

- Labov, W. 1969. "Contraction, deletion and inherent variability of the English copula". *Language* 45.715-62.
- Ladefoged, P. 1993. *A Course in Phonetics*. Fort Worth, Tex.: Harcourt Brace Jovanovich. 3rd edition.
- Leino, P. 1982. *Kieli, runo, mitta: Suomen kielen metriikka*. Pöytäkirja: Suomalaisen Kirjallisuuden Seura.
- 1986. *Language and Metre: Metrics and the metrical system of Finnish*. Helsinki: Suomalaisen Kirjallisuuden Seura. Translated by Andrew Chesterman from Leino 1982.
- Liberman, M. 1994. Optionality and optimality. Fragment of a draft, Department of Linguistics, University of Pennsylvania.
- Nagy, N. & B. Reynolds. 1994. Accounting for variable word-final deletion within Optimality Theory. Handout distributed at the 23rd Annual Conference on New Ways of Analyzing Variation (NWAV 23), Stanford University, October 20-23, 1994.
- Nirvi, R. 1945. "Voiako monikon genetiivin monimuotoisuutta supistaa?" *Virittäjä*, 277-289. [Can the variability of the genitive plural be reduced?].
- Paunonen, H. 1974. *Monikon genetiivin muodostus suomen kielessä I*. Helsinki: Suomalaisen Kirjallisuuden Seura. [Genitive plural formation in Finnish, Vol. I].
- Prince, A. & P. Smolensky. 1993. Optimality Theory: Constraint interaction in generative grammar. Ms, Rutgers University, New Brunswick, and University of Colorado, Boulder.
- Reynolds, W.T. 1994. *Variation and Phonological Theory*. Ph.D thesis, University of Pennsylvania.
- Sadeniemi, M. 1949. *Metriikkamme perusteet*. Suomalaisen Kirjallisuuden Seura. [The fundamentals of Finnish metrics].
- Tesar, B. & P. Smolensky. 1995. "The Learnability of Optimality Theory". *The Proceedings of the Thirteenth West Coast Conference on Formal Linguistics (WCCFL XIII)*, ed. by R. Aranovich, W. Byrne, S. Preuss & M. Senturia, 122-37. Stanford Linguistics Association/CSLI.
- Weinreich, U., W. Labov & M.I. Herzog. 1968. "Empirical foundations for a theory of language change". In *Directions for Historical Linguistics: A Symposium*, ed. by W. Lehmann & Y. Malkiel, 95-195. Austin: University of Texas Press.
- Wiik, K. 1965. "Finnish and English vowels". *Annales Universitatis Turkuensis*, B:94.
- Zoll, C. 1992. When syllables collide. Ms., Brandeis University.

Co-Occurrence Restrictions between Linguistic Variables

A Case for Social Dialectology, Phonological Theory and Variation Studies

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1. Introduction*

There are various ways to conceive of the relationship between phonological theory and social dialectology. One version is given by Hinskens (1995) who states as a heuristic principle that "in most instances, phonological variation and change can be explained as manifestations of general, in principle language-independent, aspects of phonological organization." According to this view, variation studies and phonological theory are in perfect harmony. While variation studies serve phonology, since "findings regarding the nature and distribution of language variation" may be used to "test theoretical claims" (p. 12), phonology also serves variation studies by "explaining processes of language change" (p. 7).

The data I will be concerned with here — co-occurrence restrictions between linguistic variables — are, in a way, a test for the "harmony view" of the relationship between phonological theory and variation studies; and indeed, they will turn out to support it in many ways. However, there will also remain some phenomena which cannot be explained as "manifestations of general aspects of phonological organization" (Hinskens), showing that the study of variation is not identical with sociolinguistics.

2. A first example: co-occurrence restrictions in the Lucanian dialect-standard continuum

Put in simple terms, the term "co-occurrence restriction" refers to the fact that linguistic variables do not always co-occur freely within a given prosodic domain such as the phonological word, the phonological phrase, or units of similar size; instead, certain restrictions of co-occurrence between variable forms hold.¹

Co-occurrence restrictions would be of little interest for variation studies if they were bi-directional and obligatory. In this case, one could rightfully argue that what we observe is not really variability within a linguistic system, but rather code-switching between two varieties. However, at least in the Italian and, in particular, in the German language area for which data will be presented in this and in the following sections, co-occurrence restrictions are often uni-directional and therefore lax enough to allow for intermediate forms between standard variety and dialect. Taking the form of uni-directional implications, they are indeed one of the main reasons for which a (morpho-)phonological continuum (or quasi-continuum) between varieties such as the standard and a local dialect has emerged in the speakers' repertoires. As such, co-occurrence restrictions are at the heart of important dialectological developments in Europe which all relate to the central issues of structural divergence and convergence of dialects and standard varieties (cf. Auer & Hinskens 1996).

The first example is taken from a study on the Italian spoken by Italian immigrants, and in particular, their children in Germany (Auer & di Luzio 1983a, b). In this study, we observed that, for an autochthonous speaker of a Southern Italian dialect such as that of the Lucania (=Basilicata), there is a whole scale of possible realizations of words or phrases between the extreme standard and the extreme dialectal form. Table (1) (adapted from Auer & di Luzio 1983a: 9, 10) situates a number of such possible realizations of some Italian words or phrases on the Lucanian standard/dialect continuum.

Table 1: Lucanian standard/dialect continua

<i>standard pole</i>				
[ve'de:re]	[dʒo'ka:re]	[kwando]	[lo:ro]	[tanto]
[ve'dɛ:rə]	[dʒo'ka:rə]	[kwandə]	[kwelli]	[tantə/tando]
[vɛ'de/və'dɛ]	[dʒo'ka]		[kwellə]	
[və're]	[ju'ka]	[kwannə]	[kwillə]	[tandə]
				[tannə]
'to see'	'to play'	'when'	'they'	'so much'
<i>dialectal pole</i>				
<i>standard pole</i>				
[le ko:se]	[la skwo:la]	[de:vo diven'ta:re]	[o porta:to ~ porta:vo ~ portai]	
[le ko:sə]	[la skwo:lə]	[de:vo diven'ta:rə/diven'darə]	[o porta:tə ~ porta:və]	
		[de:vo diven'da/diven'ta]		
	[a skwo:lə]	[adʒdʒa dəvən'da:rə]	[adʒdʒə porta:tə ~ porta:və]	
[i ko:sə]	[a sko:lə]	[adʒdʒa dəvən'da]	[adʒdʒə purta:tə ~ purta:və]	
'the things'	'the school'	'I have to become...'	'I carried'	
<i>dialectal pole</i>				

The intermediate forms can easily be described by a number of variable phonological rules such as post- and pretonic vowel reduction, nasal assimilation, postnasal voicing, raising of pre-nuclear stressed vowels, monophthongization (of /wo/), by a variable morphonological rule of infinitive truncation, by the variable morphological alternations between dialectal and standard forms for the definite article, the 3rd person plural demonstrative and the *passato*-forming auxiliary, and by some variable lexicalized phonological rules responsible for the stem-alternants in *vedere* and *giocare*.

The interesting point is that these phonological, morphonological, morphological and lexical variables are not permitted to combine freely in all cases. Co-occurrences such as

+dialectal stem/-infinitive truncation:	*[və're:rə], *[ve're:rə], etc.
+nasal assimilation/-vowel reduction:	*[kwanno]
+raising/-vowel reduction:	*[purta:to]
-dialectal demonstrative/+vowel reduction:	*[lo:rə]
+dialectal article/-vowel reduction:	?[a skwo:la]
+dialect auxiliary/-vowel reduction:	*[adʒdʒə porta:to]
-dialect auxiliary/+raising:	*[o purta:tə]
-dialect article/+monophthongization:	?[la sko:lə], *[la sko:la]
-dialect auxiliary/+infinitive truncation:	?[de:vo dəvən'da]

are clearly impossible (*) or highly problematic (?), although the inverse combination of the two variables is perfectly acceptable. In the case of co-occurrence restrictions of this type, we therefore get the following schema of possible realizations:

variable A	variable B	acceptability of A+B
+	+	+
-	+	+
-	-	+
+	-	-

An example would be A= nasal assimilation, B=vowel reduction:

nasal assimilation	post-tonic vowel reduction	acceptability of A+B
+	+	[kwannə]
-	+	[kwandə]
-	-	[kwando]
+	-	*[kwanno]

Clearly, we are dealing with a hierarchical relationship between the variables in question: variable A implies B (but not vice versa):

nasal assimilation \supset post-tonic vowel reduction.

