REGIONAL VARIANTS OF GERMAN: CATEGORIES OF PRONUNCIATION DEVIATION FROM STANDARD GERMAN

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ABSTRACT

This analysis describes categories of pronunciation variants we found in the transcription of monologues recorded for the RVG1 corpus (Regional Variants of German). Our results indicate that transcriptions on orthographic level provide useful information on regional variations of standard German. The pronunciation variants can be categorized into assimilation, enclitics, and types of single phoneme modification. Using detailed speaker data, additionally collected in RVG1, the distribution of variations over geographical areas could be displayed for each category. We found the most frequent number of deviations from standard German in the southern German speaking regions.

1. INTRODUCTION

The analysis of data bases containing spontaneous speech is supposed to help in the development of collection strategies and processing of data [1] with respect to the different degrees of spontaneity and different deviations from standard pronunciation. The work described here is part of a serial of experiments aimed towards improving our collections and finding criteria for accessing the level of spontaneity in a given database [2] [3].

We concentrate on regional deviations of standard German. Each of the 500 speakers of the RVG1 corpus produced one minute of spontaneous narration, but was asked for avoiding strong dialect. Each narration is transliterated on orthographic level with additional information on deviations from German standard pronunciation. Our interest is, to see if the information in these annotations of pronunciation deviations is sufficient to classify the deviations with respect to their type and regional occurrence.

This paper is organized as follows: First, we will shortly describe our corpus, the map we used for the regional distribution and the annotation rules for pronunciation comments. Further, we present and discuss categories of deviation and show their distribution over geographical areas.

2. MATERIAL

2.1. RVG1 Corpus

RVG1 [4] was originally collected at the Institute of Phonetics and Speech Communication in Munich in cooperation with AT&T, Lucent Technologies and the Bavarian Archive for Speech Signals – BAS, Munich [5]. The entire database consists of regionally balanced recordings of 500 speakers, each of them reads telephone numbers, computer commands and phonemically rich sentences and produces one minute spontaneous monologue. Detailed information of origin and education is available for all speakers. The monologues are transcribed using the VERBMOBIL [6] convention system for the annotation of spontaneous speech [7]. The transcriptions of the monologues of 491 speakers build the basis of the current analysis.

2.2. Map of the German Speaking Regions

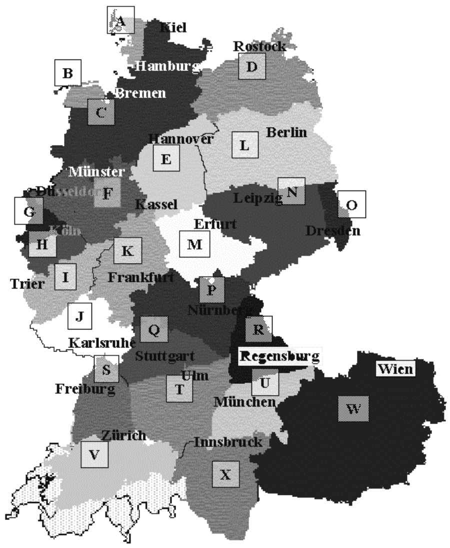

Figure 1. Dialect regions: A Nordfriesisch, B Ostfriesisch, C Nordniedersächsisch, D Mecklenburgvorpommersch, E Ostfälisch, F Westfälisch, G Niederrheinisch, H Mittelfränkisch, I Moselfränkisch, J Pfälzisch, K Hessisch, L Brandenburgisch, M Thüringisch, N Obersächsisch, O Sorbisch, P Ostfränkisch, Q Südfränkisch, R Nordbairisch, S Niederalemannisch, T Schwäbisch, U Mittelbairisch, ' V Schweizerisch, W Ostösterreichisch, X Tirolerisch

