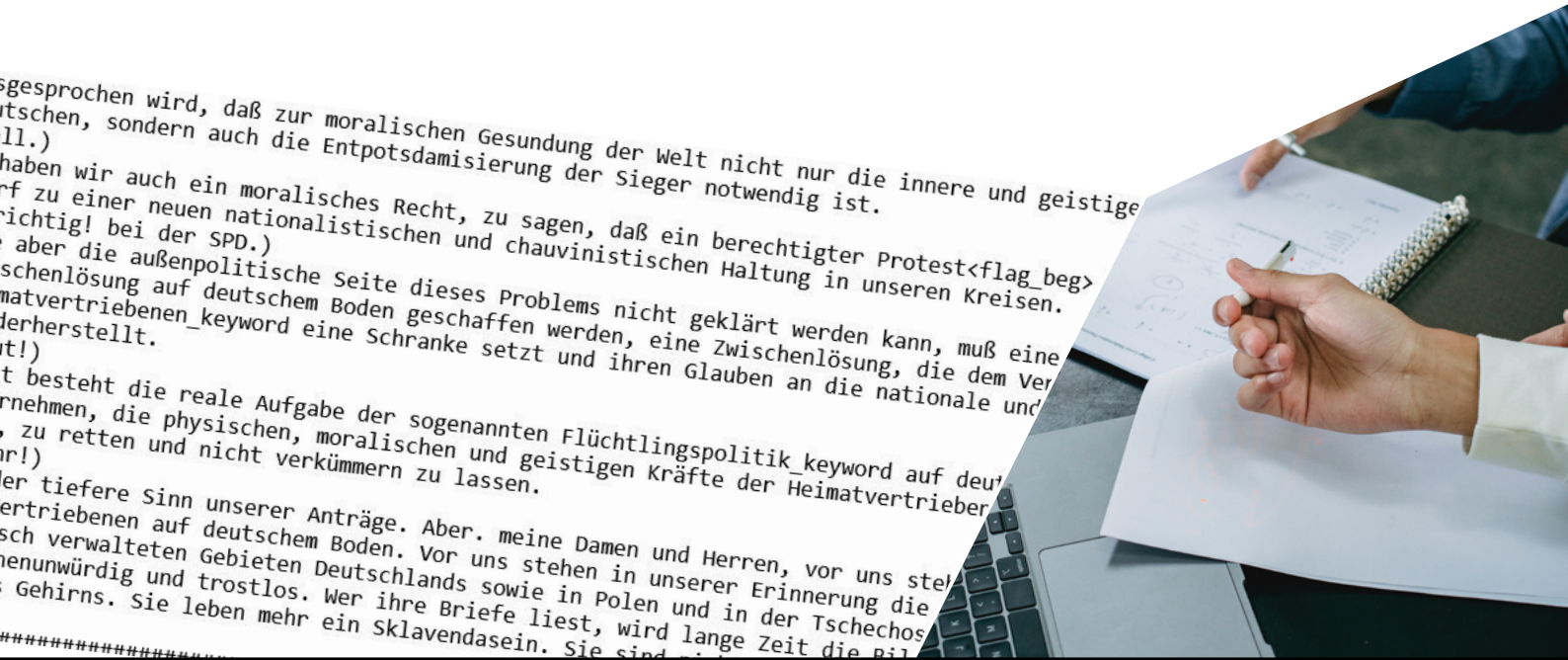Franziska Ziegler & Hannes Schammann

Detecting Theoretical Concepts in Large Corpora

Solidarity in the plenary debates of the German Bundestag

Franziska Ziegler & Hannes Schammann

Detecting Theoretical Concepts in Large Corpora.
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Abstract: Using the example of the analysis of the concept of solidarity as it transpires from speeches made during plenary sessions of the German Bundestag, this paper presents a methodology that allows for the study of complex theoretical concepts in large corpora. We suggest an interdisciplinary methodology that combines extensive qualitative content analysis from the social sciences with natural language processing (NLP) methods, in particular class-based machine learning, from computational linguistics. Our methodology enables us to identify both explicit and implicit statements about solidarity, that is to say statements that actively use the term "solidarity" (or any of its variants) and statements whose content qualifies as solidarity without actually using the term.

www.uni-hildesheim.de/migrationpolicy

Contents

1. Research aims and challenges

The availability of large quantities of digitalised texts and the existence of a variety of software for natural language processing can strongly enrich research in the social sciences and the humanities (Grimmer et al. 2021; Kantner & Overbeck 2018). Indeed, research fields such as the computational social sciences (CSS) and the digital humanities (DH) follow this promising path. Researchers in these fields are confronted with an important dilemma: while the social sciences and humanities can be about complex theoretical concepts, the software to analyse big corpora is often about quantification. As a result, researchers need to find a way to use the tools whilst doing justice to the theoretical foundations of the concept(s) underlying their research.

In this paper, we present a methodology that accepts this challenge. It combines qualitative and quantitative analysis, or elements of "close reading" and "distant reading" (Moretti 2000; Moretti 2013), to the analysis of the concept of solidarity as it transpires from speeches made during plenary sessions of the German *Bundestag*.

Our research is part of a bigger research consortium at the University of Hildesheim: SOLDISK: Solidarity discourses in the context of migration.[1] This interdisciplinary consortium, bringing together researchers from the social sciences with computational linguists, aims to detect manifestations of solidarity in large corpora by analysing communication on three different levels (citizens, NGOs, parliament). On the basis of a shared conceptual perspective (Kneuer et al. fc.; see below), the three research teams develop a tailor-made methodological approach to the analysis of the respective corpus. The authors of this paper focus on parliamentary debates.

Solidarity has attracted a high degree of attention in recent years both in societal and political life and as a normative – and increasingly empirical – concept in academic literature. This phenomenon can be observed in various fields; yet it is especially ubiquitous in the context of migration (Bauder & Juffs 2020). Questions on migration have been closely connected with questions about (the limits of) solidarity, for example in the context of the welfare state (e.g. Mau & Burkhardt 2009; Kymlicka & Banting 2006; van Oorschot 2006), as a general matter of social cohesion in modern societies (Broden & Mecheril 2014), or with respect to a society's readiness to accommodate forced migrants (e.g. Agustín & Jørgensen 2019; Koos & Seibel 2019; Bauder 2020b). They have triggered political mobilisation by migrants and activists alike (Ataç, Rygiel & Stiel 2017; della Porta 2018; Fleischmann 2020; Kirchhoff 2020) and have resonated in the public debate more generally (Brändle, Eisele & Trenz 2019; Wallaschek 2020a; Wallaschek 2020b). Solidarity in the context of migration has also been subject to fierce debates in national parliaments, including the German *Bundestag* (e.g. Hobbach 2020; von Grönheim 2018).[2] Taken together, existing research

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1 | For further information on the consortium, please consider the website https://www.uni-hildesheim.de/soldisk.

2 | Please note other studies on the **solidarity discourse in national parliaments** beyond the context of migration, e.g. Closa and Maatsch's (2014) comparative study of plenary sessions in the national parliaments of eleven Eurozone states on the European Financial Stability Facility in the autumn of 2011 and Wydra and Pülzl's (2014) comparison between plenary debates in the German and Austrian national parliaments between 2010 and 2012, also with respect to the debate on a European financial rescue mechanism. Moreover, numerous research projects have analysed **parliamentary debates in the field of migration**. To mention but a few examples on debates in the German Bundestag, see e.g. Atzpodien (2020) on

shows that solidarity as a concept remains inherently contested. Numerous authors have highlighted this characteristic. Accordingly, solidarity constitutes a continuous "battlefield" (Agustín & Jørgensen 2019: 28) over the question of which type should prevail and, hence, of who should be included in a solidarity relationship and why (see also e.g. Stjernø 2005; Karakayali 2014; Bauder 2020a; Wallaschek 2020a; Fleischmann 2020).

While the contested nature of solidarity may be understood to be "part and parcel of solidarity practices" (Fleischmann 2020: 26), existing studies that analyse parliamentary debates on solidarity in the context of migration fall short of the potential to portray the concept's contested nature with respect to at least two aspects:

First and foremost, they only consider relatively short periods of time, focusing on particular events or policy debates. For example, in her comparative study on the French and German solidarity discourse in the *Assemblée Nationale* and the *Bundestag*, Raphaela Hobbach analysed parliamentary debates on a EU refugee quota system between 2015 and 2016 (Hobbach 2020). Moreover, Hannah von Grönheim (2018) carried out a poststructuralist discourse analysis of the solidarity discourse in asylum matters for which she considered all protocols of *Bundestag* plenary sessions as well as of meetings of the European Commission between December 2010 and December 2011. These studies are very insightful with respect to the prevailing understanding of solidarity at a certain moment in time and with respect to a specific debate. They even allow for comparisons between speakers with different political orientations (as e.g. Hobbach did) and, therefore, can show how solidarity as a concept is contested at that very moment in time and with respect to a very particular policy field. However, they cannot provide insight into potential development of the understanding of solidarity over time – on a general level or with respect to a certain political orientation – nor into the solidarity discourse in migration contexts beyond the realm of forced migration.

