German Today: an areally extensive corpus of spoken Standard German

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Abstract

The research project "German Today" aims to determine the amount of regional variation in (near-)standard German spoken by young and older educated adults and to identify and locate regional features. To this end, we compile an areally extensive corpus of read and spontaneous German speech. Secondary school students and 50-to-60-year-old locals are recorded in 160 cities throughout the German speaking area of Europe. All participants read a number of short texts and a word list, name pictures, translate words and sentences from English, answer questions in a sociobiographic interview, and take part in a map task experiment. The resulting corpus comprises over 1000 hours of speech, which is transcribed orthographically. Automatically derived broad phonetic transcriptions, selective manual narrow phonetic transcriptions, and variationalist annotations are added. Focussing on phonetic variation we aim to show to what extent national or regional standards exist in spoken German. Furthermore, the linguistic variation due to different contextual styles (read vs. spontaneous speech) shall be analysed. Finally, the corpus enables us to investigate whether linguistic change has occurred in spoken (near-)standard German.

1.   Introduction

Due to historical reasons, German is a so-called pluricentric language. It is commonly assumed that German does not have one single standard form of speech but rather a multitude of national or regional standards, which are influenced by the dialects spoken in the region. Two tendencies working in opposite directions are assumed:

1. *Change*: Traditional regional dialects are on the decline. Instead a unified (and thus supraregional) form of spoken German is spreading, especially among younger speakers in urban regions of Germany – the so-called "media standard".

2. *Persistence*: Especially phonetic traces of traditional dialects persist in the spoken standard constituting different regional standards / accents.

With our areally extensive speech corpus "German Today" we aim to determine how much regional variation in (near-)standard German speech can be found in young and older educated adults. Which regional features are still in use and where?

We also aim to show to what extent national or regional standards really exist in spoken German. Have new isoglosses emerged at political borders, e.g. at the border between Germany and Austria? Or do regional standards such as "Bavarian Standard German" spread across political borders like traditional dialect areas?

Linguistic variation due to different contextual styles (read vs. spontaneous speech) shall be analysed as well.

With a view to learners of German, we also plan to determine how empirically collected pronunciation data differ from the forms codified in pronunciation dictionaries.

Finally, the corpus enables us to investigate whether linguistic change has occurred in the domain of the German standard language. The main focus of all research questions is on phonetic variation – lexical and morpho-syntactic variation are of secondary interest.

The recordings for our corpus are carried out in 160+ cities throughout the German speaking area of Europe (Germany, Austria, Switzerland, Liechtenstein, Luxemburg, Eastern Belgium, and South Tirol). In each city, read and spontaneous speech of four secondary school students (aged 16-20) who were born and raised locally is recorded with solid state recorders and headset microphones. Additionally, the speech of two 50-to-60-year-olds is recorded in 80+ cities. All participants read a number of short texts and a word list, name pictures, translate words and sentences from English, answer questions in a sociobiographic interview, and take part in a map task experiment. The resulting corpus comprises over 1000 hours of speech. It is currently being transcribed orthographically. Automatically derived broad phonetic transcriptions, selective manual narrow phonetic transcriptions, and variationalist annotations are added as well.

In many dialectological studies and atlases the phonetic domain has been thoroughly analysed and mapped.[1] However, research concerning the opposite side of the linguistic continuum, namely the German standard language, has been remarkably sparse. In our project we adopt a broad definition that originates in British sociolinguistics: Standard language is defined primarily by user and by usage as the linguistic form which is used by educated people in formal as well as informal contexts (cf. Barbour, 2005; Berend, 2005). This differs from a narrow definition which maintains that only codified forms or forms used in public contexts (cf. Ammon, 2005) can have standard status and everything else must be non-standard.

It is a common assumption that almost everywhere in the German-speaking area, even in most formal speaking styles, regionalisms of some kind can be detected. It is also assumed that these regionalisms are less prominent in most northern regions of Germany where the traditional dialects

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[1] see *Marburger Sprachatlanten*, URL: http://www.uni-marburg.de/fb09/dsa/publikationen/sprachatlanten

have all but ceased to be spoken among the younger generation.

