

THE ULTIMATE PHONOLOGICAL UNIT AS THE SMALLEST MORPHEME SHAPE

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ABSTRACT

The phoneme is divisible not only because it consists of ultimate constituents traditionally known as distinctive features, here termed kinakemes, but also because morpheme boundaries can run through phonemes. This is made possible by the ability of a kinakeme not only to participate in distinguishing morpheme shapes as a phoneme constituent, but also to provide such a shape by itself. Instances of inflexional and derivational affixes with shapes consisting of a single kinakeme are found in various languages, e.g. Estonian, Gaelic, Latvian, Nivkh (Gilyak), Romanian, Russian. A morpheme boundary can also run through a phoneme when an affix shape consists of a kinakeme cluster smaller or larger than a phoneme; the boundary then dissects the phoneme in question or its neighbour.

Ever since the notion of the phoneme as the basic unit in the sound system of language came into being, the problem of its (in)divisibility has always been present, though not always explicit in phonological theory. The insistence on the unquestionable absolute indivisibility of the phoneme, so characteristic of phonology's early days, soon gave way to the recognition of the existence within the phoneme of smaller truly ultimate constituents, named distinctive features /11, 272, 422-5; 12, 25/, merisms, phonemes, subphonemes etc. For reasons explained elsewhere /14, 82-3/ the best term is Baudouin's coinage 'kinakeme' /1, 199, 290/.

Recent research has demonstrated that these entities possess all the fundamental properties of language units:

- (1) They are language-specific and cannot therefore be items in a universal inventory, Jakobsonian /11, 484-6/ or Chomskyan /8, 335/, any more than phonemes, syllables or words could be listed so /9, 152/.
- (2) In each language they are paradigmatically united in a kinakemic system whose structure follows universal principles, but provides, like any other language sys-

tem, a unique way of segmenting and organizing extralinguistic substance, which is not sound, linguistically organized by the phonemic system, but the speaker's cerebral activity in initiating sound and the listener's subsequent perceptive cerebration /14, 83 ff.; 15, 277-83/.

(3) Each language has its specific syntagmatic patterns for kinakemic combination in phonemes, which is basically non-linear simultaneous /15, 283-7/.

(4) Kinakemic systems play a leading role in the phonological evolution of languages and determine the direction of phonemic change /7/.

The establishment of the kinakeme as the ultimate language unit does not, however, take the question of phoneme (in)divisibility off the phonological agenda, for the problem has more than just one facet. An analogy may be appropriate here with the atom, whose very name reflects its indivisibility: despite its decomposition into a host of particles it remains the ultimate quantum of a chemical element and is indivisible on that level. Likewise, the phoneme is segmentable in certain aspects and indivisible in others.

The discovery of the phoneme in 20th century phonology was in a sense a rediscovery, for the original discovery dates back to the invention of alphabetic writing, when letters were created as symbols for phonemes. As long as the sound substance behind them was not analysed, they were treated as representing indivisible units of sound. The advent of phonetics in the 19th century put an end to the notion of integral sound units symbolized by letters and led to a two-pronged attack against them, pointing out the wide range of their variation and the complexity of their production and perception. The emergence of phonology was stimulated above all by the urgent necessity to uphold the notion of sound quanta and to protect them from being disintegrated in a continuum of variable phonic realizations. Hence the firmness with which the founders of phonology rejected every infringement on the principle of phoneme indivisibility. The two questions concerning the unity of

the phoneme with its variability, its articulatory and auditory complexity, have been answered differently by modern phonology. Allophonic variation has found its place in phonemic theory and no longer threatens phonemic unity. As for the inner complexity of phoneme structure, the discovery of the kinakeme as its constituent has of course shown the phoneme to be divisible into units of a lower level. But there is another aspect of phoneme structure which in its time attracted attention in connection with the problem of phoneme divisibility - the question of monophonemicity for sounds with temporally varying articulation, i.e. diphthongs and affricates. It must be stressed that kinakemic divisibility of the phoneme does not affect their monophonemicity if it is established by the well-known criteria of classical phonology which remain fully valid. Since kinakemic combination in a phoneme is non-linear and the kinakemes, clustered to form a phoneme, are activated more or less simultaneously, none of them can occupy a temporal segment of its own.

