, the Greens move into the centre over time, in particular by relaxing their state-expanding position on the 'resource' dimension. The SPD positions also indicate some change: the party continuously pursues a more moderate position on the 'value' dimension, while simultaneously having moved into the centre since the mid-1990s on the 'resource' dimension. This suggests that both parties moved towards the 'liberal' economic camp. The positions of the Union and FDP reveal

highly positive scores: The FDP prefers a weaker state involvement with respect to the 'resource' dimension, while the Union opposes to 'new' attitudes with respect to the 'value' dimension. Government positions are rarely located in the centre of the policy space, but often in between the positions of the coalition partners. On closer inspection, the 1980 government position, the position of a government that was to break down in 1982, reveals a large gap between the SPD position (S80) and the FDP position (F80) on the first factor, but a small gap on the second factor.

In addition to the standard solution illustrated above, G-LIS can also consider the separability of cleavages. Separability is provided when an ideological statement only occurs on one cleavage per sentence. This might be an important feature when the unit of analysis is a sentence that contains different, and sometimes opposing ideological statements. Hence, we measure separability by determining the percentages of 'purity' as the percentages of sentences in the programmes in which only particular statements with respect to one cleavage appear. Figure 2 depicts the 'separability sol-ution', which explains 96.7 per cent of the total (original) variance. Although Figure 2 is very similar to the figure presenting the original solution, the cohesiveness of the PDS cluster is lower, particularly due to the outlier in 1990 (P90).

The G-LIS also enables us to identify the relative importance of each ideological cleavage within each portfolio. Figure 3 shows how the consideration of this additional

FIGURE 2
SEPARABILITY-WEIGHTED SOLUTION, STANDARDISED FACTOR SCORES IN POLICY AREA 1
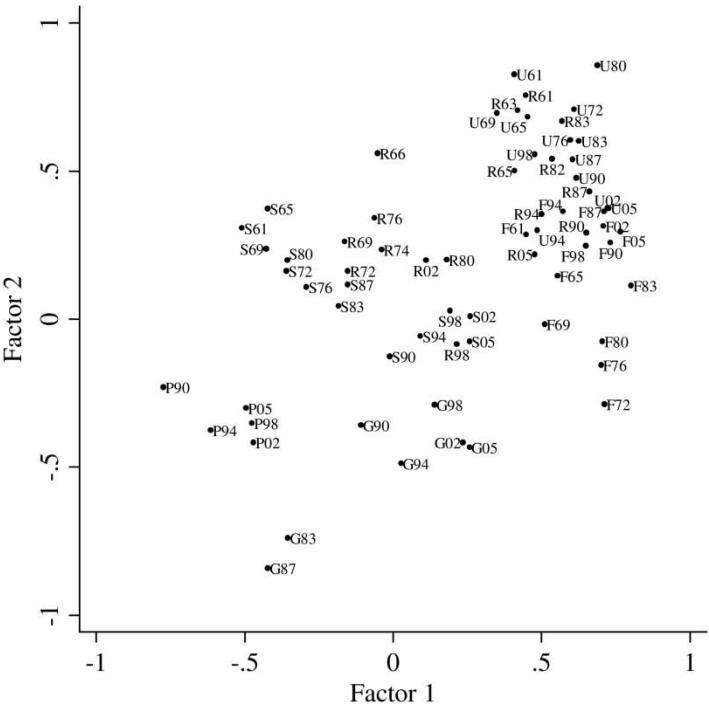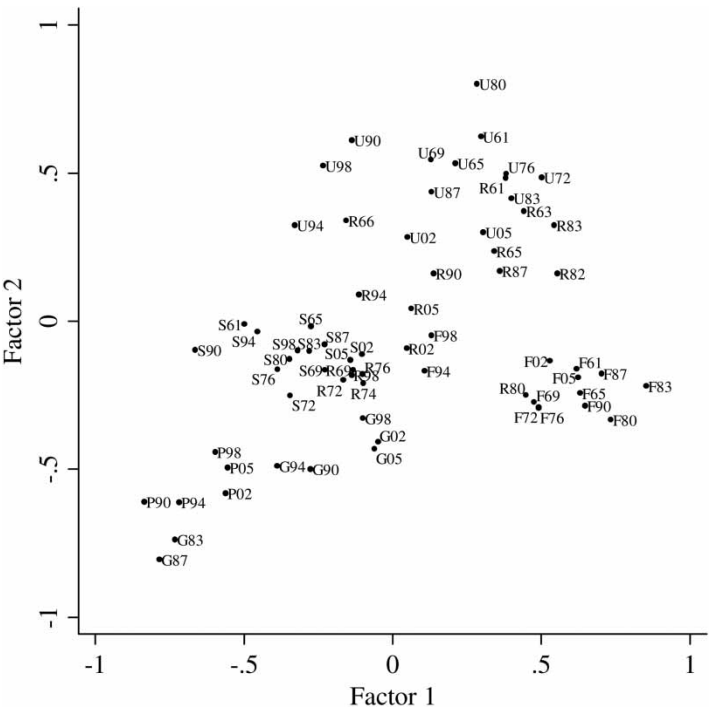'LABOUR AND SOCIAL POLICY' (ALL LT)

