

HOW TO DESCRIBE PHONOLOGICAL VARIATION

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In this paper we shall first argue for phonological analysis to abandon the self-imposed limitation on slow-careful speech as its only object of descriptions, and to extend its data domain to forms of fast and casual speech. Second, we shall critically review the theoretical and methodological tools offered to the analyst of phonological variation by current schools of phonology. In this context we shall present some substantial assumptions about the organization of polystylistic phonological systems, and their description, thereby referring to studies made by adherents of Natural Process Phonology. These assumptions will receive further illustration by a model analysis of particular cases of phonological variation in German and Italian.

1

This article is based on the conviction of its authors that it is necessary for the phonological description of a given language to cover not only carefully pronounced slow speech forms but also fast and casual speech forms. Consequently, we argue for phonological analyses, whether they are theoretically or practically motivated, to abandon their usual limitation on a single phonostylistic level (viz. slow-careful speech)¹ and to extend their data domain

¹ Cf. Pike's (1961, 124 - 125, 209 - 210) advice to analyse but slow careful speech and merely specify the stylistic level a given speech form belongs to, thereby assuming that casual speech phenomena are essentially the same across languages (which is only true as far as *general* formal and substantial properties of casual speech forms are concerned — see 3.2 and 3.3. below, but not as to the phonetic content of these forms, which is of course highly language-specific).

to the whole scale of phonological styles.² In short: we want phonological analysis to be polystylistic rather than monostylistic. This demand can be justified by the following considerations:

— From a *theoretical* point of view it is a highly challenging task to investigate phonological variation (=the properties of the phonostylistic variants of a given linguistic item; the way these variants relate to each other).

— As for *practical* implications of such an extended account of phonostylistic data, it will help to remedy one major shortcoming of traditional foreign language teaching, namely its being exclusively devoted to teaching of maximally differentiated speech forms without bothering about phonological variation within both, the source and the target language. The effects of this shortcoming can be clearly seen when we consider the following two inter-ferential phenomena typical of foreign language users:

1. Their inability to understand casual speech forms of the target language (because they) are not taught how to relate them to their careful speech correspondents.³
2. Their carefree transfer of casual speech patterns of their mother-tongue when speaking casually in the target language.

The following examples may serve to illustrate these points (cf. also Dresler (1971), Gnutzmann (1975), and Rubach (1977)): It is obvious that there is a long way from, e.g. over-precise English [wɒt du: ju: wɒnt] 'What do you want?' to casual [wɒtəwɒnt]. As for the second point, namely transfer of a casual speech pattern, consider the following case of transfer from Austrian German to Italian: Austrian German *Vr* — sequences are pronounced as such in very careful speech only. As speech becomes more casual, the *r* undergoes a rule of *r-vocalisation*. Thus, *Pferd* [pfɛrt] 'horse' is realized as [pfɛt]. When Austrians speak Italian they tend to apply this rule to Italian words meeting its applicational conditions: *Palermo* [palermo] 'Palermo' or *certo* [čerto] 'certain' are 'austrianized' as [palɛɐmo] and [čɛɐto], which makes them incomprehensible for many Italians.

² As can be seen from our wording we regard slow-careful speech as one stylistic level among others. Consequently, we argue that any special status attributed to slow-careful speech can be justified solely on pragmatic grounds (slow-careful speech seems to be most easily accessible to the analytical devices of the linguist — cf. in this respect Pike's statements referred to in footnote 1; also see Thurov (1977)) but not on any principled grounds.

³ This inability seems often to be paralleled by gross deficiencies of the language learners in pronouncing and understanding the 'weak' (i.e. clitic, unaccented) forms of form words, for — as Gnutzmann (1975) has shown in a critical review of German elementary books for aliens — what they are taught exclusively are the corresponding 'strong' forms (i.e. their isolated pronunciations under accent).

