Phonetically conditioned sound change: /u/-fronting in Zuberoan Basque

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1. Abstract: As many other languages in Europe, Zuberoan Basque (Souletin) has developed a contrasting high front rounded vowel /y/. While the development of the sound pattern itself may be due to contact, the specific inhibitory contexts found in Basque are unparalleled. We argue that the inhibitory contexts are phonetic in nature and form a set difficult to classify by means of phonological natural classes.

2. Phonological inventory of Literary Zuberoan Basque

- Diphthongs: /au, eu, ai, ei, ou, /
- Vowels: /i, e, a, o, u, ñ, /

Examples of the phonetic contexts:

(1) Fronting of /u/ > /y/

- before an alveolar-fricative sibilant /s, š, šw, š;/
- before an alveolar tap /ɾ/;
- before a dental-velar cluster /ṉ, m̱, ɲ̱/.

(2) Fronting of /u/ > /y/;

- before an alveolar fricative sibilant /s, š, šw, šw;/
- before an alveolar tap /ɾ/;
- before a dental-velar cluster /ṉ, m̱, ɲ̱/.

5. Development of /y/:

Harrington (2012) argues that context of /y/ from start contexts coarticulate. Perception-production relationships tend to be aligned in coarticulatory patterns. Sound change occurs as the context-dependent and context-independent phonetic variants come closer together and the perceptual compensation for coarticulatory effects is reduced, giving rise to a new production-perception alignment (Harrington 2012: 124). The most usual fronting context involves alveolar sibilants (Farnham 2003). Both the onset and offset of /u/ in the onset and the onset of /u/-in-letu tend to be within the /y/ space (Harrington et al. 2011).

5. Inhibition of the fronting:

As in Zuberoan, in some varieties of English, /u/-fronting is inhibited in certain contexts (Labov et al. 2006). The inhibition of English /u/ > /ʉ/ by a following dark [l] may be attributed to the degree of shared gesture of the consonant and the affected vowel. The consonants that inhibit palatalization in Zuberoan do not fit this description. However, Recasens and Pallarès (2001) suggest reasons for the resistance to coarticulatory processes in a combination of place and manner: highly constrained consonants have large coarticulatory effects in contiguous vowels and can inhibit vowel dependent effects. Some consonants involving apical activity of the tongue also require a concrete dorsal placement of the tongue, and this may inhibit neighboring vowels from articulatory processes towards the palatal zone (Recasens & Pallarès 2001: 288). While the shift from /u/ to /y/ involves a fronting in the placement of the tongue, the consonants “forcing demanding manner requirements and little dorsalpalatal contact” crucially require a lowering and back placement of the tongue dorsum, and thus inhibit /u/-fronting.

4. Context-independent sound change: /u/-fronting appears to be related to Romance influence. Both languages in contact to Zuberoan Basque, French and Gascon, share this sound pattern. Gacon shows context-free /u/ > /y/, with no inhibition. Zuberoan shows the same pattern, but with inhibitory contexts.

Blevins (to appear) suggests that language experience alters phonetic perception, by the “perceptual magnet effect” (of Kuhl 2000). When first acquiring a language, proto-classes act as magnets, drawing nearby perceptual stimuli into them. In language contact situations, continuous exposure to a second language may result in a warping of perceived distance of phonetic tokens. An external phonetic prototype may be internalized and act as a perceptual magnet in the first language of the infant. The establishment of a phonetic prototype requires perceptual saliency of the segment involved, and intense language contact spanning multiple generations. This sound change will appear to be natural and phonetically motivated (Blevins to appear).

6. Conclusions:

/u/-fronting occurred systematically in Zuberoan Basque except before /ɾ, š, s̱/, and the dental-velar clusters /ṉ, m̱, ɲ̱/, where it was inhibited. Since the inhibitory contexts do not form a natural phonological class, we argue for a phonetic source. Maintenance of /u/ was a consequence of the coarticulation caused by consonants requiring active tongue dorsum lowering and backing. This tongue dorsum placement is required to perform the fine movements of the tip of the tongue involved in the production of inhibitory segments and clusters /ɾ, š, s̱, ṉ, m̱, ɲ̱/.

- Since there is no clear phonetic conditioning factor for the development of /y/, we also suggest that /u/-fronting also occurred in Gascon, a Romance language in close contact Zuberoan.

Following Blevins (to appear), we have suggested that the perceptual saliency of /u/ alongside the continued contact with Basque Basque have facilitated the development of this sound pattern in Zuberoan Basque. The model predicts this sound change is to be similar to other phonetically motivated, natural sound changes, as in the case of /u/-fronting in Zuberoan.

- Overall the Zuberoan /u/-fronting sound pattern illustrates the importance of considering perception, production and contact in the analysis of historical developments.