The given formulation of this uni-directional (implicational) co-occurrence restriction presupposes a certain direction of thinking, starting with the standard version and applying certain rules to it in order to arrive at the dialectal form. (This direction of thinking is evident from the terms "assimilation" and "reduction".) On logical grounds, of course, one might just as well (and in some macro-sociolinguistic contexts, with more justification) start with the dialect and

formulate rules which may then be applied to yield the standard form; in this case, the implication must be stated in the opposite way (for A = full (non-reduced) vowels and B = non-assimilating nasals), as the following restructured table for the same forms shows:

full vowels	non-assimilation	acceptability of A+B
+	+	[kwando]
-	+	[kwandə]
-	-	[kwannə]
+	-	*[kwanno]

The implication is in then: full vowels \supset non-assimilating nasals.

Apart from those variables which are bound to each other by a one-sided relationship of implication, there are some others which co-occur freely. For instance, the co-occurrence of pretonic vowel reduction (which in turn implies postnasal voicing) and infinitive truncation is not constrained by any regularity, since the dialectal and the standard realizations of both variables are compatible with each other (cf. Table 1: [divent'arə], [divent'a], [dəvənd'arə], [dəvənd'a]).

Although di Luzio and I sketched some of the basic mechanisms by which variables may be linked to each other by implications of simple or more complicated, unilateral or bilateral types, our 1983 papers stated the above-mentioned regularities just in order to be able to contrast them with the language of second-generation migrants in Germany. One of the main findings of this research was that these children no longer obeyed the co-occurrence restrictions valid for autochthonous Lucanian speakers. Instead, we typically found the forms marked by '?' and '*' in the above list.² We concluded that co-occurrence restrictions are a very vulnerable part of linguistic competence; the decay of linguistic knowledge about these restrictions may therefore be viewed as an early indicator of language loss.

3. A Middle Bavarian example, with some remarks on methodology

Co-occurrence restrictions similar to the ones discussed for the Lucanian dialect/standard-continuum are also found in the High (and presumably, Middle) German dialect areas. For instance, in the Middle Bavarian dialect (as spoken roughly around Munich), the following phonological and morphonological variables are observed (processes/rules involved are once more formulated taking

the (Bavarian) standard variety as the starting point, but the inverse direction would be just as plausible):

- apocope of syllable-final /n/ in certain monosyllabics, with concomitant (compensatory) lengthening and variable nasalization of the preceding vowel
- reduced dialectal prefix /g-/ instead of std. /ge-/ as the past participle marker; the non-syllabic dialectal prefix triggers a number of assimilations to a possible stem-initial stop, which may even result in the deletion of /g-/
- a monophthong /a/ instead of the std. diphthong /au/ in certain lexical stems
- reduction and assimilation of the std. unstressed (word-final) /ben/ and /gen/ syllables with concomitant shortening of long stem vowels.

Table 2 on the next page lists some possible and impossible co-occurrences between these variables (rearranged data from Auer 1986).

Moving from Standard into Bavarian on a continuum of forms, n-apocope in the prefixes *hin-*, *an-* implies the use of the reduced past participle prefix *g-*, but not vice versa. On the other hand, the same n-apocope in the prefix is implied by the stem vowel /a/ instead of the diphthong /au/, but not vice versa. This means that the three variables may be ordered on an implicational scale:

monophthongal stem \supset n-apocope \supset reduced participle prefix.

A further morphological variable is involved, but will be mentioned here in passing only, i.e., the dialectal infinitive suffix /-a/ instead of std. /-en/. This Bavarian infinitive is weaker than the monophthongal vs. diphthongal stem vowel (cf. dial. [lafa], std. [laufən], intermediate [laufa] but *[lafən]), i.e., while it is compatible with both stem variants, choice of the dialectal — monophthongal — stem makes the dialectal infinitive necessary as well:

monophthongal stem \supset a- infinitive.

The reduction of and assimilation in unstressed /-en/ after /g, b/-final stems is clearly a post-lexical process (although the concomitant shortening of long stem vowels seems to be more frequent in verbs than in nouns). It is weaker than the n-apocope but stronger than the /ge-/ participle prefix; we thus arrive at a second implicational scale:

n-apocope \supset /-en/-reduction \supset reduced participle prefix.

Since the Bav. monophthongal stem vowels imply the application of n-apocope, we would expect that they are also stronger than /-en/-reduction (since n-apocope implies /-en/-reduction, and relationship of implication/dominance is transi-

tive). As the last row of Table (2) shows, this is indeed the case. We therefore arrive at the following overall ordering of the variables in question:

monophthongal stem \supset n-apocope \supset /-en/-reduction \supset reduced participle prefix

Note again that this statement is equivalent to:

full participle prefix \supset no /-en/-reduction⁴ \supset n-preservation \supset diphthongal stem.

Table 2: Some co-occurrence restrictions for Middle Bavarian (first line = standard, second line = possible intermediate form, third line = dialect, fourth line = impossible intermediate form, fifth line = translation and morphological segmentation of the standard form); two or three examples are given for each co-occurrence

n-apocope & reduced /ge-/	monophth. /a/ & n-apocope	n-apocope & /-en/-reduction	/-en/ reduction & reduced /ge-/	monophth. /a/ & /-en/-reduction
['ange:ʃaud] ³ ['hinge:le:gd] ['ange:hø:əd]	['hin,laufm] ['an,kaufm]	['an,ge:bm] ['an,le:gm]	[ge'tso:gm] [ge'le:gm] [ge'ge:bm]	['auf,ge:bm] ['aufge,fo:bm] [da'ne:bm,laufm]
['an,gʃaud] ['hinglegd] ['aŋ,kø:əd]	['hi:,laufm] ['ʒ:,kaufm]	['an,gem] ['an,leŋ]	[tso:gm] [gle:gm] [ge:b m]	['auf,gem] ['auf,gʃom] [dɐ'nem,laufm]
['ʒ:,gʃaud], ['ʒ:,gʃaugd] ['hi:,glegd] ['ʒ:,ke:əd]	['hi:,lafa] ['ʒ:,kafa]	['ʒ:,gem] ['ʒ:,leŋ]	[tsoŋ] [gleŋ] [gem]	['af,gem] ['af,gʃom] [dɐ'nem,lafa]
*['ʒ:ge:ʃaud], *['ʒ:ge:ʃaugd] *['hi:ge:le:gd] *['ʒ:gehe:ət], *['ʒ:gehø:ət]	?['hin,lafa], *['hin,lafm] ['an,kafa], *['an,kafm]	*['ʒ:,ge:bm] *['ʒ:,le:gm]	*[ge'tsoŋ] *[ge'leŋ] *[ge'gem]	*['af,ge:bm] *['af,gʃobm] ?['dɐ'nebm,lafa]
'looked at' (an-ge-schau- -t) 'laid down' (hin-ge-leg-t) 'listened to' (an-ge-hör-t)	'to run to' (hin-lauf-en) 'to buy' (an-kauf-en)	'to boast' (an-geb-en) 'to land' (an-leg-en)	'pulled' (ge-zog-en) 'laid, put' (ge-leg-en) 'given' (ge-geb-en)	'given up' (auf-ge-geb-en) 'postponed' (auf-ge-schob-en) 'spilled over' (da-neben-ge-lauf-en)

At this point, some comments on the robustness of our findings are necessary. Most of the empirical evidence for co-occurrence restrictions in the sense of the word in which it is used here (i.e. the studies referred to in sections 2-4) is based on introspective data. In the Bavarian and Alemannic data (this and the following section), a number of competent but also linguistically trained informants-native speakers (such as students of linguistics and colleagues) were asked to judge the acceptability of the forms in question.⁵ Only those co-occurrence restrictions were taken into account on which all informants agreed. This was not always the case. In particular, some informants were more restrictive than others. This may be due in part to the metalinguistic context which may have favoured hyper-normative statements in some informants. More likely, it is the normal state of affairs which finds its natural explanation in the fact that the relationship between standard and dialect is certainly not the same for all speakers, e.g., of Middle Bavarian. In particular, there are speakers whose repertoire is relatively strongly compartmentalized; they either use a basilectal variety of Bavarian or Bavarian Standard German. These speakers do not code-shift ("slide" into dialect or standard gradually),⁶ since there are few intermediate forms available to them. As a natural consequence, they impose strict, often bi-directional restrictions of co-occurrence on the variables which define their varieties. Other speakers have a more continuous repertoire characterized by many intermediate forms. These speakers, who may code-shift themselves, will usually give more liberal judgements on the acceptability of these forms. In other words, intuitions about co-occurrence restrictions may be a linguistic variable in their own right. They relate, among other things, to social (e.g. urban/rural speakers) and regional differences.