FIGURE 3
SALIENCE-WEIGHTED SOLUTION, STANDARDISED FACTOR SCORES IN POLICY AREA 1
'LABOUR AND SOCIAL POLICY' (ALL LT)

information affects the solution. Compared to previous solutions, the explained variance (of the original data structure) slightly decreases to 91.0 per cent. Again, the first factor refers to the 'resource' and the second factor to the 'value' dimension. The weighted solution provides a more cohesive cluster of FDP and SPD positions (outlier in 1990), while the Union's positions show a higher degree of variance. Weighting the cleavages also assimilates the positions of PDS and Greens during the earlier legislative terms. Government positions are now located in the centre of the policy space and clearly reflect the coalitional composition.

To provide an even more detailed analysis of the weighted solution, Figure 4 presents the factor loadings and the error terms for each legislative term. The capped spikes (I-beams) illustrate the upper and lower 95 per cent confidence intervals of the factor loadings. Accordingly, the budgetary cleavage (bc) dominates the first factor and provides a relatively clear arrangement on the 'resource' dimension, while the societal cleavage (sc) is the most important cleavage for the second factor with a similar impact on the 'value' dimension. The organisational cleavage (oc) has a higher loading on the first factor, while the national (nc) and the consumption cleavage (cc) load on both factors. In particular, the cleavages cc and nc seem to share similar patterns, perhaps resulting from the post-war 'peace and environment movement'.

In Figure 5 we extract the policy positions of the legislative actors in the 14th legislative term (from 1998 to 2002) from the weighted solution and display their

FIGURE 4
SALIENCE-WEIGHTED SOLUTION, FACTOR LOADINGS IN POLICY AREA 1 'LABOUR AND
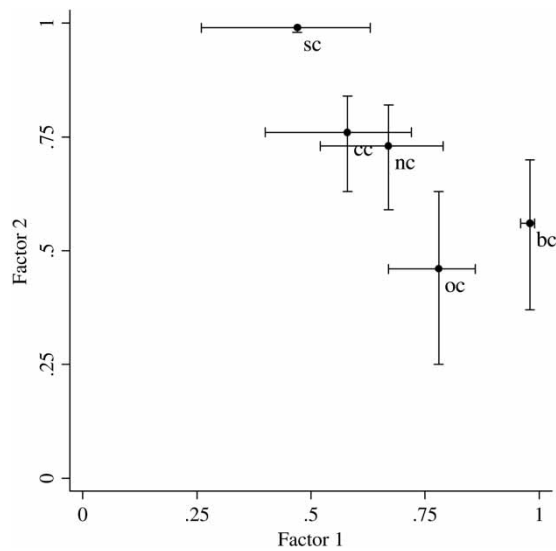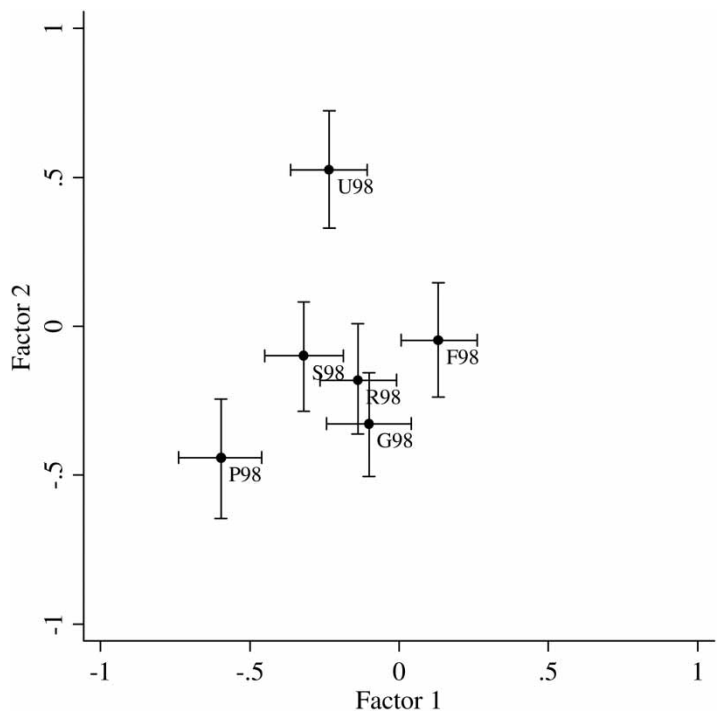SOCIAL POLICY' (ALL LT)