Nevertheless, there are only few studies aiming at a comprehensive description of the features of regionalised Standard German. To fill this scientific gap, our project aims to describe the phonetic features and their areal range in the whole area where German is used as an official language.

The only fully comparable previous study is the *Atlas zur Aussprache des Schriftdeutschen in der Bundesrepublik Deutschland* (König, 1989). The speech data used for its compilation were collected in 1976-77. The speech of 44 university students from 44 different cities spread homogeneously over the whole area of then West Germany was recorded. The students read a wordlist, a text passage and answered questions in a short sociobiographic interview. Due to lack of manpower, in the end only the data from the wordlists were phonetically transcribed and analysed. Comparable empirical studies exist for Switzerland (Hove, 2002) and Austria (Bürkle, 1995).

With its different contextual styles König's study explicitly follows a methodological design invented by William Labov (Labov, 1966) in his variationist sociolinguistic studies. However, instead of varying the social status of the informants while keeping the place the same, König tried to keep the social status at a comparable level and changed the places where people came from.

2. Concept and design

2.1 Stimuli

Several different stimuli are used for speech elicitation:

- two short texts: *The North Wind and the Sun* (recorded twice, at normal and at fast reading speed) and a 500-word popular scientific text
- 800-word text/sentences (specifically compiled for this corpus)
- 75 pictures (picture naming task)
- 25 English words and 10 English sentences (for translation into German)
- word list with approx. 1000 words (including minimal pairs)
- sociobiographic interview (approx. 30 minutes)
- map task experiment (Anderson et al., 1991; approx. 15 minutes). Due to difficulties regarding the recruitment of older participants, the map task experiment was only carried out between participants of the younger age group.

The different stimuli are mainly used to elicit different levels of formality in speech; especially the contrast of read vs. spontaneous speech is an important issue. In the spontaneous speech domain, the sociobiographic interview is carried out between a researcher and a local participant, whereas in the map task experiment two participants from the same city interact. Thus, the interview may yield radically different linguistic forms in comparison to the more informal map task situation. This is primarily the case in areas where a dialect with great linguistic distance from Standard German is the everyday vernacular among the participants (esp. in Switzerland).

Picture naming and translation from English are used to check if certain words are pronounced differently when they are written down and read aloud or elicited without providing the written form. A prominent example in German is the pronunciation of the letter <ä> when denoting a long vowel, which many Germans will pronounce as [E:][2] in reading (especially in isolated words or minimal pairs) but as [e:] in spontaneous speech (thus the prompt <Käse> 'cheese' will give ['kE:z@], whereas showing a picture of a cheese will elicit ['ke:z@]). However, we expect the results to vary according to regional factors as well, with participants from the north and east of Germany and eastern parts of Austria predominantly having no /E:/ phoneme.

The texts and the compiled sentences are used to reduce the amount of attention paid to speech production, which is greatest in minimal pairs and word lists. Therefore hypercorrections should decrease when reading sentences or texts, making the produced speech more natural. But there may also be disadvantages because reading mistakes are much more frequent and sentence stress effects may distort instrumental measurements.

The short fable *The North Wind and the Sun* is recorded twice, at normal and at fast reading speed. By comparing both versions regional differences in reading speed and especially the amount and nature of phonetic reductions will be investigated.

2.2 Cities selected for the recordings

The cities where the participants were recorded were selected according to different criteria. Firstly, the 44 cities in former West Germany analysed by König (1989) were included. That way real-time language change in the past thirty years in these cities may be detected. Secondly, the grid of 160+ cities covers the whole German-speaking area densely enough so that none of the traditional dialect areas of the German language are left out (see Figure 1). Recordings take place in large population centres (e.g. Berlin, Hamburg, Cologne, Munich, Vienna, Zurich) as well as small towns in sparsely populated areas.

