

CONFUSION OF LATERALS AND RHOTICS IN PERCEPTION



BACKGROUND

In sound change, laterals frequently change into rhotics, and rhotics change into laterals.

Cross-linguistic historical changes and dialectal variation suggest that in general the tendency for laterals to rhoticise is greater than for rhotics to lambdacise.

Specifically, do some varieties of rhotics or laterals undergo change more frequently than others?

EXPERIMENT

Subjects: 15 native listeners of Greek

Speakers: 2 male native speakers of Greek

Presentation: Forced multiple-choice test (to avoid a range effect bias, cf. Benders & Escudero 2010). Depending on syllable position, number of available choices ranged between five and eight.

Stimuli containing laterals:

- Two durations: 60 ms (average duration in spontaneous speech, Müller 2011) and 30 ms (closer to tap duration)

Onset cluster	Coda cluster	Intervocalic	Word-initial	Word-final
/pLaka/	/kaLpa/	/kaLa/	/Laka/	/kataL/
	/kaLta/			
/kLaka/	/kaLka/			

table 1: stimuli template

L = liquid (lateral, approximant rhotic, rhotic tap, rhotic trill)

ACKNOWLEDGEMENTS

This research was made possible by an LMU Research Fellowship awarded to Daniela Müller. We wish to thank all our subjects.

Stimuli containing rhotics:

Three rhotic qualities: two-closure trill, tap, approximant

- Trills retained their original duration.
- Taps were normalised to 20 ms closure duration (svarabhakti vowels were not normalised).
- Approximants were created by deleting the svarabhakti vowel, lengthening the tap closure to 45 ms, and raising the intensity level to that appropriate for a lateral (figure 1).

Exception: In word-initial position, there was an approximant transition between the tap closure and the vowel. In these cases, the initial svarabhakti vowel and tap closure were deleted to leave only the approximant part of the rhotic.

- Some taps were clearly lateralised (presenting a prominent zero in their transfer function). → both lateralised and non-lateralised taps and corresponding approximants were presented (figure 1).

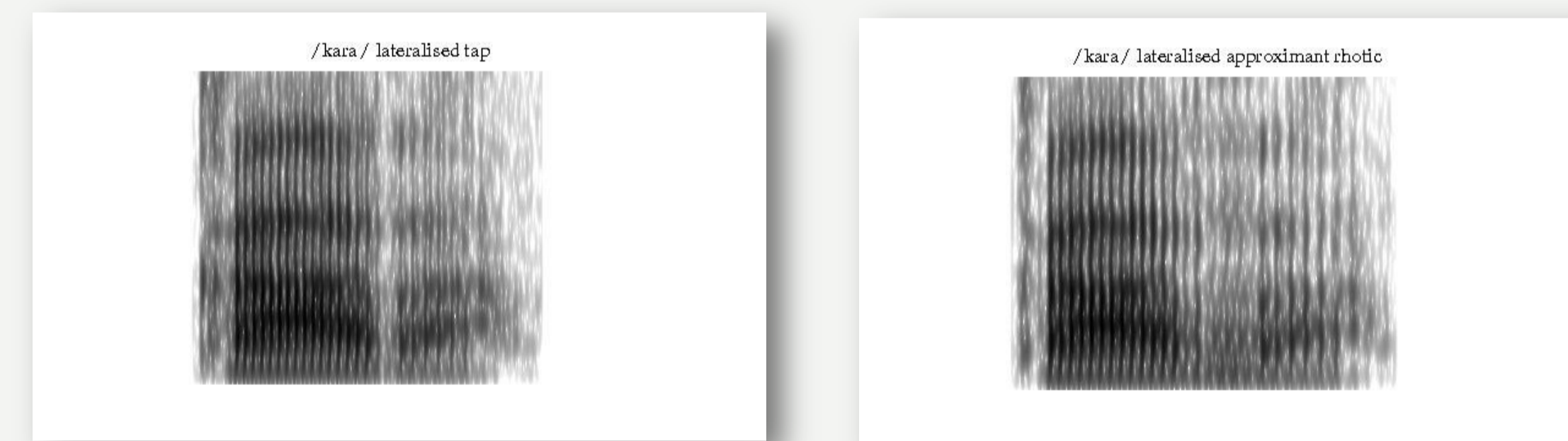


figure 1: left side: stimulus /kara/ with a lateralised tap (20 ms duration). right side: stimulus /kara/ with a lateralised approximant (45 ms) created from the lateralised tap.

