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Phonological units for phonological change: synchrony shall provide them

DMITRII ZELENSKII
Lomonosov Moscow State University

Abstract

The question of what types of units and domains are needed in order to capture phonological change is a reasonable one to ask. To answer this question, however, we first need to properly define how we understand phonological change, and the definition that we adopt for that clearly depends on the phonological framework that is assumed. I consider several influential frameworks here and then come to the conclusion that the same condition holds for all of them: change can only be described in terms of the same units (and domains) as are used for synchronic description. This leads to the following conclusion: the set of units for phonological change is a subset of the set of units that are needed for synchronic phonological description. However, it is also unlikely that some units needed for synchronic description can be fully ignored for all descriptions of changes, which leads us to the conclusion that the set of units that are needed for phonological change is also a superset of that set. The sets are thus equal: the phonological units needed for synchronic description are the units needed to account for phonological change, and the question above is meaningless.

1 Stating the question

It is relatively obvious that each subfield of any science, linguistics included, must define the units (both minimal, units par excellence, and bigger, so-called domains) that it uses to describe its object of study. For our purposes, both synchronic phonology, the science of describing phonological systems (henceforth — phonologies[1]) at a static position, and diachronic phonology, the science of describing changes of phonologies, need to define their respective units. The question of the

[1] This creates an ambiguity between phonology as a subfield of linguistics and phonology as a phonological system, the subfield's object of study; however, such ambiguities are widespread enough that this should not come as a problem to an experienced reader.

extent to which there is a correspondence between synchronic phonology's units and those of historical phonology, given the obvious link between their objects of study, is a natural one to pose.

However, I argue that the two sets of units are equal — that, by definition, one of them must be both a subset and a superset of the other. The rest of the article is structured as follows. Section 2 argues that, for all phonological frameworks typically considered in this connection,[2] the set of units needed for diachrony is a subset of units needed for synchrony. Section 3 explains why this set cannot reasonably avoid being a superset as well. Section 4 sums the paper up.

2 The subset question

In the following subsections I aim to show that, for key prominent phonological frameworks, the set of units needed for diachronic description is a subset of the units that are needed for synchronic work. This amounts, modulo footnote 2, to an argument that this is a usual relation between these sets; thus, while there is no formal unavoidability, any units used in historical phonology which are not also used in synchronic description should be viewed with suspicion.

2.1 The Moscow phonological school

The framework of the Moscow phonological school, the pinnacle of committed phonological thought in the Soviet Union, usually exemplified by Avanesov & Sidorov's (1945) textbook (subsequent important developments up to 1991 mostly involved theoretically uncommitted, technical descriptions like Zaliznyak 1967), is pointedly synchronic. Its main units are phonemes and their realisations (allophones). However, unlike descriptivists' phonemes, Moscow school phonemes are defined by a morphemic principle: an allomorph

[2] I obviously abstract away from frameworks where no segmentation is assumed: the very question of what is considered units in such frameworks is not easily resolved. Less obvious is the fact that I also exclude the Leningrad phonological school (Shcherba 1912) and, similarly, early descriptivists: as their phonemes are surface-bound, they exclude underlying units that are crucial for diachrony. I speculate, however (a formal argument seems to be impossible in this case) that, when one takes their morphophonologies into account as well, the combined theories are, for the purposes of this paper, to be treated similarly to the Moscow phonological school, discussed in section 2.1. Some arguments against early descriptivists' phonemes can be found, for instance, in chapter 4 of Carr (1993). These are also applicable to original versions of the ideas of the Leningrad phonological school (but not to those of the Moscow school; an English-speaking reader is advised to consult Iosad, to appear, on the difference — although he argues that one of the arguments is actually not problematic, citing Kasevich 1983).

contains the same phonemes, no matter what changes are induced by variable stress positions and automatic phonological alternations. Thus they are much closer[3] to Chomsky & Halle's (1968) underlying segments (if we ignore the fact that the latter are intended as feature-bundles, rather than primitives) than to, say, Shcherba's (1912) phonemes.

Several types of phonological change are possible in such a system. First, there can be lexical changes involving specific words (this will be omitted from following discussion, however, as it is an inherently lexical phenomenon). Secondly, rules for choosing allophones (automatic alternations) may change — and, in particular, may become non-automatic, or morphonological (see Itkin 2007 for a formal extension of the ideas of the Moscow phonological school encompassing this). Finally, the very set of phonemes and/or their distinctive features may change — usually as a result of changes to rules and/or an influx of loanwords — for instance, if an opposition which was previously governed by automatic change acquires a minimal pair, as in the case of palatalized vs. non-palatalized dorsals in Russian when minimal pairs such as *kuri* 'smoke' (imperative)' vs. *k'uri* 'curie' (a unit of measurement) appeared.

Each of these changes does not require any new unit (or, indeed, any new notion) which is not already used in the description of synchronic systems.

2.2 Derivational generative phonology

Standard generative phonology and many of the developments that followed it can be discussed together as having the following distinctive properties: the minimal units[4] involved are phonological features (distinctive and redundant), and there are ordered rules which change them.

Kiparsky (1982) discusses at length what the possible changes[5] are in such a phonological system. Three things can change: the order of

[3] If rules for choosing their allophones were ordered, they would be, modulo the question of natural classes, equivalent — by descriptive power, at least. However, Avanesov & Sidorov speak of *weak* and *strong* positions instead (for example, the /b/ of the Russian root /xleb/ 'bread' is in a strong position in /xleb-a/ [xlʲebˠ-ɐ] 'bread.GEN' but in a weak one in /xleb/ [xlʲepˠ] 'bread.NOM' because of the automatic voice alternation), making the description one-layered.