One of the difficulties in asking informants about the acceptability of co-occurrences is that it is often hard for them (and, indeed, for the sociolinguist who is not a native of the respective region) to distinguish acceptability from actual usage. When informants were asked to judge certain forms, they sometimes reported that they 'sounded strange' or that they 'would not use them', but that they could be heard in the speech of those who do not speak the dialect or the standard well. These statements are reminiscent of the findings of the Italian investigation reported in the preceding section, in which the non-obeyance of co-occurrence restrictions by certain groups of speakers was shown to be characteristic of insufficient language acquisition or even imminent language loss. In fact, speakers who mimic e.g. Bavarian often unwillingly expose their non-native competence by breaking co-occurrence restrictions, even though their mastery of the individual variables is perfect. Here, co-occurrence restric-

tions take on sociolinguistic meaning by characterizing certain groups of non-native speakers.

4. An Alemannic example, with a note on the prosodic domain of co-occurrence restrictions

The third set of examples is taken from research on the urban vernacular of a South German provincial town (Konstanz), located in a transition area between Swabian (North Alemannic) and High Alemannic. This vernacular presently undergoes processes of dialect/dialect and dialect/standard convergence and divergence described in more detail elsewhere (cf. Auer 1990, 1989, 1988, etc.). It also provides many further illustrative cases of co-occurrence restrictions.

For instance, the two variables n-apocope in word-final unstressed /-en/ and s-palatalization before a consonant in other than morpheme-initial position (where it is also a feature of standard German) both represent extremely regular processes of Alemannic which are difficult to suppress by its speakers. However, they are not on a par; rather, n-apocope dominates s-palatalization (n-apocope \supset s-palatalization). This is shown in the following table for the words (*die*) *besten* ('the best') and (*die*) *meisten* ('the most'):

n-apocope	s-palatalization	acceptability of A+B
+	+	[beʃdə] ⁷ , [maɪʃdə]
-	+	[beʃdŋ], [maɪʃdŋ]
-	-	[bestŋ], [maɪstŋ]
+	-	[?] [bestə], [?] [maɪstə]

Further co-occurrence restrictions in non-composite words are given in Table (3), which refers to the following additional regularities in the urban vernacular of the city of Constance:⁸

- unrounding of the std. front vowels /y/ and /ø/ ("unrounding")
- velarization (backing/rounding) of std. /a:/ ("a/-velarization")
- diphthongal realization of the std. long monophthongs /u:/ and /i:/ in the appropriate lexical contexts (Middle High German (MHG) /uo/, /ie/, "diphthongs")
- monophthongal instead of diphthongal realization of std. *auf*, *aus* ("monophthongal prefix")

- short vowels instead of std. long vowels in trochaic phonological words before single consonants in the appropriate lexical contexts (MHG short vowel) ("short vowels")
- certain lexicalized stem alternants (raising, umlaut) ("stem vowel alternations")
- monophthongal realization of std. /ai/ ↔ /ɔ/ in the appropriate lexical contexts (MHG /ei/) ("ai-monophthong")
- lexicalized total assimilation of std. /rd/ ↔ /rr/ ("rd/-assimilation")
- reduced participle prefix /ge-/ (as described above, for Middle Bavarian; cf. Table 2) ("ge-/reduction")
- as a purely morphological variable, the alternation between the std. /-t, -en/ and the dialectal /-ed/ suffix in the plural paradigm of the verbs (present tense) and the plural imperative ("/-ed/ ~ /-en, -t/").

Table 3: Some co-occurrence restrictions of (Lake) Constance Alemannic. (The first line in each cell gives the dialect –left– and (local) standard forms –right–, the second line the acceptable –left– and unacceptable –right– intermediate/hybrid forms. In the third line, the orthographic version of the German standard (plus morphological segmentation) as well as an English gloss may be found.)

variable	n-apocope	diphthongs	short vowels
/s/-palatalization	[bɛʃdə] [bestɐ] [bɛʃdɐ] ?[besdə] (die) besten 'the best'	[Ru:əf] [Ru:fst] [Ru:fʃ(d)] *[Ru:əfs(d)] (du) rufst 'you call'	[lep] [le:pst] [le:pʃ] *[lepst] du lebst 'you live'
unrounding	[lɛflə] [lœflɪ] [lœflə] *[lɛflɪ] löffeln 'to spoon'	[biəxʊ] [by:çʊ] [byəxʊ] *[bi:çʊ] Bücher 'books'	[fɛgələ] [fø:glɪn] [føgələ] [fɛ:gələ] Vöglein 'bird (dim)'
/a/-velarization	[Rɔ:tə] [Ra:tɪ] [Ra:tə] *[Rɔ:tɪ] raten 'to advise'	not possible	not possible
diphthongs	[Ru:əfə] [Ru:fɪ] [Ru:fə] *[Ru:əfɪ] rufen 'to call'	—	not possible
short vowels	[hasə] [ha:sɪ] [ha:sə] *[hasɪ] (die) Hasen 'hares'	not possible	—

stem vowel alternations	[kumə] [kɔmən] [kɔmə] *[kumən] kommen 'to come'	[ke:əxlə] [ky:çlɪn] [ki:əxlə] / *[ke:çlɪn] [ky:əxlə] *[ke:çlə] Küchlein 'cake' (dim.)	[segə] [sa:ɡɪ] [sagə] *[sɛ:gə] sagen 'to say'
mono-phthongal prefix	[uftɛ:lə] [aʊftɛ:ln] [aʊftɛ:lə] *[uftɛ:ln] auf+zählen 'to list'	[ufbi:əgə] [aʊfbi:gən] [ufbi:gə] [aʊfbi:əgə] auf+biegen 'to bend open'	[ustsalə] [aʊstsa:ln] [ustsa:lə] [aʊstsalə] aus+zahlen 'to pay off'
/rd/-assimilation	[vɛrə] [vɛ:ʊdɪ] [vɛrdə] *[vɛrn] werden 'to become'	not possible	not possible
/ge/-reduction	[gʃalə] [gəfaln] [gʃaln] ?[gəfalə] ge+fallen 'pleased'	[gRu:əfə] [gəRu:fɪ] [gRu:fə(n)] *[gəRu:əfə(n)] ge-ruf-en 'called'	[glegd] [gəle:gd] [gle:gd] *[gəlegd] ge+leg+t 'laid'
/-ed/ ~ /-en, -t/	not possible	[Ru:əfəd] [Ru:fɪ] [Ru:fəd] ?[Ruəfd] ruf! (imp.) 'call!'	[legəd] [le:gd] [le:gəd] [legd] legt! (imp.) 'lay!'
ai-mono-phthong	[mɔnə] [maɪnən] [maɪnə] *[mɔnən] meinen 'to believe'	not possible	not possible

Table 3 give an impression of how the three variables n-apocope, use of the dialectal diphthongs (ie) und (uo), and use of the dialectal short vowels (topmost row) are embedded into an implicational net of relations with other dialect features and among themselves (leftmost column). Note that n-apocope is a morphologically and lexically unrestricted process that applies whenever the nasal is in word-final position; the other two variables are lexicalized in the sense of a phonemic merger of two dialectal (=MHG) word classes in the standard language. In the modern vernacular spoken in the city of Constance, n-apocope is extremely wide-spread, while the dialectal diphthongs and short vowels are used only in a small subset of the lexicon as a consequence of the lexical diffusion of standard forms.