What must be done, then, is to develop foreign language teaching programs so as to counteract interferences as the ones mentioned above. Consequently, contrastive analyses must be carried through with the specific aim to reveal the similarities and differences two or more languages exhibit with regard to phonological variation. The practical value of such studies will basically depend upon their descriptive and explanatory adequacy, which in turn follows from their theoretical and methodological background. In the following section we shall therefore assess critically the descriptive and explanatory potentials of current models of phonology with regard to adequately accounting for phonological variation.

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Due to an increasing interest in the psychological and sociological variables governing language use, phonological variation has been investigated more and more during the last decade, both within interdisciplinary research and within phonological theory proper. Before that time, however, no explicit attempt had been made to inquire into the form and nature of phonological variation. The few structuralistic investigations systematically concerned with the description of more than one phonological style of a language suffer from the embarrassing fact that both, the allophonic distribution and the phonotactic behavior of phonemes within one style do not hold across the phonostylistic scale. The only principled way out of this dilemma would be positing 'coexistent phonemic systems' (cf. Fries & Pike (1949)), i.e. performing separate and different phonemic analyses for every phonostylistic level. This would in turn result in such an enormous increase of analytical work to be done that every phonologist would have to refrain from this solution for practical reasons. What structuralists have rather been doing is to give fairly unprecise characterizations of the fluctuations of phonological constraints between different styles in terms of 'phonemic stability/instability'.

Descriptions of this sort merely focus on differences in the *functional* (i.e. phonemic vs. allophonic) status of the correspondent phonological units of different styles, and it is highly doubtful whether such descriptions are able to point out significant properties of phonological variation at all. What remains to be done in any case is to give a systematic account of the *regular phonetic correspondences* holding between the phonological units of different phonostylistic levels; studies of the above sort tend to severely neglect this latter point. Such regular correspondences can apparently be described best within a processual framework, i.e. one has *processes* to derive from a common *item* the phonetic forms of any given phonostylistic level. Among the phonological frameworks qualifying as processual, Standard Generative Phonology (SGP) (as initiated by Chomsky & Halle (1968) and continued by, e.g., Kiparsky

(1968; 1973)) because of its methodological and substantial principles clearly provides the best theoretical background for an adequate recording of phonological variation.⁴ In particular, the importance of at least the two following basic principles of SGP must be pointed out:

1. The assumption of grammatical prerequisites to phonology; many phonostylistic rules turn out to be sensitive to lexical, morphological and syntactic information to the same extent as obligatory (see, however, footnote 11) phonological rules.

2. The strategy of derivation of phonetic output forms by means of ordered application of phonological rules on a relatively abstract underlying form (thereby covering the whole range of morphonological variation): It can be used to relate the phonostylistic variants of a lexical item as well (cf. Dressler (1972; 1975)).

Although SGP, in principle, qualifies a promising framework for an economic as well as theoretically sound description of phonostylistic data, its substantial and methodological principles should be supplemented by some basic assumptions of *Natural Process Phonology* (NPP): NPP is used as a cover term for theoretical work represented in a number of articles by David Stampe (1969; 1972), Pat Miller (1972; 1973), Arnold Zwicky (1972), Gaberell Drachman (1977a), and Wolfgang Dressler (1972; 1975; Dressler & Drachman (1977)), all of them dealing either with the processual aspects of phonology or with phonological variation proper. We shall try now to extract those results of NPP which directly bear upon the problems of describing (and contrasting) polystylistic phonological (rule-) systems.

3.1

According to Stampe (1969; 1972) the productive part of the phonology (i. e. productive phonological rules *as well as* live morpheme structure constraints) of a language *x* is made up of *natural phonological processes*. Natural phonological processes form a class of universal phonological substitutions creating phonetically plausible sound patterns. A language *x* can be said to choose among this class all the processes operative in *x*, and adapt them in such a way that they act as language-specific morpheme structure conditions and