FIGURE 5
SALIENCE-WEIGHTED SOLUTION, STANDARDISED FACTOR SCORES IN POLICY AREA 1
'LABOUR AND SOCIAL POLICY' (LT 14)

scores with the upper and lower 95 per cent confidence intervals. In this term, the SPD (S98) and Greens (G98) formed their first coalition government under Chancellor Gerhard Schröder. The government position (R98) is located in between the intervals of the coalition parties with respect to both factors. The Greens pursue a policy which is located to the right of both SPD and Union (U98) positions on the 'resource' dimension. The FDP (F98) adopts the most extreme position to the right on this dimension, whereas the Union assumes the most traditional position on the 'value' dimension. Although the PDS (P98) is the most leftist party, five of six actors prefer a stronger state with respect to the 'resource' dimension.

The constellation of actors in the 15th legislative term (from 2002 to 2005) is illustrated in Figure 6. In 2002, the Red–Green coalition was re-elected. However, in contrast to the prior legislative term, the government position (R02) has become more moderate on both dimensions, in particular on the first 'resource' dimension. The SPD (S02), Union (U02) and FDP (F02) have also moved to the right of the 'resource' dimension, while the Union became more centrist on the 'value' dimension. The noticeable proximity between the Red–Green government and the Union as the leading opposition party may have promoted the reform activities during this 15th legislative term in the 'labour and social policy' domain (see the so-called Hartz legislation).

FIGURE 6
SALIENCE-WEIGHTED SOLUTION, STANDARDISED FACTOR SCORES IN POLICY AREA 1
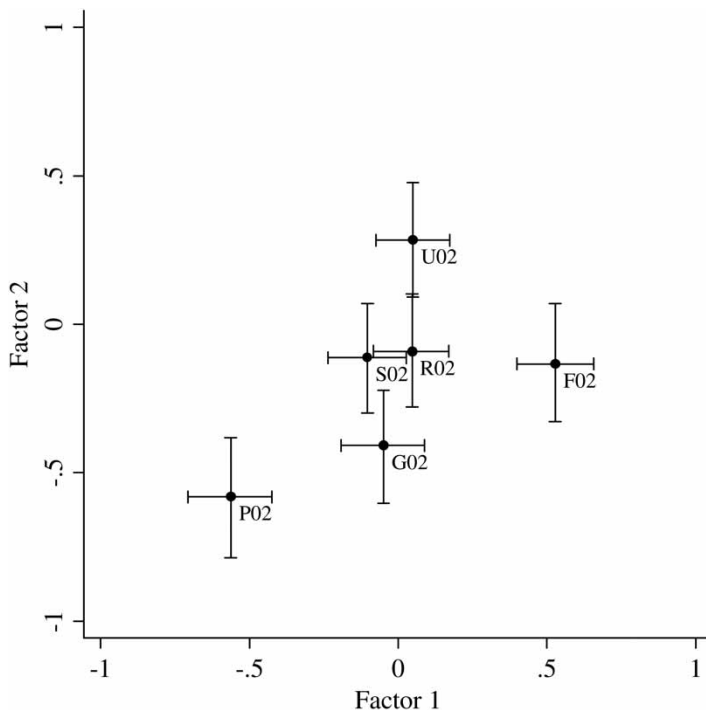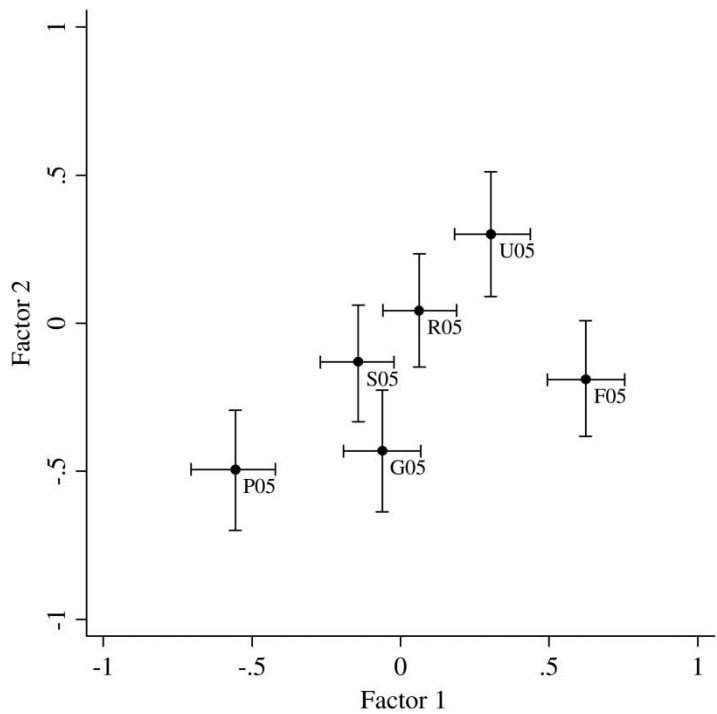'LABOUR AND SOCIAL POLICY' (LT 15)

