ON FOUNDATIONS OF HISTORICAL PHONOLOGY

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ABSTRACT

Investigation of historical phonology of a language group may include several cycles each consisting of five stages. Main problems concern the correctness of phonological solutions for source languages and the typological reliability of reconstructed phoneme systems and phonological changes. Perspectives of predictive historical phonology are discussed.

INTRODUCTION

Historical phonology stems from the so-called historical phonetics. Despite its name, historical phonetics, actually, had to manage without any objective phonetical data about most languages whose history was dealt with. On the other hand, several historical phoneticians of the prephonological period possessed a remarkably good understanding of the possible directions of sound changes, of the conditioning role of the sound system in particular sound changes, and of the variant/invariant relationship. Hence it makes no sense to try to draw a strict borderline between historical phonetics and historical phonology on the basis of different authors' terminology. What is far more significant, is the existence of cycles and natural stages of investigating the historical phonology of related languages.

1. STAGES OF HISTORICAL INVESTIGATION

Ideally, any exhaustive study of the historical phonology of a set of related languages (e.g. of a language family) should begin from investigating groups of closely related languages (the first cycle) and then unite these groups and more remotely related languages step-by-step into bigger groups in order to repeat the procedure until all the related languages are included. Each such cycle consists at the utmost of five stages.
(1) Establishing for each positional (paradigmatic) class of phonemes (consonants or vowels) or phoneme sequences its set of correspondences on the basis of the cognate set of the language group.
(2) Reconstruction (a) of positional phoneme classes of the protolanguage *L of the language group on the basis of the correspondence sets and (b) of the consonant and vowel systems of *L on the basis of the reconstructed positional classes.
(3) Reconstruction of lexical items of the protolanguage *L in terms of the reconstructed phonemes on the basis of the cognate set.
(4) Reconstruction of the sets of ordered phonological changes necessary to derive all positional phoneme classes and all phoneme sequences of each language L of the language group from those of the protolanguage *L.
(5) Building a family tree or a family-tree-based net for the language group on the basis of ordered phonological changes.

The interrelations of a cognate set and of the five stages are presented on the following scheme:
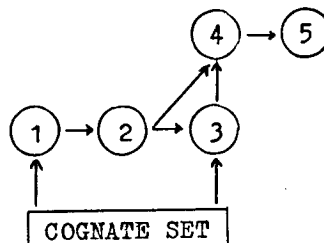
Note, however, that any further stage of a cycle may cause corrections at some earlier stage.

2. PROBLEMS OF PHONOLOGICAL RECONSTRUCTION

The quality of an investigation depends on several factors:
(a) on the choice of the most realistic phonological solution for each related language (on a stage preliminary

to a historical study);

(b) on the exhaustiveness of the phoneme correspondence sets and on the quality of available distributional data for each correspondence (stage 1);

(c) on the amount of regular correspondences actually included in the reconstruction of positional phoneme classes of the protolanguage *L (stage 2);

(d) on the typological reliability of the reconstructed consonant and vowel systems (stages 2 and 4);

(e) on the typological reliability of reconstructed phoneme sequences (stage 3);

(f) on the typological reliability of all reconstructed changes (stage 4);

(g) on the choice of the most reliable historical solutions out of the set of competing solutions.

Note that the reliability of reconstructions does not guarantee their correctness (i.e. historical reality).
Nevertheless, only a reliable reconstruction can be correct although there are no correctness criteria for reliable reconstructions. Still, among several competing reliable reconstructions one may prove to be more reliable than the others.

2.1. There exist languages whose phonology presents no or few real problems at least within the scope of historical comparative studies. On the other hand, there are languages that create serious problems for any phonological school pretending to psychological reality of its solutions. E.g., there have been long-lasting discussions about the phonemic system of Estonian. One of its several nontrivial phonological problems is the solution of its monophthong + stop pattern series, cf. the series of minimal pairs (presented in the Finno-Ugric transcription) in Table 1.

Table 1

Q1	naGĭ	maꞀkki	makkĭ makₑkĭ
		mắꞀkki	
Q2		mãGi	
Q3		mắGĬ	mắkkĭ mắkₑkĭ
	mâGₑkĭ mâGĬ		mắkkĕ

In Table 1 vowel and consonant length is indicated by means of upper diacritics, cf. (in the increasing order): (a) short vowels: ă a à; (b) long vowels: ā̆ ā̀ ā́ â; (c) strong single consonants: k ꞁ Ꞁ; (d) homomorphemic geminate consonants: k̆k kk k̀k; (e) heteromorphemic stop clusters: Gₑk kₑk k̀ₑk k̆ₑk. Note that the second component in a heteromorphemic stop cluster begins in implosion. In addition to words with heteromorphemic stop clusters also the words mãGĬ and mâkkĕ belong to dimorphemic patterns with a root morpheme ending in a (super)long monophthong. All the words have stress in the initial syllable. The situation is complicated by the

fact that Estonian has also a complicated system of diphthongs (26 types in my pronunciation), most of which pattern analogically to long vowels, and consonant clusters with there own problems; still most consonant clusters behave analogically to geminates when preceded by a short monophthong. All the monophthong + stop patterns participate in morphophonological alternations with each other. Native grammars of Estonian group all the patterns into three distinctive quantities, cf. Q1, Q2, and Q3 in Table 1; each quantity has, alongside the durational characteristics, also a characteristic pitch that has been, however, denied by some authors.
In any case, a complicated language like Estonian has many phonological solutions. Most of them are wrong and thus may serve as a source of a wrong history.