The kinakemic level is ultimately responsible for the conversion of sense into sound and the reconversion of sound into sense. Sound as the physical vehicle for the externalization of the speech signal is obviously so different from the cerebral activities with which the kinakemic system is concerned, that it has to be represented in the language system by a separate level. Deprived of its classical status of ultimate phonological (indeed, linguistic) unit, the phoneme retains its ultimateness on that level. Its properties including (in)divisibility are determined by the needs of the level it belongs to. Its kinakemic divisibility, far from being an obstacle to its function in organizing sound, is absolutely indispensable for the purpose. The phoneme is divisible in two other respects, and in both cases the divisibility is determined by the needs of other language levels without affecting the functioning of the phoneme. First, a phoneme can be crossed by a syllabic boundary. That is not possible for vowels and many languages do not permit it in consonants either. But languages that make use of the kinakeme of vowel checking may put the syllabic boundary after checked vowels inside a single consonant, between its onset and release, as in English 'body', 'supper'. Secondly, a phoneme can be crossed by a morpheme boundary, when one of the bordering morphemes uses a kinakeme and not a whole phoneme as its sole exponent.

The employment of kinakemes as exponents for morphological categories is observed in several languages. The analysis of protensity in Estonian provides abundant instances of the phenomenon. Estonian protensity with its traditionally recognized three levels (short, long, over-long) is now tre-

ated as resulting from a combination of two separate oppositions: long vs. short, over-long vs. long /cf. 16, 17/. The difficult problem of the exact phonic natures of both must be put aside in the present paper. What concerns us is the functional difference between the two: the opposition of long vs. short is mostly active in distinguishing lexical items (aasta 'year' - aste 'degree', mure 'grief' - murre 'dialect'), while the predominant function of the opposition of over-long vs. long lies in the grammatical sphere, where it is widely used to distinguish noun cases: part.sg. saali 'hall' - gen.sg. saali, gen.sg. hoone 'building' - nom.sg. hoone, part.sg. linna 'town' - gen.sg. linna, elat.sg. kallist 'dear' - part.sg. kallist. It is obvious that the kinakemes of the former opposition, which may be described as lexical protensity, do not possess semantic values of their own, whereas the kinakemes of the latter opposition of grammatical protensity serve as sole exponents of the categorial meanings of cases. That shows that the kinakeme of grammatical protensity or over-length is in itself a morpheme shape - a kind of case infix. As such it must occupy a certain fixed position in the stem shape and therefore must be able to join any phoneme in that position. The phoneme that incorporates the infix always follows the syllabic peak and may be a vowel; it is either different from the syllabic vowel and forms a diphthongal cluster with it (part.sg. laulu 'song' - gen.sg. laulu, gen.sg. laine 'wave' - nom.sg. laine), or identical with it and forms a bimoric monophthong with it, which becomes trimoric when the infix is added to it (see: saali, hoone above). The infix can also enter consonants, single (part.sg. seppa 'smith' - gen.sg. seppa, elat.sg. rikkast 'rich' - part.sg. rikast), in a cluster (part.sg. oksa 'branch' - gen.sg. oksa) or geminated (see: linna, kallist above).

In Irish Gaelic /2, 81/ categorial distinction of number and case in noun paradigms is regularly achieved by the kinakeme of palatalization: báid - baid 'boat', béal - béil 'mouth', bonn - boinn 'coin', cnoic - cnoic 'hill'.

In some German dialects /3, 384-5/ noun number is distinguished by certain kinakemes alone, e.g. voicing (pl. barf - sg. barc 'mountain', pl. brev - sg. bref 'letter'), vowel checking (pl. fiš - sg. fiš 'fish') or vowel fronting (pl. hund - sg. hund 'dog').

Before their dat.sg. inflexions -m, -i Latvian nouns display a stem-final vowel /a/, /u/, /e/, /i/ (galdam 'table', tirgum 'market', zemei 'land', sirdij 'heart'). The sole exponent for the locative case is the kinakeme of protensity included into that vowel (galdā, tirgū, zemē, sirdī); for the accusative the sole exponent is

the kinakeme of tongue-raising added to the vowel (galdu, tirgu, zemi, sirdi) /10; 5, 232/.