   The outcome of the Bundestag elections in 2005 led to a 'grand coalition' between Union and SPD. At first sight, the Union (U05) has moved sharply to the right on the 'resource' dimension towards the FDP position (see Figure 7). Furthermore, the government position (R05) is now located inside the large intervals between the SPD (S05) and the Union positions (U05). Note that the S05 position is a bit closer to the R05 position. This reflects the portfolio allocation, not the Chancellorship in general (held by the CDU Chancellor Angela Merkel). The SPD has occupied the 'labour and social policy' portfolio in the three legislative terms from 1998 to 2009. However, the government positions in the 14th and 15th legislative terms are not located closer to the SPD position regarding the important resource factor. This raises the question as to whether the median voters in the bicameral system or other factors are of explanatory value.

DISCUSSION

In this article we introduced a new method of estimating policy positions which relates the legislative context to the measurement of the policy positions of political parties and governments in distinct portfolios. A second innovation of G-LIS concerns the empirical identification of the policy space of the German multi-party system. Existing approaches – whether they use manual or computerised coding procedures – usually

predetermine the policy space by reducing it to a single dimension, while G-LIS finds a two-dimensional solution. This is particularly relevant for testing policy-seeking theories because the dimensionality of the policy space is likely to change the size of the 'winset' that comprises all alternatives which can provide for majorities in coalition building and policy change.

Methodologically, the G-LIS approach intends to increase the validity of the measurement of actors' positions by basically distinguishing between a jurisdictional and an ideological perspective. It extracts the keywords from legislative proposals which we functionally classified according to portfolios and themes. These portfolio wordbooks are then matched with documents such as party election programmes and grand government declarations which contain actors' statements on five cleavages with ideological context terms. Finally, these cleavage-specific ideological statements are analysed by using Bayesian factor analysis which identifies actors' policy positions in the policy space of each portfolio. We have shown that these policy positions may change not only due to a change in the ideological arrangement of their statements. They can also vary because the relative importance of the cleavage structure, comprising ideological statements on the organisation of the state, external relations, budgetary affairs, civil freedom and consumption, may alter. When a particular cleavage with different ideological arrangement becomes more relevant within a portfolio, an actor's location with respect to this cleavage will change.

And, finally, we have also pointed out that the cleavage structure in the portfolio on 'labour and social policy' can be represented by a two-factor solution with a 'resource' and a 'value' dimension. The G-LIS can reflect the relative importance of each cleavage stressing the budgetary arrangement in the portfolio of 'labour and social policy', while a 'separability solution' only accounts for ideological statements when they relate to a single cleavage. On closer inspection of the policy positions adopted by actors, most political parties reveal cohesive positions over time, while government positions are often located in-between those of the coalition partners. This will allow us to test models of 'making and breaking governments' and theories of legislative behaviour, which assume a policy-seeking motivation of political parties and governments.

NOTES

1. See Reimut Zohlnhöfer, *Die Wirtschaftspolitik der Ära Kohl. Eine Analyse der Schlüsselentscheidungen in den Politikfeldern Finanzen, Arbeit und Entstaatlichung 1982–1998* (Opladen: Leske und Budrich, 2001); Christoph Egle, Tobias Ostheim and Reimut Zohlnhöfer (eds.), *Das rot–grüne*

Projekt: Eine Bilanz der Regierung Schröder 1998–2002 (Wiesbaden: Westdeutscher Verlag, 2003); Manfred G. Schmidt and Reimut Zohlnhöfer (eds.), *Regieren in der Bundesrepublik Deutschland. Innen- und Außenpolitik seit 1949* (Wiesbaden: Verlag für Sozialwissenchaften, 2006); Christoph Egle and Reimut Zohlnhöfer (eds.), *Ende des rot–grünen Projektes: Eine Bilanz der Regierung Schröder 2002–2005* (Wiesbaden: Verlag für Sozialwissenschaften, 2007).