2.2. When reconstructing a phoneme system, any correspondence must be treated as a phone whose functional properties are unknown. Hence, an exhaustive set of phoneme correspondences should not include correspondences established on the basis of suspicious or ambiguous cognates. Inclusion of suspicious or ambiguous cognates and aberrant correspondences in the data body covered by reconstructions would probably falsify the history. There are, however, cases where most of the original environments of observable correspondences have been lost in the course of later changes. In such cases the reliability of reconstructions depends first of all on the number of correspondences covered by reconstructions on condition that no relatively big cognate set is ignored. Cf., e.g., the set of Permic.(Finno-Ugric), i.e. Proto-Komi (the 1st row) and Proto-Udmurt (the 1st line) correspondences of the vowels of the first syllables in Table 2. ị e ẹ and ụ o ọ are, correspondingly, illabial and labial central vowels, ọ ẹ ọ̣ are rised mid vowels. For each correspondence, the number of reliable cognates is indicated. The number is underlined if the correspondence occurs in the stem-final position.

Table 2

	*u	*o	*a	*ị	*ụ	*ọ	*e	*i
*u	<u>78</u>	2	1	24	18	1	2	
*ọ	<u>29</u>	3	<u>16</u>	8	<u>20</u>		3	
*o	<u>52</u>	3	9	6	3	3	2	
*a	<u>16</u>	4	<u>91</u>		2	5		
*ẹ	2	28	9			5	<u>27</u>	
*ọ̣	<u>7</u>	2	1	15		16	2	
*ị	14	3	1	<u>130</u>		2		8
*e	4	24	3	2		2	16	2
*ẹ̣	<u>14</u>							7	3
*i	4	8	12	1	2			<u>64</u>

2.3. The problem of typologically reliable reconstructed phoneme systems usually results from the presence of a great number of attested correspondences whose former complementarity has been eliminated by some later innovations. In such cases usually either the actual number of protophonemes will be multiplied or the original structure of the phoneme system fantastically distorted in the course of reconstruction. E.g., for Proto-Permic vowel systems containing 12-15 short vowels have been proposed. Such reconstructions are clearly unreliable.
There has been a lasting discussion about a typologically reliable Proto-Indo-European stop system. The discussion has concerned the problems of markedness, voicedness, aspiration, glottalization, and murmur of stops both in Indo-European and in other, relatively badly investigated language families. Interesting enough, the discussion has not led to new phonetical investigations of different stop triads even in modern Indo-European dialects, e.g., the Armenian ones. In other words, even the typology of the historically most interesting dialects of the world's best investigated language family rests mostly on impressions and not on firm data.
The situation is still worse in the field of the typology of changes. Although there has been steady progress in the field of the theory of change, the typology of individual changes is still almost nonexistent. We know, e.g., that long non-high vowels tend to rise, and not vice versa. On the other hand we know that all long monophthongs can be diphthongized.
According to Z. Zinkevičius the Lithuanian correspondence series uo ~ o ~ ou ~ ū represents the Proto-East-Baltic *ō̆ and not *ou from Proto-Indo-European *ōu [1]. Probably he has in view three independent changes *ō > uo, *ō̆ > ou, *ō̆ > ū.
The South Estonian long mid vowel rising *ō *ō̆ *ō̆ > ụ̄ ụ̄ ị̄ (the South Estonian vowels are lowered high vowels, contrasted to high vowels ū ū̆ ī) in quantity 3, cf. 2.1, and the North Estonian diphthongization of long mid vowels into uo üö ie both in quantity 2 and quantity 3 are usually considered to represent the same change chain with a specifically South Estonian monophthongization of uo üö ie into ū ū̆ ī [2]. This contradicts the facts (1) that South Estonian has retained long mid vowels in quantity 2 whereas no Estonian dialect has diphthongized its long mid vowels only in quantity 3 and (2) that in quantity 3 the second components of the North Estonian uo üö ie seem to be somewhat longer than the first ones and tend to lower. Besides, in Kodavere (East Estonian) described by L. Kettunen [3], long mid vowels had risen and merged in ū ū̆ ī in quantity 3 and di-