The following unilateral restrictions of co-occurrence may be stated, once more taking the standard as the point of departure:

5. Other research on co-occurrence restrictions

At first glance, the problem of unidirectional co-occurrence restrictions is reminiscent of early approaches to variation as they were developed in creole studies by such scholars as Derek Bickerton, Charles Bailey and David DeCamp, but later generalized to other contexts as well. In particular, Ch. Bailey has used the concept of implication for the description of variation in English (cf. e.g. Bailey 1973); an application to Swedish dialect data is found in the work of Thelander (cf. e.g. Kristensen & Thelander 1984). A closer look reveals that the thrust of Bailey's argument is a different one, however. First, his implications are usually not implications *sensu stricto*, but rather hierarchies of environments which impede or facilitate the application of a certain rule in a quantitative sense. The implicational relations which hold between the variables discussed here are of a different type. They are, for a given speaker or group of speakers, categorical; violating them results in unacceptable utterances. The second, even more important difference is that implicational scales are built on the domain of texts (speakers) or even text corpora (groups of speakers): a given feature A is said to imply the usage of a feature B throughout this domain. Implicational models of this type have come under attack for empirical reasons; the predictions they make seem to be too strong to hold even in the creole data for which they were originally conceived (cf., among others, Winford 1980 for a critique). Implicational co-occurrence restrictions in the sense of the term as used here make no such predictions. Since their domain is the phonological word or phrase, the occurrence of a feature A may indeed exclude the occurrence of feature B within the word or phrase; but its occurrence in the text is not at issue.

Co-occurrence restrictions in the present sense also seem to bear some resemblance to relationships of bleeding and feeding between phonological rules such as they have been used in some theories of non-variable phonology. Hinskens (1992: 293ff) has extended this idea to variable rules in his study of a Limburg dialect of Dutch. For instance, in his data, there is rule of [γ]-weakening which turns a slightly fronted voiced velar fricative into its more dialectal palatal counterpart; there is also alternation between the dialectal preterite suffix /-ət/ and the standard suffix /-də/. Hinskens shows that derivationally, γ -weakening presupposes the use of the dialectal preterite suffix but not vice versa; i.e., in addition to std. Dutch *wurgde* 'strangled' (1./3. sg.) [wɔ̃rəɣ'də], both [wɔ̃rəɣ'ət] and [wɔ̃rəjət] are possible, but not *[wɔ̃rəjdə]. However, this case is different from the one discussed above, for the γ -weakening rule can only apply in syllable-initial position. Unless the dialectal suffix is used, which has VC-structure and moves the stem-final fricative

into the syllable onset, the necessary phonological context for weakening is not available, for the standard suffix with its CV-structure would leave the stem-final fricative in the coda of the preceding syllable. Therefore, the morphological dialect form feeds the phonological dialect rule by providing the context without which it could not apply. This, however, was not the case in the examples of Tables 1-3 where the variables in question did not affect their obligatory linguistic contexts in the sense of a feeding or bleeding relationship.

Thirdly, co-occurrence restrictions should not be confounded with analyses of co-variance in the sense of statistical methods such as factor analysis (as used, e.g., in van Hout 1989: 247ff, Auer 1992: 182ff). The main difference is once more that analyses of co-variance are based on correlations between variables as they occur in the domain of texts, whereas implicational co-occurrence restrictions are restricted to the domain of phonological words or phrases. While unidirectional co-occurrence restrictions establish hierarchical relationships between variables, analyses of co-variance group together (if only in statistical terms) variables which 'behave' similarly. In both cases, an attempt is made to structure the variational space between standard and dialect. Whether it is possible to assign the two types of interrelationships between linguistic variables to different stages in the emergence of a continuum, as suggested by van Hout (1995: 156), must remain an open question at the present stage of our knowledge.¹⁰

To my knowledge, co-occurrence restrictions in the sense intended here were first discussed by Kučera (1973) in an article on possible and impossible hybrid forms between Standard Czech and the Bohemian "supradialectal" (regional) variety known as "Common Czech" ("obecná čeština"). His results are listed in Table 4. They will be of some importance in the discussion (cf. below, p. 88, 93).

Table 4: Hybrid forms between Standard and Common Czech according to Kučera 1973 (rules are formulated going from Standard into Common Czech)

Disobeying the following implications between variables results in unacceptable forms:

1. /y:/-diphthongization (/y:/→/ej/) ⊃ gender neutralization in instr.pl. of "hard" adjectives (/mi/→/ma/)
2. /y:/-diphthongization (/y:/→/ej/) ⊃ infinitive reduction (/ti/→/t/)
3. /e:/-raising (/e:/→/i:/) ⊃ /ct/-infinitive (/ci/→/ct/)
4. vowel shortening (/e:/→/e/) ⊃ /ct/-infinitive (/ci/→/ct/)
5. /v/-insertion (word-initially before V) ⊃ k-softening (e.g. /k/→/č/ before 3.ps.pl. /ou/).

Disobeying the following implications between variables results in "bad" forms:

6. /y:/-diphthongization (/y:/→/ej/) ⊃ gender neutralization in nom.pl. of "hard" adjectives (/e:/, /a:/, /i:/→/i:/)
7. /v/-insertion (word-initially before V) ⊃ informal present tense suffixes of certain verbs (/i:/, /i:/→/u/, /ou/)
8. informal 3.ps. present tense suffix of certain verbs (/i:/→∅) ⊃ /e:/-raising (/e:/→/i:/)
9. /v/-insertion (word-initially before V) ⊃ /e:/-raising (/e:/→/i:/)
10. Within a feminine NP, gender neutralization in instr.pl. (/mi:/→/ma/) must apply everywhere (Adj & N). Within masculine and neuter NPs, a colloquialism (gender neutralization /y:/→/ama/) in the head implies that in the adjective, but not vice versa.
11. All colloquialisms are restricted to lexical items of the appropriate "stylistic" domain.

In a series of papers, the Austrian dialectologist Hannes Scheutz (1985a: 253ff & 106ff; 1985b: 251ff; 1996) has stated and discussed a number of co-occurrence restrictions for intermediate forms between Austrian Standard German and the Middle Bavarian dialect of the Mühlviertel (Ulrichsberg). In Scheutz' data, there is a comparatively high number of bidirectional restrictions on co-occurrence which suggest that dialect and standard in the given speech community represent rather solid varieties ("co-existing systems", in Scheutz' words), and not a continuum. For instance, he notes that within the limits of a syllable, a phonological word, or a phonological phrase (based on a compound or a prefix+word or even a complex NP), forms must agree with respect to phonological variables such as /r/-vocalization, /l/-vocalization, vowel quality (tenseness) and quantity (Pfalz' Law), velarization of /a:/, and various dialectal alternations of stem vowels (such as /ai:/→/œ/, unrounding, no umlaut). On the other hand, Scheutz also states a number of unidirectional co-occurrence restrictions, allowing for a number of intermediate forms. They are the following:

- 1) A dialectal stem vowel with primary accent in a compound entails the dialectal form of phonological variables such as l-vocalization in the secondary accent position, while the opposite does not hold; cf. his example ['ni:ə:mɔ'gɛ], [ni:mɔ:lɛ], [ni:mɔ'gɛ] but *['ni:ə:mɔ:lɛ] *nigmal's* 'never' (1985a: 254).
- 2) Dialectal stem vowels equally presuppose reduction of the word-final sequence *Cen*, but not vice versa; cf. [zɔ:ŋ], [zɔ:ŋ], [zɔ:ŋ] but *['zɔ:ŋ] *sagen* 'said' (Scheutz 1985a: 254) (cf. Table 2 above for the same process in FRG Middle Bavarian).

3) As in the materials presented in Table 2 above, dialectal stem alternations or n-apocope entail reduction of the /ge-/ prefix, but the latter is compatible with both standard and dialect realizations ([dɛŋkt], [gɔdɔxt], [dɔxt] but *[gɔdɛŋkt] *gedacht* 'thought'; Scheutz 1985a: 105f).

4) Most dialectal stem vowels (such as 'unrounding' of the std. labio-palatal vowels or monophthongization of /au/ as in [ba:m] std. *baum* 'tree') entail the dialectal ∅-suffix (instead of std. /-e/) for the 1st ps. sg. of the present tense and for the plural of various noun classes, but not vice versa (cf. [gɪnt], [gɪndə], [gɪnd], but *[gɪndə] *Gründe* 'reasons'; Scheutz 1985a: 109ff; equally *[ba:mə] *Bäume* 'trees'; Scheutz 1996: 22).