2. See Hans-Dieter Klingemann, 'Election Programs in West Germany: Explorations in the Nature of Political Controversy', in Ian Budge *et al.* (eds.), *Ideology, Strategy and Party Change* (Cambridge: Cambridge University Press, 1987), pp.294–323; Hans-Dieter Klingemann and Andrea Volkens, 'Coalition Government in the Federal Republic of Germany: Does Policy Matter?', in Michael Laver and Ian Budge (eds.), *Party Policy and Government Coalitions* (Basingstoke: Macmillan, 1992), pp.189–222; Thomas König, Andrea Volkens and Thomas Bräuninger, 'Regierungserklärungen von 1949 bis 1998. Eine vergleichende Untersuchung ihrer regierungsinternen und -externen Bestimmungs-faktoren', *Zeitschrift für Parlamentsfragen* 30/3 (1999), pp.641–59; Thomas König, Till Blume and Bernd Luig, 'Policy Change without Government Change? German Gridlock after the 2002 Election', *German Politics* 12/2 (2003), pp.86–146; Susumu Shikano and Franz U. Pappi, *The Positions of Parties in Ideological and Policy Space: The Perception of German Voters of their Party System* (Mannheim: Mannheimer Zentrum für Europäische Sozialforschung, Working Paper No. 73, 2004); Franz U. Pappi and Susumu Shikano, *Ideologische Signale in den Wahlprogrammen der deutschen Bundestagsparteien 1980 bis 2002* (Mannheim: Mannheimer Zentrum für Europäische Sozial-forschung, Working Paper No. 76, 2004); Simon Franzmann and Andrè Kaiser, 'Locating Political Parties in Policy Space. A Reanalysis of Party Manifesto Data', *Party Politics* 12/2 (2006), pp.163–88; Eric Linhart and Susumu Shikano, *Die Generierung von Parteipositionen aus vorverschlüsselten Wahlprogrammen für die Bundesrepublik Deutschland 1949–2002* (Mannheim: Mannheimer Zentrum für Europäische Sozialforschung, Working Paper No. 98, 2007); Thomas Bräuninger and Marc Debus, 'Der Einfluss von Koalitionsaussagen, programmatischen Standpunkten und der Bundes-politik auf die Regierungsbildung in den deutschen Ländern', *Politische Vierteljahresschrift* 49/2 (2008), pp.309–38; Jonathan Slapin and Sven-Oliver Proksch, 'A Scaling Model for Estimating Time-Series Party Positions from Texts', *American Journal of Political Science* 52/3 (2008), pp.705–22; Ralf Schmitt, *Die politikfeldspezifische Auswertung von Wahlprogrammen am Beispiel der deutschen Bundesländer* (Mannheim: Mannheimer Zentrum für Europäische Sozialforschung, Working Paper No. 114, 2008).

3. See Frank Castles and Peter Mair, 'Left–Right Political Scales: Some Expert Judgements', *European Journal of Political Research* 12/1 (1984), pp.73–88; Michael Laver and Ben W. Hunt, *Policy and Party Competition* (New York: Routledge, 1992); Kenneth Benoit and Michael Laver, *Party Policy in Modern Democracies* (London: Routledge, 2006).

4. Ian Budge, Hans-Dieter Klingemann, Andrea Volkens, Judith Bara and Eric Tanenbaum (eds.), *Mapping Policy Preferences. Estimates for Parties, Electors, and Governments 1945–1998* (Oxford: Oxford University Press, 2001); Hans-Dieter Klingemann, Andrea Volkens, Judith Bara, Ian Budge and Michael McDonald, *Mapping Policy Preferences II. Estimates for Parties, Electors, and Govern-ments in Eastern Europe, European Union, and OECD 1990–2003* (Oxford: Oxford University Press, 2006); compare Kenneth Benoit and Michael Laver, 'Benchmarks to Text Analysis: A Response to Budge and Pennings', *Electoral Studies* 26/1 (2007), pp.130–35; Kenneth Benoit, Michael Laver and Slava Mikhaylov, 'Treating Words as Data with Error: Uncertainty in Text Statements of Policy Positions', *American Journal of Political Science* 53/2 (2009), pp. 495–513.

5. Michael Laver, Kenneth Benoit and John Garry, 'Extracting Policy Positions from Political Texts Using Words as Data', *American Political Science Review* 97/2 (2003), pp.311–31; compare Ian Budge and Paul Pennings, 'Do they Work? Validating Computerised Word Frequency Estimates against Policy Series', *Electoral Studies* 26/1 (2007), pp.121–9.

6. Slapin and Proksch, 'A Scaling Model for Estimating Time-Series Party Positions from Texts'; Sven-Oliver Proksch and Jonathan Slapin, 'Position-Taking in European Parliament Speeches', *British Journal of Political Science* (2009, forthcoming).