Unfortunately, the grid of recording sites had to be reduced for the older participants. This is merely due to practical reasons (lack of manpower in our project and difficulties in recruitment of participants).

Regarding our recordings at schools in smaller towns, the actual place of birth and living of some participants may actually be some nearby village. In areas like southern Germany, where in recent years the linguistic gap between towns and their rural surroundings has grown significantly (the population of the latter still clinging to the traditional dialects to a much greater extent), this can lead to very different linguistic behaviour of the participants at the same place of recording. However, the place of residence and many other possibly influencing factors are well documented (see Section 3.1.) and can therefore be observed in later analyses.

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[2] All phonetic transcriptions are given in X-SAMPA, URL: http://en.wikipedia.org/wiki/X-SAMPA

Recording Sites (Secondary Schools)

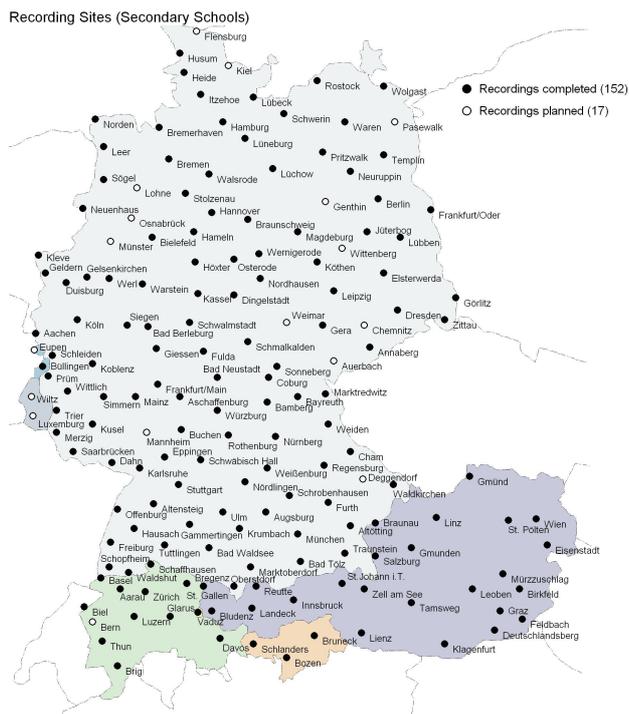● Recordings completed (152)
○ Recordings planned (17)

Figure 1: Recording sites (secondary schools): completed recordings and recordings planned for summer 2008

2.3 Participants

For our primary corpus, four speakers (two female, two male) aged 16-20 are recruited at one secondary school in each of the 160+ cities. For our secondary corpus, two speakers (one female, one male) aged 50-60 are recruited at adult education centres in 80+ cities (out of the 160). Both groups of participants have secondary school education. A further requirement is that the participant is born and has grown up in or near the place of recording and at least one of her/his parents is from the region as well. By restricting the social variables in this way we aim to homogenize the participants' linguistic background, ruling out effects of mobility as far as possible. We do this because we aim to find out how the Standard German of the "indigenous" people looks.

We included two age groups in our survey to be able to detect linguistic change in apparent-time. However, one must be cautious in comparing the age groups because the sociolinguistic variables may well be influenced by socio-economic variables other than age alone (e.g. in the secondary corpus a majority of the participants had university training).

2.4 Recordings and technical equipment

For the field recordings several microphone and recorder types were tested. Finally, a combination of Sennheiser HSP4 headset cardioid microphones and Marantz PMD671 solid state recorders was chosen for the recordings of the main corpus. The headset cardioid microphones are very effective at suppressing all kinds of ambient noise often encountered at schools. Initial problems

with hum on some field recordings were countered by using rechargeable batteries instead of AC mains power. For most of the recordings at the adult education centres a Sennheiser MKE2 omni-directional clip-on microphone and a Mayah FlashMan solid state recorder were used. The recording quality is 16 Bit, 44.1 kHz. In the interviews and map tasks the participants use separate microphones and their speech is recorded on separate audio tracks.