Secondly, existing studies do not systematically include implicit statements about solidarity in the analysis. An explicit statement of solidarity is one that includes the term solidarity (or, more precisely, the regular expression ".*[Ss] solidar.*"). An implicit statement of solidarity is one whose

content qualifies as solidarity without actually using the term. In order to be able to identify implicit statements of solidarity, one needs to clearly define the elements that make up a solidarity relationship. Von Grönheim circumvents this tasks by only considering explicit statements on solidarity, i.e. statements that actually use the term. The author identifies various moral justifications brought forward in the parliamentary debate in support of or against the reception of forced migrants. Solidarity constitutes but one justification in this regard. Hobbach, on the other hand, takes into consideration both explicit and implicit statements on solidarity. Accordingly, 'European solidarity' includes "all justifications that refer to the moral obligation to help members of the European community" (Hobbach 2020: 8). In addition to explicit references to solidarity, they may constitute implicit references, defined as "the need to help other Europeans (countries or people)", "the importance of European cohesion" or "arguments relating to a national or historical responsibility for the preservation of Europe or the EU" (Hobbach 2020: 8-9). While Hobbach thereby opens the analysis to further solidarity statements, it remains unclear why these types of argumentation were subsumed under 'European solidarity' and others were (potentially) excluded.

We aim to address these shortcomings with our research project in two ways: First, we considerably expanded the period of investigation and took into consideration the communication on solidarity by parliamentarians and members of the government when giving speeches during plenary sessions of the *Bundestag* over a period of seven decades: between the opening session in September 1949 and December 2019. Second, in line with the SOLDISK consortium (Kneuer et al. fc.), we examined both explicit and implicit solidarity statements. In doing so, we aim to identify different types of solidarity, delimit them from each other and trace their development over the past 70 years. Which solidary actors, which motivations for solidarity and which contributions figure prominently in the understanding of solidarity as it transpires from German parliamentary speeches? Can we observe any differences between political parties? Are certain understandings of solidarity persistent over time or do they relate to specific events or migration flows only? Do certain periods of time or events trigger explicit communication on (a certain understanding of) solidarity whilst others demonstrate similar conceptions of solidarity, yet without explicit reference to the term?

In order to answer these questions, we need to overcome two main sets of challenges. On a theoretical level, we need to find a definition for a complex theoretical concept that allows for operationalisation under the given circumstances. For this purpose, we build upon the conceptual work of the SOLDISK consortium and operationalise it in a way

the dynamics of parliamentary party competition during the European migration crisis with a quantitative-qualitative analysis of debates of the 18th legislative period; Klein's (1997) linguistic analysis of the parliamentary debate on asylum between 1991 and 1993; and Blätte and Wüst (2017) show for plenary debates between 1996 and 2013 that discussions on migration and integration were structured by parliamentary and mandate-specific factors.

that meets the requirements of our research questions and our corpus. Secondly, and relatedly, we need to find a way to identify both explicit and implicit solidarity statements in a corpus of a size so large that it cannot be analysed with more conventional qualitative social science methods. This second aspect constitutes the main focus of this paper and our contribution to the study of theoretical concepts in large corpora. In what follows, we will describe our methodology which essentially constitutes a discourse analysis and combines qualitative content analysis from the social sciences with natural language processing (NLP) methods from computational linguistics. In section two we focus on the conceptualisation and briefly present how we define "solidarity", "context of migration" and "solidarity in the context of migration". On this basis, and after the description of the corpus in section three, we move towards the operationalisation of the concepts introduced in section two. We proceed in two steps. Section 4.1 explains how we identify and analyse explicit statements of solidarity; section 4.2 describes the process for implicit statements of solidarity. We will describe methodological and practical challenges encountered along the way and how we try to mitigate them. In the final section, we briefly reflect on the transferability of our methodology to future research projects.

2. Conceptualisation

2.1 Solidarity statement: definition and definition elements

Our analysis is governed by two premises that we share with the SOLDISK consortium. While we elaborate on these two premises in further detail elsewhere (Kneuer et al., fc.), it shall suffice here to present the main line of argumentation and the ensuing operational solidarity definition.

Firstly, in contrast to normative approaches to the study of solidarity, we put the emphasis on what solidarity is rather than what it should be. Therefore, we apply an empirical-analytical approach and use a relatively neutral concept of solidarity, inspired by Andrea Sangiovanni's "solidarity as joint action" (2015). Accordingly, the SOLDISK consortium assumes that solidarity entails givers and takers who show a motivation for contributing something to overcome an adversity or to accomplish a goal that is perceived as shared. The relationship between givers and takers may rest on equality, reciprocity and/or a shared identity (Kneuer et al. fc.).

Secondly, against the background of a discursive understanding of solidarity (Cinalli et al. 2021; Wallaschek 2020b; Brändle et al. 2019), the SOLDISK consortium suggests that the concept generates meaning in the communication about solidarity: when communicating about solidarity, political actors reflect their individual understanding of solidarity. Accordingly, we add the elements of "solidarity statement" and "speaker" to the solidarity definition and arrive at the following operational definition:

"We identify a statement as a discursive manifestation of solidarity if a speaker refers to a contribution targeted at overcoming an adversity or at accomplishing a shared goal. The speaker indicates that the adversity or goal is shared by both giver and taker of solidarity. The speaker may describe the relations between giver and taker as unequal and reciprocal. The speaker may refer to shared identity to motivate the contribution."

On the basis of this definition, the SOLDISK consortium identifies three core elements of a solidarity statement:

- ► **1. Actors:** There are three types of actors: givers and takers of solidarity as well as the speaker (who may or may not concur with either or both of the remaining actors). The relationship between giver and taker of solidarity may be characterised by equality if both belong to the same group (in-group); it may also be characterised by inequality when the taker is situated outside the group of solidarity givers (out-group).
- ► **2. Motivation:** There are three main kinds of motivations for a solidary contribution: adversity, goal or identity. In order to qualify, a motivation must be shared by both giver and taker of solidarity.
- ► **3. Contribution:** In order for a giver to be in solidarity with a taker on the basis of a certain motivation, the giver needs to make a contribution. Contributions may be of various kinds, and include both actions and attitudes (see below in section 4.1.). Contributions may also vary with respect to whether they are rendered unconditionally or only with certain conditions attached.

2.2 Context of migration

The SOLDISK consortium defines a context of migration as a section of a speech (sentence, paragraph or other) that deals with either **migration** or **migration-related diversity**. This definition follows recent efforts in migration studies to circumvent the subject of migration policymaking (Schammann 2018; Scholten 2020; Schammann & Gluns 2021).

As there is no single definition of migrant and/or migration at the international level, and inspired by the definition advanced by the International Organisation for Migration (IOM), we understand migration in a broad sense, namely as a situation when a person

"moves away from his or her place of usual residence, whether within a country or across an international border, temporarily or permanently, and for a variety of reasons. [...]." (IOM 2019: 132). Yet, as opposed to the IOM definition, our definition for the purpose of the SOLDISK research project includes within-country movements only if, from the perspective of the German *Bundestag*, they have an external dimension. We thereby explicitly exclude migratory movements *within* the Federal Republic of Germany, in particular population movements between Eastern and Western Germany post-1990 as well as rural depopulation.[3] While equally interesting – and potentially the subject of future analysis – the internal character of these movements may adversely affect the possibility of relating solidarity to them in an unambiguous fashion. Instead, it may overlap with considerations of nationality, rural and regional development, and others.

Secondly, migration-related diversity refers to the societal situation that arises as a result of the presence of (naturalised) immigrant residents (and their offspring). It pertains to the societal discourses in a "post-migrant society" (Foroutan 2019) as well as the conditions provided for resident immigrants and the issues that determine these conditions, including in the fields of housing, employment, education, language acquisition, social benefits, political participation and so forth. (cf. Tomas Hammar's definition of immigrant policy; Hammar 1985: 9). Thus, debates on migration-related diversity address matters of *social inclusion* and *social cohesion* (Schammann & Gluns 2021).

In summary, for the purpose of the SOLDISK consortium, we define a **context of migration** as a section of a speech (sentence, paragraph or other) that deals with

▶ either a situation in which persons move away from their place of usual residence, whether within a country (except Germany) or across an international border, temporarily or permanently, and for a variety of reasons

▶ or a societal situation that expresses migration-related diversity, whether through societal discourses in a post-migrant society or through conditions provided for resident immigrants.