The use of kinakemes as categorial exponents is widespread in Romanian, where it is found in the paradigms of nouns and verbs. The best-known example is the use of the palatalization kinakeme to mark the plural of nouns (pl. lupi 'wolf' - sg. lup) and the 2nd person in verbs (dormi 'sleep' - 1st sg. dorm). But there are other instances as well. The four canonical forms expressing number and gender, e.g. sg.m. vecin 'neighbour', mindru 'proud', pl.m. vecini, mindri, sg.f. vecină, mindră, pl.f. vecine, mindre, demonstrate that kinakemic distinctions also exist between the two genders: both masculine forms end in high vowels /u/, /i/, regularly reduced to zero representations after single consonants (as in vecin, vecini), whereas both feminine forms end in non-high vowels /ə/, /e/; the masculine gender is thus marked by the positive kinakeme of tongue-raising, the feminine remains unmarked and usually includes its negative counterpart into its final vowel. But the feminine gender uses the positive kinakeme of tongue-lowering for its definite article: def.sg. casa 'house', cartea 'book', ziua 'day' with low vowels - /a/, front /ea/, back /ua ~ oa/, absent from the indefinite forms (casa, carte, zi). In the 3rd person of many Romanian verbs indicative and conjunctive forms are distinguished only by the presence or absence of the positive kinakeme of fronting in the inflexional vowel (ind. bate - conj. bată 'beat', conj. poartă - ind. poartă 'carry'). Thus, the positive kinakemes of consonant palatalization, of tongue-raising and tongue-lowering can alone act as exponents for the grammatical categories of number, gender, definiteness in Romanian nouns, of person and mood in verbs.

The ability of single kinakemes to serve as grammatical exponents is not confined to morphological categories. They may also function as indicators of syntactic relations. For instance, in the Nivkh (Gilyak) language /4; 6/ syntactic subordination is marked by changing a modal kinakeme in the initial consonant of the headword. When a verb takes an object or a noun takes an attribute, it reflects its syntactic domination by a kinakemic restructuring of its initial consonant: the kinakeme of occlusion is replaced by that of constriction and vice versa, voicing is interchangeable with devoicing (bod' ~ vod' ~ pod' - 'to hold'), the kinakeme of aspiration with that of constriction (khu ~ xu 'arrow'). The role of kinakemes as markers of syntactic dominance in Nivkh is functionally analogous to the Persian ezāfe, i.e. the suffix attached to the noun when it takes an attribute (pesar-e mard 'the man's son', ab-e garm 'hot water').

The same pattern of kinakeme interchange is widely used in Nivkh lexico-grammatical derivation. Replacement of initial occlusion by constriction may form a causative verb (kukud' "to fall" - kukud' "to drop"), a change in the opposite direction creates a deverbal noun (fuvd' "to saw" - puf "a saw"). The kinakeme of voicing in the initial consonant of a qualitative word indicates intensity (tuzla 'cold' - duzla 'very cold') /2, 102; 6-I, 72; -II, 41/.

The use of a single kinakeme as an exponent of lexico-grammatical derivation is found in Russian, where the inclusion of the palatalization kinakeme into the stem-final consonant is highly productive in building deverbal and deadjectival nouns: ПОДПИСАТЬ - ПОДПИСЬ, СВЯЗАТЬ - СВЯЗЬ, ОБУВАТЬ - ОБУВЬ, БЕЗДАРНЫЙ - БЕЗДАРЬ, УДАЛОЙ - УДАЛЬ, НОВЫЙ - НОВЬ.

