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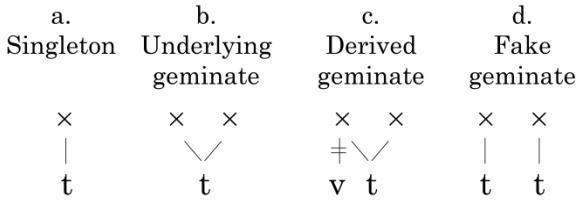
On the phonetic properties of Hungarian geminates

All Hungarian consonants can occur both as short (singleton) and as long (geminate). The distribution of geminates, however, is restricted in Hungarian (Siptár–Törkenczy 2000). Geminates cannot stand word initially or as part of consonant clusters. If an underlying geminate occurs next to another consonant, it obligatory degeminates and must surface as short (Nádasdy 1989; Polgárdi 2005).

Previous findings confirmed that duration is the main acoustic cue for the distinction between short and long consonants (e.g., Ham 2001; Ridouane 2007; Pycha 2010). Nevertheless, some acoustic phonetic investigations explored that phonemic length is not clearly manifested in the phonetic duration of Hungarian singleton and geminate consonants. In other words, speakers tend to pronounce both singletons and geminates with varied durations, therefore duration of short consonants shows relatively large overlaps with that of long consonants (e.g., Siptár–Gráczi 2014).

The present research is based on that the abstract representations of singletons and geminates – see (1) – are reflected in the phonetic details of speech production. A phonetic examination of long consonants categorized by their abstract phonological representations can provide a more accurate picture of the process of gemination. Geminates can be distinguished into three types: underlying/lexical (b), derived/assimilated (c) and fake/concatenated geminates (d) (see Nádasdy 1989; Ridouane 2010; Siptár–Gráczi 2014). We hypothesized that (i) singletons and the three types of geminates might display different durational values, and (ii) phonemic context might influence these durations.

(1)



In this study, durational differences between Hungarian singleton and geminate consonants are discussed. The acoustic correlates of various gemination types (underlying, derived, fake geminates) are examined. In addition, the object of this study is to investigate the effect of phonemic context on durational features of singleton and geminate consonants.

The main questions are (i) how acoustic cues contribute to the phonological length contrast, (ii) whether different types of geminates could be differentiated based on their acoustic correlates. Furthermore, we are curious to see (iii) whether consonant duration depends on the quality of the preceding and/or the following vowel.

The investigation focuses on the production of singleton and geminate stops in an approximately 10-hour long spontaneous speech sample of ten male speakers from BEA database (Gósy et al. 2012). The data set contained manually segmented voiceless stop consonants in intervocalic (V_V or V_#V) positions (120 stops per speaker, on average). Durational measurements of total C-duration, closure duration, VOT as well as the presence or absence of the release are reported in this study (Figure 1).

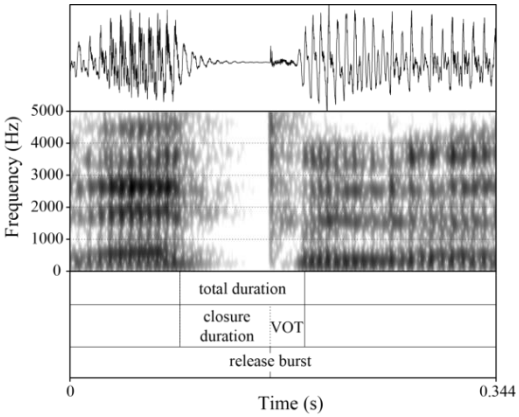


Figure 1. Acoustic parameters of a Hungarian voiceless stop consonant

Results confirmed that geminates were one-and-a half times longer than single stops, on average. Similarly to other languages (such as Buginese, Madurese, and Toba Batak, see Cohn et al. 1999; Italian, see Esposito–Benedetto 1999), our results provided evidence that the most important cue in the length distinction of stops is closure duration but not VOT. The same acoustic correlates suggest similar representations of underlying and derived geminates in the speech plan. In contrast, fake geminates seemed to be produced with tendentiously longer durations than true geminates, which suggests that fake geminates are represented as a consonant sequence rather than a long consonant. Our results confirmed the effect of the preceding vowel on the consonant duration.

This study may provide important implications for the phonological and phonetic aspects of gemination in Hungarian.

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