7. See Laver *et al.*, 'Extracting Policy Positions from Political Texts Using Words as Data'; Slapin and Proksch, 'A Scaling Model for Estimating Time-Series Party Positions from Texts'; compare Lanny Martin and Georg Vanberg, 'A Robust Transformation Procedure for Interpreting Political Text', *Political Analysis* 16/1 (2008), pp.93–100; Andrea Volkens, 'Strengths and Weaknesses of Approaches to Measuring Policy Positions of Parties', *Electoral Studies* 26/1 (2007), pp.108–20.

8. Laver and Budge, *Party Policy and Government Coalitions*.

9. Michael Laver and Kenneth A. Shepsle, *Making and Breaking Governments. Cabinets and Legislatures in Parliamentary Democracies* (Cambridge: Cambridge University Press, 1996).

10. Keith Krehbiel, 'Institutional and Partisan Sources of Gridlock: A Theory of Divided and Unified Government', *Journal of Theoretical Politics* 8/1 (1996), pp.7–40; Thomas König and Thomas

Bräuninger, 'Wie wichtig sind die Länder für die Politik der Bundesregierung bei Einspruchs- und Zustimmungsgesetzen?', *Zeitschrift für Parlamentsfragen* 28/4 (1997), pp.605–28; König *et al.*, 'Policy Change without Government Change?'.

11. An online-service for the initiatives from the 8th to the 15th legislative term is available by the 'State of Federal Legislation' (GESTA) information system at http://dip.bundestag.de. Additional GESTA data about proposals from the 14th to the 16th legislative term of the German Bundestag (until 22 August 2007) can be found at http://www.bundestag.de/bic/standgesetzgebung. The old GESTA database was replaced at the beginning of the parliamentary summer break in 2007. The new (modified) information system DIP21 is available at http://dip21.bundestag.de. Unfortunately, we had to manually reconstruct comparable data about the proposals from the 4th to the 7th legislative term by means of the 'proceedings' of the German Bundestag/German Bundesrat (available electronically since 1976). We cannot provide the relevant information about all proposals, because a standardised documentation of legislative activities is missing before 1972. Further differences compared to other statistics stem from mergers of proposals or different ways of counting. Regarding the 'proceedings' see Deutscher Bundestag, *Verhandlungen des Deutschen Bundestages und des Bundesrates 1949–2009 ff* (München: Saur, 2009); regarding the German federal legislation in general see Peter Schindler, *Datenhandbuch zur Geschichte des Deutschen Bundestages 1949 bis 1999. Band 2* (Baden-Baden: Nomos, 1999), pp.2318–635; Michael F. Feldkamp, *Datenhandbuch zur Geschichte des Deutschen Bundestages 1994 bis 2003* (Baden-Baden: Nomos, 2005), pp.571–612; compare Thomas König and Thomas Bräuninger, *Gesetzgebung im Föderalismus* (Speyer: Forschungsinstitut für öffentliche Verwaltung, Speyerer Forschungsberichte No. 237, 2005); Bernhard Miller and Christian Stecker, 'Consensus by Default? Interaction of Government and Opposition Parties in the Committees of the German Bundestag', *German Politics* 17/3 (2008), pp.305–22.

12. Latest downloading of legislative proposals as at 31 December 2008.

13. 'SIMSTAT/WordStat' is a suite of software packages produced by Provalis Research. The text mining tool 'WordStat' runs at the base of the data analysis tool 'SIMSTAT'. See Tyler Johnson, 'Review of WordStat 5.1, SIMSTAT 2.5, and QDA Miner 2.0', *The Political Methodologist* 15/1 (2007), pp.11–14; Angelique Davi, Dominique Haughton, Nada Nasr, Gaurav Shah, Maria Skaletsky and Ruth Spack, 'A Review of Two Text-Mining Packages: SAS TextMining and WordStat', *The American Statistician* 59/1 (2005), pp.89–103.

14. The thematic classification (Sachgebiet) refers to the official directory of federal legislation (Fundstellennachweis). It is comparable to the 'Directory of Community Legislation' at the EU level. The foremost fee-based database of German Law 'Juris' provides information about the thematic classification of laws at http://www.juris.de.

15. 'WordNet' is a lexical database of the English language, which is available for download from 'Princeton University Cognitive Science Laboratory' (http://wordnet.princeton.edu); Christiane Fellbaum (ed.), *WordNet: An Electronic Lexical Database* (Cambridge, MA: MIT Press, 1998).

16. 'GermaNet' is the German version of 'WordNet', developed at the Division of Computational Linguistics of the Linguistics Department at the University of Tübingen (http://www.sfs.uni-tuebingen.de/GermaNet); see Claudia Kunze and Lothar Lemnitzer, *Computerlexikographie: Eine Einführung* (Tübingen: Narr, 2007), pp.136–65.

17. The CDU and its Bavarian sister party CSU presented election programmes on their own in the first decades of the Federal Republic of Germany and again in 1990 (German reunification). In these cases we refer to the CDU programme.