2.5 Current state of recording phase

Currently, the project has reached the final stage of the recording phase. Up to this date (March 2008) we have carried out recordings at 152 secondary schools (611 participants[3]) and 81 adult education centres (159 participants). To fill the final gaps additional recordings are planned for a maximum of 17 cities (see Figure 1). We expect to complete our recordings by summer 2008.

3. Processing

3.1 Documentation

Each participant fills in a detailed sociobiographic questionnaire. If necessary, the collected data are supplemented by the researcher during the interview. The following areas are covered:
- sex and other physical factors (body height and weight, smoking habits, tongue or lip piercings)
- year of birth
- place(s) of birth, residence, school attendance, and work
- education
- biographic and educational background of partners, parents, and grandparents
- language use and speech training
- relationship between map task partners.

Metadata regarding the recordings and annotation files are also documented, e.g.
- date and place of recordings (including geocodes)
- technical information about recordings and sound files
- type of stimuli
- type, format and conventions of transcripts and annotations
- legal information.

To ensure that these metadata can be used for statistical analyses such as correlations between sociobiographic data and use of pronunciation variants, they have to be documented in a standardised fashion. Therefore all recordings and participant data are documented using "memasysco", a metadata management system for speech corpora with XML schema based structured storage (Gasch et al., in press). The system allows:
- unified validatable documentation in different corpus projects
- project-internal metadata management (in particular validatable data entry and revision)
- comprehensive and effective search and retrieval across the metadata of all in-house speech corpora

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[3] At one secondary school only three students could be recruited, whereas at two schools six students were recorded.

- publication of corpus metadata.

Project-specific XML schemas, which are derived from a generic repository of XML schemas, are used for validation at the time of data entry and revision, thus ensuring a thorough quality control. Data entry and revision are facilitated by a browser-based XML Editor plug-in and a web-based application controlling personalized user access, ID assignment and document workflow. After final document revision and validation the XML instances are imported into an object relational Oracle XML database using structured storage. This XML database allows the implementation of a retrieval interface using XPath/XQuery. Structured search and retrieval will also include annotation data and other documents belonging to a corpus.

3.2 Annotation

3.2.1. Orthographic transcription

Annotating over 1000 hours of read and spontaneous speech is a rather daunting task. As a first step, the speech data are transcribed orthographically. The orthographic transcription of read speech is carried out semi-automatically using a Praat script (Boersma and Weenink, 2007) that fills the intervals between manually set word boundaries with the respective orthographic material. The initial orthographic transcription of read speech has been completed for all participants.

Since it can easily happen that a participant misreads a word and has to reread it or that the order of words is changed erroneously, the automatically filled intervals usually have to be corrected manually. After the initial transcription pass only some spot checks are performed. As it became clear during the manual phonetic transcription process (see Section 3.2.2), this procedure is not sufficient. More than once the content of the intervals is accidentally shifted to the left or the right. Therefore, a formal corrections procedure for the word list data has been introduced. We developed a Praat script that successively plays all intervals matching a specified regular expression (usually one lexeme) and waits for the user to correct any mistakes. The lexemes chosen for a correction pass are interspersed across the word list at regular intervals. An error usually affects several neighbouring intervals, and the whole stretch of affected lexemes is corrected during the same pass. All corrections are documented, and we expect to see a rapid decline of errors for each tested lexeme as the correction procedure progresses.

Spontaneous speech is transcribed completely manually in 2-3 second stretches. The conventions for orthographic transcriptions of spontaneous speech were discussed and agreed upon between several in-house projects, building on existing transcription conventions (Goedertier and Goddijn, 2000; Kohler et al., 1994). For example, punctuation is not marked but lexical capitalisation is applied (the latter one in accordance with German orthographic conventions). The initial transcription pass of the interview data is followed by a thorough correction pass, which is carried out by a second transcriber. The interviews of all 159 older participants have been orthographically transcribed and are now in the process of being corrected. 150 interviews with the younger participants have been orthographically transcribed so far. As there is currently a lot of uncertainty regarding our future resources, we can give only a rough assessment of when we expect to complete the orthographic transcription of all interviews: by mid-2009 in the best case, by the end of 2010 in the worst case.

