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WHY IS IT THAT PEOPLE ALLOW FOR SLACK IN THE PHONETIC INTERPRETATION OF VOWELS, BUT NOT OF CONSONANTS?

1. Slack

(1) phonological vs. phonetic identity of segments
   a. vowels
      everybody agrees that there may be considerable slack (regarding Place)
   b. consonants
      everybody seems to agree that there is no slack at all (regarding Place, but also Manner and laryngeal specifications).

==> that's strange…
1. in itself
2. the fact that as far as I can see this has never been a topic of discussion since 1985

(2) Place vs. the rest I
vowels
slack only concerns Place because there is not much more to say about Manner
   a. nasality is not at stake
      because nasal vowels can only be phonologically nasal, and non-nasal vowels could not be phonologically nasal
   b. ATRness: Place or Manner?
      ATRness is a better candidate, parting company with Place regarding slack, i.e. being treated as consonants: the Element-based identity was abandoned early on, and there are two ways to go about ATRness:
      1. headedness (ATR = headed, non-ATR = headless)
      2. empty-headedness (non-ATR = empty-headed, ATR = non-empty-headed)

      ==> no cross-linguistic variability on the radar

(3) Place vs. the rest II
consonants
   a. Place
      no slack (examples below)
   b. Manner
      no slack
   c. laryngeal specifications
      traditionally no slack, but things are moving: Cyran (2012, 2014) and laryngeal relativism (rather than realism)

2. Some examples (for slack in vowels)

(4) Licensing Constraints
   a. Charette & Göksel (1994, 1996), Kaye (2001) etc.
      The phonological identity of segments depends on their behaviour in phonological processing.
   b. ==> structuralism in GP, dialectic between the (structuralist) system and (generative) processing (Scheer 2010).
      Dresher (2009).

(5) Polish: three [ɛ]'s
   Gussmann (2007: 56ff)
   a. there are three phonologically distinct [ɛ]'s
      1. palatalizing e (lot - loci-e "flight Nsg, Lsg"): I--A
      2. non-palatalizing e (lot - lot-em "id. Nsg, Isg"): __--I--A
      3. post-velar e in recent loans (kelner, kemping): A--I
   b. which all bear the palatal agent I, though in different function (no automaticity of palatalization in presence of the palatal agent)
   c. the "surface neutralization" occurs during post-phonological spell-out (phonetic interpretation), rather than *in* the phonology (by phonological computation).

(6) Inuit dialects
   Dresher & Compton (2011: 222)
   a. two phonetically identical [i]'s,
      1. "strong" i: palatalizing, < Proto-Eskimo i
      2. "weak" i: non-palatalizing, < Proto-Eskimo schwa
   b. strong [i] = I
      weak [i] = nothing
   c. diachronic change
      1. of the phonological computational system: nill
      2. of the spell-out system (phonetic interpretation):
         _ ↔ ə > _ ↔ i

(7) more of the same in Czech
   a. two phonetically identical [i]'s,
      1. spelt <y>: non-palatalizing, < Common Slavic u
      2. spelt <i>: palatalizing, < Common Slavic i
   b. do your favourite analysis…

3. Some non-examples (for slack in consonants)

(8) velars
- a. GP doctrine
  (acquired on the basis of exactly one language as far as I can tell, Fula)
  velars are empty-headed, i.e. U is absent
- b. host of cases where velars spit out U
  Scheer (1999)
  e.g. Czech vocative where
  1. -i after palatal-final stems: Tomáš - Tomáš-i
  2. -u after velar-final stems: kluk - kluk-u
  3. -e elsewhere: holub - holub-e
- c. today there is broad agreement that U is present in velars
  Backley (2011):
  1. labials = U is head
  2. velars = U is operator
- d. but no slack on the radar
  this distribution of U is supposed to hold for all languages.
  ==> you can predict the phonological identity of labials and velars from their phonetic characteristics, no matter how they behave.