2.3 Solidarity in the context of migration

Finally, for a statement to constitute solidarity in the context of migration, we need a link between the solidarity statement and the context of migration. For this situation to occur, not only do we need a section of speech that qualifies as context of migration (cf. section 2.2), but the latter also needs to relate directly or indirectly to a solidarity statement (cf. 2.1) – hence, both aspects need to belong to the same context. In addition to a certain proximity of the two aspects, in most cases it will be possible to identify the context of migration through one element of our solidarity definition, e.g. the actor(s) of solidarity, the adversity, or the solidary contribution. The following statement from the corpus demonstrates this link:

> *"We need laws and provisions that support rather than further exclude the people who seek protection, refuge and a new home here with us. [...] We, DIE LINKE [the Left Party, added by the authors], say: Ladies and gentlemen, support and solidarity is the order of the day! We say that the people who arrive here are a source of great enrichment for us. They bring along knowledge, experiences and skills of various different kinds. Together we must create a welcoming culture so that neighbours live together rather than next to each other like strangers." (Sabine Zimmermann, DIE LINKE, 2015, BT_18_109_02)[4]*

The term "solidarity" is located in close proximity to a migration context: "persons who seek protection, refuge and a new home". As this statement was made in the context of the arrival of great numbers of protection seekers in Germany, we can safely assume that the persons referred to have crossed an international border. In the present scenario, this group of people is portrayed as the taker of solidarity with whom the giver ("we") acts in solidarity. In order to prevent further exclusion (motivation), the speaker envisages the enactment of appropriate laws as well as the creation of a welcoming culture (contribution). Hence, in the example, the "taker" element of the solidarity definition expresses the context of migration.

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3 | Our data shows that, in the late 1980s and early 1990s, migratory movements between the (former) German Democratic Republic (GDR) and the Federal Republic of Germany (FRG) were regularly put in a solidarity context. We consider statements that refer to movements before 3 October 1990 as "migration contexts" as the movement included the crossing of an international border. Similarly, we exclude those that refer to movements thereafter, even if they use similar terminology (e.g. "Flucht aus der DDR"/ escape from the GDR).

4 | German original: „Es braucht Gesetze und Regelungen, die denjenigen Menschen, die bei uns Schutz, Zuflucht und eine neue Heimat suchen, helfen und sie nicht weiter ausgrenzen. [...] Wir als Linke sagen: Unterstützung und Solidarität ist das Gebot der Stunde, meine Damen und Herren! Wir sagen, dass die Menschen, die hierherkommen, eine große Bereicherung für uns sind. Sie bringen viele unterschiedliche Kenntnisse, Erfahrungen und Fähigkeiten mit. Wir alle gemeinsam müssen eine Willkommenskultur schaffen, damit Nachbarn miteinander leben – und nicht wie Fremde nebeneinander."

In order to be able to identify and analyse solidarity statements in a corpus, the concepts of "solidarity", "context of migration", and "solidarity in the context of migration" require further operationalisation. Any operationalisation will necessarily have to adjust to the specific characteristics of the corpus in question. In what follows, we will present the different methodological steps we have taken for the purpose of transforming these concepts into units that are analysable in the context of the *Bundestag* corpus. Before turning to this undertaking in section 4, we will briefly describe the corpus as it comprises the data to which our operationalisation will have to be applied.

3. The corpus

In order to analyse the political understanding of solidarity in the context of migration, we want to examine the communication on solidarity by parliamentarians and members of the government when giving speeches during plenary sessions of the German *Bundestag* in the first 70 years of its existence. Covering the period between the opening session in September 1949 and December 2019, our corpus comprises 19 legislative periods, which correspond to 4,262 parliamentary sessions and over 200 million tokens. The parliament's publication office publishes all transcripts of parliamentary sessions online; they are available in PDF format as well as in XML format for all sessions since 1949.[5] One should note, however, that the XML files primarily contain the plain text; meta data is limited to the legislative period, date, document type, document identifier, and document title. If we want to analyse to what extent certain types of understandings of solidarity correlate with e.g. the political orientation or the role of the speaker (e.g. regular member of parliament versus member of government) or his or her parliamentary group (e.g. member of the governing faction(s) versus member of the opposition) as well as development over time, however, we need to be able to link every solidarity statement with information on these matters. Therefore, a workable corpus would not only comprise the plain text but equally be equipped with the relevant additional meta data.

On the occasion of the 70th anniversary of the Bundestag in 2019, several groups of journalists and researchers built corpora that comprised the parliament's plenary sessions. Notable examples are the corpus prepared by the German weekly *DIE ZEIT*[6] as well as the corpus compiled by a team surrounding Martina Schories at the daily newspaper *Süddeutsche Zeitung* in cooperation with the Technical University of Darmstadt.[7] While we appreciate the accessibility of the two corpora for a wider audience, in particular due to their very good visualisation, they are not entirely suitable for our research endeavour. As they do not include meta data other than the date (year), the two corpora do not enable us to link statements (text segments) to, for example, a speaker or a political party.

In contrast, Andreas Blätte and his team at the University of Duisburg-Essen have built a corpus by preparing the plain text documents issued by the Bundestag and transforming them into XML files according to the guidelines of the Text Encoding Initiative (TEI)[8]. The corpus has also been subjected to linguistic annotation with TreeTagger[9] and comprises extensive meta data, including the speaker's name, party and role, the legislative period and session number, the agenda item, the year and the date. A first corpus covering the period 1996-2016 was published in 2017 as part of the PolMine Project[10] and is freely available on GitHub.[11] Supported by two student assistants from the University of Hildesheim, the team added the remaining documents covering the years 1949-1996 and 2016-2019 in 2020 and kindly granted exclusive pre-access to our research team.[12]

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4. Operationalisation

In order to be able to analyse both explicit and implicit solidarity statements in the context of migration, we proceed in two steps: In stage one, we identify explicit references to solidarity, i.e. statements in which a speaker uses the regular expression ".*[Ss]olidar.*" in the context of migration. In the German language, ".*[Ss]olidar.*" entails various words and compound words, including "*solidarisch*" (solidary), "*unsolidarisch*" (lacking solidarity), "*Solidarität*" (solidarity"), "*Solidarität-spakt*" (pact of solidarity) and the like. When a speaker deliberately uses the term "solidarity" or any of its variations, we can safely assume that s/he has a certain understanding of the concept which s/he communicates in the way s/he uses the term. By taking into account all explicit references to solidarity in the context of migration we can then determine different types of how speakers understand solidarity. On the basis of this analysis we can proceed to stage two in which we aim to identify implicit references to solidarity. In contrast to the statements analysed in the previous step, the statements we identify in stage two do not contain any reference to ".*[Ss]olidar.*". In terms of their linguistic characteristics, however, they are similar to the solidarity types identified in stage one.

This methodology is strictly interdisciplinary. It combines qualitative methods from the social sciences, in particular qualitative content analysis, with natural language processing (NLP) methods from computational linguistics, including class-based machine learning. As the individual steps strongly depend upon each other, constant exchange between the disciplines is of utmost importance. In what follows, we describe the two-stage process in further detail. We also discuss methodological challenges as well as potential solutions along the way.

4.1 Stage one: explicit solidarity references

In stage one, we aim to identify different understandings of solidarity as we can infer them from explicit statements on solidarity, i.e. statements that involve the use of the regular expression ".*[Ss]olidar.*". We proceed in four steps: Firstly, we identify statements that figure ".*[Ss]olidar.*" in the context of migration. Secondly, we code[13] the statements with categories and codes we derive from our operational definition of solidarity and the elements that make up the definition. Next, we create a solidarity profile for each statement based on the individual combination of definition elements and their respective manifestation (i.e. sub-codes). Finally, on the basis of a qualitative content analysis of the combined individual solidarity profiles, we identify understandings of solidarity that are particularly salient. The latter constitute the basis for stage two of our analysis: the identification of implicit solidarity statements (cf. section 4.2).

4.1.1 Identification of statements: KWIC-search and qualitative inspection

We begin with our analysis of explicit solidarity statements by identifying an exhaustive list of solidarity statements in the context of migration. The identification was realised in close cooperation with our colleagues Fritz Kliche and Ulrich Heid, using a keyword-in-context (KWIC) query, followed by the manual evaluation of each occurrence.