Especially the map task data can be rather dialectal, making them hard to understand for transcribers not familiar with the respective dialect. Therefore, the map task data have not been transcribed yet. Crowdsourcing the orthographic transcription of map task data (e.g. similar to Distributed Proofreaders[4]) or directly recruiting locals for the transcription of heavily dialectal speech might be possible solutions. To this end, we are planning cooperations with linguistic institutions in Switzerland and Austria.

3.2.2. Phonetic transcription

We recently started creating manual phonetic transcriptions for selected lexemes from the word list (see examples in Section 4). With the help of a Praat script all realisations of a lexeme are extracted from the corpus. In a first pass the transcriber only listens to all realisations and notes all obvious variants. To speed up the phonetic transcription process and to avoid typos, pronunciation variants can be selected from a tailored Praat ManPage[5].

Being aware that manual phonetic transcription is a subjective matter, we are planning a mix of strategies to ameliorate or circumvent the problems caused especially by narrow transcriptions:

1. Some phenomena are so auditorily obvious, that a broad transcription will be sufficient to demonstrate possible variants in our corpus. Deletions belong to this category, as well as word stress variation (e.g. in compounds) and categorical segmental variation on the phoneme level (most frequent in loan words like the initial consonant of <Chemie> 'chemistry' or <China> which has the variants [k], [C], [S], [s\], [x], see Figure 4).

2. Some fine phonetic detail can be captured best with quantitative signal-based methods. Measuring duration (e.g. for VOT), analyses of voicing and intensity (e.g. for fricatives), and the automatic computation of formants (for vowels) or other frequency measures belong to this category. However, normalisation of the calculated values across all speakers is an important issue, which might not be solved satisfactorily for every type of measurement.

3. For the remaining cases, which require manual narrow phonetic transcriptions, we have yet to devise a procedure that allows comparison of at least two independently created segmentations and transcriptions.

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[4] URL: http://www.pgdp.net/c/ (accessed: March 26, 2008)
[5] adapted from John Tøndering's `Label.man`, URL: http://www.cphling.dk/pers/johtnd/praat/my_praat.htm

To facilitate the manual phonetic transcription process and to allow a combined search across orthographic and canonic phonetic transcriptions, an automatic alignment tool will be used. First tests applying the Munich automatic phonetic segmentation and labelling system MAUS[6] to read data have proved promising. Therefore we plan to use it to produce an automatic broad phonetic segmentation and transcription as soon as the orthographic transcription has been corrected.

3.2.3. Variationalist annotation

A variationalist annotation layer will be added to the interviews and map task data. Variants of selected variable phenomena will be annotated, e.g. different forms of the negation particle *nicht* 'not' or variants in the indefinite article system (especially weak forms are of interest to us). This annotation will eventually enable us to analyse the basic variative structures of spontaneously spoken German and to compare the interview data with the map-task setting. As this kind of annotation is very time-consuming (it has to be applied to the majority of spontaneous speech in the corpus to yield worthwhile results), we still have to tune and test an annotation system that can be applied manually with high effectiveness and low error rate.

3.3 Mapping

Our primary means to analyse the annotated data are maps that show the realised variants of a lexeme or a phoneme in a specific position. Currently we use the mapping software KartPro[7], which has been developed for dialectological studies. KartPro reads tab-separated lists of values containing information about the realised variants and the coordinates of each speaker. It allows to assign specific symbols to each type of variant. To generate the tab-separated lists for KartPro we developed a tailored Perl[8] program that extracts the necessary data from the Praat annotation files (TextGrids) and a list of city coordinates. Examples of maps produced with KartPro are shown in Section 4. The final versions of the maps will also be published on the internet, where we will make use of colours rather than shades of grey and symbol forms.

