Philippe Ségéral Université Paris 7
Tobias Scheer Université de Nice

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Full Interpretability: evidence from Virtual Geminates

One prominent aspect of the relation between Phonetics and Phonology concerns the phonetic interpretation of various phonological representations that occur throughout derivation. Classically, "intermediate" representations, that is those that are neither underlying nor the input to phonetics, may be phonetically uninterpretable, and actually most of the time are. This holds true for orthodox SPE-type approaches as well as for more recent theories such as Feature Geometry, Underspecification Theory or standard Government Phonology: all of these models recur to fill-in rules, default rules or some kind of epenthesis that apply only once phonology has operated. The thereby "lately" acquired phonological properties are indispensable for phonetic interpretation, and hence all representations prior to them phonetically ill-formed.

A radically different view is argued for by Declarative Phonology and in more recent versions of Government Phonology that credits what Harris (1996) calls "full interpretability". Both approaches aim at accounting for phonological facts by enriched representations rather than by extrinsically and chronologically ordered rules. Yet, the claim of full interpretability is most radical in that it ends up denying the existence of an independent phonetic component of the grammar. Full interpretability, as exposed in Harris (1996), Harris & Lindsey (1990,1995), relies on phonological primitives of the monovalent kind. Those, as well as combinations thereof, and as opposed to features, are fully pronounceable: A=[a] etc. Phonology is conceived as operating linking and delinking on representations that articulate melodic, syllabic and prosodic primes, as well as hierarchised relations thereof. Hence, nothing is filled in or provided by default, and all primes in all representations have a lexical source. This kind of approach not only conveys to a view where phonetics and phonology contract a one-to-one relationship (for a given phonological representation, one and only one phonetic realisation, and for a given phonetic realisation, one and only one phonological representation), but also leaves the putative level of systematic phonetic interpretation without a body: nothing is to be interpreted because all representations since the lexicon are fully pronounceable.

We believe that this view of the relation between phonetics and phonology is correct in essence and desirable anyway because it constrains the theory a good deal. Namely, the level of phonetic interpretation cannot be used anymore as a kind of black box where all kinds of things happen that phonologists do not understand and therefore wish to be discharged of. It forces phonology to be explicit.

However, we have come across massive evidence in genetically unrelated languages that seems to invalidate the approach discussed. That is, the phonological analysis of Somali, Cologne German and standard German enforce some consonants to be regarded as geminates, although they are phonetically non-geminate. In a classical SPE-type approach, these facts can easily be accounted for by recurring to ordered rules: the consonants are born as geminates, and behave as such when phonology applies. Once phonology has operated, a rule of degemination leads to the actual phonetic form. The challenge met by our presentation is to maintain a model without extrinsic rule-ordering while reconciling the facts with Harris' full interpretability. Or, in other words, to explore when, under which conditions and how far phonology is licensed to step away from phonetics. In the sense alluded to above, it may also be regarded as a contribution to the recent debate on opacity, i.e. how phonology is to account for this kind of phenomenon without recurring to ordered rules.

The facts concerning virtual gemination are as follows. In the presentation, we provide analyses for three languages, i.e. Somali, Cologne German and standard German, of which only the two former fit in the frame of this abstract.

In Somali (Chushitic), verbal forms are built by suffixing personal and tense markers to the stem. For instance, a stem like *keen* "bring" is conjugated as in (1).

(1)

	Habitual Present				Past			
	stem	pers.	tense		stem	pers.	tense	
1sg	keen	ø	aa		keen	ø	ay	
2sg	keen	t	aa		keen	t	ay	
3m.sg	keen	ø	aa		keen	ø	ay	
3f.sg	keen	t	aa		keen	t	ay	
1pl	keen	n	aa		keen	n	ay	
2 pl	keen	t	aa	n	keen	t	ee	n
3 pl	keen	ø	aa	n	keen	ø	ee	n
imper	keen	ø	ø					

For stems presenting three consonants like *gudub* "cross", a vowel-zero alternation in line with the cross-linguistically typical pattern ø/__CV vs. V/__{CCV, C#} (cf. Slavic, German, Moroccan Arabic, Hungarian,…as described in Scheer 1997) is observed: *gudøb-aa* "I use to cross" vs. *gudub-t-aa* "you (sg) use to cross" and *gudub* "cross!" (the same pattern holds true for all conjugated forms). Note that the vowel appearing within the two final consonants is always a copy of the stem-vowel.

The inflexion of a special class of verbs ("third conjugation") involves the marker *-(a)t-* that intervenes between the stem and personal suffixes. Thus, a stem like *qab* "hold", whose identity is unambiguously revealed by the imperative *qab-o*, has a 1sg /qab-at-ø-aa/=[qabtaa]. Just as the three-consonant stems previously discussed, the class-marker at hand shows a vowel-zero alternation: while the allomorph *–øt-* can be observed in the 1sg, *-at-* surfaces in the 2sg /qab-at-t-aa/=[qabataa]. If a cluster precedes *–(a)t-*, zero does never occur: for a three-consonant stem belonging to the third conjugation like *dhaHl* "inherit" (imperative *dhaHl-o*, "dh"=retroflex, H=voiceless pharyngeal fric.), both 1sg and 2sg show the vowel, i.e. /dhaHl-at-ø-aa/=[dhaHladaa], /dhaHl-at-t-aa/=[dhaHlataa], respectively. It is important to note that /t/-->[d] /V__V, as illustrated in the 1sg, is general in Somali.

