Transparent vowels: Small cogs in large machines

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Problem. Transparent vowels, i.e. vowels that seem invisible to vowel harmony (VH), pose a challenge for feature-based and phonetically grounded accounts alike (Gafos & Dye 2011): Finnish *i*/*e* (1) are classified as [–back]/articulatorily front, yet do not pattern as such. This abstract argues that their transparency follows from their internal structure, more precisely their size: Transparent vowels are structurally small, thus invisible to VH.

Proposal. Pöchtrager (2015, in print), dealing with the reduction of unstressed vowels (Catalan, Brazilian Portuguese etc.), argued that openness be expressed structurally: open-mid vowels (5) are bigger (contain more empty structure) than close-mid vowels (4), which are in turn bigger than high vowels (3). Vowel reduction ([ɛ]→[e], [e]→[i]) can be uniformly expressed as the loss of structure (extendable to other patterns, e.g. [ɛ/e]→[ə]). If correct, that structural difference should show up elsewhere, too. Here I argue that it plays a role in VH.

Finnish VH (Karlsson 1974) defines three sets of vowel: (non-transparent) front (F), transparent (T), back (B). T combines freely with any other vowel, unlike F or B, cf. (1). (3–5) give the structures of Finnish *i*/*e*/*ä*. All three contain the element **I**. Openness is encoded structurally by the amount of empty structure. Universally, a vowel consists of up to two nuclear heads (xN in 3–7, the projection of one embedded in that of the other), each of which can project maximally twice. (The projections of a head will be simply referred to as "projections".) T *i*/*e* only involve two layers and thus one projection suffices, *ä* will require a third layer and thus a second projection, which is crucial: All F vowels have their **I** in the *higher* projection, where **I** can escape and harmonise the other vowels of the domain. B does not cooccur with F, as it would be harmonised by F. T vowels have **I** lower down, making them inert to VH.

(1) stems

F	*kylä* 'village'
F, T	*täti* 'aunt', *isä* 'father'
T	*keli* 'weather'
B, T	*nalle* 'bear', *melu* 'noise'
B	*talo* 'house'
B, F	**päta*, **patä*

(2)

part. case	
kylä-ä	
täti-ä, *isä-ä*	
*keli-ä (*keli-a)*	
nalle-a, melu-a	
talo-a	

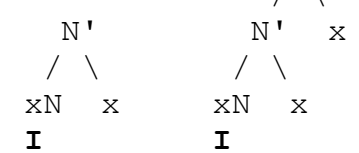
abbreviations

F(ront) = {y,ö,ä}

T(ransparent) = {i,e}

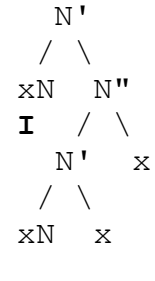
B(ack) = {u,o,a}

(3) *i*

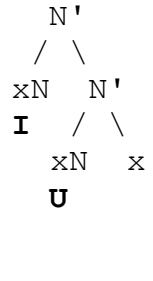


(4) *e*

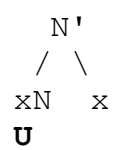
(5) *ä*



(6) *y*



(7) *u*



Consider now *y* [y] (6). The combinatorial possibilities of **I** and **U** are universally restricted (Pöchtrager 2009, 2015, Živanovič & Pöchtrager 2010) and thus must be separated into two different projections, with **I** higher than **U** (also true for *ö*). This unites all F vowels (*y*/*ö*/*ä*), with **I** always in the higher projection. Note that openness is still uniformly expressed by the amount of empty structure: *i* (3), *y* (6), and *u* (7) have one empty position each and thus all count as high. B vowels, like (high) *u* in (7), simply lack **I**. On the other hand, both F and T

do have it, but differ in where it sits. The three sets are adequately characterised (no **I**, **I** high, **I** low) and "transparency" follows from (small) size.

(2) shows that if a stem contains *only* T vowels, they behave as F. Assume that T vowels try to form a chain from left to right, and, if they succeed (i.e. if no F/B intervenes) they "gang up" (similar in spirit to Kiparsky & Pajusalu's 2003 "Combinatoric markedness constraint") and **I** can get out, even from the lower projection. Being small is not a problem if everyone is small; or, put differently, size is relative.

Further issues. 1. A language does not have to have T vowels: Turkish does not (Charette & Göksel 1996), which can mean one of two things: (i) **I** is more mobile in Turkish and can get out even from a lower position. (ii) The structure of Turkish and Finnish *i* might be different, though this would require acoustic evidence. **2.** Further confirmation for the present proposal comes from Hungarian, where only *i* [i], *í* [i:], *é* [e:] are truly T, but not the short counterpart of *é*, viz. *e* [ɛ]. This follows: The T group will have structures like (3–4), but *e* [ɛ], being more open, will be like (5). High(er) vowels are generally more likely to be transparent (Anderson 1980, Beňuš 2005) and this falls out from the present proposal. **3.** The opacity (opposite of transparency) of *a* (in languages like e.g. Pulaar) might follow from the vowel being low, hence big (containing a lot of empty structure), thus possibly too big for VH to get across.

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