

# Geminate onsets in Dutch interjections: VOT normalisation and the gemination factor

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## 1. Introduction

Traditional grammatical analysis: interjections reside outside the core grammar.

Dingemans et al. (2014): Interjections like *huh?* are part of the grammar. Although geminates do not occur in Dutch, they do in interjections which have **deviant phonology** (they end in a lax vowel and start with a geminate) and **deviant syntax** (no merge).

In interjections, an illicit coda /h/ is copied to the onset (Postma and Scheer 2014), which results in a longer initial consonant, i.e. a geminate. The present study looks at phonetic and phonological evidence for onset geminates in Dutch interjections.

## 2. Method

Comparison of the initial /b/ in the minimal pair *bak* 'container' (Fig. 1) – *bah* 'interjection of disgust' (Fig. 2).

Relational measures have been shown to be a better measure to distinguish singletons from geminates than the raw durational values do (Kawahara, in press).

**Voice Onset Time (VOT):** We expect that prevoicing (negative VOT) for /b/ in *bah* is longer than in *bak*.

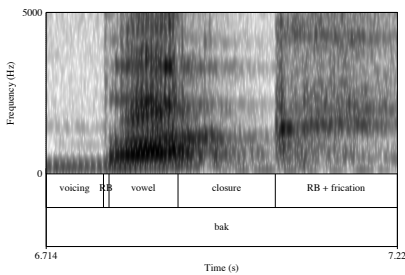
**Normalized VOT:** VOT divided by word length (see Fig. 3, curve 1) or by vowel length (curve 2-4).

**Gemination factor:** Normalized VOT for *bah* divided by normalized VOT for *bak*.

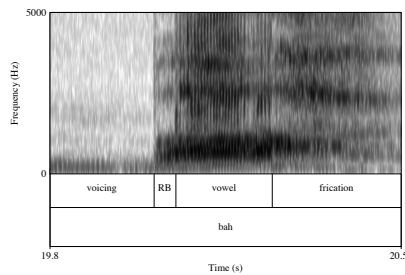
## 3. Phonetic evidence

For 15 out of 18 speakers, VOT was longer in *bah* than in *bak*. Two speakers devoiced /b/ in *bah* to [p]. The remaining speaker had a positive VOT in *bak*.

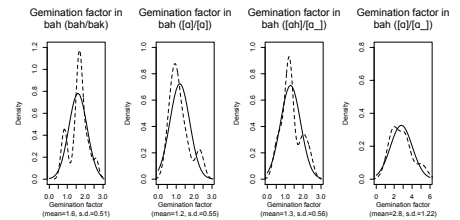
For most speakers values of the gemination factor are around two (see Fig. 3, curve 1 and 4), which means that their /b/ is about twice as long in *bah* as in *bak*. Absolute as well as normalized VOT values show there is significantly more prevoicing in *bah* than in *bak*. There is no significant difference in word length between *bak* and *bah*.



(1) Spectrogram and textgrid of the word *bak* 'container' spoken by SB (RB = Release Burst)



(2) Spectrogram and textgrid of the word *bah* 'interjection of disgust' spoken by SB (RB = Release Burst)



(3) Gauss curve and density for the four different methods of computing normalized VOT (N=15)

## 4. Phonological evidence

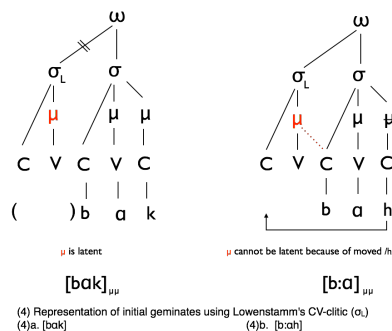
Length is present in the phonological representation (geminates are not just phonetically longer). For example, the following minimal pairs exist:

(1)a. ggoh  
 [x:ɔ] (or [x:ɔʔ])  
 amazement

(1)b. gooh!  
 [xɔ:]  
 amazement

(2)a. bbah!  
 [b:ɑ] (or [b:ɑh])  
 physical/moral disgust

(2)b. baah!  
 [bɑ:]  
 physical disgust



Two of the speakers do not geminate the onset, but devoice it to [p]. This is another way to realize a geminate (Topintzi 2004:213). We provide a model in Moraic Theory: the [sg] feature from the coda is copied to the onset (see Fig. (4)a and (4)b).

## 5. Conclusions

We showed phonetic and phonological evidence for geminate consonants in Dutch. Phonologically, both the gemination and devoicing of /b/ in *bah* can be explained by the copying of the [sg] feature from the coda to the onset. There are different ways to compute normalized VOT and the gemination factor, some of which show the difference between singletons and geminates better than others.

Since segments overlap, only studying the acoustics of sounds is not sufficient. In future research, articulation of Dutch geminates should also be tested. In addition, a larger study with more items and repetitions should be used.