[4] In some frameworks, links between features (or, usually, bundles thereof) are added; this does not change the general idea.

[5] Asserting, additionally, that such changes happen during acquisition; while this is a fairly basic claim if one accepts a Chomskian paradigm of the language faculty more generally, it is irrelevant to the technical claims developed here.

rules, a rule's formula, and the set of distinctive features involved. The first two are relatively self-explanatory; the third case can be illustrated by the following example: vowels which were previously distinguished by ATR with a redundant phonetic back feature can become distinguished by the back feature, with the specification for ATR becoming redundant (this, of course, entails certain reformulations of rules, which are deemed automatic).

A digression is necessary here. Steriade (2000) argues against the distinction between distinctive and redundant features. However, (most of) her arguments are based on the premise that /d/ and /ɾ/ cannot be distinguished by the (near-universally distinctive) feature [sonorant]. However, that feature's main purpose is to distinguish between 'good' closure (in oral stops, affricates and non-lateral fricatives)[6] and 'degraded' closure (in laterals, nasals, glides, vowels…), and the pair for /d/ on that parameter is, obviously, /ɾ/, as its closure is degraded by virtue of being extra-short yet it does not entail laterality or any other additional difference in articulation. The premise is thus, I contend, wrong.[7] A similar issue shall be discussed in subsection 2.4.

What is of importance for my purposes is that all the three types of change introduce no new units: both rules' formulae and their order are used in synchronic description, as well as a feature's being distinctive or redundant if the distinction is accepted at all (if it is not, the third type of change becomes a subtype of the second).

2.3 Standard Optimality Theory

Given that Optimality Theory (Prince & Smolensky's 1993/2004) is an offspring of generative thought, it has always cared about the acquisition of grammars — and thus about their change. However, given the limited nature of a classical OT grammar (reduced to a universal generator, a universal set of constraints with language-specific ordering and a universal evaluation mechanism) and the even more limited space for differences, the only (non-lexical) change in OT lies in acquiring a different ordering of constraints. As both constraints and their ordering are (obviously) used in synchronic descriptions (as

[6] It is, of course, another question entirely why fricatives (and thus also affricates) are considered to have a 'good' closure, despite it being articulatorily incomplete (hence the fricative noise). I do not have an answer for this, yet languages seem to universally agree that non-lateral fricatives are not sonorant. 'Maximality' of closure may be relevant (one cannot change a fricative into a stop keeping the tongue body's form constant, whereas for a fricative and an approximant this *is* seemingly possible), yet this brings about additional problems, most obviously for laterals.

[7] I do not here comment on other aspects of Steriade's paper; suffice it to say that, even if the premise were right, the results would not be uncontroversial.

are the features comprising lexical items), Optimality Theory is yet another example of a framework where historical phonology is described using the units of synchronic phonology.

2.4 Phonetically based phonology

There are also strands of phonological thought which try to directly base phonology on phonetics, so that their synchronic description is based on formants, nasal poles and similar objects. Such work comes in two flavors.

One of them, exemplified by Blevins & Garrett (2004), considers such objects directly relevant for historical phonology, keeping synchronic descriptions simple (or, using the technical term, "substance-free"). While at first glance this looks like a blatant violation of the claim brought forth in this paper, upon closer scrutiny this turns out not to be the case: while there are properties of units that are relevant for diachronic change and are absent from synchronic grammars, they are not units themselves: they are used to deduce the general confusability (and thus potential for change) of the very same units that are used in synchronic description and have no independent use (unlike, say, Chomsky & Halle's 1968 features, which, despite being non-linear, are independent units, each having their own influence on grammar and its changes — see subsection 2.2). Thus the claim that units used for description are the same in all modern frameworks is not undermined by work like Blevins & Garrett (2004).

The other flavor of such work, exemplified for instance by most other contributions to Hayes, Kirchner & Steriade's (2004) volume (and, indirectly, also by Steriade's 2000 aforementioned paper), directly uses such objects (or their derivatives) in synchronic descriptions as well as in diachronic work, and is therefore also consistent with this paper's claim.

3 The superset argument

Now, having shown that the set of units used by historical phonology is a subset of units used by synchronic phonology, I shall argue that it is, under reasonable assumptions, also a superset.

The argument looks like[8] a formal proof by contradiction and goes as follows. Suppose that the set of units used in historical phonology is *not* a superset of synchronic phonology's set of units. In such a situation, there is at least one unit which belongs to the latter set but

[8] It is important to note that it is not, in fact, a formal proof because its last step is somewhat speculative.

not to the former — that is, by the sets' and the subfields' definitions, used to describe phonologies but not phonological changes. This would entail that the unit neither ever changes itself nor influences changes of other units. To the best of our knowledge, no minimal unit (be it segment or feature) is unchangeable, and all the phonological domains postulated so far (moras, syllables, feet, phonological words — both with and without clitics, and prosodic phrases), as well as morphemes, are extensively used in describing phonological change. Therefore, in a nutshell, there is no such unit.

4 Conclusion

This paper establishes that historical phonology does not need to define its own units because they need to be the same as the units used to describe the synchronic states involved in the changes that are studied by historical phonology.

Having established this, one must, of course, consider the question of which synchronic framework (and thus which units) are to be used. I do not answer that question here. In any case, it is to be resolved based on synchronic evidence. Vaux (2008) and Zelenskii (2019) provide what I think are compelling arguments that it should not be Optimality Theory.

Comments invited

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Author contact details

Dmitrii Zelenskii
Lomonosov Moscow State University
Bolshevikov prospekt, 3-1, ap. 26
St. Petersburg, 193231
Russian Federation

dz-zd@mail.ru

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