The number and distribution of the speakers over the German speaking areas was originally obtained using a complex system with respect to population density and dialectal aspects [4]. The currently used map has its focus on dialectal aspects and represents all the regions based on the dialectal maps of König [8]. Some dialects are spoken in sparsely populated regions. Therefore, less speakers of these regions are recorded. This has the consequence, that the data does not allow statistically founded predicates for pronunciation modifications of all 24 dialect regions. To obtain an overview, if geographical areas correlate with certain pronunciation variants annotated in the RVG1 transcriptions, we combined the dialect regions in broad geographic classes, with respect to their geographical direction and to their dialectal relationship. These classes consist of six areas: north (dialect regions A, B, C, D), mid (dialect regions E, F, K), west (dialect regions G, H, I, J), east (dialect regions L, M, N, O), south-east s-e (dialect regions P, R, U, W) and south-west s_w (dialect regions X, Q, S, T, V) (see also [9]).

2.3. Transcription of Pronunciation Comments

The rules for the transcription of a pronunciation variant of standard German are part of the system for the annotation of spontaneous speech of VERBMOBIL. A transcriber gives always the correct orthographic representation of a word. In case of a deviation, a comment within brackets containing a representation of the deviation follows. The rules for pronunciation comments tell the transcribers, how variants should be annotated, and assure consistency within the annotations. Additionally, the consistent issues of these annotations allow an easy filtering and automatic processing. The rules are described in detail in [7] and [10].

3. RESULTS

The entire corpus consists of a vocabulary of 8252 word types. 29% of these have at least one comment on pronunciation deviation. Altogether, 71851 tokens are spoken. 23% of these tokens are annotated as modified pronounced. Only 6% of the annotated comments contain constricted lexical items affecting two words. The remaining 94% describe modifications within one lexical item.

3.1. Constriction of Lexical Items

We refer to a constriction of lexical items for merged words where the transcriber could not identify a word boundary. Constrictions can be easily found by searching for comments starting with a "2", indicating, that two lexical items will be commented within one comment bracket. Example: *haben wir <!2 hamma>*

3.1.1. Enclitic. 40% of the word constrictions are categorized as enclitic. We refer to the term enclitic in case of a pure merge of two words where one of the words or parts of the words are eliminated. Most of these cases contain apostrophes indicating missing phonemes. Also cases with additionally dialectal phoneme modifications which are not coherent to the constriction are allocated into this category. The most frequent enclitics in our material are productions of the words "*mit dem*" annotated as: *<mi'm>, <mi'em>, <'m>* or *<mit'm>*.

Occurrences are found at high number in the south-eastern area, followed by mid, south-west and west (figure 2).

3.1.2. Assimilation. The category of assimilation is defined as phoneme shifts conditional upon the influence of the adjacent phonemes at the merging point of the concerned lexical items. Assimilation is found on 59% of comments on constricted words. The hit list is leaded by "*haben wir*" (99 cases) annotated by the following pronunciations: *<amma>, <hämma>, <hämmer>, <häwe>, <hamar>, <hamir>, <hamma>, <hammer>, <heme>, <hemma>, <homma>, <humma>*

Assimilated "*haben wir*" can be found in nearly all dialect regions. Figure 2 shows a high number of commented assimilation for the southern regions, but also frequent occurrences in the western area.

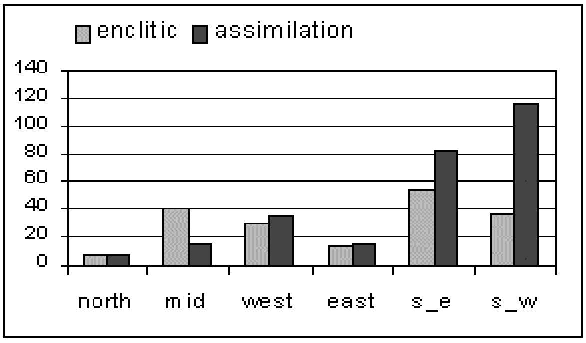

Figure 2. Total counts of assimilation and enclitics distributed over broad geographic areas.