A KWIC is a format for concordance lines extracted from a corpus. It yields a collection of contexts for a certain key word (or node), whereby the size of the context may be determined freely. In our case, we are only interested in the node "solidarity" (or any of its variants) in

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[13] | For greater clarity, we use social science terminology instead of CL terminology in this part of the text that covers the coding procedure leading up to a qualitative content analysis. Hence, we use ˝coding˝ instead of ˝annotation˝ and ˝codes˝ or ˝categories˝ instead of ˝labels˝.

the context of migration. While we reduce the absolute number of solidarity contexts in this way, we need to operationalise the context of migration in terms of contents and size. For this purpose, we determine the node "solidarity" using the regular expression ".*[Ss]olidar.*" (which matches with e.g. „Solidarität", „solidarisch", „unsolidarisch" etc.). The KWIC-query produces a hit only if the node appears no further than 75 tokens away from a list of pre-defined terms that connote a migration context (positive list) and if no term listed on a stopword list (or negative list) appears in the context of the query match. We developed the positive list in several steps, taking into account and doing justice to particularities in terms of language as well as historical experiences with migration in the German context after 1949. In a first step, we gathered migration terms from the relevant current and former German legal sources[14] as well as from the literature on historical dimensions of migration (incl. Oltmer 2010; Hoerder 2010; Karakayali 2008; Bade & Weiner 1997). In a second step, we discussed a first draft of the list with our colleague at the Institute for History at the University of Hildesheim, Philipp Strobl, who works on historical aspects of migration and provided important input. In a third and final step, we double-checked the relevance of each term for the Bundestag corpus by means of a simple frequency analysis.[15]

The query window of 151 tokens (75 tokens to the left and right of the node) was determined on the basis of theoretical requirements as well as the exploration of different sizes of query windows for the accuracy of results. The size of the query window needed to be sufficiently concise to ensure that the node is truly in the context of migration. On the other hand, the window size also needed to be sufficiently large, so as to account for the habits of speech of the forum as well as the individual speakers. We tried different window sizes (30, 50, 75 and 100 tokens to the left and right of the node) and scrutinised a random selection of hits for the same periods of time. The number of true positives was significantly higher for the window size +/- 75 tokens than for the windows +/-30 and +/-50 but did not miss out a relevant number of true positives as compared to the window size +/-100 tokens. As a result, we determined the size of the query window to be +/-75 tokens.

The stopword list prevents a concordance from occurring in the results if any of the terms contained therein occurs in the context of the query match. The stopword list was compiled once the positive list had been finalised. By randomly scrutinising around 10 %

of the query results we identified lexemes of the node or any of the terms listed on the positive list that did not trigger solidarity in a migration context. We added a term to the stopword list only if there was no doubt that this term would not trigger a true positive. This can be safely assumed, for example, for the terms "Solidarnosc" or "Ausländermaut" (connoting the toll that was planned – but never implemented – and that required EU foreigners to pay for the use of highways in Germany).[16]

The stopword list constitutes only one way of excluding false positives from the list of relevant statements. More importantly, the individual inspection by the researchers which followed upon the computer-based query is another important measure in order to attain more refined results. Every occurrence had to go through a manual inspection by the researchers who, on the basis of the theoretical conceptualisation of "solidarity in the context of migration", reached a qualitative decision on whether or not to include the occurrence in further analysis. The number of true positives differs from the total number of statements identified by the KWIC search for at least three reasons: Firstly, we excluded occurrences that – notwithstanding the presence of both the node and at least one term from the positive list within a window of 151 tokens – did not constitute a statement about solidarity in the context of migration. This may have to do with the ambiguous nature of some of the terms. For example, the term "Integration" does not only refer to the inclusion of migrants into a host society but also, for instance, to increased cooperation in the context of the European Union. Moreover, an occurrence also constitutes a false positive if the node and the query term do not belong to the same context. Notwithstanding the relatively concise output window, it is possible that a speaker uses a migration term when talking about one issue and "solidarity" when talking about another one.

Secondly, we subsumed two or more occurrences under one statement if they both occurred in the immediate linguistic neighbourhood of each other and also belonged to the same context. As some of the speakers tend to use the term "solidarity" rather frequently, it may be possible that the term appears repeatedly within the confines of a few sentences or even the same sentence. If the terms refer to the same solidarity relationship (that is, if they relate to the same giver and taker of solidarity, for the same motivation and the same contribution), we subsumed them under one statement. Thirdly, we added a statement if one occurrence described more than one solidarity context. This was the case, for example, when a speaker enumerated different sol-

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14 | For an overview, please refer to this website: https://www.integrationsbeauftragte.de/ib-de/service/rechtsgrundlagen (last access 06 December 2020).

15 | Please consider annexe 7.1 for the full list of terms.

16 | Please consider annexe 7.1 for the full list of terms.

idarity relationships in one sentence, such as the following:

> "However, we experience desolidarisation within the European Union but also towards vulnerable individuals." (Gunther Krichbaum, CDU, 2015, BT_18_130_01)[17]

This assertion demonstrates two solidarity relationships with different takers of solidarity (member states in the former and refugees in the latter). Consequently, this occurrence constitutes two statements. While we frequently deleted occurrences or subsumed several occurrences under one statement, we added new statements only very rarely.

4.1.2 Annotation of definition elements: the codebook

Following the exclusion of false positives from the list of solidarity passages, we applied our solidarity definition (as mentioned above) in order to identify the definition elements as well as the exact confines of the solidarity statement. For this purpose, the SOLDISK consortium developed a codebook that reflects the definition elements, including the actors (speaker, giver, taker) and the relationship between them, the motivation for a solidary contribution (adversity, shared goal, identity), including the issue and geographical scope, as well as the contribution itself (action or attitude) and, potentially, the reciprocal nature of it.

Moreover, in addition to the codes derived from the solidarity definition, we developed sub-codes in a deductive-inductive manner, taking into consideration both the theoretical and empirical literature in the field as well as the peculiarities of the data at hand. While the consortium aims at a high degree of harmonisation, not least for the purpose of better comparability between the individual projects, sub-codes also need to reflect idiosyncrasies of the individual corpus: as the different corpora involve different kinds of speakers with different possibilities of action, we expect their understandings of solidarity to be different. For example, we expect regulatory action to be much more prominent in the statements made by members of the legislative in the German Bundestag than in those by social workers, not least because of the nature and purpose of the forum.

The sub-codes presented in the following have been developed in the context of the Bundestag corpus and, therefore, represent the logic underlying this particular forum for discussion. They may therefore differ from those of the other two projects (for further detail please consult the sys-tem of codes in annexe 7.2). Three categories deserve closer attention here: the type of giver or taker, the motivation issue(s), and the type of contribution.

Firstly, with respect to the **type of giver and taker**, sub-codes have been developed in a deductive-inductive manner, and taking into consideration two dimensions: (1) the actor's role in a political system and (2) the geographical scope:

The solidarity statements we analyse for the purpose of this research endeavour were all made during plenary sessions of the German *Bundestag*. As the directly elected chamber of the parliament, the *Bundestag* is situated at the heart of representative democracy in Germany. The actors that are involved in the wider political decision making process in order to assert their interests, however, naturally extend beyond the confines of the parliament or the political organs more generally. Policy research has tried to capture the interactions of various actors in the process of policy making. Notably, Fritz Scharpf's (1997/2018) actor-centred institutionalism depicts policy outcomes as the result of the interactions between individual, collective and corporate actors within particular institutional settings. Rather than political organs, political institutions are understood to be systems of rules – legal or social – that "structure the courses of actions that a set of actors may choose" (Scharpf 2018: 38). Actor-centred institutionalism thus differs from other theoretical approaches, in particular sociological institutionalism, which include political organs, such as parliament or the public administration, in the concept of institutions (Treib 2015: 279). Collective and corporate actors are both composite actors and result from the aggregation of individuals. Although, empirically, it is not possible to define clear dividing lines between the two actor categories, they differ analytically: the former "are dependent on and guided by the preferences of their members", while the latter have "a high degree of autonomy", both from the beneficiaries of their action and from those who carry it out (Scharpf 2018: 54). Moreover, collective actors are characterised by the cooperation among their members in strategic coalitions, clubs, movements or associations whilst corporate actors usually constitute organisations that are characterised by hierarchical leadership, such as public authorities (Blum & Schubert 2018: 74f). It is for this reason that corporate actors are usually understood to be rather homogenous actors (Treib 2015: 281).