4. Online guessing game

We devised a guessing game to draw public interest to our corpus and to gather data about the perception of regional variation. The game is available on the internet[9] and draws random examples from a database of sound clips. Currently the sound clips only stem from map task and interview recordings. The game consists of several rounds. The first round starts with two sound clips from two different cities; three possible cities are offered to the players, who can listen to the sound clips as often as they like. In each round the number of sound clips and cities are raised by
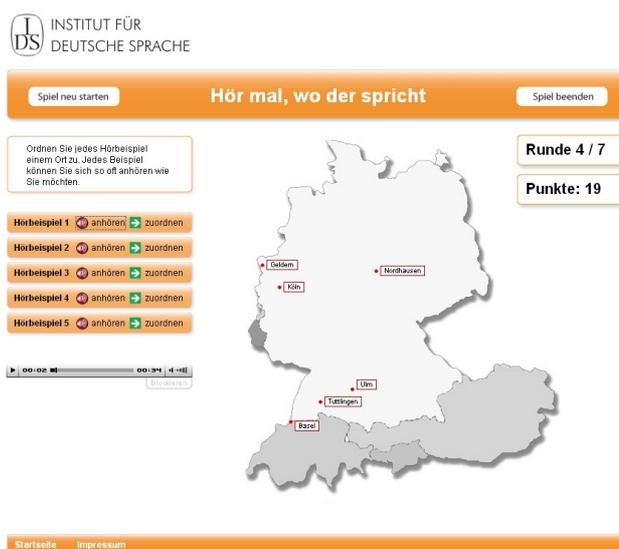

Figure 2: Screen shot of the online guessing game with randomly selected sound clips from the corpus

one (see Figure 2 for the screen shot of a fourth round offering five sound clips and six possible cities). The players gather points when they guess the correct city and all guesses are logged. Thus, the logged data can be used to analyse which cities (or rather which speakers) are likely to be assigned correctly and which ones are often mismatched. However, using the game for a reliable perception study would require a carefully selected database of sound clips.

5. First exemplary results

In order to work out standards and procedures of how to exploit the corpus data we recently annotated and mapped several lexemes of the word list read by young participants.

In Figure 3 the stress pattern of *Kaffee* 'coffee' is the main topic. According to German pronunciation dictionaries (cf. Duden Band 6, 2005), it can have stress on the first (black dots) or on the second syllable (circles with white core). The map shows that in Germany there is no region where one of the stress patterns is predominant. In Switzerland and even more so in Austria and Southern Tirol, stress falls regularly on the second syllable. So we have a clear case of an Austrian (and in tendency also Swiss) national variant as opposed to a mix of both stress types in Germany in our main corpus of young speakers. And there is also a variant of the stressed first syllable type with a final schwa instead of a full vowel, showing mainly in the north of Germany (black cross). These facts should be used to supplement future pronunciation dictionaries with information as to where in the German-speaking area which variant is used.