5) The relationship between morphology and phonology is reversed, however, in the case of the weak adjectives, which may exhibit a ∅-suffix in the dialect but require dialectal stem vowels in this case, while the dialectal stem vowels are compatible with the std. /-e/-suffix as well (cf. *die* {[gɔɐ̯s], [gɔ:sə], [gɔɐ̯sɐ] but *[gɔ:s]} *große Frau* 'the big woman'; Scheutz 1985a: 113f).

6) The dialectal ∅-suffix instead of std. /-et/ in the past participle implies the reduced dialectal /g/-prefix (instead of std. /ge-/, past participle), but not vice versa (cf. [gɪret], [gɔre:dət], [gɔre:dət] but *[gɔre:t]/*[gɔret] *geredet* 'talked'; Scheutz 1985a: 256).

6. A structural explanation

In this section, the question will be addressed of whether the data presented thus far can be explained by some structural linguistic regularities.

A first, very crudely formulated question might be this: are the data evidence for a principled superiority of morphology over phonology (as is argued by Scheutz)? I think not, and first of all for logical reasons. As repeatedly shown above, a given implicational relationship

phonological dialecticism ⊃ morphological dialecticism

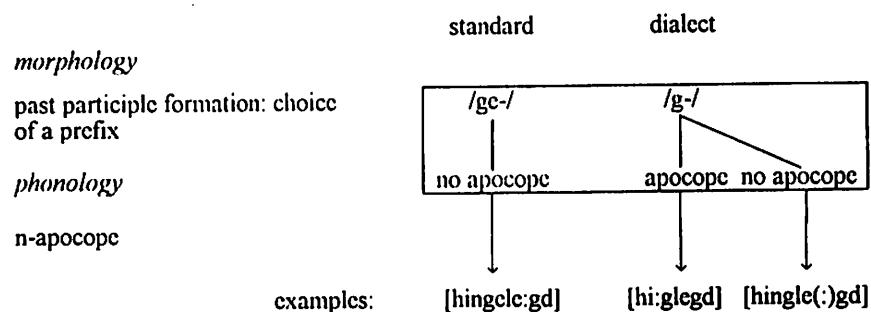
always has as its logical counterpart the implicational relationship

morphological standard form ⊃ phonological standard form.

Whether the first or the second formulation is chosen depends on if one takes the standard or the dialect as one's starting point. (In sociolinguistic terms, 'taking the standard as the starting point' may imply that the standard converges towards the dialect, while 'taking the dialect as the starting point' may imply that

the dialect converges towards the standard; i.e. different versions of how intermediate forms between standard and dialect come into being are involved.) This means, we are dealing with two unknowns: the sociolinguistic question of whether the standard or the dialect should be taken as the starting point for formulating a given implicational relationship, and the linguistic question of whether morphology or phonology takes the lead. One of them has to be fixed as an *a priori*, the other may be an empirical question. Given the fact that syntax-morphology has been assumed to take priority over phonology in linguistics from early comparative and typological research onwards up to most modern models of generative grammar, the following discussion will take this hierarchical relationship for granted, but leave the relationship between dialect and standard open since it differs from one sociolinguistic context to the next.¹¹

The precedence of morphology over phonology suggests that speakers decide on the choice of a given morphological form without taking (segmental) phonology into account; only after having chosen this morphological form according to the morphological system of the standard or the dialect, will they adapt their phonology to it. For instance, a Bavarian speaker (cf. Table 2) may choose in the morphological component of his or her grammar between the dialectal past participle prefix /g-/ and the corresponding standard prefix /ge-/. Phonologically speaking, choosing the first is compatible with the application or non-application of n-apocope in the prefixes /hin-, an-/; while the second prescribes the use of the non-apocoped forms:



Assuming the priority of morphology over phonology, the implicational relationship must then be (contrary to our initial formulation):

std. /ge-/prefix \supset no n-apocope.

In the German dialect data, similar relationships for pairs of morphological and phonological variables may be stated for

FRG Bavarian: std. infinitive \supset diphthongal stem (p. 74)
 std. /ge-/prefix \supset no *Cen* reduction (Table 2)
 std. /ge-/prefix \supset std. diphthongal stems (Table 2)

Alemannic (Table 3):

std. /ge-/prefix \supset std. /u:/, /i:/ monophthongs
 std. /ge-/prefix \supset no n-apocope
 std. /ge-/prefix \supset std. long vowels
 std. /-t/ verbal sfx. \supset std. /i:/, /u:/ stem vowels (no diphthong)

Austrian Bavarian (Scheutz' data, cf. p. 84f)

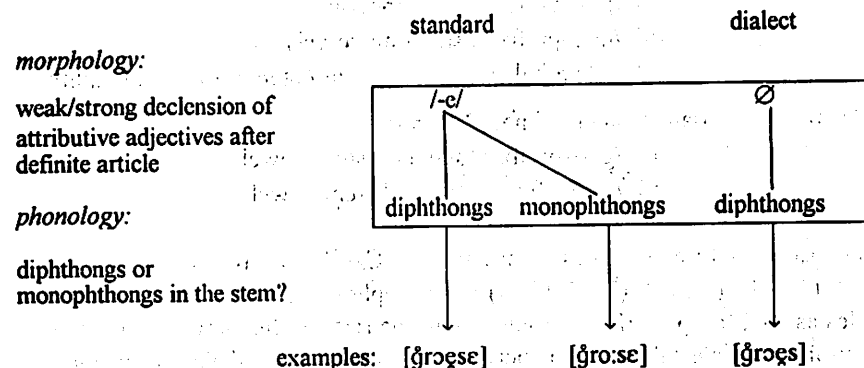
std. /ge-/prefix \supset standard stem vowel
 std. /-e/-suffix \supset standard stem vowel.

The same picture emerges from Kučera's Czech data (cf. his implications (1), (2), (3), (4), (5), (6), (7); Table 4) and it applies to some of the Lucanian examples as well (cf. p. 70ff. and Table 1, e.g. the relationship between infinitive truncation and dialectal stems, or between the standard vs. dialect form *loro/quelli* and schwa reduction in unstressed syllables). In all these cases, standard morphology prescribes certain phonological realizations, while a speaker who remains within the morphological system of the dialect may choose between phonological forms of the standard and those of the dialect. The sociolinguistic situation seems to be such that the dialect has integrated phonological variation into its system, converging towards the standard variety.

We may conclude that there is indeed some evidence for a systematic explanation of the co-occurrence restrictions stated above. A high number of them can be subsumed under a general principle according to which standard morphology prescribes standard phonology, but dialect morphology allows either phonological packaging (this is by and large the solution given by Kučera). This is indicative of a sociolinguistic situation in which dialect morphology is less "salient" than dialect phonology, while standard morphology has a relatively strong position, being a marked structure within the repertoire of the speakers which entails certain phonological adaptations.¹²

Nonetheless, this way of thinking about co-occurrence restrictions alone is not sufficient. First of all, there is a high number of co-occurrence restrictions between phonological *or* morphological variables which *eo ipso* cannot be explained by the relationship between morphology and phonology. Second, there are at least two cases in which the picture is reversed. One is Scheutz' one-sided co-occurrence restriction between the weak adjective declension in Austrian Bavarian (Mühlviertel dialect) and the dialectal stem vowels (cf. above, p. 85).

The other is Kučera's implication (8), according to which the dialectal suffix of the 3rd ps. present tense suffix of certain verbs prescribes Common Czech /e/-raising (cf. Table 4). In both cases, again assuming a priori the dominance of morphology over phonology, it is the standard variety which permits colloquial/dialectal or standard phonological realizations, while dialect morphology requires dialect phonology; cf. for the Mühlviertel case:



The third and possibly most important reason for which the solution discussed up to this point is not a satisfactory one is that what we have lumped together as phonological and morphological variables up to now is in fact made up of very heterogeneous rules and phenomena. For instance, in the Alemannic data, stem vowel alternations as between [sa:gn]/[seɡə] 'to say' and the palatal realization of the sibilant in all pre-consonantal positions have been grouped together as phonological variables. Yet, the first are radically lexicalized, i.e. there is only a handful of words in which, e.g., Lake Constance Alemannic has an umlaut stem in the place of a standard non-umlaut (or vice versa); each of them has to be learned individually. S-palatalization, on the other hand, is extremely productive and can be applied with minimal knowledge of the dialect.¹³ The variables grouped together as morphological are of a very heterogeneous nature as well. For instance, the often-mentioned Bavarian reduction of the prefix /ge-/ is in fact a special application of a more general phonological rule of schwa-deletion in pre-tonic environments which is additionally constrained by morphological contexts. In addition to the past participle prefix /ge-/ its usage extends to other pre-tonic /ge/ syllables (such as the nominalizing prefix /ge-/ as in Bav. /gsuax/ *Ge-suche* 'act of searching', or the morphologically unanalyzable pretonic syllable /ge/ in Bav. /gfvind/ *geschwind* 'quick', or Bav. /gfaɪn/ *Gefallen* 'favour'). Other pretonic unstressed schwa-syllables, such as /be/, are also affected (cf. Bav. /psuax/ *Besuch* 'visit', Bav. /pfiat+di/ *behiite dich* 'watch over you'). While the "morphonological" /ge-/ reduction in the past participle prefix turns thereby out

to be only one application of a more general (although morphologized) phonological rule of pretonic vowel reduction, a morphological rule such as the Austrian Bavarian the zero-suffix adjective inflection where German standard requires a schwa is different. In fact, the Bavarian form here is a remnant of a very old alternative morphological system of adjective/noun congruence; the standard system certainly cannot be taken as the 'underlying' form from which the dialectal form is derived via schwa deletion, and no phonological rule of reduction or deletion is involved at all. Thus, we are dealing with a 'less' and a 'more' morphological rule.