18. In 1990 the West German Greens presented a programme that was different from the common programme of West German and East German Greens ('Wahlplattform Die Grünen/Bündnis90'). We refer to the common programme.

19. See Hans U. Behn, *Die Regierungserklärungen der Bundesrepublik Deutschland* (München: Olzog, 1971); Manuel Fröhlich, 'Regierungserklärungen mit Geschichte', *Das Parlament*, 20 Nov. 1998, p.13; Karl-Rudolf Korte (ed.), *Das Wort hat der Herr Bundeskanzler. Eine Analyse der Großen Regierungserklärungen von Adenauer bis Schröder* (Wiesbaden: Westdeutscher Verlag, 2002); Klaus Stüwe, *Die Rede des Kanzlers. Regierungserklärungen von Adenauer bis Schröder* (Wiesbaden: VS Verlag, 2005). In 1961 Vice-Chancellor Erhard had to read the declaration on behalf of Chancellor Adenauer.

20. The four exceptions are caused by Chancellor Adenauer's resignation in 1963, Chancellor Erhard's resignation in 1966, Chancellor Brandt's resignation in 1974 and the constructive vote of no-confidence against Chancellor Schmidt in 1982.

21. We are currently not in a position to precisely assess the correctness of all manifestos. Until now, we calculated on the basis of nine SPD election programmes an error rate less than 4 per cent (GESIS files in comparison with the scans of the original programmes). Nevertheless, this error rate does not reflect some fundamental problems, e.g. that speeches are considered as election programmes.

22. The length of the government declarations is artificially inflated in the WZB files; compare Stüwe, *Die Rede des Kanzlers*, p.121.

23. See Eneko Agirre and Philip Edmonds (eds.), *Word Sense Disambiguation. Algorithms and Applications* (Dordricht: Springer, 2007).

24. The German refinement of the CMP approach also differentiates between ideology (CMP category, variable 'Position') and policy area (variable 'Politikfeld'). But because no individual data are available, researchers cannot combine the analyses. See Andrea Volkens, *Handbuch zur Inhaltsanalyse programmatischer Dokumente von Parteien und Regierungen in der Bundesrepublik Deutschland* (Berlin: Wissenschaftszentrum Berlin für Sozialforschung, Discussion Paper FS III 02/203, 2002); compare Shikano and Pappi, *The Positions of Parties in Ideological and Policy Space*; Pappi and Shikano, *Ideologische Signale in den Wahlprogrammen der deutschen Bundestagsparteien 1980 bis 2002*.

25. This portfolio standardisation is complicated by the fusion of competencies or the separation of competencies (see e.g. the 'Federal Ministry for Economics and Labour' under Wolfgang Clement in the 15th legislative term) and the creation of new ministries (see e.g. the 'Federal Ministry of the Environment, Nature Conservation and Nuclear Safety' which was created a few weeks after the Chernobyl disaster in 1986. Until then, the Federal Ministry of the Interior the Federal Ministry of Agriculture and the former Federal Ministry of Youth, Family and Health were responsible for environment policy. As a consequence, instead of the original portfolio classification the thematic classification (Sachgebiet) serves as a linkage to the 14 standard portfolios. The thematic classification allows a refined analysis of broad policy areas (see e.g. the Federal Ministry of the Interior that has competencies in issues related to internal security, managing immigration, public administration, sports, etc.).

26. Portfolios (which consist of themes) and ideological dimensions are independently conceptualised. We do not assume a transformation. In contrast to this, see James M. Enelow and Melvin J. Hinich, *The Spatial Theory of Voting. An Introduction* (Cambridge: Cambridge University Press, 1984), pp.36–79.

27. See John D. Huber and Ronald Inglehart, 'Expert Interpretations of Party Space and Party Locations in 42 Societies', *Party Politics* 1/1 (1995), pp.73–111; Benoit and Laver, *Party Policy in Modern Democracies*.

28. Seymour M. Lipset and Stein Rokkan, 'Cleavage Structures, Party Systems, and Voter Alignments. An Introduction', in Seymour M. Lipset and Stein Rokkan (eds.), *Party Systems and Voter Alignments: Cross-National Perspectives* (New York: Free Press, 1967), pp.1–64; Seymour M. Lipset, 'Cleavages, Parties and Democracy', in Lauri Karvonen and Stein Kuhnle (eds.), *Party Systems and Voter Alignments Revisited* (London: Routledge, 2001), pp.3–9.

29. Regarding ideological (bi-)polarity compare Michael Laver and John Garry, 'Estimating Policy Positions from Political Texts', *American Journal of Political Science* 44/3 (2000), pp.619–34; Benoit and Laver, *Party Policy in Modern Democracies*.