⁴ For a rare example of a structuralistic study concerned with both, the functional (scil. 'functional' as used by structuralistic phonologists) and the *processual* aspect of phonological variation, see Thurow (1977). Thurow uses an item-and-process model as a descriptive framework, whereas most structuralists have adhered to item-and-arrangement procedures. It must be pointed out, however, that the above mentioned descriptive shortcomings of structuralistic investigations can only partially be attributed to this methodological difference; they are rather due to the structuralists' overrating of the *phonemic vs. allophonic principle* of phonological analysis.

phonological rules respectively, producing but language-specific phonetic output forms; that is to say, the application of natural phonological processes within a particular language is controlled by language-specific constraints. What makes this concept of process phonology highly attractive for our purposes is the following:

1. It permits a principled account of phonological variation. Interstylistic differences of phonetic patterns become easily derivable if one assumes that the constraints on the application of phonological processes vary systematically from style to style. This means that, e. g., a process which operates exclusively within morphemes in one style is allowed to additionally apply across morpheme boundaries in another style, and even across word boundaries in a third one; likewise, two processes standing in a bleeding relationship in one style may feed each other within another style. Finally, processes which do not operate in certain styles (i. e. are suppressed in those styles) come up in other stylistic forms of speech.

2. By attributing processual properties to both, morpheme structure conditions and phonological rules NPP permits a unified characterization of productive phonological regularities as processes. This permits us to explicitly account for the rather frequent fact that in cases like the Italian and German ones below a morpheme structure condition *and* a phonological rule — though operative on different phonological structures on different levels — may express one and the same phonotactic regularity.⁵ Moreover, if we imagine a morpheme structure condition of a language *x* and a phonological rule of a language *y* providing phonotactically identical structures, the relevance of this unification of description for contrastive analysis becomes obvious, since it is by no means clear how a morpheme structure condition and a phonological rule *as such* can be compared with each other, SGP allotting entirely different statuses to them.⁶

⁵ In Kisseberth's (1970: 294) words: "As is often the case, phonological rules... in a sense 'recapitulate' the morpheme structure condition(s)". See also Wojcik (1976) for a discussion of this point.

⁶ This must not be misunderstood as denying the motivatedness of differentiating between morpheme structure conditions and phonological rules (as does, e.g., Hooper (1976) from the point of view of Natural Generative Phonology). It has been shown by numerous authors (see Dressler (1977: 54 - 57) for a review) that morpheme structure conditions can legitimately be postulated on various grounds. One may summarize all these arguments in favor of morpheme structure conditions: there are *indeed* (1) phonotactic regularities which hold *exclusively within* morphemes as well as (2) phonotactic regularities holding within morphemes on the *systematic phonemic* (-abstract) level *only*. What adherents of NPP have stressed rather, is the necessity of characterizing the properties common to both morpheme structure conditions and phonological rules in terms of natural phonological processes.

OBLIGATORY FOR ALL STYLES:

- (1) tomba, ɛmpito, triomfo, invido, onda, mentsionare
mandzo, pɛnso, kɔnššo, mantša, mandžare, banjka,
aŋgolo, džemma, dɔnna, deńno

In addition, Italian has a phonological rule of nasal assimilation applying across morphosyntactic boundaries¹⁰ which extends its application with progressive casualness of speech, as can be seen from the list in (2a - d) (cf. Gnerre (1976: 289 - 292)).

OBLIGATORY FOR ALL STYLES:

- (2a) assum+to → assum+to
spɛn+to → spɛn+to
in+patsiɛntsa → im+patsiɛntsa
in+grato → in+grato
in+mɔbile → im+mɔbile

OBLIGATORY FOR LESS CAREFUL (=colloquial) STYLES:¹¹

- (2b) kon # permesso → kom # permesso
kon # grandettsa → koŋ # grandettsa
kon # malitsia → kom # malitsia

Fed by a rule which deletes the final vowel of certain endings of (in order of preference) auxiliary verbs ((2c), already in colloquial styles), modal verbs and

detail is given only to those parts of the transcript which are of immediate interest for the phenomenon under concern. This must be kept in mind especially for German casual speech forms which considerably differ from the forms cited below because of the operation of other casual speech rules affecting vowel quantity and quality. The effect of these rules on the phonetic output will be neglected for sake of clarity.