Given these shortcomings of the simple equations 'morphology dominates phonology'/'standard precedes dialect', more sophisticated treatments are necessary. In particular, processes need to be evaluated on a *phonology-morphology continuum* between purely post- or pre-lexical phonological processes/regularities¹⁴ on the one hand, and morpho(pho)nological phenomena (lexical rules in the sense of Lexical Phonology with varying degrees of morphological restrictions on their application) on the other; and on a second continuum between *fully productive and maximally lexicalized* phenomena. The maximally lexicalized rule of course is a lexical rule which applies to one particular lexical item only (as in Alem. /were/ ↔ std. /werden/ 'to become'; cf. above, Table 3).

A revised version of our morphology-dominates-phonology hypothesis is now possible since we are able to distinguish degrees of morphologization and of lexicalization, and are therefore in a position to take into account co-occurrence restrictions *between* phonological or morphological processes. On the morphological side, there are relatively few consequences since relationships of co-occurrence between two morphological or morphonological phenomena are not frequent in the data considered here. Some cases suggest that there may be rather strict, bilateral co-occurrence restrictions between morphological variables, and no continua (cf. e.g. the relationship between the Lucanian truncated infinitive and the auxiliary, both [de:vo dɔvən'da] and [adʒdʒa dɪvən'tare] are ill-formed, although the second form may be somewhat less acceptable than the first; also cf. Kučera's restriction No. (10)). An interesting case is Scheutz' co-occurrence restriction (6) which states that the use of the reduced dialectal participle suffix (Ø instead of std. /-et/) implies the reduced dialectal /g-/prefix (instead of std. /ge-/), but not vice versa. In this case, the suffix is more lexicalized than the prefix, since lexical items may co-select /-en/ or /-et/ as suffixes, but the prefix is predictably /ge-/ in this morphological environment (or Ø, depending on its phonological context). In this case, the more lexicalized dialectal suffix form implies the less lexicalized dialectal prefix.

More important are the consequences for co-occurrence restrictions between phonological variables. Let us look once more at the Alemannic data in Table 3, and in particular, at the implicational relationships stated for the phonological rules of this dialect. Provided we assume (again in the sense of an *a priori*) that deeper lexical levels (strata) have priority over more shallow ones, the following pairs of phonological variables behave in a similar way:

Table 5: Unilateral co-occurrence restrictions of (Lake) Constance Alemannic and the lexicalization of phonological rules

more lexicalized		less lexicalized		post/prelexical
		diphthongs, short vowels	⊃	n-apocope
dialectal stem vowels, monophthongal prefix, /rd/-assimilation, ai-monophthong			⊃	n-apocope
dialectal stem vowels	⊃	diphthongs	⊃	s-palatalization
dialectal stem vowels	⊃	short vowels unrounding ¹⁵	⊃	s-palatalization n-apocope

For the phonological phenomena discussed for FRG Bavarian and Austrian Bavarian (Tables 2 and 3) the following relationships hold:

Table 6: Unilateral co-occurrence restrictions of FRG Bavarian and the lexicalization of phonological rules

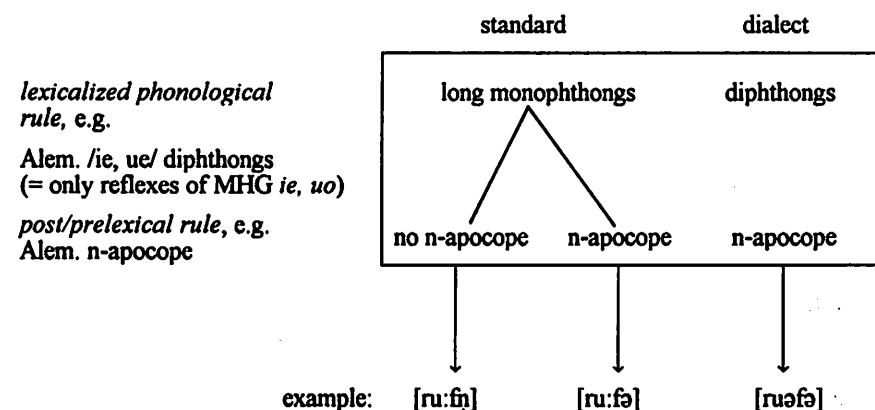
more lexicalized		less lexicalized		post/prelexical
monophthongal stems ¹⁶	⊃	n-apocope ¹⁷		
		n-apocope	⊃	Cen reduction

Table 7: Unilateral co-occurrence restrictions of Austrian Bavarian and the lexicalization of phonological rules

more lexicalized		less lexicalized		post/prelexical
dialectal stem vowels				⊃ Cen reduction
		/iɐ/-diphthongs (for MHD /ie/)	⊃	/l/-vocalization

In the Lucanian data (cf. p. 71), more lexicalized phonological variables such as stem vowel variants or /nd/-assimilation imply the postlexical process of post-tonic vowel reduction.

Note that contrary to the morphology/phonology pairs discussed above, this group of pairs of more and less lexicalized phonological variables shows flexibility on the standard side, not on the dialect side of the repertoire, e.g.:



We may therefore conclude that, with respect to co-occurrence restrictions, the relationship between morphological and phonological rules or phenomena is indicative of a certain convergence of the dialect which takes on in a variable way phonological features of the standard. But the relationship between more and less lexicalized rules or processes is predominantly of a different kind: here, it is the standard which variably includes features of the dialect, while choosing a more lexicalized dialectal form also implies using the post- or prelexical rules of the dialect. The latter finding is a natural one given the fact that most lexicalizations imply an increase of complexity on the dialect, not on the standard side, i.e., it is

the dialect speaker who has to memorize lexical context information, not the standard speaker.

In closing this section, a third possible structural regularity should be mentioned which needs further research, however. Some data suggest that there may be a regular relationship between processes in the tonic syllable and those in post-tonic (unstressed, or secondarily stressed) syllables. If we give precedence to the tonic syllable/head (which makes sense in the "stress-timed" varieties dealt with in this paper), we can group together the following pairs of variables one of which affects the stem vowel, the other the posttonic or final unstressed syllable:

Lucanian: dialectal stem vowel ⊃ post-tonic vowel reduction

Bavarian: monophthongal stem ⊃ Bav. infinitive
 monophthongal stem ⊃ *Cen* reduction

Alemannic: unrounding,
 /a/-velarization,
 diphthongs,
 short vowels,
 dialectal stem vowels, ⊃ n-apocope
 /rd/-assimilation,
 ai-monophthong

 diphthongs,
 short vowels ⊃ /-ed/ ~ /-en, -t/

In all cases, dialectal forms in the ictus position imply the use of the dialectal forms in the unstressed position, while dialectal forms in the less 'monitored' unstressed syllables are compatible with standard or dialect in the stressed syllables. However, this regularity makes the wrong prediction in the case of Alemannic s-palatalization and n-apocope: here, s-palatalization (in tonic syllables) would be expected to imply n-apocope (in unstressed syllables), but the opposite is true: n-apocope implies s-palatalization, or rather: a non-palatalized stressed syllable prescribes the standard non-apocoped unstressed syllable in /-n/. Also, the rhythmical regularity cannot explain the unidirectional co-occurrence restrictions between two processes either in the stressed syllable (such as, in Lake Constance Alemannic, between "s-palatalization" and "diphthongs", or between "stem vowel alternations" and "diphthongs" or "short vowels"; Tab. 3), or in the non-stressed syllables (such as in Scheutz' restriction 6, cf. p. 85 above).¹⁸

7. What doesn't fit in: the non-harmonious bits and pieces

We have been able to group the variables in question on purely linguistic grounds in such a way as to present a plausible overall picture of the intermediate forms which characterise the emergent regional varieties of German and possibly of other languages. The picture is compatible with a sociolinguistic view of these new regional varieties as being the result of a mutual convergence of both the standard variety and the dialect towards each other. (Of course, unidirectional co-occurrence restrictions are not the only mechanism which is responsible for this standard/dialect convergence.) At the same time, our result supports Hinskens' view quoted at the beginning of this paper that "in most instances, phonological variation and change can be explained as manifestations of general, in principle language-independent, aspects of phonological organization."