All stimuli were 250 ms long.

REFERENCES

BENDERS, TITIA & PAOLA ESCUDERO (2010), "The interrelation between the stimulus range and the number of response categories in vowel categorization". In Proceedings of the 11th Annual Conference of the International Speech Communication Association, (Interspeech 2010): 26-30 September, 2010, Makuhari, Chiba, Japan.

MÜLLER, DANIELA (2011), Developments of the lateral in Occitan dialects and their Romance and cross-linguistic context. Doctoral dissertation, Universitat de Tolosa 2 – Lo Miralh & Ruprecht-Karls-Universität Heidelberg.

HYPOTHESES AND RESULTS

HYPOTHESIS 1

Short duration enhances the tendency to rhoticisation for all laterals.

HYPOTHESIS 2

Laterals rhoticise more than rhotics lambdacise.

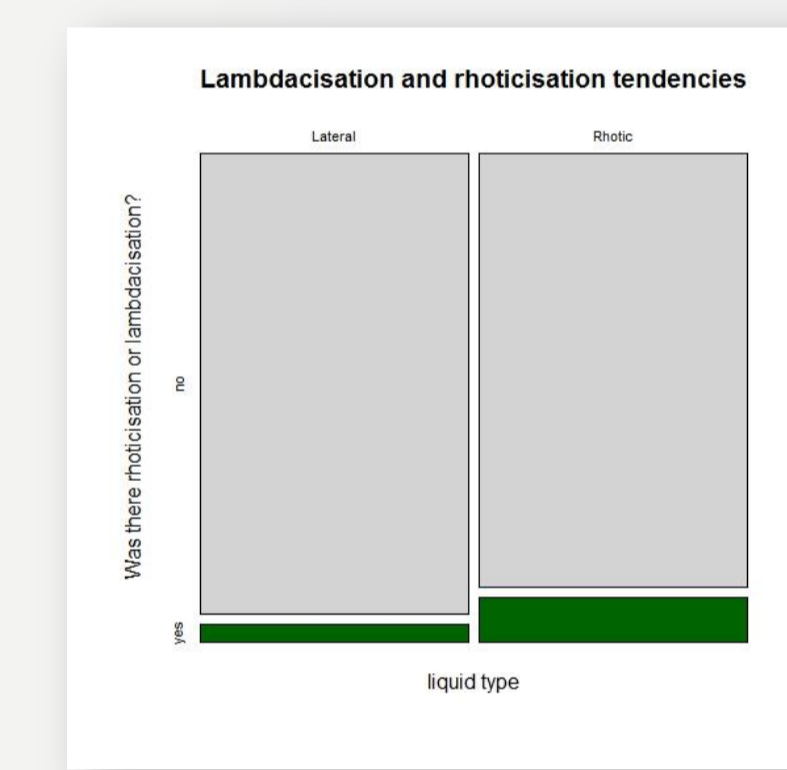


figure 3

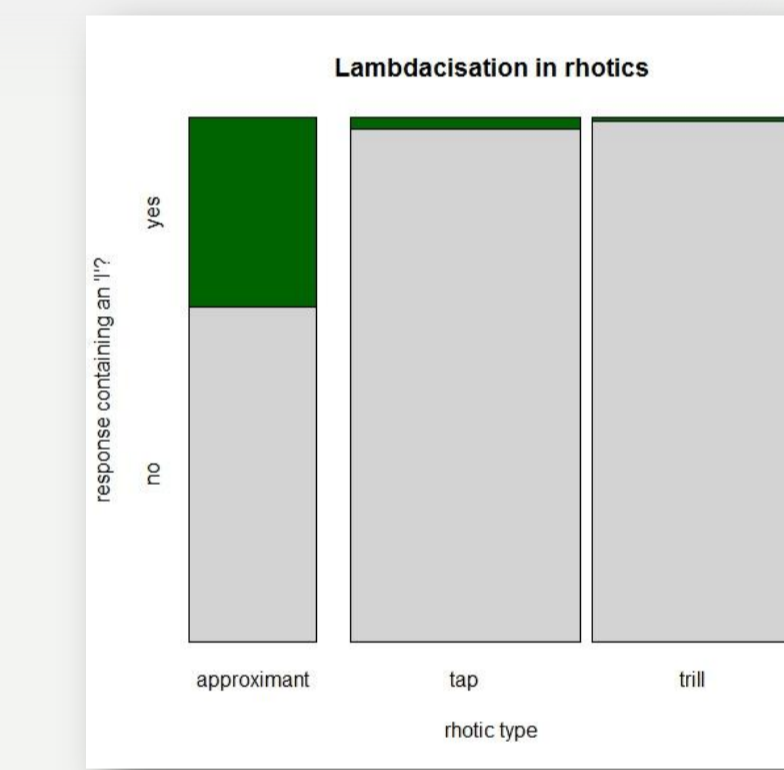


figure 4

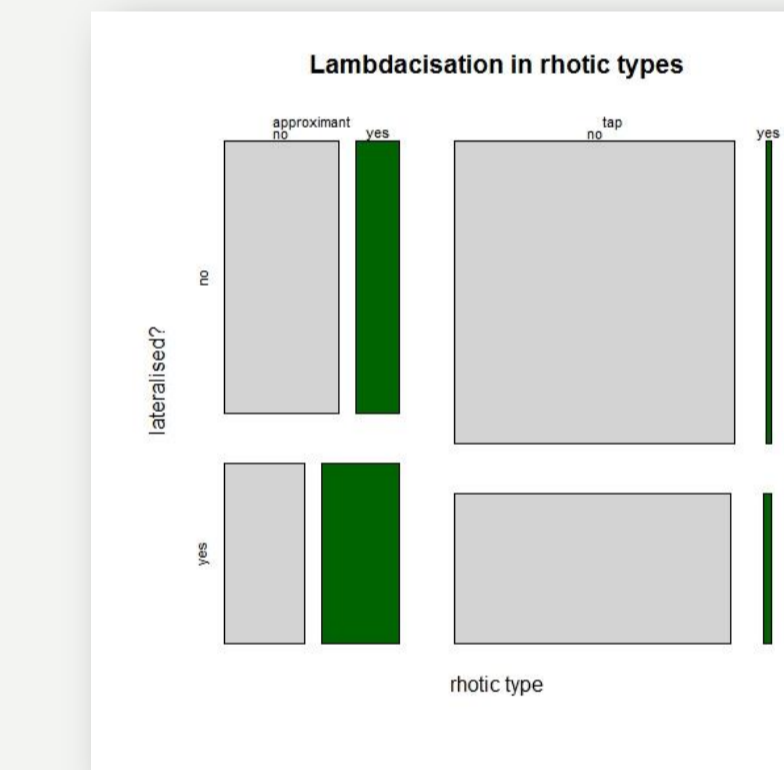


figure 5

2 In our results, subjects heard more rhotics as 'l' than they heard laterals as 'r' ($\chi^2 = 56.2$, $p < .0001$) (figure 3).

Among the rhotics, approximants were lambdacised significantly more often than taps and trills (taps vs. approximants: $z = -15.352$, $p < .0001$, trills vs. approximants: $z = -12.017$, $p < .0001$, but taps vs. trills: $z = -2.622$, $p < .05$; figures 4 and 5).

If we omit, however, the approximants from the comparison, rhotics were significantly less heard as 'l' than laterals were heard as 'r' ($\chi^2 = 21.156$, $p < .0001$), as predicted by Hypothesis 2.

HYPOTHESIS 3

Approximant rhotics are more prone to lambdacisation than taps.

3 L-responses are more likely to occur with approximants than with taps ($\chi^2 = 236$, $p < .0001$) (figure 4).

Syllable position was a significant factor only for approximants (figure 6). In short laterals only the intervocalic position differed from all others.