¹⁰ As for boundary symbols used, '+' denotes a boundary of both inflectional and derivational morphology; '#' denotes a boundary between clitics (stressless) words and stressed words (as well as a boundary between compound constituents in German examples); '# #' signals a boundary between stressed words. It must be pointed out, however, that the assignment of a particular boundary symbol to a given syntactic construction will often appear to be rather ad-hoc, since at the moment theoretical knowledge about boundaries available to the analyst is rather scant.

¹¹ Rather than classifying rules as *obligatory* vs. *facultative* we consider all rules to be *obligatory within certain styles*; this results from the basic assumption of NPP on the organization of polystylistic phonological systems, according to which a phonological style can be unequivocally defined as a cooccurrence of a number of specifically adapted natural phonological processes. Once a given style has been chosen on extralinguistic grounds, the speaker simply *must* apply all style-specific processes. 'Obligatory rules' in traditional terminology are simply rules which *invariably hold for all styles*.

full verbs (2d), the nasal assimilation rule even applies across '# #' — boundaries in casual styles:

- (2c) abbiamo # gridato → abbian # gridato

OBLIGATORY FOR CASUAL STYLES:

- (2d) p̄ossoño # # pagare → possom # # pagare
mandžano # # pane → mandžam # # pane

4.2

When compared to Italian, German turns out to be less restrictive as far as morpheme-internal nasal-consonant sequences are concerned: [m] may precede non-homorganic dentals and velars as well as homorganic labials, cf. (3) vs. (4):

- (3) hɛmdɔn, zamt, amzɛl, imkɔr
(4) ambos, lumpɔn, šimpf

[n] is found before homorganic dentals, quasi-homorganic palatoalveolar [ʃ], and palatals, cf. (5) and (6):

- (5) ɛndɛ, ɛntɛ, aɛns, unzɔr, gants, mɛnš
(6) fynf, manç

[ŋ] may precede homorganic velars, i.e. properly speaking [k] only (cf. (7)), since the few instances of morpheme-internal [ŋg]-clusters are exclusively found in non-native words. Additionally, there is a rather limited group of morphemes with heterorganic [ŋs]-sequences, cf. (8):

- (7) banjk, kraŋk, zeŋke
(8) aŋst jynst, leŋs

Since there are good arguments to derive *all* context-independent instances of [ŋ] (those in (8) as well as those in *ziŋən*, *šviŋən*, which form minimal pairs with *ziɛn*, *šviɛn*, thus qualifying ŋ as a taxonomic phoneme) from underlying /ng/ (via ng → ŋg → ŋɔ, cf. Dressler (to appear)) the following rule of nasal assimilation (9), corroborated in some cases by a rule of *g-loss after ŋ* (cf. (10)), will be made responsible for all the velar nasals presented above:

- (9) n → [+back] / ___ [+back]
(10) Sample derivations:

	c		
<i>nasal assimilation</i>	/bank/	/angst/	/ziŋ+ən/
<i>g-loss after ŋ</i>	banjk	aŋst	ziŋ+ən
	—	aŋst	ziŋ+ən
	[banjk]	[aŋst]	[ziŋ+ən]

Morpheme structure conditions will account for all instances of complementary distribution of [m] and [n], i.e. the positions before the labials (where only [m] appears, cf. (4)) and before [ts], [š], [f], and [ç] (where only [n] appears: *gants, menš, fynf, manç*).