We now have to look at the limitations of this approach. They become apparent where certain unilateral restrictions on the co-occurrence of two variables either contradict the pattern or cannot be explained by it. The first applies to the two instances of pairs of a morphological and a phonological variable mentioned above in which it is the morphological form of the dialect which implies the use of dialectal phonology. One is Scheutz' implicational relationship between the weak adjective declension in the Mühlviertel dialect and the dialectal stem vowels (e.g. Bavarian diphthongs as reflexes of MHG diphthongs = std. long monophthongs).¹⁹ The other is Kučera's implication (8), according to which the dialectal suffix of the 3rd ps. present tense suffix of certain verbs prescribes Common Czech /e:/-raising. Our model is not able to explain this partial reversal of the relationship between standard and dialect (or between morphology and phonology).

The second applies to the following co-occurrence restrictions between phonological processes/regularities of Lake Constance Alemannic which all refer to either post- or prelexical processes not restrained morphologically or lexically:

n-apocope ⊃ s-palatalization
 /a/-velarization ⊃ n-apocope,

and equally to the Lake Constance Alemannic restriction of co-occurrence between the lexicalized dialectal features

unrounding ⊃ diphthongs.

There is no way to predict or explain these unidirectional co-occurrence restrictions structurally, since the processes do not differ in grammatical status.

Kučera and Scheutz tell us that, in the given cases, the morphological variable in question is perceived as particularly 'marked' and therefore disappearing in the dialect; so we have reason to believe that the marked behaviour of these variables with regard to co-occurrence restrictions is supported by and reflected in their receding status in language change. But of course, the fact that there is language change going on requires an explanation in itself. In the case of the Constance variables, most notable in the implicational relationship between *n*-apocope and *s*-palatalization, no language change is involved. However, *s*-palatalization is the dialectal feature local speakers find hardest to get rid of when they want to speak standard German. All these facts indicate that there is some kind of "saliency" involved which regulates the relationship between the variables. This is where the "socio" in sociolinguistics comes in; where there is a social surplus in variational patterns which cannot be related to questions of phonological theory in the abstract, non-social sense.

8. Concluding remarks

A speaker who has two or more varieties at his or her disposal may code-switch between these varieties, at sentence or clause boundaries or within grammatical constituents. However, if the varieties in question are structurally closely related, and if certain sociolinguistic conditions hold (as in the case of standard and dialect varieties), the speaker may also combine features of the two or more varieties in a more intricate way, dissolving the clear-cut separation of 'codes' for the sake of a more continuous structuring of the repertoire. As in code-switching, these 'mixtures' are in the first place a speaker's choice; but in the long run, they may have consequences for the organization of the community's repertoire as a whole, leading to the convergence of, e.g., dialect and standard.

In this paper, two structural regularities have been discussed which seem to regulate the 'mixture' of dialect and standard features within phonological phrases in the cases considered here. The first of them refers to the relationship between morphology and phonology: if two variables are combined one of which is more morphologized than the other, then the standard realization of the first will usually prescribe the standard realization of the second, while the dialectal realization of the more morphologized variable will be compatible with both standard and dialect forms of the less morphologized (ideally purely phonological) one. The second structural regularity refers to lexicalization: if of two

(phonological or morphological) variables, one is more lexicalized than the other, then the dialectal realization of the more lexicalized variable will usually prescribe the dialectal realization of the second, while the standard realization of the more lexicalized variable is compatible with both standard and dialect realizations of the less lexicalized one.

No claim is made to the universality of these regularities; on the contrary, they seem to be contingent on the sociolinguistic situation for which they were formulated and may be expected to hold for similar situations at best. Even in the German and Italian dialectological context, there are some exceptions and some unexplained co-occurrence restrictions for which a purely social account is necessary. It seems that given the appropriate social backing, any co-occurrence restriction may be turned upside down. (Scheutz 1996: 23 notes such a reversal for *Honoratiorenösterreichisch* or Austrian "*Höhere-Töchter-und-Söhne-Jargon*", as he calls it.)

In conclusion, some of the features of uni-directional co-occurrence restrictions in the sense of the term as used here are highlighted again:

- a) Co-occurrence restrictions are of *methodological relevance* for variation studies since they affect the way in which indices are calculated in the sense of "knock-out environments". The problem is that given a unidirectional co-occurrence restriction between two variables, it is inappropriate to count the two variables independently, since speakers are not free to choose any longer in the implied case: "Whenever one is dealing with linguistic variables not related by free combination [...] Labov's micro-analysis will not suffice" (Kristensen & Thelander 1984: 241).
- b) Co-occurrence restrictions are one of the ways in which complex repertoires become organized along continua of standard-dialect realizations. They are therefore of relevance for the *study of convergence* between standard and dialect varieties. The more a given repertoire is characterized by bi-directional restrictions of co-occurrence, the more it is dichotomized. On the other hand, the more of these bi-directional restrictions of co-occurrence are loosened and turned into uni-directional ones, the more the repertoire will be open for intermediate forms. Regularities such as the ones discussed in this paper may shed some light on the relative contribution of standard and dialect to the emergent intermediate varieties or continua.
- c) The domain of co-occurrence restrictions is not the speaker or the text, but the *phonological phrase* or the *phonological word*. In this sense, the notion differs in important ways from earlier research on implicational scales but also from research using factor analysis or other measurement instruments of co-variance. Whether unidirectional co-occurrence restrictions can be stated in larger do-

mains (such as the prosodic phrase or utterance) is an open question for future research.

d) As part of a competent speaker's linguistic knowledge, co-occurrence restrictions are of a delicate nature. Vernacular language which disobeys co-occurrence restrictions sounds awkward and unpolished. But their complete mastery is the final stumbling block for newcomers willing to *acquire* the "spoken language" of a new region, and their non-obeyance often betrays the non-native.²⁰ In contexts of language loss, co-occurrence restrictions often disappear first (i.e., are no longer acquired by the next generation).

Notes

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1 The term itself was introduced into sociolinguistic research in the sixties in the context of the ethnography of speaking. In particular, Ervin-Tripp (1964) and Gumperz (1969) used it in order to refer to the relationship between a cluster of linguistic variables and their situation-of-occurrence. Cf. Gumperz (1969: 245f): "The value of a variable in a particular situation in a particular utterance is never independent of that of other variables within the same stretch of speech [...]. Variants [...] tend to appear in co-occurent sequences. It is the variation of each distinctive cluster of values, not a single variant, which correlates with distinctive social content or function. Wherever co-occurrence rules are regular and clearly statable we can speak of speech variation as alternation between varieties." Note that in this usage (as in many others) the domain of co-occurrence is not restricted to a small prosodic domain such as the phonological word, but holds for longer units such as "stretches of speech" or even "texts"; cf. below, section 5.

2 Cf. Di Luzio (1991) for further research along these lines.

3 All voiced obstruents should be read as lenes (lax consonants) with optional, but rare voicing.

4 Deletion of the orthoepic schwa in word-final unstressed /en/ and assimilation of the nasal to the stem-final /b/, /g/ is typical for the Bavarian standard variety of German as well.