(9) t, d (s,z)
- a. dentals
  1. were supposed to be place-defined by R
  2. after R was abandoned, they were (are) place-defined by A
- b. in both cases the only reason was default or "I don't know what to do":
  1. we know that (non-sonorant) dentals don't have I or U
  2. so what can they have???
- c. bad solutions
  1. solution 1
     we invent a new element just for this occasion, R, no idea how this is independently pronounced, doesn't occur in vowels.
  2. solution 2
     we use the Element we're left with and that does not seem to have any function in consonantal Place definition otherwise: A
- d. evidence:
  1. there is little evidence that s,z have A and I (rhotacism)
  2. there is not a shred of evidence that t,d have A, they never spit out A
- e. a timid step towards more slack
  I-coronals vs. A-coronals
  Backley (2011: 72ff, 87ff)
  1. but still not a single phenomenon showing that t,d (s,z) have A
  2. A continues to be motivated only by default: oh look we need to distinguish 5 Places, 3 of which are coronal (Ngiyambaa), we can distinguish 2 coronal Places with I head vs. I operator, so what's the identity of the third? Must be A…
     Backley (2011: 90).

4. What that all means

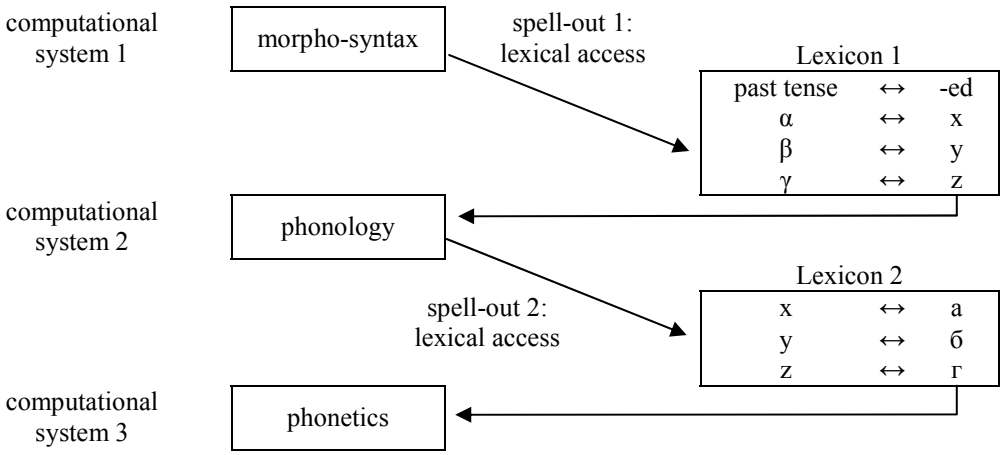
(10) generalization
  a. slack exists because of processing
     and for no other reason
  b. the elemental identity of segments is a function of their behaviour,
     NOT of their phonetic characteristics

(11) this is the implementation one of the most deeply rooted genetic properties of GP
(which was never made explicit in the early literature, though)
Phonological Epistemological Principle (PEP)
"the only source of phonological knowledge is phonological behaviour. Thus, phonetics […] plays no role in the postulation of phonological objects nor the interaction of such objects."
Kaye (2005: 283)

(12) consequence of slack
  a. phonetic interpretation
     Harris & Lindsey (1990, 1995: 46ff), Harris (1996), Gussmann (2007: 25ff)
     a GP essential, but kind of buried in the 90s and forgotten today.
  b. slack = mismatch of phonology and phonetics
  c. hence there must be a translation from one into the other
     ==> phonetic interpretation exists only because of slack.

(13) implementation of phonetic interpretation in the modular architecture of grammar
Scheer (2014)
  a. on modular standards, in order to communicate computational systems need to translate different vocabulary sets into one another.
  b. this is called spell-out.
  c. there is only one type of spell-out
  d. we know how the upper spell-out works: translation of morpho-syntactic structure into phonological material.
  e. the lower spell-out must be the same, just with different input and output vocabulary
  f. translation is through a **lexical access**.
     It is **NOT computational**.
     ==> main difference with Boersma & Hamann's BiPhon model where translation is computational, but which otherwise is along the same lines.
     Boersma (1998, 2009), Boersma & Hamann (2008), Hamann (2014)
  g. lexical translation makes translation **arbitrary**
     entries in different lexica do not share any property and their relationship is necessarily arbitrary.
     In BiPhon: cue constraints.