3.2. Phoneme Modifications

We limited the analysis of phoneme modifications to comments regarding the pronunciation variants of a single word. These comments start with "1", indicating, that the comment describes a variation of the preceding lexical item. Example: *Hasen <!1 Hosen>*. These variations were divided into pure elisions of phonemes (47%) and modifications of single phonemes (53%) which are shifted into other phoneme categories. Further, we decided to count those deviations where we found at least 20 or more comments on a single word type. Therefore, we analyzed 74% of all pure elisions and 61% of all comments containing phoneme shifts.

3.2.1. Pure Phoneme Elision. We named this category pure phoneme elision to indicate that we analyzed these elisions in cases, where phonemes are missing, but the remaining pronunciation meets the standard pronunciation and no other phoneme changing occurred. Only in this case, the transcriber has to mark the elision with an apostrophe for missing one or more phonemes at the position of the elision within the orthographic representation. The idea behind this rule was, that modified phoneme clusters would make it often very difficult for the transcriber to define the position of an elision. We categorized the group of words containing an apostrophe in initial, medial and final elision.

- 14% of all elisions occur in initial word position. Examples: *"dem" - <'m>, "natürlich" - <'tü'ich>*
- 12% of all elisions occur somewhere within the word. Examples: "eigentlich" - <ei'ntlich>, "ziemlich" - <ziem'ich>
- The elisions in final position (74%) build the category with the most frequent occurrences. Examples: "*und" - <un'>, "nicht" - <nich'>*

Figure 3 shows the distribution of the total counts of initial, medial and final elisions over the broad geographic areas. Generally, all elisions occurred in all areas. The final elisions show a remarkable higher occurrence in general, and specially in the southern areas.

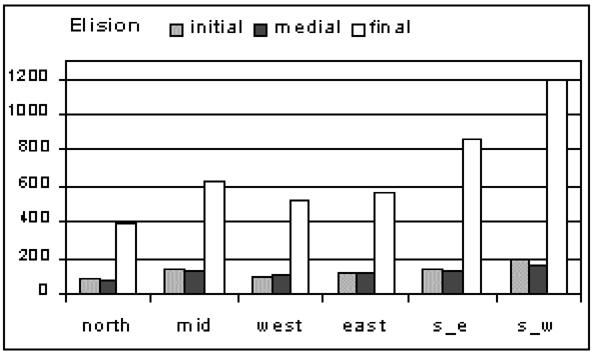

Figure 3. Total counts of phoneme elisions in initial, medial and final word position.

3.2.2. Consonant Shifts. Out of typical consonant shifts for German dialects König described in [11], 5 are found prominently in our material:

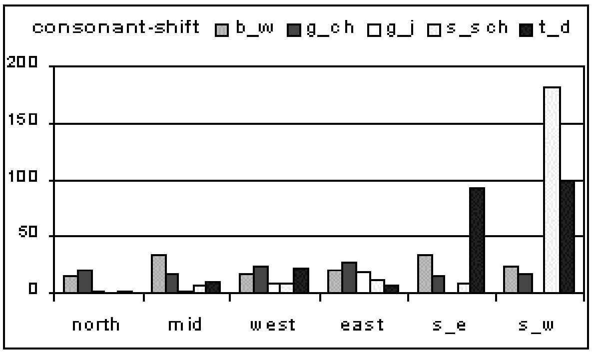

Figure 4. Total counts of consonant shifts: e.g. b_w: the first letter indicates standard /b/ is modified to /w/.