5 The data in Kučera (1973) and Auer & di Luzio (1983) are based on the (second) author's native intuitions. Scheutz (1985 etc.) in part uses corpora of texts. In variation studies, introspective data are treated with a sound skepticism. However, co-occurrence restrictions are hard to state on the basis of spoken language corpora. The reason is that — unless very extensive corpora are available — it is not easy and sometimes impossible to find substantial lists of words for all pairs of variables involved. Therefore, the most important basis of empirical studies on co-occurrence restrictions will usually be acceptability judgements.

6 Cf. Auer (1986) for "code-shifting" in this sense, and for its relationship to co-occurrence restrictions.

7 As in the case of the Bavarian examples, voiced segments are phonetic lenes with optional but rare voicing.

8 These variables are discussed in detail in Auer (1990).

9 Cf. the discussion in Scheutz (1985: 256ff), Kučera (1973: 516ff).

10 "Implicational relationships are important, first of all at the emergence of a continuum (when the language varieties are still largely separate), secondly as a type of structural linguistic relationship [between linguistic variables], and thirdly in local subclustering (side dimensions)" (van Hout 1995:156 —our translation, Eds.).

11 This is not the place to discuss recent proposals in linguistics (e.g. in prosodic morphology) which question the old assumption of the morpho-syntactic priority over phonology.

12 There are, to be sure, "shallow" phonetic rules which are so ubiquitous throughout the repertoire that their suppression results in a hyper-formal or spelling pronunciation. In such a case, 'dialect' (or rather, everyday language) phonology/phonetics does not imply the use of dialect morphology, of course, and standard morphology is compatible with both the hyper-formal and the everyday language phonology. An example is the suppression of *Cen*-assimilation (not: reduction!) in the Bavarian dialects. The morpho-phonological reduction of the /ge-/ prefix triggers this late rule of *Cen*-assimilation, but not vice versa ([gəlaʃən], [gəlaʃm]), [gəlaʃm] but *[gəlaʃən]; Scheutz 1996:21).

13 The only important piece of contextual information which outsiders often forget when mimicking the dialect, is that no morphological boundary may intervene between the sibilant and the consonant (therefore dial. **reischt* = std. *(er) reist* 'he travels').

14 Cf. Moosmüller (1988), Dresser & Wodak (1982), Auer (1990, 1995). Postlexical rules or processes apply to the output of the lexicon without reference to morphology and without any lexical restrictions, prelexical rules (the redundancy rules of Underspecification Theory) define the possible phonemic forms of standard and dialect; examples would be Bav./Alem. *C en* simplification for postlexical rules, and Alem. s-palatalization for pre-lexical rules respectively.

15 Cf. Auer (1990) on lexical diffusion in this formerly productive pre-lexical regularity.

16 The Bavarian monophthongization of MHG /ou/ is highly irregular, as the following pairs (from Merkle 1975/76: 14) show:

/kafa/	kaufen	'to buy',	but	/saufa/	saufen	'to drink (for animals)'
/rafa/	raufen	'to fight',	but	/naufa/	schnaufen	'to breathe'
/braxa/	brauchen	'to need',	but	/rauxa/	rauchen	'to smoke'.

The monophthong is restricted to a small group of (perhaps two dozen) words.

17 This phonological rule (which, contrary to the Alemannic one, refers to tonic syllables, mainly monosyllabic words) is a very late one; it seems fairly regular (cf. Merkle 1975/76:18f), but some words are exceptions (e.g. *Kahn*, *Sinn*, *Bahn*).

18 The example discussed in footnote 19 is a problem for the stress-based explanation as well.

19 Another counter-example may be the Austrian Bavarian implication: (dialectal) *o* plural suffix \rightarrow a-velarization (cf. [ta:gə], [dɔ:g], [dɔ:gə] but *[da:g]/*[ta:g]; Scheutz 1996:21).

20 Cf. Scheutz (1996:25): "Es ist immer wieder zu beobachten, daß bei Kindern, die das dialektale System erst sekundär — in der peer-group — erwerben, das Gefühl für Kookkurrenzverstöße nur gering entwickelt ist."

References

- Auer, Peter. 1986. "Konversationelle Standard/Dialekt-Kontinua (Code-Shifting)". *Deutsche Sprache*, 97-124.
- 1988. "MHG *i* and *u* in the city dialect of Constance". Auer & Di Luzio 1988.44-75.
- 1989. "Zur Dehnung im Alemannischen (am Beispiel des Konstanzer Stadtdialekts)". *ZDL* LVI:1.32-57.
- 1990. *Phonologie der Alltagssprache. Zur Beschreibung von Variation am Beispiel des Konstanzer Stadtdialekts*. Berlin: de Gruyter.
- 1995. "Modelling phonological variation in German". *Verbale Kommunikation in der Stadt* ed. by I. Werlen, 9-37. Tübingen: Narr.
- Auer, Peter & Aldo di Luzio. 1983a. "Structure and meaning of linguistic variation among Italian migrant children in W. Germany". *Meaning, Use and Interpretation of Language* ed. by R. Bäuerle, Ch. Schwarze & A. von Stechow, 1-21. Berlin: de Gruyter.
- 1983b. "Three types of variation and their meaning". *Status of Migrants' Mother Tongues* ed. by L. Dabène, M. Flasaquier & J. Lyons, 67-100. Strasbourg: European Science Foundation.
- Auer, Peter & Aldo di Luzio, eds. 1988. *Variation and Convergence*. Berlin: de Gruyter.
- Auer, Peter & Frans Hinskens. 1996. "The convergence and divergence of dialects in Europe. New and not so new developments in an old area", *Sociolinguistica* XX.1-30.
- Bailey, Ch.-J. 1973. *Variation and linguistic theory*. Arlington, Va.: Center for Applied Linguistics.
- Di Luzio, Aldo. 1991. "On some (socio-)linguistic properties of Italian foreign workers' children in contact with German". *International Journal for the Sociology of Language* 90.131-57.
- Dressler, U. & Wodak, R. 1982. "Sociophonological methods in the study of sociolinguistic variation in Viennese German". *Language in Society* II.339-70.
- Ervin-Tripp, S. 1964. "An analysis of the interaction of language, topic, and listener". *American Anthropologist* 66.86-102 (special issue, *The Ethnography of Communication*).
- Gumperz, John. 1969. "Theme: How can we describe and measure the behavior of bilingual groups?". *Description and Measurement of Bilingualism*, ed. by L.G. Kelly, 243-49. Toronto: University of Toronto Press.
- Hinskens, Frans. 1992. *Dialect levelling in Limburg. Structural and sociolinguistic aspects*. Ph.D. Thesis, Univ. of Nijmegen.
- 1995. What can sociolinguistics offer phonological theory — and vice versa? Ms., University of Nijmegen.
- van Hout, Roeland. 1989. *De structuur van taalvariatie. Een sociolinguistisch onderzoek naar het stadsdialekt van Nijmegen*. Ph.D. thesis, University of Nijmegen.
- 1995. "Taalvariatiepatronen in een sociolinguistisch netwerk". *Taal en Tongval* XLVII.2.149-58.
- Kristensen, K. & M. Thelander. 1984. "On dialect levelling in Denmark and Sweden". *Folia Linguistica* XVIII:1-2.223-46.
- Kučera, Henry. 1973. "Language variability, rule interdependency, and the grammar of Czech". *Linguistic Inquiry* 4.499-521.
- Merkle, Ludwig. 1975. *Bairische Grammatik*. München: Heimeran [reprint 1976, Deutscher Taschenbuch Verlag, München].
- Moosmüller, Sylvia. 1988. "Sociophonology". Auer & di Luzio 1988.75-92.
- Scheutz, Hannes. 1985a. *Strukturen der Lautveränderung*. Wien: Braumüller.
- 1985b. "Sprachvariation und Sprachwandel. Zu einigen Problemen ihrer Beschreibung und Erklärung". *Ortssprachenforschung*, ed. by W. Besch & K. Mattheier, 231-58. Berlin: E. Schmidt.
- 1996. "Umgangssprache als Ergebnis von Konvergenz- und Divergenzprozessen zwischen Dialekt und Standardsprache". *Dialektgenerationen, Dialektfunktionen, Sprachwandel*, ed. by Th. Stehl. Tübingen: Narr.
- Sebba, Mark. 1993. Congruent categories and the syntax of code switching. Ms., University of Lancaster.
- Winford, D. 1980. "The creole situation in the context of sociolinguistic studies", *Issues in English Creoles* ed. by R.R. Day, 51-76. Heidelberg: Groos.

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