The conclusion can safely be reached that a wide range of kinakemes, both vocalic and consonantal, among them vowel checking and fronting, tongue raising and lowering, protensity, palatalization, occlusion, constriction, aspiration, voicing and devoicing, are quite capable of serving as the sole exponents of various derivational meanings - syntactic dominance in a phrase, morphological in the categories of case, number, gender, definiteness, person, mood; lexico-grammatical in shifting a word from one class to another. In general linguistic terms the capability of kinakemes to function as morpheme exponents refutes the idea of the morphemic indivisibility of the phoneme. When a kinakeme, which is naturally incapable of externalization outside a phoneme, constitutes a morpheme shape in itself and is thus from the morphosemantic viewpoint independent of the phoneme it enters, it is separated from the other kinakemes in the phoneme structure by a morpheme boundary. Kinakemes are capable of building affix shapes not only singly, but also in clusters. Strictly speaking, every affix shape can be described as made of a kinakeme cluster, since a phoneme is always such a cluster. But there is no need to do so if the affix shape consists of entire phonemes. However, the identity between kinakeme clusters in their two constitutive functions - making up phonemes and morpheme shapes - is not obligatory, and a cluster as an affix shape may not equal any phoneme or phoneme combination. The affix shape is often larger than a phoneme and contains an extra kinakeme which is incorporated into the adjacent phoneme of the stem. Linguistic tradition has treated such instances as sound alterations, phoneme replacements, which entails separate treatment for each case of replacement. Relegating the phenomenon to the kinakemic level brings more uniformity to linguistic description. Of the languages discussed above Gaelic

and Russian abound in affix shapes that expand beyond the inflexional phonemes and penetrate into the phonemes of the stem. For instance, the Irish possessive noun prefix of the 3rd person contains, besides the entire phoneme /ə/, the kinakeme of constriction for the masculine sg. (port - a phort 'his port', cota - a chota 'his coat'), the kinakeme of voicing for the plural (a bport 'their port', a gcota 'their coat'). In contrast the corresponding prefix for the fem.sg. is equal to the phoneme /ə/ (a port 'her port', a cota 'her coat') /2, 79-83/.

In Russian the vowel /e/ is unable to begin a suffix shape alone and is therefore always accompanied in it by the kinakeme of palatalization implanted into the final consonant of the stem: loc.sg. *СТОЛЕ*, dat. sg. *ТРАВЕ*, inf. *ТВЕРДЕТЬ*, where the palatalization kinakemes in /l'/, /v'/, /d'/ do not belong to the stem shapes, but to the affix shapes together with the vowel /e/. As a morpheme boundary separates the kinakeme of palatalization from the rest of the phoneme it joins, the stem shapes by themselves do not undergo any changes on the kinakemic level despite the changes in the kinakeme structures of their final consonants.

The Russian vowel /i/ is not always accompanied by the kinakeme of palatalization in suffix shapes. It equals the suffix shape in some noun inflexions (nom.pl. *ПИ-ЛИ*), but in verb inflexions beginning with the same vowel phoneme it is accompanied by the kinakeme of palatalization placed in the last consonant of the stem: *ПИЛИТ*. Affix shapes may also be smaller than a phoneme, which then has to fill the resulting gap in its structure by admitting a certain kinakeme from the stem shape. This is the essence of synharmonism. For instance, in Finnish the kinakeme of vowel fronting or its negative counterpart is carried over from the stem vowels into the vowel of the suffix: inf. *puhumaan* 'speak' - *leikkimaan* 'play'.

In English the suffix shape in 'hopes', 'moves' contains only the kinakemes common to both phonemes /s/, /z/, and the suffix shape in 'hoped', 'moved' likewise contains only the kinakemes common to /t/, /d/. In other words, the suffix shapes do not show any variation determined by the phonemic context. The kinakemes of voicing and devoicing which enter the suffixal consonants, belong to the stem shapes and not to the suffix shapes /13/.

Affix shapes larger or smaller than phonemes have a special role to play in strengthening the unity of the derived word, as the penetration of one morpheme shape into the phonemes that otherwise belong to the other morpheme, the resulting participation of a phoneme in two morpheme shapes at once are factors which help to cement the ties between the morphemes. But each direction

of penetration has a typological significance of its own. When the affix shape is larger than the affixal phoneme and spills over into the stem, it serves to emphasize the constitutive role of the affix in the structure of the word and accordingly reduces the discernibility of the stem; this is a characteristic trend in synthetic languages. On the other hand, analyticized languages show a typological propensity to emphasize the pivotal role of the stem by its easy separation from the affixes, and that requires the stability of the stem, well-defined morpheme boundaries; the unity of the word is also enhanced by morpheme boundaries running through phonemes, but the phonemes affected in such languages belong to affixes, whose shapes are smaller than the phonemes. It can be said that in the former type of languages the unity of the word is based on the power of its affixes, whereas in the latter type it uses the stem as its bulwark.

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