- 31% of the shifted consonants are found for a standard /t/ shifted to /d/. Additionally, in Figure 4 can be seen, that this shift seems to be a typical southern phenomenon. Examples: *"nicht" - <ned>, "Montag" - <Mondag>*

- We found shifts of non-initial /s/ to /sch/ on 30%. The overview in Figure 4 shows that this kind of variation seems to be typical for the south-western regions. Examples: *"ist" - <isch>, "erst" - <erscht>, "gestern" - <geschdan>*

- In 20% of the analyzed consonant shifts the standard pronunciation is /b/ while the annotation within the comment shows /w/. Altogether, Figure 4 shows that this phenomenon can be found in all geographic areas on a comparable number. Examples: *"habe" - <hawe>, "aber" - <awa>*

- Since years there are discussions whether final /g/ has to be pronounced as /ch/ in standard German. Both versions are in use within standard German. Therefore, it is not clear, whether a transcriber annotates this case as variation from standard or not. We found /g/ > /ch/ in 16% of our consonant shifts, 70% of these concern final /g/. Figure 3 displays for this case a broad distribution over all areas. Examples: *"Tag" - <Tach>, "gesagt" - <gesacht>*

- A variation which seems to be typical for east German areas is the shift of /g/ to /j/. Examples*: "gesagt" – <jesacht>, "gut" - <jut>*

3.2.3. Modified Vowels

3.2.3.1. Diphthongs: 246 cases of our material are diphthongalized monophthongs. 556 cases are monophthongalized diphthongs, 61 cases are vowel shifts within diphthongs.

Figure 5 shows, that the diphthongizations are found nearly exclusively for speakers from the southern regions. Three types diphthongizations seem to be specially interesting:

- 17% of the diphthongizations we found are annotated as a modification of standard /a/ to diphthong /ei/. Examples: *"gesagt" - <gseit>, "also" - <aiso>*

- For further 17% of the diphthongizations, /u/ is modified to /oa/. Examples: *"muß" - <muaß>, "gut" - <guad>*

- 30% diphthongalized vowels are found in case of /a/, modified to /oi/. In nearly all of these cases /a/ was followed by /l/. Examples: *"halt" - <hoit>, "mal" - <moi>*

Figure 5 shows further, that monophthongalized diphthongs again are found most frequent for the southern areas. But also the western and the eastern area shows occurrences, and even in the mid area this phenomenon can be observed in our data.

- 55% of all monophthongizations are annotated for the modification of /ei/ to /a/. Examples: *"einen" - <an>, "weil" - <wal>, "einmal" - <amal>*

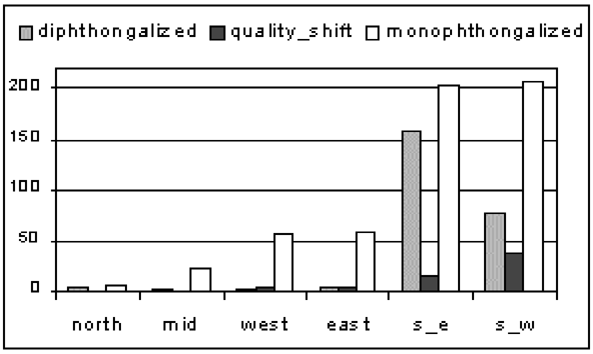

Figure 5. Total counts of diphthongalized monophthongs, quality shifts within diphthongs, monophthongalized diphthongs over the geographical areas.

- 17% of the observed cases are found for the modification of /au/ to /a/. Examples: *"auch" - <a>/< ach>, "auf" - <af>*

As can be seen in figure 5, quality shifts within diphthongs occur nearly exclusively in the south-western and the south-eastern area. They consist mainly in 25% of type /ei/ to /oa/, in 23% of type /au/ to /ou/ and in 23% of type /eu/ to /ei/. Examples: *"daheim" - <dahoam>, "auch" - <ou>*

3.2.3.2. Monophthongs: We analyzed 1634 cases where monophthong vowels shifted into another vowel quality. To categorize these shifts, we used a simple code by means of describing the movements a vowel makes within the IPA vowel chart. Since the alphabet represents phoneme classes of German vowels only very broadly, we coded vowel shifts in vertical direction indicating the levels, a vowel rises (first code position) or drops (second code position). The third position within the code describes rounded (o) or unrounded (e), the fourth position codes horizontal movement, frontal (f) or back (b). For example, the movement e > u would be coded as 1xob, 1 = one level up, x = no level down, o = rounded, b = back.