30. See Teije J. Euverman and Adrianus A. Vermulst, *Bayesian Factor Analysis* (Groningen: University of Groningen, 1983); Simon Jackman, 'Estimation and Inference via Bayesian Simulation: An Introduction to Markov Chain Monte Carlo', *American Journal of Political Science* 44/2 (2000), pp.375–404; Jeff Gill, *Bayesian Methods: A Social and Behavioral Sciences Approach* (Boca Raton: Chapman and Hall, 2002); Andrew Gelman, John B. Carlin, Hal S. Stern and Donald B. Rubin, *Bayesian Data Analysis* (London: Chapman and Hall, 2003); Kevin M. Quinn, 'Bayesian Factor Analysis for Mixed Ordinal and Continuous Responses', *Political Analysis* 12/4 (2004), pp.338–53.

31. Considering duplications, portfolio words and exclusion words we can realise the compilation of the ideology wordbook with reasonable expenditure. The ideological wordbook can be transferred from one legislative term to another in order to determine the adequacy. Definitely, the more words/terms the wordbooks already contain the better is the relationship between cost and benefit.

32. Daniel Finke wrote the Gauss code. He will publish the code at http://www.rzuser.uni-heidelberg.de/~dfinke.

33. Regarding the salience and (non-)separability of voters' preferences see Susumu Shikano, 'Die Eigendynamik zur Eindimensionalität des Parteienwettbewerbs. Eine Simulationsstudie', *Politische Vierteljahresschrift* 49/2 (2008), pp.229–50; Enelow and Hinich, *The Spatial Theory of Voting*.

34. The 1973 and 1991 grand government declarations are coded as R72 and R90, because they are related to the beginning of the legislative terms after the federal elections in 1972 and 1990, respectively.

APPENDIX 1
ANALYSED TEXTS (AFTER CORRECTIONS)

ID	Document	Length (in words)
01	Programme / Union 1961	442
02	Programme / Union 1965	10480
03	Programme / Union 1969	2373
04	Programme / Union 1972	3807
05	Programme / Union 1976	6707
06	Programme / Union 1980	11284
07	Programme / Union 1983	5169
08	Programme / Union 1987	17448
09	Programme / Union 1990	5592
10	Programme / Union 1994	11603
11	Programme / Union 1998	8332
12	Programme / Union 2002	20030
13	Programme / Union 2005	10756
14	Programme / SPD 1961	6406
15	Programme / SPD 1965	23495
16	Programme / SPD 1969	3120
17	Programme / SPD 1972	13015
18	Programme / SPD 1976	16523
19	Programme / SPD 1980	9458
20	Programme / SPD 1983	10478
21	Programme / SPD 1987	9776
22	Programme / SPD 1990	7695
23	Programme / SPD 1994	14510
24	Programme / SPD 1998	13649
25	Programme / SPD 2002	20503
26	Programme / FDP 2005	12119
27	Programme / FDP 1961	2490
28	Programme / FDP 1965	6918
29	Programme / FDP 1969	4460
30	Programme / FDP 1972	885
31	Programme / FDP 1976	8120
32	Programme / FDP 1980	24575
33	Programme / FDP 1983	7569
34	Programme / FDP 1987	5956
35	Programme / FDP 1990	27114
36	Programme / FDP 1994	40951
37	Programme / FDP 1998	23764
38	Programme / FDP 2002	32118
39	Programme / FDP 2005	21378
40	Programme / The Greens 1983	4442
41	Programme / The Greens 1987	17940
42	Programme / The Greens 1990	4327
43	Programme / The Greens 1994	30727
44	Programme / The Greens 1998	4194
45	Programme / The Greens 2002	22644
46	Programme / The Greens 2005	28178
47	Programme / PDS 1990	9446
48	Programme / PDS 1994	6812
49	Programme / PDS 1998	14970
50	Programme / PDS 2002	13809
51	Programme / PDS 2005	8425

(*Continued*)

APPENDIX 1
CONTINUED

ID	Document	Length (in words)
52	Declaration / Government 1961	8099
53	Declaration / Government 1963	12113
54	Declaration / Government 1965	11955
55	Declaration / Government 1966	6064
56	Declaration / Government 1969	8718
57	Declaration / Government 1972/73	9214
58	Declaration / Government 1974	8133
59	Declaration / Government 1976	15125
60	Declaration / Government 1980	10828
61	Declaration / Government 1982	9197
62	Declaration / Government 1983	11894
63	Declaration / Government 1987	13801
64	Declaration / Government 1990/91	15015
65	Declaration / Government 1994	7406
66	Declaration / Government 1998	12217
67	Declaration / Government 2002	6201
68	Declaration / Government 2005	11123