

Using random effects to investigate phonetic variation: a puzzling discrepancy between production and perception

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This study reports on perception (rhyme decision with morphed stimuli; see (1)) and production (word-list reading; see (2)) differences in the vowel systems of three groups of subjects: 45 Netherlandic-Dutch subjects, 45 Flemish-Dutch subjects, and an unclear group of 18 Dutch-speaking Belgians who have been in the Netherlands for a long time (years<--->decades). I term this group ‘unclear’ because it is conceivable that some of these subjects, but not others, may have adapted their Flemish phonetics to the Netherlandic norms, which can be considered a long-term form of phonetic accommodation (*sensu* Pardo et al 2012). This is the present study’s object of investigation, with a focus on the Dutch tense mid vowels (contextually-restricted diphthongs in Netherlandic Dutch, monophthongs in Flemish Dutch; Adank et al 2007).

What factors discriminate ‘successful’ adapters from ‘unsuccessful’ adapters? Because the critical third group of subjects is not (a priori) homogeneous, the present study partitions the 108 subjects into groups that are defined *empirically*. For the production part, this is done by finding clusters in the predicted random slopes of a naïve mixed-effects model, which turns out to work very well. Puzzlingly, the same approach performs poorly for the perception data, though a group-level effect does arise when explicitly entered into the model. The precise reason for this discrepancy is not known, but it suggests that for perception but not production, even the reference groups are not homogeneous.

- (1) Example stimuli for the rhyme decision task, which was designed to be a covert phoneme-decision task. The percentages refer to the degree to which the vowel [e:] was morphed to [ɛi]. All words were pseudowords to enable precise experimental control of the vowels without running into the Ganong effect (Ganong 1980).

Auditory word	Participant				→ does this rhyme with	Visual target
	1	2	3	4		
[de:tə]	20%	40%	60%	80%	→ does this rhyme with	<grijte>?
[ble:tə]	40%	60%	80%	20%	→ does this rhyme with	<zete>?

- (2) Example stimuli for the word production task:

nobelere
pijn
verschuil
beul