As for assimilations across boundaries, the most formal style lacks them completely; with increasing casualness [n] (but never [m] or [ŋ]) assimilates-in-place to a following obstruent or nasal (with the exception of a following palatal [j], [ç]), surmounting progressively stronger boundaries, as can be seen from the forms in (11a - c):

OBLIGATORY FOR ALL STYLES EXCEPT THE MOST FORMAL ONE (across '+'-boundaries):

- (11a) an+pakən → am+pakən
 an+fy:rən → am+fy:rən
 an+maxən → am+maxən
 an+kla:gən → aŋ+kla:gən

But *never*: um+diçtən → *un+diçtən
 ziq+t → *zin+t

OBLIGATORY FOR COLLOQUIAL SPEECH (across '#'-boundaries):

- (11b) an#pe:tər → am#pe:tər
 ren#pfe:rt → rem#pfe:rt
 an#gerda → aŋ#gerda

OBLIGATORY FOR CASUAL SPEECH (across '##'-boundaries):

- (11c) 'die Auto *bahn bauen*'
 ba:n##baçən → ba:m##baçən

Note that in spite of [n] being assimilated across progressively stronger boundaries, the distribution of [m] and [n] *within* morphemes remains the same throughout the phonostylistic scale, with the minor exception of [n] being assimilated-in-place to labiodental fricatives, as speech becomes more casual, *fynf* being realized as *fymf*.

As soon as forms like those in (11b) appear, a rule of *progressive nasal assimilation* begins to operate (both within morphemes and across '+'-boundaries), assimilating a following syllabic nasal to the place of articulation of any preceding consonant (again with the exception of [ç] and [j]). A number of other rules have to do preparatory work to provide for its applicational conditions:

First, a *schwa-deletion* rule deletes the [ə] in forms like in (12a):

- (12a) a : bənt, ju : gənt, ge : gən, trep+ən, li : b+ən,
 laçf+ən, lə : v+ən, kempf+ən, kom+ən, bak+ən,
 raçx+ən, ziq+ən

Second, *resyllabification* yields

- (12b) a : bnt, ju : gnt, ge : gn, trep+n, li : b+n,
 laçf+n, lə : v+n, kempf+n, kom+n, bak+n,
 raçx+n, ziq+n

which are 'intermediate' forms only, i.e. constitute no possible output forms. Progressive nasal assimilation has to apply *obligatorily* now, giving

- (12c) a : bmt, ju : gnt, ge : gn, trep+m, li : b+m
 laçf+m, lə : v+m, kempf+m, kom+m, bak+m,
 raçx+m, ziq+m

It is interesting that this progressive type of nasal assimilation, unlike the regressive one which exclusively applied to [n], is 'strong' enough to yield *atŋ* for careful speech *atəm*, i.e. applies both to [n] and [m].

With increasing casualness progressive nasal assimilation may extend its domain of application even across '#'-boundaries, cf. (13):

- (13) 'Ich *mache ihn auf*'¹²
 max(ə)#i:n → max#ŋ

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Nasal assimilation being a typical *obscuration process* (it provides for homorganic articulations, thereby saving a considerable amount of articulator movement, regardless of a resulting reduction of morpheme transparency) we expect it to maximize its application with increasing casualness of speech. And this is exactly what happens both, in Italian and German, the extension affecting the agents, patients, environments, and directions of the process. This cross-stylistic expansion of nasal assimilation along the phonostylistic scales of German and Italian is given schematically in Tables 1 and 2 below. Let us consider Italian first: here the cross-stylistic extension is in two steps and exclusively involves the *environment* specification of the process. Its minimal application (i.e. its 'obligatory' application in traditional terms), indexed EX'T O, is within morphemes ('+__+') (where it applies to [n] as its sole patient), *functioning* as a morpheme structure condition, and across

¹² Here a number of other rules have to derive the weak forms of form words like *i:n* first, which then form the input of progressive nasal assimilation (for a detailed account, see Gnutzmann (1975), and Kohler (1977: 219 - 230)).