- The code category we found most frequently, is 2xxx (45%). This means, the vowels are shifted up by two steps in vertical direction. The shift /a/ > /e/ is the only movement, where we found occurrences (45% of all vowel shifts). It occurred generally in every region. Therefore, it does not seem to be a typical dialectal phenomenon. Examples: *"das" - <des>, "hat" - <het>, "dann" - <denn>*

- 11% of the vowel shifts were classified as 2xob: two steps up in vertical direction, rounded, moved back. 2xob occurred in our material only for the shift /a/ > /o/. Figure 6 shows this movement specially in the southern areas, also to a less frequent number in the western and eastern regions. We assume, that the high number of annotations of /a/ pronounced as /o/ in the southern regions has to be seen as a problem of decision transcribers make. /a/ is specially in the south-eastern regions often realized as shifted back and slightly rounded. Listeners from middle and northern regions tends to percept this as /o/, while listeners from the southern regions tends to hear a clear /a/ phoneme. Therefore, it might depend on the origin of a transcriber, which decision is made. Examples: *"aber" - <oba>, "hab'" - <hob>, "Tag" - <Dog>*

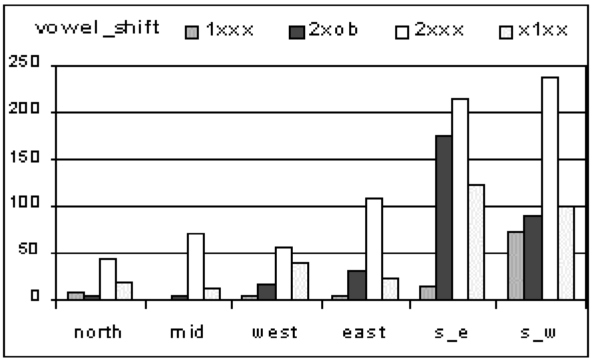

Figure 6. Vowel shifts: amount of occurrences of the four movements with the most occurrences

- The category x1xx (one level down in vertical direction) can be found on 19% of our material. It consists to the highest percentages in 18% /i/ > /e/ shifts, 1% /u/ > /o/ shifts and 0,5% /e/ > /ä/ shifts. Figure 6 shows the most occurrences in the south-eastern area, followed by the south-western and the western area. Examples: *"nicht" - <ned>, "die" - <de>, "sie" - <se>*

- The category coded as 1xxx (one level up in vertical direction) seems to characterize some dialects in the south-eastern and south-western area. Altogether, the 7% we found of this category contains /a/ > /ä/ (3%), /ä/ > /e/ (0,5%), /e/ > /i/ (2%) and /o/ > /u/ (1%). Examples: *"hat" - <hät>, "dann" - <dänn>, "gewesen" - <gsi>*

4. CONCLUSION

Since we don not have material in comparable number of all dialectal regions of the German speaking area, we can not analyze which kind of deviation phenomena of standard German are typical deviations of a region. What we could demonstrate in this paper is first, that there are certain clues within the pronunciation comments which allow analyses about what phenomena occur and where they occur. Altogether we found most of the commented variants in the southern areas.

5. FUTURE WORK

As also assumed in former analyses [2], recordings of regions like Switzerland or Austria should not be analyzed together with data from Germany. This dialects tend to become a language of their own and falsify the results of experiments about standard German. Separated analyses for Germany and these regions will be made.

Also more attention should be given to the origin and background of a transcriber. We found a couple of cases, where it would have been interesting, whether the transcriber speaks a northern or southern German. We assume, that here again at least transcribers from southern regions make other decisions as those from northern regions. Therefore, we will analyze interacting of education and regional origin of transcribers on pronunciation annotations.

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