Depending on whether political actors are defined in a narrow or in a broad way, some actors may be considered as political actors or not. As the involvement of certain actors in the policy-making process varies between policy fields, a narrower or broader understanding of political actors may also depend on the policy field of interest (Blum & Schubert 2018: 77). Notwithstanding differences, the literature

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17 | German original: „Wir erleben hier jedoch eine Entsolidarisierung innerhalb der Europäischen Union, aber eben auch gegenüber den in Not geratenen Menschen."

on political actors in the Federal Republic of Germany, or in representative democracies more generally, usually refers to the following set of actors:

- ► individuals
- ► intermediary actors, including initiatives, social movements, associations, political parties
- ► government and administration, including various organs of the executive branch, the legislative branch and the judiciary (Frevel & Voelzke 2017; Rudzio 2019; Rudzio 1977)[18]

These different groups of actors are represented in our corpus as well. Moreover, against the background of the subject field, speeches do not only cover actors which are situated at the federal level in Germany, but equally refer to other political levels within Germany, other national levels or even the European or international arena. Taking into account the two dimensions – role and scope – and following the perspective of the Bundestag as the forum in which the solidarity statements are made, we distinguish three types of individuals (migrants, non-migrants, non-specified) and three types of intermediary actors (social movements, associations/NGOs, political parties). They are assigned irrespective of the geographical level(s) on which they may operate. Individuals and intermediary actors cannot be clearly allocated to a single geographical level as they easily cross geographical and structural boundaries. Consequently, for istance, the Refugee Council of Lower Saxony is assigned to "associations/NGOs"; but so is the "*Vluchtelingenwerk Nederland*" (Dutch Refugee Council) and "European Council on Refugees and Exiles".

Furthermore, we distinguish political actors (strictly speaking) on the German federal level from those associated with any other level within Germany or beyond. We only take into account the horizontal division of power for government actors at the federal level of Germany (three types, i.e. executive branch, legislative branch, judiciary). As concerns government actors which are situated outside the German federal level, however, we focus on the vertical division of power and only consider the level of the forum (five types: local, sub-state, state, EU/ European, international). As a result, government actors of these levels are considered to be a part of the respective level as a whole. This logic also applies to any political actor at the national level of another state. For example, the prime minister of New Zealand, Jacinda Ardern, any other member of her government, and any parliamentary group is coded as "Nation states".

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18 | The media, sometimes referred to as the "fourth power", are usually mentioned in this context as well, for its communicative function in the political decision-making process. However, we decided not to operationalise the media, as they do not occur in our data as a giver or taker of solidarity.

Secondly, as regards **motivation issues**, sub-codes have been developed in a deductive-inductive manner, taking into account findings from the relevant academic literature as well as the data at hand. In line with the SOLDISK consortium, we distinguish four sub-codes: economy, culture, security (individual and collective) and organisational or institutional coordination.

The literature in the field of migration suggests that debates on migration usually relate to either one of the following issues, "each of which is polarising and thematically charged in distinct ways" (Cornelius & Rosenblum 2012: 246): economy, culture, and security. The economic dimension of the immigration debate stresses economic costs and benefits of migration, including its effect on national economic productivity, the effect on local wages and working conditions, as well as the impact on the national budget. Secondly, the immigration debate refers to cultural conflicts through which national identity is negotiated. The third dimension addresses international interests. Accordingly, security concerns are often inherent to the debate on immigration. Yet diplomatic questions may also be at issue when opening or limiting access to the labour market for migrants from a certain country of origin as well as when granting international protection to citizens of certain states. In the latter case, Rosenblum and Cornelius argue, "the normative underpinnings of international human rights law compete with the security and diplomatic interests" (p.251). It is therefore possible to distinguish individual security – directed at the protection of the individual's life – from collective security – directed at the state or a society as a whole. Our final motivation issue – organisational or institutional coordination – includes cases in which the (potentially dysfunctional) organisational structure constitutes the motivation for solidarity. This sub-code is not fully covered by the tripartite classification advanced by Cornelius and Rosenblum. It may hinge on several of these aspects and potentially even go beyond them. Yet, in particular in the context of the Common European Asylum System and discussions about its revision, the sub-code becomes inevitable.

Thirdly, with respect to the code "contribution", we distinguish three types of solidary contributions: actions, attitudes, and general declarations of solidarity. While we do not further differentiate attitudes and general declarations, we have identified six types of solidary actions.

We derive the distinction between action and attitude as separate types of solidary contributions from the theoretical debate on 'solidarity as joint action' (Sangiovanni 2015) as well as solidarity as expressed as a specific attitude (Lahusen & Grasso 2018; van Oorschot 2006). For the purpose of our analysis, solidary contributions only constitute attitudes if a speaker does not also refer to potential actions related to the attitude

at stake. By way of example, we find an *attitude* as solidary contribution in the following statement:

"The acceptance of our asylum law depends on our proper application of the asylum law [...] Only if we apply the law consistently, the solidarity of the large majority of citizens of this country will persist." (Mark André Helfrich, CDU, 2015, BT_18_121_02)[19]

The speaker refers to the "acceptance of our asylum law" as the contribution of the "majority of citizens" (i.e. the giver of solidarity). The contribution primarily constitutes an attitude, even though, indirectly, it also entails concrete actions, for example the requirement to abide by the law. Interestingly, the speaker also mentions the contribution to be conditional upon the "proper application of the asylum law" (potentially by the state authorities). This aspect, however, is not part of the solidary contribution of the giver of solidarity which is at heart of this statement; it has to be performed by a third actor.

Moreover, solidary contributions in the form of actions may be further differentiated. We distinguish *six types of solidary action*: financial, in-kind, human resources, reception/allocation, communication, and regulatory. Sub-codes take into account resource-classification models from business studies as well as the concept of burden-sharing in international refugee protection while keeping in mind the data at hand. Business studies often distinguish four key resources of a firm: physical, intellectual, human and financial (Osterwalder & Pigneur 2010), occasionally grouped into tangible (physical and financial resources) and intangible resources (human and intellectual resources) (Chatterjee & Wernerfelt 1991: 35). Accordingly, physical resources include, amongst others, production facilities, machinery, and distribution networks. Financial resources and securities are cash and credit lines, as well as stock options. Finally, and in addition to the actual staff (human resources), intellectual resources in the form of brands, patents or copyrights are vital for the innovative capability of the firm (Osterwalder & Pigneur 2010: 35). The specific context and input requirements of a firm certainly do not fully overlap with the broad array of solidarity contexts imaginable. The classification may nevertheless constitute a good starting point for pooling different solidary actions as they, too, may involve a variety of resources.

In contrast to a purely resource-driven perspective, others have submitted a classification of solidary actions based

on an understanding of burden-sharing (Noll 2000; Thym & Tsourdi 2017). Accordingly, in the context of the Common European Asylum System of the European Union, costs and responsibilities may be distributed amongst member states in four ways: normative sharing (through legislative harmonisation), financial sharing (through compensation through EU budget), operational sharing (through technical and human support) as well as physical sharing (through the (re-) distribution of individuals between Member States) (Noll 2000: 263f; Thym & Tsourdi 2017: 618-19). The classification has been developed with respect to a very specific context: solidarity between EU member states in the context of EU asylum policy. For this reason, and similar to a resource-driven classification, it may not be transferrable to every possible solidarity context. Nevertheless, it adds important elements that we also find in the data: solidarity in the form of legislative or regulatory action and solidarity in the form of reception or allocation of migrants – a contribution that cannot be limited to either financial, in-kind or human support.

A last kind of solidary action we find in our data is a contribution that involves a communicative element. In the literature, this kind of solidary contribution has sometimes been associated with a political dimension of solidarity (Lahusen & Grasso 2018; Scholz 2008). As opposed to a charitable dimension of solidarity that encompasses (financial) help to those in need, the political dimension involves communicative action. Accordingly, Lahusen and Grasso (2018) note:

"In fact, people demonstrate solidarity with other persons in struggle or in need when participating in collective actions (e.g. public claims-making, political protests, communication campaigns) that strive to improve the situation of these groups by mobilising on behalf of their rights and entitlements" (Lahusen & Grasso 2018: 6).

Communicative solidary action has also been described in the context of migration (e.g. Atac, Rygiel & Stierl 2017; Fleischmann 2020). In our corpus, a communicative contribution may be either one-directional or multi-directional. One-directional communicative action refers to the public demonstration of one's position, for example through the participation in a public protest or rally. On the other hand, the negotiation of an agreement with others may constitute multi-directional communicative action. It differs from regulatory action in the sense that the negotiation process (leading towards a regulatory act) is considered by the speaker to constitute the solidary action rather than the regulatory act itself.