NASAL ASSIMILATION IN ITALIAN

		ENVIRONMENTS							
DIRECTIONS		PATIENTS	+	—	+	—	#	—	#
EXT 0:	regressive	{ n	all agents						
		{ m, n, ñ	all agents						
EXT 1:	regressive	{ n	all agents						
		{ m, n, ñ	all agents			all agents			
EXT 2:	regressive	{ n	all agents						
		{ m, n, ñ	all agents		all agents		all agents		

AGENTS:	Stops	p	b	t	d	k	g
	Affricates			ts	tš	dz	dz
	Fricatives	f	v	s	š	z	
	Nasals	m		n		ñ	

Table 1

NASAL ASSIMILATION IN GERMAN

		ENVIRONMENTS							
DIRECTIONS		PATIENTS	+	—	+	—	#	—	#
EXT 0:	regressive	n	k, g; p, b, pf ts, š						
EXT 1:	regressive	{ n	k, g; p, b, pf ts, š						
		{ n	all agents						
EXT 2:	regressive	{ n	k, g; p, b, pf ts, š, f, v						
	progressive	{ m, n	all agents			all agents			
EXT 3:	regressive	{ n	k, g; p, b, pf ts, š, f, v						
	progressive	{ m, n	all agents			all agents			

AGENTS:	Stops	p	b	t	d	k	g
	Affricates	pf		ts			
	Fricatives	f	v	s	š	z	x
	Nasals	m		n		ŋ	

Table 2

Table 1)¹³ remains the same for all three adaptations of the process. In German, nasal assimilations extends in three steps. Here we find both, a *regressive* and a *progressive* variant (the regressive variant being the basic one: it appears throughout adaptations EXT 0 to EXT 3 of the process (see Table 2)). The *patient*-class for regressive nasal assimilation remains the same for all extensions, namely |n| only, whereas the progressive variant applies to both (syllabic) |n| and |m|.

— In EXT 0, in its maximally restricted form (in very careful speech) nasal assimilation applies *regressively* only, *triggered* by (1) the velar stops (thereby *functioning* as a phonological rule) as well as (2) by a class of *agents* (|p|, |b|, |pf|, |ts|, |š|) before which |m| and |n| are in complementary distribution (thereby *functioning* as a morpheme structure condition).¹⁴

— EXT 1 involves the application of the *regressive* variant of the process across morpheme boundaries, being triggered by *all agents* listed beneath Table 2.

— In EXT 2 the *environment* of *regressive* nasal assimilation comes to include clitic boundaries as well, with the same *agent*-class as in EXT 1. At the same time, the *progressive* variant of nasal assimilation, being in turn triggered by an *all-agent-class*, becomes operative, acting both within and across morpheme boundaries. Finally, |f| and |v| are added to the morpheme-internal *agent*-class of the *regressive* variant.

— EXT 3 consists in an expansion of the *environments* of both, the *regressive* variant (across '#'-boundaries) and the *progressive* variant (across '#'-boundaries) with the same *agents* as before.

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To summarize, we have tried to exemplify how Natural Process Phonology (NPP) contributes to a better understanding and description of phonological variation. In particular, we have emphasized NPP's basic assumptions on the processual organization of (polystylistic) phonology, according to which differing phonetic patterns of different styles are generated by various applicational adaptations of natural phonological processes. Additional fundamental principles of NPP permitted us to characterize phonological rules and morpheme-

¹³ *Agents* operating within a given environment are listed in the column of that environment.

¹⁴ It is important to note here that the process does not account for *all* the cases of complementary distribution of nasals before consonants reported in 4.2.: the exclusive appearance of |n| before |f| and |c| cannot be considered as being generated by the natural phonological process of nasal assimilation, since no homorganicity is achieved; instead, a simple redundancy will capture these distributional regularities.

morpheme boundaries ('_+_') (where |m|, |n|, and |ñ|) are its patients, *functioning* as a phonological rule there. With progressive casualness, nasal assimilation expands its applicational domain across clitic boundaries ('_#_') first (EXT 1), and across stressed-word boundaries ('_##_') then (EXT 2). The *direction* of nasal assimilation as well as the *agent*-class (given beneath

me structure conditions in a uniform way, and to develop valid hypotheses about the extent of application natural phonological processes exhibit in different styles. Thus, we tried to justify our initial suggestion to include the theoretical outcomes of NPP into the heuristics and the methodology of analysis of phonological variation.

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