In the second example (Figure 4) the initial consonant of the word *Chemie* 'chemistry' is mapped. In German pronunciation dictionaries (cf. Duden Band 6, 2005) the initial consonant has only the single codified form of [C]. In our main corpus, quantitatively at least three main variants and another two to three secondary ones show up: The
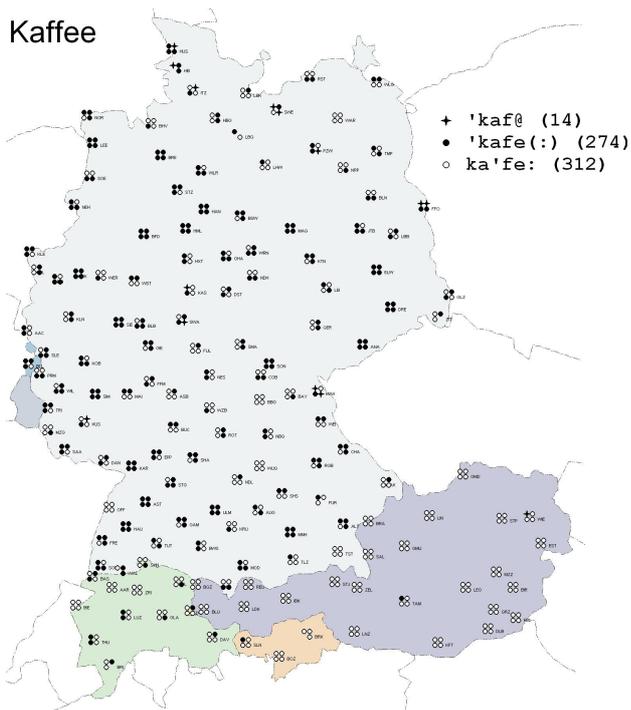
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[6] URL: http://www.phonetik.uni-muenchen.de/Forschung/Verbmobil/VM14.7.html

[7] Kartierprogramm Ver. 18.12.2003, URL: http://omnibus.uni-freiburg.de/~post/kartprog.html

[8] URL: http://www.perl.org/

[9] URL: http://multimedia.ids-mannheim.de/hoermal/web/

Figure 3: Pronunciation variants of *Kaffee* 'coffee' realised by younger participants, absolute frequencies in brackets

codified variant [C] (light grey filled squares) is concentrated mainly in the northern areas of Germany, with scattered occurrences everywhere else (a secondary concentration showing in Switzerland). So in our data only a minority of the German-speaking people actually use the codified variant. The second fricative variant [S] (light grey unfilled squares) can be heard in the north as well but is predominant in the central areas of Germany. In the same area the sound [s\] (light grey unfilled circles), articulatorily in the middle between [C] and [S], is the minority variant.

In the south of Germany, Austria and South Tirol, closely related aspirated plosives of the Type [k_h] (dark grey unfilled squares) and palatal affricates of the type [kC] (dark grey filled squares) are the major variants. At a few places in North Tirol, velar affricates of the type [kx] (unfilled crosses) are documented. The greatest diversity of variants can be found in Switzerland, where beside the codified form and the aspirated plosive / palatal affricate variant the velar [x] represents a truly Swiss form.

This example shows that there are cases where neither the concept of national variants nor that of traditional dialect areas can exclusively account for the areal distribution of the linguistic variants. The Swiss form [x] shares its area of occurrence with two other variants that are most frequent outside Switzerland. The Austrian variant [kC] is also predominant in southern Germany. There it is documented only in the two states of Bavaria and Baden-Württemberg, irrespective of traditional dialect areas. But another implication of the map is even more important: The fact that only one form of the seven documented in this corpus is codified in the most popular German pronun-

ciation dictionary shows how inadequate information gained from this source can be. To amend this state of affairs is one of the main goals of our project, we aim to provide e.g. learners of German with the forms actually in use in the German speaking countries, not just those that ought to be used according to prescriptive sources.

6.   Outlook

Apart from cases like those shown, which are either restricted to one (like *Kaffee*) or a small set of lexemes (like *Chemie*, which has a parallel in *China* 'China'), we are also going to analyse segmental phonetic variation of native German words with respect to their distribution. The comprehensive analysis of position-dependent realisations of vowel and consonant phonemes will bring new insights into the exact phonetic shape of different German regional accents. To achieve this, we will have to rely on acoustic analyses as well as traditional narrow phonetic transcriptions. Finally, the data will also be aggregated and regions of similarity and dissimilarity will be calculated with dialectometric methods (Nerbonne & Kretzschmar, 2003). Analyses of supra-segmental phenomena are planned as well but will have to be postponed to a later stage of the project.

