

Ander Beristain & José Ignacio Hualde
University of Illinois at Urbana-Champaign

**On the relationship between production and perception in phoneme merger in progress:
Palatal delateralization in Basque**

In a speech community where sound change leading to a merger between two phonemes is in progress, there will be conservative speakers who perceive and produce the contrast between the two sounds and innovative speakers who do not. Some speakers may perceive the contrast and not produce it. Labov's work on "near-mergers" showed that the fourth logical possibility is also found: some speakers do not perceive a difference between the two traditionally contrastive sounds, but do not fully merge them in their own speech [1]. We examine the production and perception of the contrast between the central palatal /j/ and the lateral palatal /ɬ/ in Azpeitia Basque. As in other varieties of Basque [2], this contrast is now unstable, possibly because of contact with Spanish, a language where the delateralization of /ɬ/ is very advanced, including in the Basque Country (north of Spain) [3]. The variety of Azpeitia is particularly interesting because the contrast has a relatively high frequency, since /j/ is epenthesized between /i/ and another vowel in many morphological contexts, e.g. /mendi-a/ [mendi^je] 'the mountain' (in dialectal spelling *mendiye*) and /l/ is palatalized in the same context, e.g. /mutil-a/ [muti^ɬe] 'the boy' (*mutille*) [4, 5]. 12 female speakers of Azpeitia Basque (age range 22-27), all bilingual in Spanish, but with different degrees of bilingualism, participated in two tasks. In the **production** task, as reported in [6], each speaker read 20 words with -y- and 36 words with -ll- in a carrier phrase, interspersed with distractions, for a total of 672 tokens. We calculated the difference between intensity minimum in the consonant and maximum in the following vowel (IntDiff). This difference in intensity is expected to show higher values for /j/ than for /ɬ/, for which there is lateral airflow [7]. Results show good differentiation in this dimension (mean IntDiff /ɬ/ = 6.3 dB, /j/ = 13.7 dB), but not equally so for all speakers (Fig. 1). The **perception** of the contrast was tested in an ABX test with meaningless sequences (e.g. [aɬa], [a^ja], [aɬa]). The results show much interspeaker variation, but with a clear overall bias to respond /ɬ/ regardless of the input (Fig. 2). We calculated *d'* accuracy as the difference in z-scores of 'hits' (response /ɬ/, when this was the correct answer) minus 'false alarms' (response /ɬ/ when the correct answer was /j/). Using this calculation, values range from 1.55 (Spkr 21 in Fig. 2) to a low of -2.34 (Spkr 11). In order to determine whether those speakers with a most robust contrast in production are also those with a most clear perception of it, we calculated the **correlation** between the mean of the difference between the two sounds in the production results and accuracy in perception. A moderately good correlation was found ($r=0.56$). As shown in Fig. 3, whereas for most participants production and perception are strongly correlated, for a few of them they are not. 6 participants obtained perceptual discrimination *d'* values of 0.84 or above. 5 of these also showed relatively large difference in their production means. We conclude that these speakers both perceive and produce the phonemic contrast (Spkrs 17, 18, 19, 21, 22). One speaker (Spkr 24), however, was much more accurate in perception than in production. All other speakers performed at a low level in both production and perception of the contrast, except for Spkr 12, whose production performance shows a very good separation between the two phonemes, but displayed lack of good discrimination in the perception test ($d' = -0.56$). All possible types of speakers are thus found, even though most speakers are indeed consistent between production and perception in either making a contrast or not making it. Crucially this is a very different type of contrast from those involved in the existing literature on near-mergers, which has focused on vowel and tone mergers [1, 8] and confirms the applicability of the concept of near-merger in sound change in progress.

References.

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Figures.

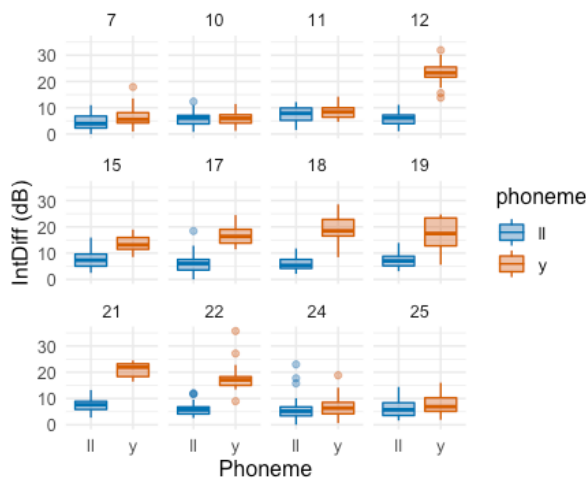


Figure 1. Production results (IntDiff)

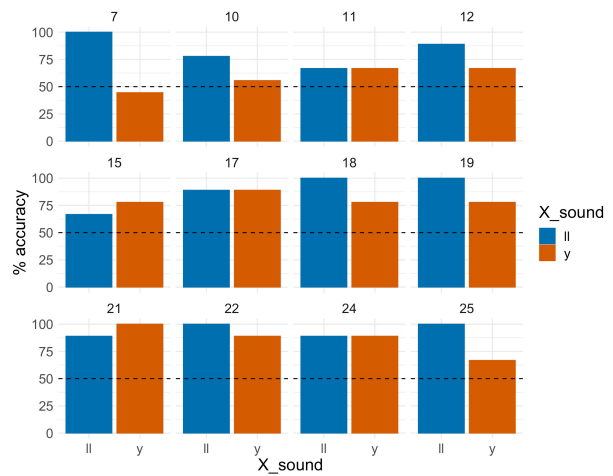


Figure 2. Perception results (Accuracy scores)

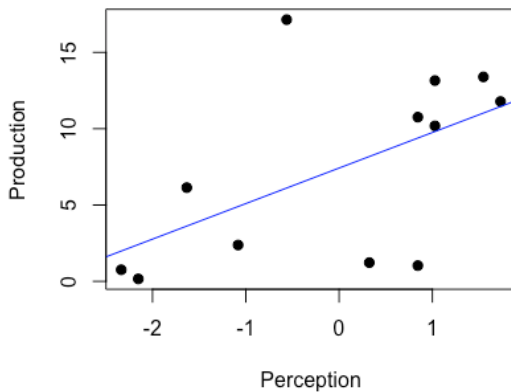


Figure 3. Correlation between production and perception