(14) fragment of grammar involving phonology



(15) consequence #1
slack is a property of the interface, not of consonants, vowels, Place etc.
a. hence we expect that any slack concerns ALL phonological primes and all kinds of segments
b. there is no reason to have slack in vowels but not in consonants, to have it in Place but not in Manner etc.
c. work should be directed to empirically substantiate what theory predicts:
slack also concerns
1. Manner in consonants
2. Place in consonants (timid step: I-coronals vs. A-coronals)
3. nasality in vowels
4. ATRness
5. laryngeal properties ==> done by Cyran
d. Dresher (2009) is more consistent:
all features, in consonants as much as in vowels, depend on processing, i.e. on how they behave.

(16) arbitrariness
a. arbitrariness raises the question
==> how much slack do we want, how much do we allow for?
b. we know that the same phonetic object may have distinct phonological identities across languages: [ɛ] may be
1. I.A,
2. A.I or
3. I.A
But may it also be
4. I alone?
5. A alone?
6. or even U alone?
c. intuitively, there must be limitations on how things can be pronounced, since otherwise a three vowel i-a-u system could in fact be flip-flop where [i] is the pronunciation of A, [a] of U and [u] of I.
d. the arbitrariness of post-phonological spell-out enforces a counter-intuitive position: yes, flip-flop is indeed a possible situation.

(17) example for a lot of slack regarding consonantal Manner:
"r"
a. in some languages the sonorant "r" is pronounced as a uvular fricative [ʁ, χ] or trill [R]. French, German, Norwegian and Sorbian are cases in point.
b. In these languages, like all other obstruents [ʁ] undergoes final devoicing (if present in the grammar), and voice assimilation.
c. Phonologically, however, it "continues" to behave like a sonorant: only sonorants can engage in a branching onset, but the uvular fricative or trill does so jollily.
d. When looked at through the lens of post-phonological spell-out, there is nothing wrong with this situation: for some reason the languages in question have decided to pronounce the phonological item /r/ as a uvular. This does not change anything to its phonological properties or behaviour.

(18) example for a lot of slack in vowels:
South-East British posh girls
a. realize [uu] as [ii]
Henton (1983), Harrington *et al.* (2008), Uffmann (2010)
boot = [biit]
b. but the vowel in question continues to insert w
see [j] it
do [w] it = d[ii w] it

(19) if spell-out is arbitrary, why is there little or zero slack in 95% of cases?
a. crazy rules
rules are not born crazy, they become crazy through aging
when a context-free change applies to a term of a regular rule
1. k → t͡s / __i
2. t͡s > s
3. k → s / __i
Bach & Harms (1972)
b. ==> craziness is an exclusively diachronic matter
languages may or may not react against diachronic change messing up their rules
c. life-cycle of rules
they start out as completely regular processes with full phonetic motivation and then crawl up into the grammar form the broadest to the narrowest strata.
Bermúdez-Otero (2012)
d. in order to acquire a slack-containing grammar, children must have evidence for slack. A pure flip-flop grammar where
i = A
a = U
u = I
will not survive transmission to the next generation: children will simply lexicalize what they hear.
The posh girls' grammar may survive because there is the w-hint.

(20) acoustic signature of Elements
   a. Elements are held to leave a traceable signature in the acoustic signal:
      dip, rump, mass
      among many others, Harris & Lindsey (1995: 52ff)
   b. under arbitrariness of spell-out, this is not always the case
   c. consequence:
      you can't do speech recognition on a purely acoustic input without knowing anything about the behaviour of the language in processing.

(21) but anyway
   a. I have never understood how the Phonological Epistemological Principle (PEP) could be compatible with
      1. the absence of slack in consonants
      2. the acoustic signature of Elements
   b. if the phonological identity of segments exclusively depends on their behaviour (PEP), the only way the absence of slack and a stable acoustic signature could exist is the uniformity of behaviour of segments in all languages.
   c. That is,
      1. there should be no craziness
      2. cross-linguistic variation in slack should only occur within the limits of dip, rump, mass
   c. this is obviously not the case.

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