This paper seeks to motivate a well-known stress system asymmetry through exploration of a perceptual basis for the pattern. It is not uncommon for languages with an otherwise alternating stress pattern to allow two unstressed syllables to occur specifically at the end of the word, resulting in word-final stress lapse (e.g. Finnish, Norwegian, Pintupi). Comparison with a (in-development) database of reported stress correlates (currently consisting of 56 languages from 27 language families) finds a significant correlation between languages tolerating a word-final stress lapse and using duration to cue stress (possibly in conjunction with intensity and pitch) \((p = 0.022)\), but does not find such a correlation between final lapse and the use of either intensity \((p = 0.483)\) or pitch \((p = 0.951)\).

This correlation is potentially explained by word-level final lengthening (Lindblom (1968), Oller (1973)). While we may assume final lengthening exists to varying degrees across languages, it is specifically in those languages in which duration is a stress cue that it could potentially contribute to the rhythmic pattern of the word. This perceptual motivation for the correlation between duration as a stress cue and final lapse tolerance is supported by perception experiments.

Subjects were native English speakers who took the perception studies through Amazon’s Mechanical Turk through ibex (Drummond 2014). Subjects were excluded who could not correctly identify more than two-thirds of the stimuli that truly alternated in stress. Subjects heard strings of five syllables (synthesized with MBROLA (Dutoit et al. 1996) and concatenated in Praat (Boersma and Weenink 2014)), and responded that the string either alternated in prominence or failed to. (Example strings: \(BAbaBAbaBA\), \(BibiBibi\), \(BuBuBuBuBu\), where the last string ends in an unstressed, but lengthened, vowel). The graph in (1) shows that when duration was included as a cue to stress, syllable strings with final lengthening (rightmost bar) were very likely to be identified as alternating. A sharply different result was found when duration was not one of the stress cues, as is shown in (2).

The results of the studies thus far indicate that final lengthening can contribute to a word’s rhythmic pattern. However, the fact that penultimate stress is cross-linguistically common suggests that final lengthening does not contribute to clash. This suggests that while final lengthening is a prominence when adjacent to an unstressed syllable, it is not when adjacent to a stressed syllable. In order to test this hypothesis, a followup experiment will be run in which non-alternating strings fail to alternate in prominence because of clashes, rather than because of lapses. Thus, the no-alternating syllable strings would have initial or final clash and the test strings would have a syllable with the appropriate edge-phonetics adjacent to a stressed syllable. The stimuli are being finalized and the experiment itself will be run in early 2015.

The results of this line of work indicate that there is a perceptual motivation for the relatively common tolerance of final stress lapse across languages and indicates that final lengthening can affect the phonological patterns of a language.
(1) Dur/int/pitch as stress cues (N=19)

![Bar chart showing percentage of alternation in prominence for different positions.

(2) Int/pitch as stress cues (N=30)

![Bar chart showing percentage of alternation in prominence for different positions.

References


Drummond, Alex. 2014. Ibex: Internet based experiments. Accessible at http://spellout.net/ibexfarm/.