A third type of solidary contribution remains rather vague as it constitutes a *general declaration* of solidary action or attitude. As such, it may include the proclamation of a framework or a position. An example for a gen-

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19 | German original: „Die Akzeptanz unseres Asylrechts hängt davon ab, dass wir das Asylrecht ordnungsgemäß anwenden [...]. Nur wenn Recht und Gesetz konsequent angewendet werden, werden die Solidarität der großen Mehrheit der Bürgerinnen und Bürger dieses Landes anhalten."

eral declaration of solidary contribution is the following statement. While the speaker clearly has a contribution in mind when urging the addressee (the government) to act, it remains unclear in what way exactly:

"We are a community of humanity, of peace, of solidarity […] Now do something that is honest and lasting and that will not be forgotten again in a couple of months when the catastrophes will have disappeared from the front pages of the newspapers." (Katrin Göring-Eckardt, Bündnis 90/Die Grünen, 2015, BT_18_099_03)[20]

Moreover, a considerable number of statements in this group do not even hint at any form of action or attitude. By merely requesting "solidarity", they leave the contribution vague and open to interpretation. Consider the following statement:

"Intra-European solidarity and responsibility in the admission of these desperate people to the European Union is required" (Ralf Brauksiepe, CDU, 2015, BT_18_124_09)[21]

Before turning to the more technical aspects of the coding procedure, one last general comment concerning the definition of (sub-) codes is in order. Notwithstanding our efforts to define (sub-) codes with distinct meaning, it is important to bear in mind that some sub-codes remain ambiguous when applying them to the data at hand. A good example for this phenomenon is the term "Europe" as an actor of solidarity (giver or taker). Speakers use "Europe" in different ways: they may refer to the intergovernmental level of member states in some instances (which would trigger the sub-code "nation states"), and to the supranational level of EU institutions in other instances (which would trigger the sub-code "EU/Europe"). In some cases, they also speak of "Europe" when they actually mean Europeans, i.e. the citizens of the European Union. While it is usually possible to identify a reference to the European society as a whole (rather than some political or state level),[22] it is more difficult – and sometimes even impossible – to distinguish between the intergovernmental and supranational levels. While the following statement probably refers to member state solidarity because of the reference to the Dublin Reg-

ulation for determining the member state responsible for an asylum application, we cannot be fully certain about this conclusion:

"Solidarity in Europe needs to be our shared concern. We reject Dublin II and III in its current version because it is antisocial and because it is unjust." (Christina Kampmann, SPD, 2014, BT_18_009_02)[23]

In order to avoid possible analytical shortcomings, it is important to bear in mind these conceptual ambiguities throughout the analysis. In particular, we consider them when we define distinct understandings of solidarity (see further below in section 4.1.4).

4.1.3 The Coding Procedure

With respect to the coding procedure, we started coding the first statements in the autumn of 2019 with a first draft of the codebook and using the software MAXQDA. We sharpened the (sub-) codes and definitions in the subsequent months, and applied them to statements from the 13th through 18th legislative period.[24] The peak coding phase, however, only began once we were granted full access to a corpus covering all legislative periods. It lasted from October 2020 to May 2021. Coding was carried out by five graduate student coders,[25] closely supervised by the project researchers.

We identify two main challenges to the coding procedure. Firstly, comparable to every bigger research project that involves a corpus that cannot be handled by a single person within a reasonable amount of time, the engagement of multiple coders bears the risk of discrepancies between the work of different individual coders, i.e. a low inter-coder reliability. Secondly, and interrelated, coding the definition elements of a complex theoretical concept is challenging and requires at least some understanding of the scientific discussion on solidarity. Moreover, the complexity of the work increases the risk of a lower inter-coder reliability.

In order to guarantee a high degree of inter-coder reliability whilst doing justice to the complex theoretical nature of the concept of solidary, we took a number of measures to that end: At the start of their engagement, all coders went through a two-part training seminar during which

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they received an introduction to research on solidarity, the research aims and methodology of the SOLDISK research consortium as well as detailed instructions on the coding procedure. Moreover, coders were provided a comprehensive codebook, including definitions of the individual (sub-) codes and examples from the corpus, as well as a "procedural guide" with additional information on the technicalities of the coding process, including frequently asked questions, and regular coding challenges. This guide was constantly updated throughout the coding process, as new questions arose and additional coding challenges had to be resolved.

The second part of the introductory training involved the parallel coding and discussion of ten solidarity statements of different time periods. Afterwards, coders were given responsibility for one legislative period, and started coding the material using MAXQDA. In parallel to the actual coding in MAXQDA, coders documented every text snipped they processed in a separate file ("documentation file"). The documentation included information on false negatives, the validation of meta data information (speakers' name, party and role), the policy field of the debate in the context of which the statement was made, as well as any potential difficulties the coders encountered when coding the statement. On average, coders spent eight to ten hours of coding every week. They spent five to ten minutes deciding whether a statement actually constituted a solidarity statement in the context of migration (i.e. a true positive) and, if this was the case, another 10 to 20 minutes coding the definition elements.

Admittedly, the approach of assigning legislative periods as a whole carries the risk of giving rise to coded material that may be relatively coherent within a legislative period but demonstrates bigger discrepancies in-between different legislative periods. Yet, allocating legislative periods as a whole (rather than distributing the statements of each legislative period amongst all coders), gave students the opportunity to get acquainted with the specific language used during that time, recurring political events as well as the dominant political actors referred to by speakers or acting as speakers themselves. Against the background of the rather complex process of coding a theoretical concept, experience showed that the students' confidence grew with the time they spent on the same time period and, consequently, their results became better. In order to mitigate potential discrepancies in-between legislative periods, regular meetings in small groups were inherent to the entire coding procedure.

Coders met with the researchers on a regular basis in order to discuss general questions and specific statements from the sample. Meetings usually consisted of two student coders and one researcher. In the beginning of the engagement, meetings were scheduled on a weekly basis; after students had gotten more confident, meetings were held only every other week. The group meetings allowed

for an in-depth discussion of multiple individual statements and, thereby, for the thorough examination (and resolving) of potentially challenging solidarity constellations. At the same time, discussions on individual statements also allowed coders and researchers to acquire a harmonised understanding of the (sub-)codes. Coders were also encouraged to send questions and, potentially entire statements, to the researcher in-between meetings – an option they frequently made use of, especially in the beginning of the engagement. Answers to questions of general interest were communicated to all coders and documented in the "procedural guide". Finally, after the coder completed the coding of a legislative period, a researcher carefully checked the coding of every tenth statement, in particular including all those that were listed by the students in the respective documentation files.

In sum, although we are aware of the persisting downsides associated with qualitative coding of a complex theoretical concept, we are confident that the combination of the measures taken contributed to their mitigation and eventually to a high degree of inter-coder reliability. The coded text material, however, only constitutes the starting point for an analysis of different understandings of solidarity. As mentioned, we define an understanding of solidarity to be the individual combination of all definition elements and their respective manifestations (i.e. sub-codes). The number of possible understandings of solidarity corresponds to the number we get when multiplying the respective number of sub-codes of each definition element with each other.[26] Yet, some understandings may be more salient than others (at certain moments in time or throughout the period covered), some may be more significant from a theoretical point of view, and others may be particularly important for speakers with a certain political orientation. In order to be able to analyse these tendencies, we need to depict the individual combination of definition elements and their individual manifestations for every solidarity statement in our corpus and then cluster them. We will describe this two-step process in the following section.

4.1.4 Identification of salient solidarity profiles

The first step towards an analysis of understandings of solidarity was the creation of a solidarity profile for every solidarity statement identified in the previous step. As MAXQDA does not allow for this operation, we needed to transfer the information enclosed in the MAXQDA file for each statement into a document type that allows for the analysis envisaged.

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26 | If we multiply the number of sub-codes of all definition elements with each other, we get 3.628.800 possible combinations – and hence potential understandings of solidarity.

For this purpose, we designed an Excel spreadsheet. Every row corresponds to a text snippet identified via the KWIC query described under section 4.1.1. Columns correspond to the original text snippet, information on true/false positives, certain meta data information, as well as all elements of the solidarity definition and additional analytical elements (the codes). A final column corresponds to the effective solidarity statement that is usually shorter than the text windows encompassing 150 words. Columns corresponding to meta data or codes with multiple options were equipped with a drop-down menu, comprising the various options (sub-codes) (for an overview, please see figure in annexe 7.3).

As a result, for every original text snippet identified, we not only have meta data information (on the date and speaker), but also on whether it constitutes a true positive or not. Moreover, in case of a true positive, the row includes information on the specific manifestations of each definition element. The individual combination of definition elements and their individual manifestations as well as the corresponding meta data constitutes what we call a solidarity statement's **profile**.

One aspect requires some further reflection here, namely the presence of multiple manifestations of a profile element. This is the case, for example, when a speaker enumerates several different solidary contributions or mentions both a shared goal and an adversity as motivation for them. Although solidarity statements usually do not contain more than one manifestation for each element, this is not the case for a limited number of statements. As the spreadsheet only allows for the identification of one manifestation per element, we needed to determine how to handle cases with multiple manifestations:

Firstly, if the statement contains two (or more) manifestations of a definition element that all belong to the same sub-code, the respective sub-code will be selected without further ado. For example, in the following statement, the speaker refers to two measures taken by a number of EU member states in order to handle the situation at the European border with a view to the arrival of increased numbers of protection seekers.

