

Series B

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PHONOLOGY, MORPHOLOGY, AND MORPHOPHONEMICS:
GENERAL THEORY WITH APPLICATIONS TO FINNISH

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"Phonology, Morphology, and Morphophonemics"

Classical structural theories of phonology center upon the notions 'phoneme' and 'morpheme'. The former is primarily a meaning-differentiating element, the latter a meaning-bearing element. These theories share a similar metascientific perspective on what constitutes grammatical description insofar as both phonology and morphology are concerned with items and their arrangements. Phonological structure is thus basically regarded as a system of distinctive units (phonemes, members of oppositions, invariants) whereas morphology is taken to deal with the nature of morphemic primes as well as with variations in their phonemic shape. It seems fair to characterize these structural approaches as "unit-oriented" because explicit deductive rules have a clearly secondary status: the central concern for most structural theories is to establish paradigms of invariant structural units.

Generative phonologists, on the other hand, view phonology and morphology in a very different perspective. For them, sound structure is explicitly assumed to take the form of a mental system of ordered rules which generate phonetic representations for syntactic surface structures. In most variants of generative phonology, no distinction is made between phonology proper and morphology/morphophonemics: this view owes to the generative conception of phonology/morphology

as an interpretive input-output device which relates surface syntax to phonetics. In particular, this is true of the "Standard Theory" presented in Chomsky-Halle's The Sound Pattern of English. Some modified versions of generative phonology, such as Wurzel's Studien zur deutschen Lautstruktur and Kiefer's Swedish Morphology, distinguish between phonology and pure morphology, but morphophonemic phenomena are still retained within the phonological component. Generative phonology could reasonably be termed "rule-oriented" because units such as phonemes are clearly secondary to the system of generative rules. It is this system, not a set of invariant primes, that is taken to be a description of the main structural properties of phonology and morphology.

The monolithic conception of phonology and morphology as a unified whole makes generative phonology more abstract than most classical theories. In paper (i), I discuss a number of problems arising in connection with this view on the relations between phonology and morphology, including the thesis of mentalism and problems relating to validation, claims for "truth", empiricism, and the descriptive strength of the theory. The general conclusion is in line with the views of other critics of (standard) generative phonology such as Anttila, Botha, and Linell: most of the basic assumptions of generative phonology have not been proven true and there do not even seem to be any obvious prospects of uncovering positive evidence confirming these hypotheses (about mentalism, evaluation, deep rule orderings, elaborate formal devices etc).

In particular, I argue for a concrete conception of phonology which implies that not only functionally relevant morphological rules (i. e. morphological insertion rules, "fusioning rules" such as Swedish ablaut as a past tense marker, and stem-forming rules) but morphophonemic rules as well should be transferred to the morphological component. I argue that a valid and explanatory theory of phonology

(in conflict with basic generative assumptions) must play close attention to phonemes/oppositions/surface contrasts. For instance, Halle's famous argument against the relevance of the phoneme is found not to be tenable, phonemes (or sometimes maybe principal extrinsic allophones) should be regarded as descriptions of the "real" intuitions of native speakers, phonemes obviously play a role in sound change, and so on. There also seem to be crucial formal and functional differences between allophonic rules (A-rules) and morphophonemic rules (MP-rules). Formally, MP-rules are stronger than A-rules. The latter effect minor (often environmentally conditioned) adjustments of phonemic segments but do not normally have the force of e. g. inserting and deleting segments as do morphophonemic rules. Similarly, the powerful and complicated generative machinery of rule ordering has been devised primarily for the needs of MP-rules (formalized as abstract phonological rules). Normally, A-rules are everywhere-rules. Furthermore, A-rules are always productive whereas most MP-rules are unproductive. A-rules define notions such as 'basis of articulation' and 'pronounceability in language L' whereas MP-rules play no important role in this respect but rather express paradigmatic alternations between phonemes in grammatically or lexically established environments. Usually, A-rules have no exceptions whereas MP-rules do (because the former are productive, the latter unproductive). Finally, A-rules tend to transfer in foreign-language learning giving rise to a "foreign accent" whereas MP-rules do not transfer in this fashion (because they do not define constraints on pronounceability). A-rules and MP-rules also differ in terms of function. A-rules implement underlying phonological structure "by producing overt signs" (Andersen): they have a semiotic function. One should also observe that the existence of A-rules is a necessity both in speech production and in speech perception. Speech production is facilitated because a somewhat imprecise use of the production mechanism is allowed; perception is facilitated by the

redundancy created. MP-rules, on the other hand, have no such functions. Rather, they stand out as synchronic complications of the ideal structure of linguistic signs embodied in the principle "one content - one expression". MP-rules create allomorphy which is redundant and complicating from a paradigmatic (even if not from a syntagmatic) point of view. Normally, morphophonemic alternations exist due to the interference of sound change with morphological structure.

