
Gradience, variability and the visibility of voicing in Dutch

Marc.van.Oostendorp@meertens.knaw.nl, Leiden University, the Netherlands

Two phenomena involving voicing in Dutch play a key role in recent criticisms of formal approaches to phonology: final devoicing (Port and Leary, 2005) and voicing assimilation (Ernestus and Baayen, 2003). I propose that both phenomena can be made to follow from reasonable assumptions about phonological formalisation.

Final Devoicing. Port and Leary (2005) argue that Final Devoicing presents a case against formal phonology since the phenomenon is gradient: it has been shown experimentally that neutralisation is often not absolute in languages with final devoicing. Fine-grained phonetic measurements show a distinction between Dutch *rad* ‘wheel’ [rɑt] (from /rad/) and *rat* ‘rat’ [rɑt] (from /rat/). Furthermore, listeners are sensitive to these cues: even if they claim not to hear a difference, they will make the right guess approximately 70% of the time. From this, Port and Leary (2005) conclude that there is no categorical phonology.

This conclusion is too radical. If we take these phonetic facts seriously, it only means that phonology should be able to distinguish between an underlyingly voiceless [t] and a devoiced [t̚], and phonetics is able to read this distinction. We argue that this follows automatically within OT from a view of faithfulness based on the classical principles of Containment and Consistency of Exponence (Prince and Smolensky, 1993). According to these principles, nothing can be literally deleted in the phonology, although it can be left ‘unparsed’, signaling to the phonetics its relative lack of importance. The advantage of such an approach is furthermore, that it is based on a restrictive view of faithfulness relations, hence of phonological derivations. We show that in this way, it can also solve Steriade (2001)’s ‘Too Many Repairs’ Problem, thus further strengthening the case of formal phonology.

Voicing assimilation. Ernestus and Baayen (2003) present substantive evidence to the effect that voicing assimilation in Dutch past tense formation cannot be due to rules, but rather is the effect of online competition between stored forms. Roughly, regular past tense takes the form $-[tə]$ after underlyingly voiceless obstruents and $-[də]$ after sonorants and underlyingly voiced obstruents.

Their key argument relies on variation. The ‘underlying’ voicing of final obstruents in Dutch stems is to some extent predictable from the shape of the stem (length of the vowel, structure of preceding cluster, etc.) Speakers are sensitive to this statistic predictability: if a stem ends in an obstruent with an ‘unexpected’ underlying voicing specification given its phonotactic shape, people will more often produce the ‘wrong’ past tense form, and if they produce or recognize the ‘correct’ form, this takes them a longer amount of time.

Ernestus and Baayen (2003) could be interpreted as evidence against phonological processes and in favour of stored forms, but this disregards the fact that the past tense ‘voice assimilation’ has always played a problematic role in the phonology of Dutch (see for instance Zonneveld, 1978). Voicing assimilation in clusters ending in a plosive is otherwise always regressive, and never progressive (van Rooy and Wissing, 2001). In other words, this process is completely specific to past tense morphology, and might therefore be more amenable to an analysis in terms of allomorphy to begin with. ‘Real’ phonological processes, such as Final Devoicing, do not show variability of the type observed by Ernestus and Baayen (2003): there are no mistakes of the type where word-final obstruents are produced as voiced prepausally, even if this voicing is predictable from the shape of the stem.

We propose that the observed variability here is due to the fact that allomorph selection is at least partly extragrammatical, hence subject to different factors, including the statistical effects posited by Ernestus and Baayen (2003).

Bibliography

- Ernestus, M., Baayen, H., 2003. Predicting the unpredictable: Interpreting neutralized segments in dutch. *Language* 79, 5—38.
- Port, R., Leary, A., 2005. Against formal phonology. *Language* URL <http://www.cs.indiana.edu/y.final.pdf>.
- Prince, A., Smolensky, P., 1993. Optimality theory: Constraint interaction in generative grammar. Manuscript, Rutgers University and University of Colorado at Boulder. Available at ROA and published 2004 at Blackwell.
- van Rooy, B., Wissing, D., 2001. Distinctive [voice] implies regressive voicing assimilation. In: Hall, T. A. (Ed.), *Distinctive Feature Theory*. Mouton de Gruyter, Berlin.
- Steriade, D., 2001. The phonology of perceptibility effects: The p-map and its consequences for constraint organization. Ms., UCLA.
- Zonneveld, W., 1978. *A Formal Theory of Exceptions in Generative Phonology*. Foris, Dordrecht.