"22 member states of the European Union commit themselves in the mission EUNAVFOR MED; they provide nine ships and twelve aircrafts. This is a sign of European solidarity." (Roderich Kiesewetter, CDU, 2015, BT_18_127_04)[27]

As both the provision of "nine ships" and "twelve aircrafts" can be qualified as resources in kind, the existence of two

solidary contributions does not prevent us from assigning a manifestation for the profile element "contribution issue". A similar situation arises when a speaker refers to several motivations for a solidary contribution. Even if they are of a different kind (e.g. one constitutes an adversity and the other a shared goal), if they both refer to the same issue, a manifestation of the profile element "motivation issue" may be assigned.

"The difficult social situation in several member states exacerbates poverty-driven migration within Europe; and this affects the sense of solidarity of the countries of destination. We counteract this with our legislative proposal [...] The aim should be to adjust the social minimum standards upwards" (Anette Kramme, SPD, 2016, BT_18_200_04)[28]

The statement comprises two motivations for solidary action: the "difficult social situation" in some EU countries that triggers intra-EU migration is presented by the speaker as an adversity; the upward adjustment of "social minimum standards" is portrayed as a goal. Although they constitute different types of motivation, they nonetheless refer to the same "motivation issue" namely "economy" (which includes matters of social welfare). Secondly, in case of a genuine plurality of manifestations, we assign the value "multiple mentions". In the example, the profile element "contribution type" will be assigned "multiple mentions".

After having created profiles for all solidarity statements, in a second step, we aim at making sense of the more than three million possible combinations. For this purpose, we cluster the individual solidarity profiles into several distinct understandings of solidarity. We proceed by pooling all solidarity profiles in one spreadsheet and by analysing them using the filter function (for individual columns) as well as the IF function – in combination with the AND and OR functions (for entire rows). We proceed in a deductive-inductive manner, taking into account the frequency of occurrence (at certain moments in time, throughout the entire period under examination) or their persistence over time as well as points of reference in the relevant academic literature.

An understanding of solidarity differs from a profile in the sense that it may include several (or all) manifestations of a single profile element, if considered necessary. This is not possible for an individual solidarity profile where only one manifestation can be identified for each column (yet consider the option "multiple mentions"). Therefore, a

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27 | German original: „22 Mitgliedstaaten der Europäischen Union engagieren sich in der Mission EUNAVFOR MED, diese stellen neun Schiffe und zwölf Luftfahrzeuge zur Verfügung. Das ist ein Zeichen europäischer Solidarität."

28 | German original: „Die schwierige soziale Lage in einigen Mitgliedstaaten verschärft die Armutsmigration innerhalb Europas, und diese greift die Solidaritätsbereitschaft der Zielländer an. Dem steuern wir mit unserem Gesetzentwurf entgegen [...] Das Ziel muss doch eine Anpassung der sozialen Mindeststandards nach oben sein."

certain understanding of solidarity may consider either a single sub-code of a category, several sub-codes or the category as a whole. For example, if we want to capture member-state solidarity in the European Union in the context of the Common European Asylum System (CEAS), we need to take into consideration profiles that fulfil the following criteria: Firstly, as concerns givers and takers of solidarity, we take into account "nation states", "EU/Europe" as well as the sub-codes referring to the German federal level (i.e. "GER, generic", "GER, legislative branch", "GER, executive branch", "GER judicial branch") and exclude profiles which involve all other kinds of "giver" and "taker". Moreover, the relation between "giver" and "taker" of solidarity shall be characterised as an "in-group" relationship (giver/taker relationship). Secondly, while this understanding of solidarity is indifferent with respect to the motivation type, we only consider profiles that refer to issues relating to "organisational and institutional coordination" (motivation issue) and that also refer to a European level (motivation scope). Finally, this understanding of solidarity is also indifferent with respect to the type and reciprocal nature of the contribution (cf. figure 1).

Notwithstanding our efforts to define sub-codes with distinct meaning, it is important at this point to bear in mind that some sub-codes remain ambiguous (see above). For example, in the case of EU member state solidarity, we are only interested in member states as givers and takers of solidarity. As the data comprises statements in which a parliamentarian requests the German government to accept migrants from the Greek islands for the purpose of burden-sharing, it is insufficient to include the sub-code "GER, generic"; we need to also take into consideration the more specific sub-codes addressing the horizontal division of power at the German federal level. However, this amount of detail risks entailing a higher number of false positives. Therefore, it is vital to check every selected profile for its consistency with the understanding of solidarity in question.

As a result, a single understanding of solidarity subsumes numerous solidarity profiles. It is therefore possible to attribute a number of individual solidarity statements to a certain understanding of solidarity. We can repeat this operation with multiple understandings of solidarity of interest. In this manner, we are already able to analyse our corpus with respect to explicit solidarity statements. We can trace the development of individual solidarity understandings over time, compare their significance with each other and analyse which understanding was more prominent with which parliamentary group and whether preferences remained stable over time.

At the same time, we are not only interested in explicit solidarity statements, but equally want to take into consideration implicit statements on solidarity in the context of migration. The text material we gather from assembling all solidarity statements that can be associated with a particular understanding of solidarity also constitutes the training data for this next step in our analysis: the identification of implicit solidarity references through natural language processing methods, particularly class-based machine learning.

4.2 Stage two: implicit solidarity statements

Stage two uses an active learning approach to machine learning and, therefore, requires a close interaction of NLP methods and manual evaluations of results by the researchers ("close-reading"). It also requires close cooperation between computational linguists and social scientists. While our colleagues from the computational linguistics department Fritz Kliche and Ulrich Heid realised the technical aspects of this stage; the authors of this paper are responsible for the evaluation of results.

We identify implicit solidarity statements using class-based machine learning with DistilBERT (Sanh et al. 2019), an adaptation of BERT (Devlin et al. 2019). BERT (Bidirectional Encoder Representations from

Figure 1: Sub-codes relating to the solidarity understanding "EU member-state solidarity in the context of CEAS"

1.01 giver	1.02 taker	2 speaker function	3 giver/ taker relation	4.1 motivation type	4.2 motivation issue	4.3 motivation scope	5 contribution	6 reciprocity
Nation states EU GER, generic GER, legislative branch GER, executive branch GER, judiciary	Nation states EU GER, generic GER, legislative branch GER, executive branch GER, judiciary	[indifferent]	in-group	[indifferent]	coordination	EU/ European	[indifferent	[indifferent]

Transformers) is a language representation model created by the Google AI Language team around Jacob Devlin which has also been applied to Google queries as of late 2019. The BERT model – just like the DistilBERT model – constitutes of two step procedure. In a first – and time consuming – step, the model is pre-trained with a large amount of unlabelled data (pre-training). In a second step, the model undergoes fine-tuning with task-oriented labelled input data (fine-tuning). In its original English version, BERT was pre-trained on the English Wikipedia and the BookCorpus,[29] containing 2500 million and 800 million tokens, respectively (Devlin et al. 2019). DistilBERT constitutes a distilled version of BERT: it is a language representation model that is reduced in size while retaining BERT's language capabilities (Sanh et al. 2019). We use a German version of DistilBERT, "distilbert-base-german-cased",[30] and use input data from our *Bundestag* corpus for fine-tuning. Potential biases that may arise as a result of the discrepancy between the texts on which the model was trained and the texts on which the model is eventually applied are mitigated due to the two-step training model.

In order to identify implicit solidarity statements, we apply a binary text classification to the *Bundestag* corpus, successively for each understanding of solidarity. For each understanding, we create two sets of input data: Class 1 comprises of all solidarity statements that can be associated with the particular understanding of solidarity (cf. section 4.1.4). Class 0 encompasses the same number of text snippets as are available for class 1. However, as opposed to class 1, the texts are randomly selected from the corpus and neither include the general expression ".*[Ss]olidar.*" nor any expression from the list identifying a "context of migration" (cf. section 4.1.1). The length of the random texts corresponds to the average number of tokens of the training data of class 1. Moreover, they are retrieved from the same time period as the instances of class 1. Note that the two aspects may vary depending on the specific understanding of solidarity we are interested in. We use the

data for class 0 and class 1 to train a model, using only one epoch to avoid overfitting. Afterwards, we apply the model to the corpus data: As a sliding window, we collect pairs of adjacent paragraphs which contain at least one entry from the list of expressions that connote a "context of migration".