Thus, there seem to be ample reasons for transferring morphophonemics to the morphological component. This provides for a concrete conception of phonology, the domain of which comprises characterizations of phonemes, distinctive features, allophonic rules, neutralizations, phonotactic arrangements, and natural sequence rules (where 'natural' means relatable to allophonics, phonotactics, and notions such as 'ease of articulation' and 'pronounceability'). Furthermore, underlying forms should be concrete (roughly: basic allomorphs in near-phonemic shapes).

Morphophonemic rules fall into a descending hierarchy of naturalness, productivity, and strength, where the phonologically definable rules are more natural and strongly rooted in grammar than those rules which operate in grammatical environments which are in turn more natural than rules operating upon specific lexically marked items. The latter two types of MP-rules I call "morphologized" and "lexicalized", respectively. Morphological simplification is seen to be mainly an elimination of complicating MP-rules. This simplification takes the form of gradual elimination of lexical markings and imperviousness of new items such as borrowings to undergo lexicalized rules, which might ultimately lead to rule loss.

Finally, I make an attempt at characterizing the notion 'productive rule'. Allophonic rules are productive, which can be seen e. g. in

the nativization of borrowed words. This property of allophonic rules relates to their being global restrictions on pronounceability. MP-rules, on the other hand, are normally unproductive. In particular, this is true of lexicalized rules: why should new items take on idiosyncratic lexical specifications making them subject to redundant MP-rules which create purposeless allomorphy? Sometimes, grammatically definable MP-rules seem to be productive. Specific morphological categories can exert morphological pressure upon the phonemic build-up of morphemes as concatenated in strings. This is akin to genuine phonological productivity but differs from it in the sense that morphological pressure only works in particular grammatical environments. Thus, morphological pressure is not an absolute limitation on what is strictly speaking pronounceable. Consequently, morphological pressure does not transfer in foreign-language learning whereas A-rules do transfer, giving rise to a "foreign accent".

The resulting conception of the relations between phonology, morphology, and morphophonemics becomes in a sense eclectic insofar as it contains theoretical ingredients from traditional, structural, as well as generative grammar. Phonology and morphology are distinct, morphophonemics going with the latter. Phonology should be concrete, that is, substance-based. Here, notions such as 'phoneme' and 'opposition' are of prime importance. On the other hand the domain of phonology is not exhausted by the establishment of phoneme inventories and distributions. Morphemes as concatenated in syntactic structures can be subject to strictly phonological concatenation rules and these too belong to phonology. Likewise, a prospective theory of phonological universals should be concrete and based upon substantive considerations of the speech mechanism, its inherent properties and limitations, and its use. Language-specific morphological and morphophonemic phenomena should not interfere with the construction of such a theory. But real 'explanation' in

phonology must be not only phonetic but also functional in nature as has long been the case in traditional grammar: cf. such well-known restrictions upon sound change as "avoidance of homonyms" and "conformity to surface phonotactics".

"Centrála problem i finskans böjningsmorfologi, morfofonematik och fonologi"

In this part of the dissertation, I apply the theory sketched above to Finnish, discussing the basic processes of inflectional morphology, morphophonemics, and phonology.

The underlying inventory of segments contains the vowels /i e ä y ö u o a/ and the consonants /p t k d s h v j l r m n ŋ/. /d/ and /ŋ/ have to be given synchronic status of independent phonemes (both in the native and the borrowed strata of the lexicon) even though they are "weak" and somewhat "anomalous" due to defective distribution and relative scarcity of occurrence. The glottal stop, on the other hand, is not underlying but arises in specific morpheme sequences due to the (lexicalized) MP-rule of initial doubling.