figure 6

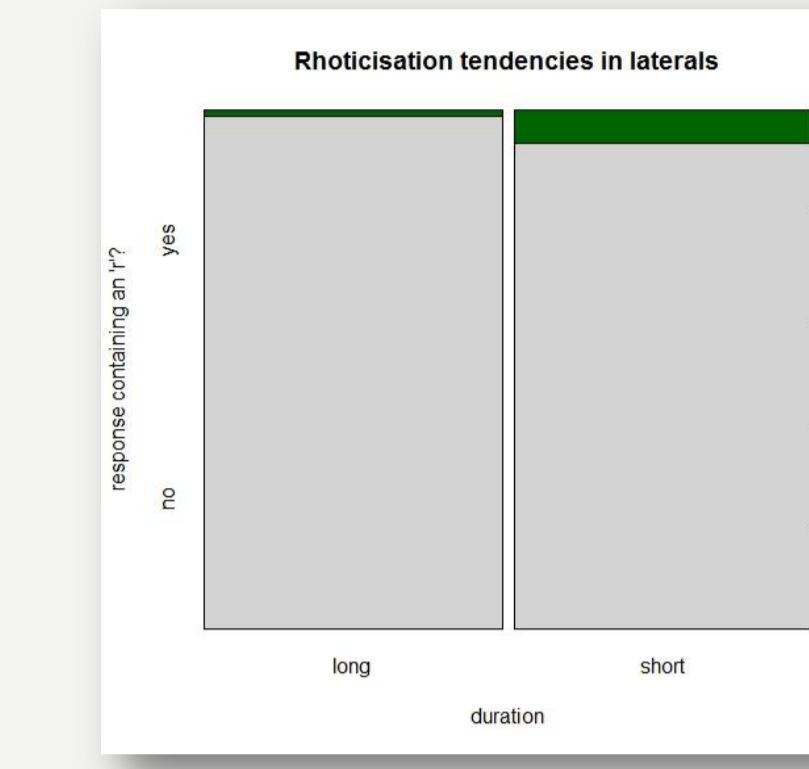
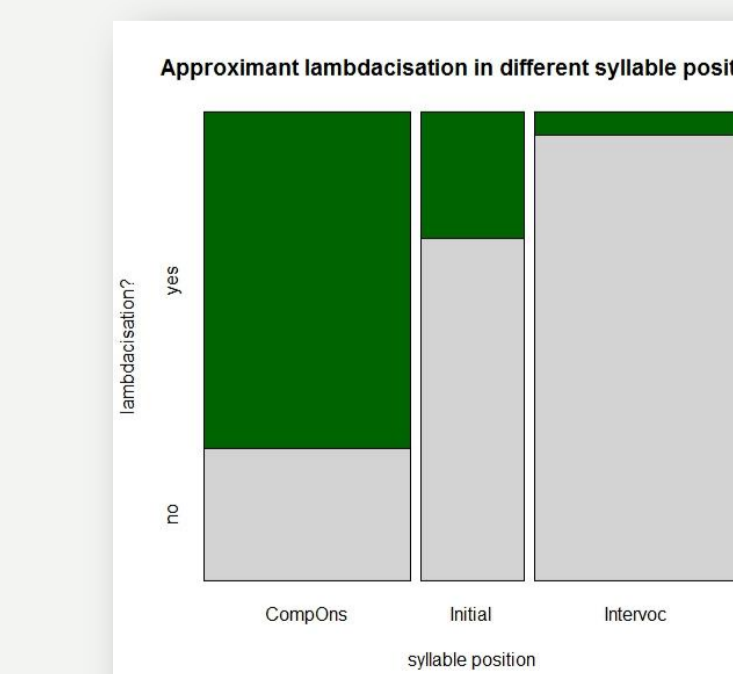


figure 2

1 R-responses are more likely to occur in 30ms-laterals than in 60ms-laterals ($\chi^2 = 32.875$, $p < .0001$) (figure 2).

HYPOTHESIS 4

Trills are almost never mistaken for laterals.

4 Out of 1066 tokens containing trills, only 8 times (0.8%) did subjects give a response containing a lateral. In 986 cases (92.5%), subjects responded with "r" to trills.

HYPOTHESIS 5

Lateralisation only has a greater effect in perception in the longer approximants than in the shorter taps.

5 In our results, lateralised vs. non-lateralised approximants differed significantly ($z = 5.934$, $p < .0001$), but lateralised vs. non-lateralised taps did not ($z = 1.397$, n.s.).

