

## Creaky voice in the speech of L1 Polish learners of English

Research in second language (L2) speech acquisition has tended to focus on segmental aspects of language structure such as consonants and vowels, which are typically described as sets symbols placed onto two-dimensional charts. One area which is still largely unexplored is how the voice itself may differ between languages, and whether L2 learners adopt target language norms with regard to the use of non-modal phonation, especially creaky voice. This question is becoming more and more relevant given the increased use of creaky voice by L1 speakers of English in recent years (Yuasa 2010; Wolk et al. 2012).

In this presentation we investigate whether Polish learners of English show increasing levels of creaky voice use as a function of increased L2 proficiency and pronunciation training. We also consider the origins and functions of creak, which may be used in the realization of phonological phenomena such as /t/-glottaling and hard attack on syllable-initial vowels, as well as at the ends of phrases. We therefore operationalize a distinction between phonological (t-glottaling, initial vowels) creak and phrase-level creak.

We recorded L1 Polish learners of English, comprising two proficiency levels, speaking in both L1 and L2, performing sentence-reading tasks. Using manual annotation, we divided voiced portions of the signal into modal and creaky intervals, and the creaky intervals were further divided into phonological creak as opposed to phrase-level creak. At this point, we have gathered two types of data: (1) the overall proportion of phrase-level creak as a function of language spoken (Polish vs. English), proficiency level, and accent studied (US vs. British) from 20 speakers, and (2) an acoustic comparison of phrase-level creak and phonological creak from 14 speakers, performed using VoiceSauce (Shue et al. 2009).

Our current findings may be summarized as follows.

- L1 Polish speakers of English tend to use more creak in L2 than L1, an effect which is stronger for students with a higher proficiency level and among those learning American as opposed to British English.
- There are differences in a selection of acoustic parameters, including measures of f0, spectral tilt, and spectral noise, between phonological creak and phrase-level creak (cf. Garellek & Seyfarth 2016).

We will further discuss relevance of our findings for theories of L2 speech acquisition, and the phonetics-phonology relationship.

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