The underlying forms of free morphemes are concrete, viz. for nouns the free nominative allomorph (e.g. /lasi, tuli, käsi, vene, kallis, varis/), and for verbs the strong grade of the vowel stem (e.g. /tule, juokse, anta, tunte, kumarta/). This view differs from that in previous generative treatments, which normally set up abstract underlying forms such as /käte/ for the paradigm käsi : käte+en : käde+n : kät+tä : käs+i+ä. In such instances, I claim that the underlying form (which historically has been käte in the paradigm just presented) has been restructured in favor of concreteness because the morphophonemic alternations and the rules accounting for them have become synchronically opaque and unproductive. Thus,

there is no substantive evidence in contemporary Finnish e. g. for a rule of e-raising or (in nouns) for a rule of assibilation which would give derivations such as käte --> käti --> käsi. Such abstract generative rules are replicas of original sound changes. From a synchronic point of view, however, these rules are no longer transparent or productive; this can be seen in the creation of neologisms as well as in the nativization of borrowed words (cf. the inflection of lasi, Swedish glas: lasi : lasi+n : lasi+a, not e. g. lasi : ⁺lade+n : ⁺lat+ta in analogy with the pattern provided by käsi). Instead, the alternations have been lexicalized in the sense that they are effected by rules triggered by idiosyncratic lexical feature specifications which are part of concrete lexical entries (such as /käsi, [m rule(x)]/). In this fashion, the grammar in a natural way captures the fact that a paradigm such as /käsi/ is intuitively complicated as well as unproductive. Other instances of restructured underlying forms coupled to lexicalized morphophonemic alternations include the paradigm types kallis : kallii+n and vene : venee+n. Here, the normal and productive types are varis : varikse+n and nalle : nalle+n, respectively.

Considerable attention is devoted to an examination of the relations between vowel stems and consonant stems. In the lexical forms, consonant stems are frequent only in the disyllabic noun type askel, kämnen, sisar. Surface vowel stems are formed by epenthesis, consonant stems by deletion (of -/e/). Sometimes, these processes are accompanied by consonant alternations in the root (e. g. clin : elime+n). These three types of rules form the block of stem-forming rules. These rules are functionally related in the sense that they all form stems and formally related with regard to the definition of their environments: they all require the same or a similar phonological composition of the following suffixal allomorph. Consonant stems thus only occur before suffixes with the structure CV(X), where X can be any string and C is non-labial. However, this

generalization is violated by a few morphological exceptions. I thoroughly examine the historical background of this restriction on the distribution of consonant stems and come to the conclusion that it was originally a pure restriction on pronounceability, but that in the synchronic structure it has now been partly morphologized. In particular, the vowel stems tend to force out the consonant stems which can be partly explained as a result of the universal preference for open syllables. The relative strength of the vowel stems also shows up in instances of (more or less) free variation between equivalent morphological forms such as the genitive plural, where words formed on the consonant stem are becoming increasingly obsolete, cf. ^(?) hirt+ten, ^(?) mer+ten, [?] suurin+ten, ⁺ olut+ten, ⁺ rakkaut+ten, ⁺ saanut+ten.

When morphophonemic alternations have become opaque, restructuring has taken place not only in underlying forms of free morphemes but sometimes in grammatical categories as well. Thus, I claim that the partitive singular of vene-morphemes (cf. vene : venee+n : vene+ttä) for many speakers has been re-analyzed from venet+ttä to vene+ttä. Primarily, this process is due to the loss of the final consonant -h/ in the basic nominative allomorph. Thus, the partitive morpheme has acquired a third allomorph /-ttA/ in addition to /-A/ and /-tA/. For roots ending in -c/, it is no longer predictable whether the partitive singular allomorph to be selected is /-ttA/ or /-A/, cf. vene+ttä but nalle+a. The distinction can best be made by using a lexical feature in connection with the vene-roots, which are unproductive. This implies that the restructuring has given rise to an embryonic distinction between two nominal declensions.

Other instances of restructurings can be found in the contracted verb paradigms (e. g. herätä : herään : heräsi : herännyt). When the historical consonant gradation and assibilation (ü --> si) have

become opaque and unproductive, restructuring has taken place in e. g. the first and second infinitive and the past tense, giving morphological segmentations such as herä+ttä, herä+ten, herä+si for earlier herät+ä, herät+en, heräs+i. In the infinitives, the morphological insertion rules have thus changed through restructuring even though the allomorph inventory has remained the same. In the past tense, however, a new allomorph /-si/ has arisen which is very productive in some dialects and in substandard Finnish (cf. hyllä+si and hyllä+s pro hyllä+i). I also claim that the underlying forms of contracted verbs have been restructured from e. g. previous /herät/ to /herää/. This development is another facet of the dominance of vowel stems over consonant stems.