LISTENER VARIABILITY

Listeners varied significantly with respect to the number of different proposed answers they chose for the same stimuli over nine repetitions during the multiple-choice perception test (figure 7) ($\chi^2 = 28.429$, $p < .05$), but post-hoc comparisons showed that only subject "VP08" differed significantly from subjects "VP05" and "VP06" ($z = 3.459$, $p < .05$ and $z = 3.459$, $p < .05$, respectively).

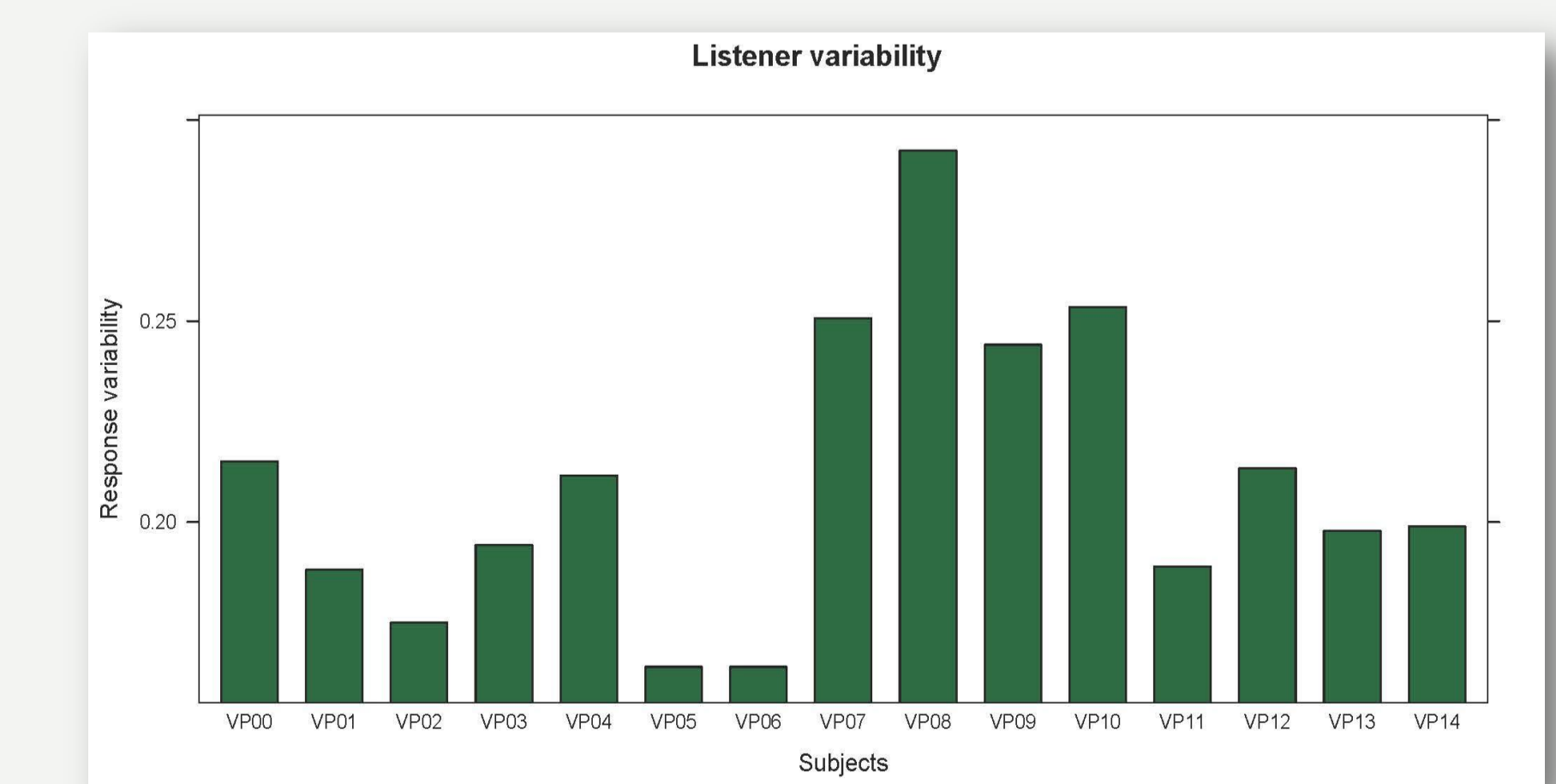


figure 7: ratios of used responses to available responses among listeners