phtongized to ua üä iä in quantity 2; at the same time long low vowels *ā *ǟ had diphthongized to ua iä both in quantity 2 and quantity 3. Hence, both Kodavere and South Estonian indicate that rising and diphthongization of long mid vowels have different prerequisities: quantities 2 and 3 differ both in duration and in pitch. Likewise, it is possible that these prerequisities are to some extent universal, and probably there exist also conditions when long mid vowels reveal no tendency to change. Probably there are also several other changes or tendencies that can be actualized only under certain "hidden" conditions.
In view of that it is meaningful to look for such conditions comparing both dialects that have retained an old feature and those that have changed it. Apparently, often conditions are preserved after the change has taken place. E.g., in Livonian (a Baltic Finnic language spoken in the northern tip of Kurland, Latvia) all short vowels were lengthened (also in diphthongal nuclei) before a short vocalic or sonorant coda after the Livonian coda polarization had taken place in long syllables with plain tone and no long monophthong. Later u (except after ĭ) and i (after ĕ) were dropped after such lengthened vowels. Now a new round of vowel lengthening is in progress. Short initial components in diphthongs that have no contrastive pair beginning in a long component tend to lengthen [4]. This tendency concerns alongside syllables with plain tone also those with stød in diphthongs whose second component u or i does not morphophonologically alternate with v or j. Cf. Table 3 with Livonian polyphthongs. The lengthening tendency concerns diphthongs of classes 2 (tend to shift to class 3) and 4 (tend to shift to class 5). As this lengthening still remains in the framework of subphonemic free variation, Livonian must have retained the conditions necessary for such a lengthening for a considerable stretch of time.

Table 3

	u			i				
	Plain		Stød		Plain		Stød	
	1	2	3	4	5	1	2	3	4	5
u								uĭ	ùi	u'i	ū'i
o	oŭ où	(ō)	o'u						ŏi		ō'i
a						aĭ	aĭ	ài	a'i	
ọ							ọĭ	ọ̀i	ọ'i	
ẹ	ẹù	(ẹ̄)	ẹ'u				ẹĭ	ẹ̀i	ẹ'i	
ä	äù	(ǟ)	ä'u							
e							eĭ	(ē̆)	e'i	
i	iù	ĭu	i'u							
uo							ŭoĭ	ŭoĭ	ùoi	ŭo'i	u'oi
ie	ĭeù	(ĭe)	ĭe'u							

Estonian, on the other hand, reveals no tendency to lengthen the initial components of diphthongs even when they have a relatively short final component (in quantity 2). North Estonian dialects rather represent different stages of lowering of the final components u and i under the influence of the quality of the following consonants.

3. PREDICTIVENESS IN HISTORICAL PHONOLOGY

Apparently, establishing the necessary conditions of changes like those discussed in 2.3 is a task of historical phonology. Such a task means that historical phonology must become predictive at least in the weak sense of predictiveness: it must be capable of estimating the possibility or impossibility of one or another change. Doubtless, predictive historical phonology has higher requirements for the quality of synchronical phonological studies than does the current synchronical phonology. Synchronical phonology can often well manipulate any data of a local dialect or a standard language having only an impressionistic knowledge of manner and place of articulation. Predictive historical phonology needs considerably more concrete knowledge. One must be able to satisfactorily characterize the differences of "the same phoneme" (a) in different positional classes of the same language or dialect and (b) in similar positional classes of different languages or dialects. Nevertheless, collecting the relevant data on different phonological changes and their prerequisities is a task of typology rather than historical phonology. Hence, phonological typology must change from a branch that eagerly deals with collection and classification of both correct and incorrect impressionistic data into one that carefully checks up the correctness of the data it manipulates.

The perspective of predictive historical phonology demands that the role of abduction in phonological changes must be reviewed. Abductive changes, singled out by H. Andersen, are claimed to be unpredictable [5]. Actually there are maybe only two classes of unpredictable phonological changes: (a) sporadic and (b) those conditioned by speech disorders of a prestigious member of a little language community. The most striking examples of abductive change are rather chains of entirely natural single changes. The output of other examples of abductive change still contains features known from the input stage of the change. Such changes result from the effect of a set of universal tendencies whose actual number, scope and structure is still unknown. E.g.:

(1) The number of phonological rules in a grammar tends to be minimal.
(2) The domain of a phonological rule tends to be minimal.
(3) The phonological complexity of a phoneme sequence (syllable, stress group, word) tends to vary periodically.
(4) The number of phonemes in a phoneme system tends to be minimal.
(5) The length of allomorphs of a language tends to be minimal.
(6) Phoneme mergers tend to follow the principle of minimal articulatory efforts.

The first three tendencies are, probably, consequences of the tendency to minimize the volume of brain work. Thus it is more economical to memorize frequent inflectional forms and phrases than to compose them again and again. Tendencies (4) and (5) have partially opposite effects: tendency (5) may cause an increase both in the number of phonemes and in homonymy. As these tendencies act persistently they must be considered both in historical and synchronical phonology.

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