Finnish is often claimed to be a strictly agglutinating language where there is a one-to-one-correspondence between sememes and morphemes. But historical developments have given rise to several instances of unsegmentable morphological complexes where one expression unit manifests two content units, cf. the local cases (such as /-ssa, -lla/), the comitative case ending /-ine-/ for singular/plural and comitative, the imperative III p. sg. /-koon/, the passive participle /-tu/ etc. Thus, Finnish is continuously developing away from strict agglutination.

I also discuss the basic morphophonemic rules, in particular consonant gradation, initial doubling, vowel mutations in front of suffixal i, and consonant cluster reduction. The rule of consonant gradation is heavily morphologized: its context has to include reference to morpheme boundaries, and specific suffixes are positive or negative exceptions to the rule. Quantitative and qualitative consonant gradation are both unproductive in a strict sense, but qualitative gradation is more unproductive than quantitative gradation. The former comprises disparate processes such as assimilation, voicing, deletion, and spirantization, whereas quantitative gradation

is more homogeneous being based on shortening only. Homogeneous rules are "simpler" than heterogeneous rules and this explains why the former are more strongly rooted and persistent in grammar. But consonant gradation is not only morphologized. In noun paradigms such as taival : taipale+n the unproductivity of the gradation process has led to restructuring of the nominative allomorph whereby the originally derived weak grades have entered the lexicon. The paradigm taival : taipale+n can be distinguished from nivel : nivele+n only by an idiosyncratic feature inducing gradation, which means that the rules have been lexicalized.

I further argue that the morphophonemic rule of initial doubling has been lexicalized. A rule feature belonging to specific morphemes induces a lengthening of an eventual following consonant in the next morpheme, cf. vene+kin [venek:in]. This feature is a property of the whole morpheme and it cannot be localized to final position as current practice in (both traditional and generative) Finnish grammar implies, cf. solutions such as the generative /veneh+kin/ --> [venek:in] or the traditional venex+kin --> [venek:in].

The rules specifying stem-final alternations in front of suffixal i are also strongly morphologized, as they require detailed information about the suffixes that follow. I discuss the change -/a/ --> o in certain disyllables in considerable detail, showing that it is functionally motivated by the tendency not to allow paradigms to shift between the two vowel harmony classes "front" and "back", cf. kela+a : kelo+i+ssa (with retained back harmony) but kel+i+ssa (vowel fronting takes place after the deletion of the final -/a/ unless -/a/ --> o).

The stem-forming rules discussed above are a subset within the set of morphophonemic rules.

I also discuss the fundamental phonological rules, viz. vowel harmony, vowel sequence adjustment (either vowel deletion or spirantization of i to j in certain VVV-strings), and nasal assimilation. The rule for suffixal vowel harmony is distinct from the phonotactic condition defining permissible intramorphemic combinations of vowels. The latter obeys specific paradigmatic constraints ruling out some morpheme types which would otherwise get variant suffixal harmony due to the application of morphophonemic rules (cf. the absence of verbs such as ⁺pita+a : pita+vat : pide+tään pointed out by A. Groundstroem). The rule of suffixal vowel harmony is almost exceptionless in inflectional morphology but numerous derivational suffixes do not undergo it in some contexts: thus after stems containing only neutral vowels, the back suffix variant has often been regularized, as in viisi+kko.

Finally, I have also discussed some functional constraints or conspiracies which are important for understanding Finnish morphology and phonology. These are the tendencies in favor of paradigmatic cohesion, avoidance of homonyms, conformity to surface phonotactics, and disyllabicity. Often, these tendencies have originally been constraints upon sound changes, which have survived as defining contexts for the morphophonemic alternations remaining as reflexes of these sound changes. Such trends explain many superficial irregularities, e. g. the consonant gradation type /-k-/ : -v- in nouns and the imperviousness of some verbs with /-t-/ in the root to undergo assibilation before past tense i. Both of these phenomena exemplify the tendency to avoid homonyms.