Applying the model to the pre-filtered corpus, each text segment is assigned a probability, indicating to which degree it belongs to class 1 and to class 0, respectively. The classification constitutes the basis for further evaluation by the researchers as the first active learning iteration. To this end, we closely examine text segments with high probabilities for class 1. The screening involves the following aspects:

- ▶ presence of all solidarity elements (actors, motivation, contribution)
- ▶ presence of the particular manifestation(s) of solidarity elements (i.e. sub-codes) that define the respective solidarity type

On this basis, researchers decide whether a text segment constitutes an implicit solidarity statement. Implicit solidarity statements are added to the training material of class 1. We repeat the process described above: Using the extended training data for class 1, a new model is trained and applied to text snippets from the corpus containing at least one entry from the migration list, followed by the manual evaluation of those text segments with high probabilities for class 1. As we repeat this operation with all understandings of solidarity identified through qualitative content analysis in stage 1 (cf. section 4.1.4), we can inform our analysis on explicit solidarity statements with data on implicit solidarity statements. As a result, we can explore questions, such as the following: Is the development of a certain solidarity type over time the same if we consider explicit statements and if we consider implicit statements? Do speakers with a certain political orientation make use of explicit solidarity statements while speakers who are members of another party primarily use implicit statements?

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29 | For more information on the BookCorpus see Zhu et al. (2015).

30 | Consider https://huggingface.co/distilbert-base-german-cased/tree/main (last access 11 May 2021).

5. Conclusion

Using the example of the analysis of the concept of solidarity as it transpires from speeches made during plenary sessions of the German Bundestag, this paper has presented a methodology that allows for the study of complex theoretical concepts in large corpora. We have suggested an interdisciplinary methodology that combines extensive qualitative content analysis from the social sciences with NLP methods, in particular class-based machine learning, from computational linguistics. Our methodology enables us to identify both explicit and implicit statements of solidarity, i.e. statements that actively use the term "solidarity" (or any of its variants) and statements whose content qualifies as solidarity without actually using the term.

Our proposed methodology chimes with other efforts that use NLP methods while doing justice to the theoretical foundations of the concepts underlying the research (Grimmer et al. 2021; for examples see also e.g. Kantner 2016; Lemke & Wiedemann 2015; Blessing et al. 2013). Rather than being limited by scarce data (in small qualitative research projects) or by quantified data (of qualitative concepts), our methodology constitutes a way to combine the advantages of both "worlds". In addition to the concept of "solidarity", it may also be applied to other concepts that are highly complex and that may be associated with numerous meanings, such as 'democracy', 'representation' or 'freedom'.

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7. Annexes

7.1 KWIC-query

- **Node:** "`.*[Ss]olidar.*`"

- **Range:** 75 tokens to the left and right of query match

- **Positive list [terms required for concordance to occur in results]:**
  „`.*[Aa]syl.*`","`.*[Ff]l[uü]cht.*`","`[Ff]liehen.*`","`.*-flohen.*`","`Refugee.*`","`[Dd]isplaced`","`.*[Ss]chutzberechtigt.*`","`.*[Ss]chutzsuchend.*`","`Resettlement.*`","`[Ss]ubsidiär.*`","`.*[Mm]igra.*`","`migrier.*`","`[Ee]inwander.*`","`[Ee]ingewandert.*`","`[Zz]uwander.*`","`[Zz]ugewandert.*`","`[Aa]uswander.*`","`[Aa]usgewandert.*`","`Ausländer.*`","`.*[Aa]ussied.*`","`Sudetendeutsche.*`","`Volksdeutsche.*`","`.*[Vv]ertriebene.*`","`Zwangsarbeit.*`","`Gastarbeit.*`","`Fremdarbeit.*`","`Anwerbe.*`","`Saisonarbeit.*`","`Landarbeit.*`","`[Rr]usslanddeutsch.*`","`Familienzusammenführung.*`","`[Uu]nbegleitete.*`","`.*[Ss]taatsangehörig.*`","`.*[Ss]taatenlos.*`","`Einbürgerung.*`","`Aufenthalts.*`","`-Bleiberecht.*`","`.*[Ii]ntegration.*`","`.*[Aa]ssimil.*`","`.*[Ff]reizügigkeit.*`","`.*[Aa]ufnahme.*`","`.*[Aa]bschiebung.*`","`.*[Rr]ückführung.*`","`.*[Aa]usweisung.*`","`[Ii]slam.*`","`[Mm]uslim.*`","`[Jj]esid.*`","`Schengen.*`","`Dublin.*`","`UNHCR.*`","`UNRRA.*`","`UNRWA.*`","`IRO.*`","`IOM.*`", "`.*[Rr]assis.*`", "`.*[Hh]erkunft.*`", "`[Mm]uttersprach.*`", "`Vaterland.*`",

- **Stopword list [terms that prevent a concordance from occurring in results]:**
  „`Solidarnosc`","`Bündnissolidarität`","`Solidaritätszuschlag.*`","`Solidaritätsbeitrag.*`","`Solidarbeitrag.*`","`Solidarzuschlag.*`","`Solidaritätszuschlag.*`","`Solidaritätsstärkungsgesetz`","`Inkaufnahme`","`Nettokreditaufnahme.*`","`Ausländermaut`","`Tarifflucht`", "`Bestandsaufnahme.*`"

7.2 System of codes

1.01 giver	1.02 taker	2 speaker function	3 giver/taker relation	4.1 motivation type	4.2 motivation issue	4.3 motivation scope	5 contribution	6 reciprocity	7.1 evaluation element	7.2 evaluation position
individuals_migrants	individuals_migrants	speaker_is_giver	in-group	adversity	culture	local	action_regulatory	unconditional	solidarity	positive
individuals_non-migrants	individuals_non-migrants	speaker_is_taker	out-group	goal	individual_security	sub-state	action_financial_resources	conditional	giver	negative
individuals_non-specified	individuals_non-specified	speaker_is_giver_and_taker	multiple_mentions	identity	collective_security	national	action_resources_in_kind	multiple_mentions	taker	insufficient
social_movements	social_movements	speaker_not_giver_or_taker	n/a	multiple_mentions	other_security	EU_European	action_human_resources	n/a	adversity	too_far_reaching
associations_NGOs	associations_NGOs	multiple_mentions		n/a	economy	global_international	action_communication		goal	absent
political_parties	political_parties	n/a			coordination	other	action_reception_allocation		identity	other
GER_generic	GER_generic				undefined	multiple_mentions	attitude		contribution	n/a
GER_legislative_branch	GER_legislative_branch				multiple_mentions	n/a	general_declaration		other	
GER_executive_branch	GER_executive_branch				n/a		multiple_mentions		n/a	
GER_judiciary	GER_judiciary						n/a			
nation_states	nation_states									
EU	EU									
international_organisations	international_organisations									
sub-national	sub-national									
other	other									
multiple_mentions	multiple_mentions									
n/a	n/a									

7.3 Documentation of solidarity profiles

Figure 1: Detail of the document with solidarity profiles, including meta data and full statement

#	date	year	ses si	ses po	true po	maxQDA ID	speaker role	solidarity statement	0. policy field	1.01 giver	1.02 taker	2 speaker function	3 giver/ taker	4.1 motiv. type	4.2 motiv. issue	4.3 motiv. scope	5 contri-bution	6 reciprocit	7.1 eval element
1643	2015-04-22	2015	18	99	yes	BT_18_099_03_5	mp	Natürlich ist es keine Lösung für die	external affairs	EU	individuals, mig	speaker is giver	out-group	goal	culture	EU/ European	general declar	unconditional	
1644	2015-04-23	2015	18	100	no														
1645	2015-04-23	2015	18	100	yes	BT_18_100_09_1	mp	Im Irak ist die Lage ebenfalls besorgniserregend. Mittlerweile sind laut UNHCR mindestens 2,7 Millionen Menschen innerhalb des Iraks auf der Flucht. Obwohl die Bundesregierung immer wieder besonders auf die dramatische Lage der stark betroffenen Minderheiten im Irak hinweist, ist sie diesbezüglich bisher untätig geblieben. Liebe Kolleginnen und Kollegen, es sind diese Menschen, die unsere gezielte Hilfe brauchen. Ihnen müssen wir das Höchstmaß	residence/ reception	GER, generic	individuals, migrants	speaker is giver	out-group	adversity	individual security	global/ international	general declaration	n/a	
1646	2015-04-23	2015	18	100	yes	BT_18_100_09_2	mp	Deutschland nimmt rund drei Viertel aller syrischen Flüchtlinge auf, die weltweit durch humanitäre Programme außerhalb der Krisenregionen Schutz finden. Meine Damen und Herren, 125 000 Syrer leben heute in Deutschland. Davon sind fast 70 000 nach Beginn des Konfliktes als Asylbewerber zu uns gekommen. Die Solidarität mit den Bürgerkriegsflüchtlingen aus Syrien und aus dem Irak ist nach wie vor groß in unserem Land. Ausländerbehörden und	residence/ reception	GER, generic	individuals, migrants	speaker not giver or taker	out-group	adversity	coordination	national	general declaration	n/a	solidarity

LP18_19_Profile | Sub-Codes | SOLI-Types | Statistics