

Some evidence for the front to back sound change in rhotics

Engstrand et al. (2007) offer some evidence for the perceptual motivation of the change from front to back rhotics. This is reflected by the fact that in the coronal/dorsal borderland, articulatory reinterpretation of ambiguous rhotics may be the source of historical sound change because place of articulation may be ambiguous enough to be misperceived. Engstrand et al. (2007) also note that changes in coronal to dorsal place of articulation for rhotics may be phonetically motivated and, thus, likely to take place from time to time in the world's languages. This would then justify a polygenetic scenario for this change. Carib languages show evidence which confirms this claim. In the Southern group of Carib languages, Meira & Franchetto (2005) give a number of correspondences between alveolar rhotics and a pharyngeal tap in Kuikuro (this sound, unknown in the API, is transcribed by the symbol [ɾ] according to a proposition made by Demolin et al. 2009). In some cases there is an intermediary stage giving the sequence $r > l > \rho$. This is illustrated in the following data taken from Meira and Franchetto (2005).

Diachronic evidence for the origin of the Kuikuro tap (Meira & Franchetto 2005).

	Yukpa	Tiriyó	Hixkaryana	Makuxi	Panare	Bakairi	Ikpeng	Kuikuro
leaf	wehtʃare	itu ari	ari	jare	tjan, -jan	sari	ampo(n)	taɾi
agouti	kasare	akuri	akurje	akuri	akup	aki	aki	akuɾi
cassava	po	uru	uj-uru	ikei, kise	j-un			uɾu
say	ka	ka	ka	taa	ka	au-ge-li	ke-li	u-ki-taɾi

For Engstrand et al. (2007) the F2/F3 region might be the cause of the articulatory ambiguity between rhotics and therefore the perceptual source of the diachronical change. Demolin et al. (2009) found that around Kuikuro pharyngeal taps there are a majority of back to front sequences of vowels rather than the contrary. This favors the lowering of F3 and its approximation with F2 and contributes to what Engstrand and his colleagues call an ambiguous rhotic that can be reinterpreted as a short backward closure. Kuikuro pharyngeal taps also show a very prominent F4/F5 approximation, suggesting that the constriction is made in the upper pharyngeal region of the vocal tract.

Some interesting variations were observed with old Kuikuro speakers who produced a variant [l] in the word [iɾu] 'squirrel (*Sciurus stramineus*)' where other speakers were producing a clear pharyngeal tap. The interesting fact about this word is that the variant is produced between a high front and a back vowel. The coarticulation between a high front vowel and an alveolar tap shows a clear initial transition of F2 towards the 1800 Hz locus of an alveolar closure. This is illustrated at Figure 1. Another interesting fact is that F3 lowers before the tap and approximates with F2 suggesting that the coarticulation with a back vowel gives a more velar or backward place of articulation. The release of the tap is accompanied by a weak frication. The formant transitions following the tap show a lowering of F2, F4 and F5, all converging towards F3 situated around 2150 Hz. This context, where a tap is articulated between a front and a back vowel, contributes to the lowering of the F3 transition before the tap and its approximation with F2 contributes to the production of an ambiguous rhotic that can be reinterpreted as a short backward closure as proposed by Engstrand et al. (2007). This is reinforced by the convergence of F2, F3, F4 and F5 in the transitions after the closure. We believe that the [l] variants of the eldest Kuikuro speakers might be the remaining trace of the sound change process that did take place in the history of Kuikuro and Carib languages.

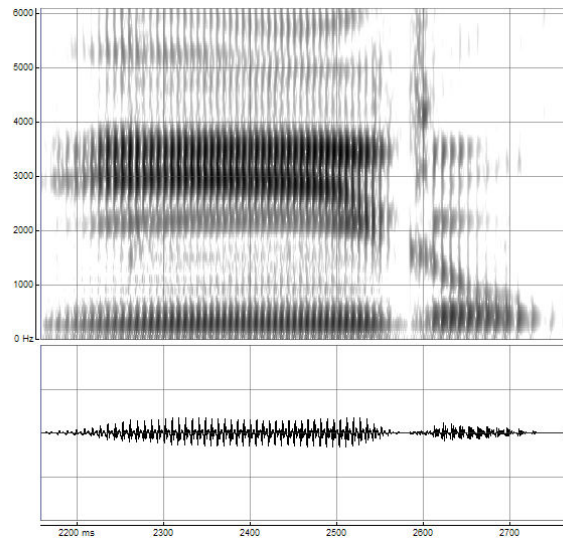


Figure 1. Spectrogram and audio waveform for the word [iɾu] ‘squirrel’

Demolin, D., Franchetto, B. and Fausto, C. (2009). Pharyngeal taps in Kuikuro. Ms submitted to the Journal of the International phonetic Association.

Engstrand, O., Frid, F. and Lindblom, B. (2007). A perceptual bridge between coronal and dorsal /r/. In M.-J. Solé, P. Beddor and M. Ohala (Eds.), *Experimental approaches to phonology*. Oxford, Oxford University Press. 175-191.

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