Now let us go back to the form 2sg /qab-at-t-aa/=[qabataa], which is extraordinary in two respects: 1. it shows a vowel [qab**a**taa] where zero is awaited according to the phonotactics observed elsewhere in the language (*gudøb-aa*) and in other languages: ø/__CV; 2. the dental is voiceless even though it stands in intervocalic position. So clearly, the phonological structure here is not what its phonetic form pretends to be. As to the former, the irregular presence of the [a] can be due either to the presence of a preceding cluster (parallel to 1sg /dhaHl-at-ø-aa/=[dhaHladaa]) or to one that follows (parallel to 2sg /gudub-t-aa/=[gudubtaa]. Somali offers the opportunity to decide between these two options: overt geminates that are phonetically realised as such do exist in this language, but only a subset of consonants is given access to this option, that is voiced obstruents and sonorants [b,d,dh,g,l,m,n,r]. Thus, if [b] were a geminate in [qa**b**ataa], it would appear as such on the surface. On the other hand, no statement of this kind can be made for [t] because voiceless consonants do not geminate overtly anyway. Hence, we are left with the conclusion that the object [t] has exactly the phonological behaviour of a cluster. If its status as a phonological geminate is assumed, the other extraordinary property it displays falls out naturally: [t] misbehaves with respect to /t/-->[d] /V__V because it is not a /t/ but a /tt/. Moreover, morphologically, two /t/'s are present underlyingly anyway: /qab-a**t-t**-aa/=[qabataa].

As a result, the only consistent analysis covering all data discussed relies on the possibility for /tt/ to be pronounced [t].

An identical case can be made for Cologne German, i.e. the variety of German spoken in the city of Cologne. The most striking feature of this language is a velarisation, examples of which are given in (2).

(2)

		standard Ger.	Cologne German		
a.	n - ŋ	bʁaw**n**	bʁu**ŋ**	braun	"brown"
b.	t – k	hɔj**t**ə	hy**k**	heute	"today"
	d – g	ʃnaj**d**ən	ʃni**g**ə	schneiden	"cut"
c.	nt - ŋk	bu**nt**	bu**ŋk**	bunt	"colorful"
	nd - ŋ	bi**nd**ən	bi**ŋ**ə	binden	"tie"

Synchronically, there is no way to predict the context in which this velarisation occurs. The only generalisation that may be drawn is of comparative nature: simple consonants (2a,b), as opposed to clusters (2c), velarise in words where the standard German cognate shows a preceding diphthong [aj,aw,ɔj], and only in this environment. However, there are numerous words where Col.German does not velarise where st.German shows diphthongs, e.g. both st.G and ColG [bajn, lawt, fχɔjd(ə)] "leg, noisy, joy", ColG *[biŋ, luk, fχyk]. Moreover, vowel quantity is irregular in ColG words that have undergone velarisation: while the regular reflex of st.G diphthongs is a long high vowel in ColG (e.g. stG Haus, Weib, Teufel = ColG [huus, viif, dyyvəl]), all velarised ColG forms exhibit a short vowel, cf. (2). The key to the problem is of diachronic nature: both st.G and ColG have a common ancestor, Old High German (OHG), where all vocalic expressions discussed, that is stG diphthongs as well as their long and short ColG cognates, were long high vowels (Middle High German=MHG):

(3)

stG	ColG		MHG		OHG
aj	i, ii	<	ii	<	ii
aw	u, uu	<	uu	<	uu
ɔj	y, yy	<	yy	<	uu

Hence, the velarisation is to be regarded as a synchronically inactive process that has occurred in or before MHG. The following generalisations can be established: 1. in MHG, velarisation occurs after long high vowels. Words like ColG [bajn] etc. are more recent loans from st.G; 2. velarisation triggers shortening of the preceding vowel. All and only the words that underwent velarisation exhibit vowel-shortening.

The synchronically inactive character is also demonstrated by the fact that all recent non-German loans provided with the appropriate stG or ColG context miss velarisation, e.g. stG [klawn, tɛʁmiin] "clown, date" = ColG [klawn, tɛʁmiin], *[kluŋ, tɛʁmiŋ].

As a result, the velar consonants that came into existence through velarisation must be underlyingly present in ColG.

The fact that dentals may velarise only after *long* vowels, and that their shortening is triggered by velarisation strongly suggests a process where the overall space/weight occupied by the vowel and the consonant is constant (T=dental, K=velar): VVT > VKK. As a matter of fact, the product of the velarisation is a geminate. Velarisation does not occur after short vowels because no gemination would be possible: a short vowel is unable to cede a skeletal slot in order for the velar to geminate.

Finally, the analysis regarding the phonetically simple velar as an underlying geminate receives striking support from a synchronically active process in ColG. Namely, [g] does not exist in this language unless it is the result of velarisation. All "native" [g] have become [j]: compare stG *gespielt, ungeheuer, gross, Glück, egal, Propaganda, balgen, geärgert* = ColG *jespillt, unjeheuer, jroos, Jlück, ejaal, propajanda, baljen, jeärjert*. Note that recent loans also undergo /g/-->[j], cf. *Propaganda*. Hence, our [g] in velarised words such as in (2) must be different from /g/. Its resistence against /g/-->[j] is straightforward if its phonological identity is /gg/.

In our presentation, we evaluate the consequences of admitting a simple phonetic realisation for a phonological geminate. Virtual geminates can either be handled by extrinsically ordered rules or by enriched representations combined with a theory of vowel-zero alternations, as we shall demonstrate. Along the known pattern, we argue that the latter option is to be preferred because rules of the type "degemination" merely state the facts instead of explaining them. However, enriched representations where geminates remain geminates at any stage of the derivation are an alternative to ordered rules at the cost of releasing, at least partly, Harris' full interpretability. Does this imply that this notion is erroneous and should be abandoned? Our answer is negative because the cases where full interpretability is at odds with the facts can be rigidly defined and are restricted to phenomena where phonological analysis establishing an identity different from the phonetic realisation is compulsory.

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