Vowel duration patterns in contemporary Scottish Standard English

The Scottish Vowel Length Rule (SVLR) / Aitken's Law is one of the most notable features of Scottish English phonology: it states that vowels are long in stressed open syllables, before morpheme boundaries, voiced fricatives and /r/, but short everywhere else (McClure 1977). The rule partially contradicts the Voicing Effect (VE) which states that vowels are generally longer before voiced than before voiceless consonants in English (Tanner et al. 2020). While various studies have investigated Aitken's Law, many previous findings remain contradictory. The unresolved questions of the geographical scope of the SVLR as well as the influence of age and gender-related variation have not yet been satisfactorily answered. Furthermore, no study has yet investigated the vowel durational patterns of naturally spoken Scottish Standard English (SSE).

The present study offers a new approach towards analyzing vowel duration in Scotland. It is the first study to investigate twelve vowels of the Basic Scottish Vowel System (Abercrombie 1979) in all possible phonetic contexts. It is also the first SVLR investigation whose sample is representative for the whole of the country in terms of the speakers' regional background, age and gender. Unlike most previous studies, I analyzed SVLR patterns in naturally spoken SSE and accounted for all relevant segmental and suprasegmental factors.

Data was retrieved from the ICE Scotland corpus and the sample was complemented by sociolinguistic interviews which I conducted in different areas of Scotland. Overall, the sample includes 23.5 hours of speech from 130 speakers (*64 female, 66 male*) of three age groups (*young, middle, old*) who were raised in six different regions (*Insular, Highlands and Hebrides, Northeast, West-central, East-central, Southern*). I force-aligned the datasets with the updated version of the Montreal Forced Aligner (McAuliffe et al. 2017) and corrected the segmentations manually. I used ProsoBox (Goldman and Simon 2020) for the automatic identification of prosodic stress patterns and retrieved a total number of 127804 tokens. The statistical analysis was conducted in R (R Core Team 2022) and I fitted linear mixed effects models with the lme4 (Bates et al. 2015) and lmerTest (Kuznetsova et al. 2017) packages. *Word* and *speaker* were treated as random factors.

The findings reveal that the SVLR is especially consistent in the vowels /i/, /u/, /aɪ/, /e/ and /o/. The influence of the VE is relatively weak overall (see Figure 1). The models show that the SVLR operates more consistently in the Central Belt of Scotland; Aitken's Law is weaker in the Highlands and Hebrides as well as in the South of the country. Age-related variation is very weak and the impact of gender turned out to be insignificant. Prosodic factors have a strong influence on Aitken's Law: there are significant interactions between the SVLR, pre-pausal lengthening and prosodic stress and the findings corroborate previous observations of an Anti-Voicing Effect (Stuart-Smith et al. 2019). This finding has important implications for English phonology as it contradicts the notion that English vowels are generally longer before voiced consonants (House and Fairbanks 1953).

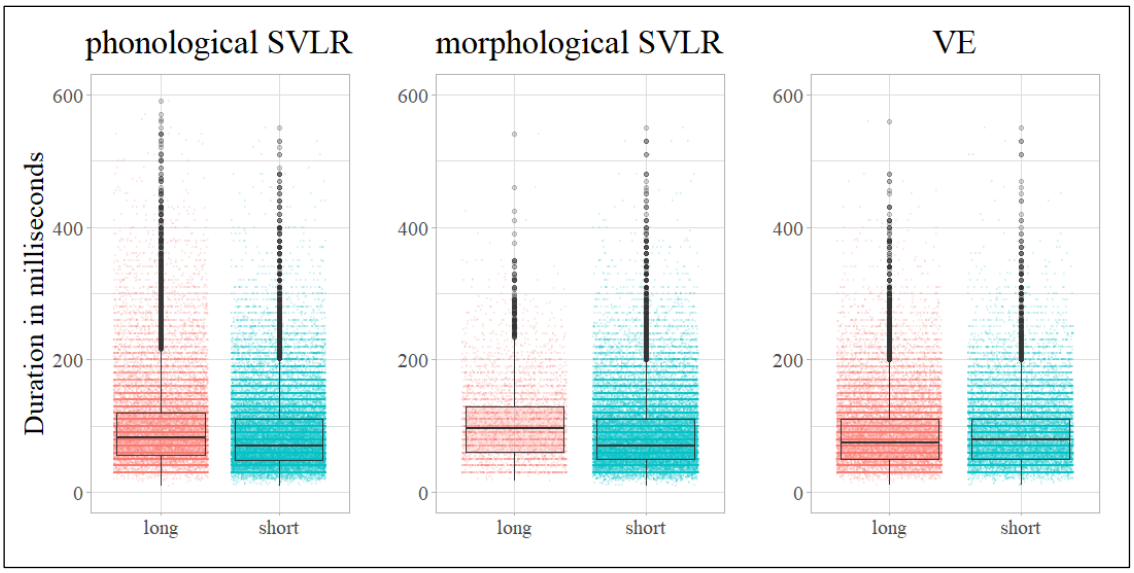

Figure 1. Boxplots of the phonological and morphological SVLR long and short contexts as well as boxplots for the VE long and short environments.

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