7.   References

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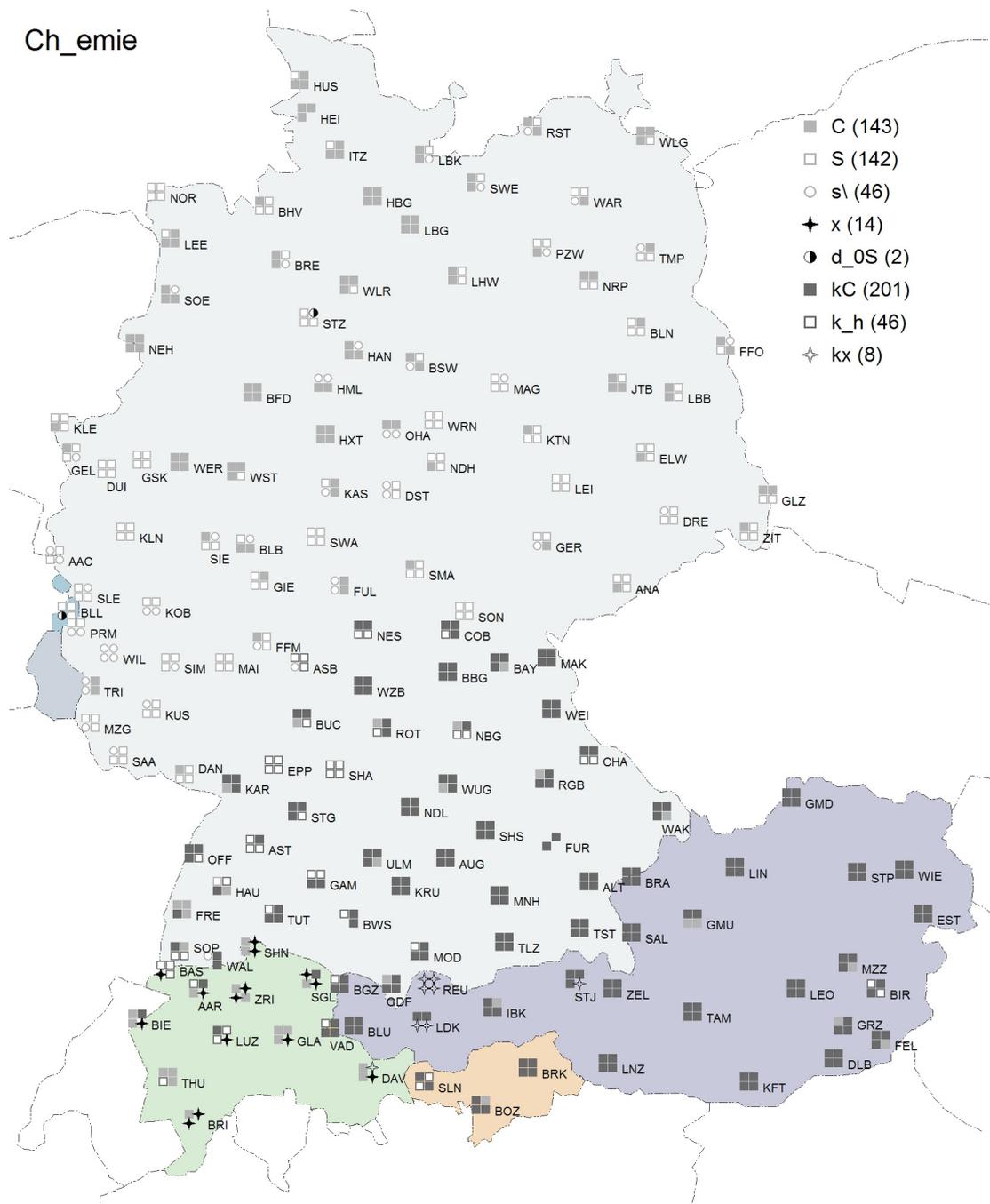
Figure 4: Pronunciation variants of the first consonant in *Chemie* 'chemistry' realised by younger participants, absolute frequencies in brackets