

The [ATR]/laryngeal connection and emergent features

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In this paper I argue that the connection between [ATR] values in vowels and laryngeal specifications in consonants (e. g. Trigo 1991, Vaux 1996) provides evidence for emergent phonological features and thus for a non-universal mapping between phonological representations and phonetic realisation. I argue that [ATR] specifications that are active in vowel-consonant interactions are not necessarily redundant specifications that follow from the phonetic properties of relevant segments but rather may arise emergently in a process of phonologisation.

The phonological connection between ‘tense’ (or [(+)ATR]) vowels and voiced consonants is phonetically grounded in pharynx expansion, which is implicated both in tongue root advancement and voicing. Diachronically, it has been suggested (e. g. by Vaux 1996, 2009) that [ATR] can become phonologically active because it is made available to the computation as a redundant feature associated with voiced obstruents. Although this account appears plausible at least from a diachronic perspective, it can only work when a number of synchronic assumptions are accepted. For instance, it requires the participation of redundant features to the phonological grammar and the availability of a mechanism that ties certain phonetic properties of voiced segments specifically to the (normally vocalic) feature [ATR]. The latter assumption in particular is much more easily available if the feature set is universal and includes both the feature [ATR] itself and the relevant phonetic correlates.

In this paper I discuss a case of the phonologisation of vocalic tenseness from length and its interaction with laryngeal features in Welsh that appears to lead to the paradoxical outcome of [ATR] (‘tense’) vowels causing following stops to devoice.

In most varieties of Welsh, long vowels are realised as tense while short vowels are realised as lax (Jones 1984, Mayr & Davies 2011). However, we find an exception from this generalisation in many southern dialects (e. g. Awbery 1986), where long mid vowels in particular are tense before a non-high vowel in the following syllable but lax otherwise:

- (1) a. [ˈgwɛːduχ] *dywedwch* ‘(you) say’
b. [ˈgwɛːdoð] *dywedodd* ‘((s)he) said’

Although the phonetic roots of this pattern could lie in a trade-off duration in inherent length (cf. Crosswhite 2000), its sensitivity to the undoubtedly phonological feature of height appears to justify its classification as a phonological rather than phonetic process. The phonological status of the phenomenon, however, implies that tenseness must have undergone phonologisation and entered the computation as a feature that is at least partially independent from length.

A further development is seen in south-eastern dialects that show the phenomenon of ‘provection’, traditionally described as a lenis (‘voiced’) stop becoming fortis (‘voiceless’) following a stressed vowel (Greene 1967, S. E. Thomas 1983, C. H. Thomas 1993):

- (2) a. [gwɛˈgəsa] *gwregysau* ‘belts’
b. [ˈgwɛkɪf] *gwregys* ‘belt’

I analyse the phenomenon as involving the feature used for laryngeal contrast in Welsh, [spread glottis] ([SG]), which interacts with vowel length. The roots of the interaction, and the fact that provection only affects stops, lie in the restricted distribution of long vowels in Welsh, which are only allowed before a small number of consonants (Awbery 1984). In particular, long (and thus phonologically tense) vowels may appear before lenis stops, and thus all contexts for provection

are associated with (historically) long vowels. I suggest that in dialects with provection the tense/lax contrast was reinterpreted in terms of the non-redundant laryngeal feature [SG] rather than having any connection with quantity.

Crucially, as noted by S. E. Thomas (1983), provection is not neutralising: the ‘devoiced’ stop in a form like (2-b) is different from a lexical fortis stop in lacking aspiration. I suggest that provection involves a double link of the feature [SG] spanning the stressed vowel and the following stop; the lack of positive VOT in such doubly linked structures is paralleled by its lack in fricative-stop sequences. Thus, the paradox of [ATR] vowels causing a devoicing of following consonants can be resolved in terms of top-down pressures on phonologisation.

The existence of cases such as this one shows that the phonological patterning of [ATR]-type features and laryngeal specifications is not necessarily guided by the presence of ‘[ATR]-like’ properties in the signal: the top-down pressures exerted by the system can lead to phonetically unexpected phonologisations. Although the better-grounded association of [ATR] with voicing is of course possible, and frequent, the theory of phonology must also allow for cases where the phonetic interpretation of phonological structures is more arbitrary. The data discussed in this paper thus contribute to the body of evidence that is compatible with a theory where phonological features are emergent, and non-arbitrary grounding is not a principle of grammar but derives from other sources (Mielke 2007).

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