Perception evidence for the proportional increase theory of weight

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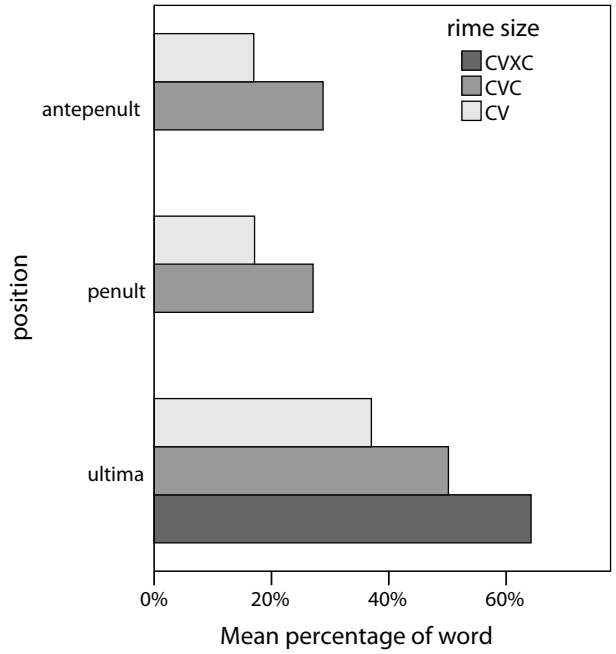
Norwegian requires stressed syllables to be heavy, and, while CVC is heavy non-finally, it is light word-finally, where a CVXC syllable counts as heavy (e.g. Kristoffersen 2000). Lunden (2006) gave evidence from a production study with Norwegian speakers that shows that there is a proportional relationship between V, the canonical light rhyme, and heavy syllable rhymes. The chart in (1) shows the comparison of different rhyme shapes in different positions (where rhyme duration was divided by the duration of the whole word, in order to control for rate of speech and other timing effects not under consideration here).

(1) Rime/word percentage by syllable position and size



It can be seen that a VC rhyme in the antepenult or penult has approximately the same relationship to a V rhyme in the same position of the word (a 69% and a 58% percent increase, respectively). All word-final syllables are longer, due to word-level final lengthening (Oller 1973), and it is noteworthy that while a final VC is *longer* it does not have the same proportional increase over a final V rhyme (36%) that is found non-finally. Lunden found that the average *proportional* increase of a heavy rhyme over a light V rhyme was notably consistent across all positions. A VXC rhyme has a 74% increase over a V word-final rhyme, making it very similar to the proportional increase found between a non-final VC and non-final V.

Lunden thus proposes, as an alternative to final-consonant extrametricality, that there is a consistent requirement for a syllable to count as heavy: its rhyme must reach a certain proportional increase over a V rhyme in the same position of the word.

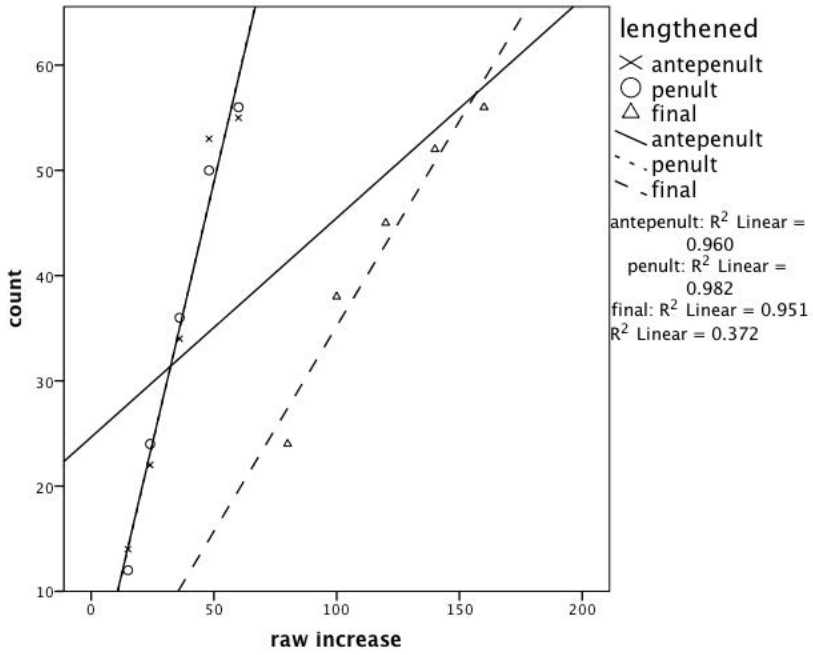
This paper presents the results of an MFC experiment with 34 Norwegian speakers (17 males, ages 16–62, M=33.5) in order to examine the evidence of this proportional increase re-

lationship from the perceptual side. The proportional increase theory of weight predicts that categorization of a syllable as heavy should increase linearly as a function of its proportional, not raw, increase in duration over a same-position light V.

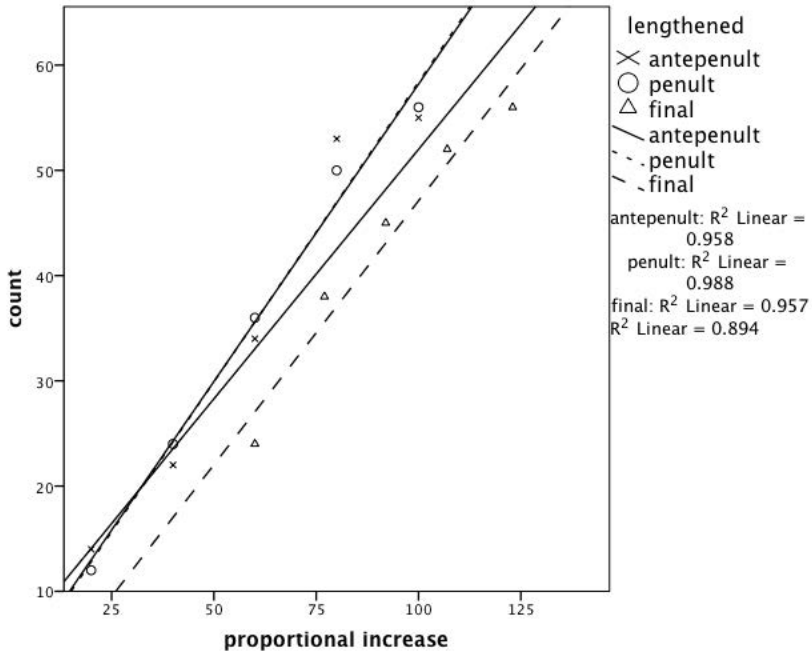
A three-syllable "baseline" word was constructed with [a] as each nucleus, standardized in pitch and intensity. Each [a] was independently lengthened 20, 40, 60, 80, and 100%. Thirty-four native Norwegian speakers were asked to identify the stressed syllable in each nonce word and report how clear it was that the stress was on that syllable. Asking about stress serves to probe a speaker's intuitions regarding weight because the primary-stress syllable in Norwegian must be heavy.

The graphs in (2) and (3) show the increase in instances where the lengthened syllable was identified as the stressed syllable as a function of the raw and proportional increase of the rhyme over that of a same-position V. The antepenult and penult fit lines are on top of each other.

(2) Count correct as a function of raw increase over same-position CV

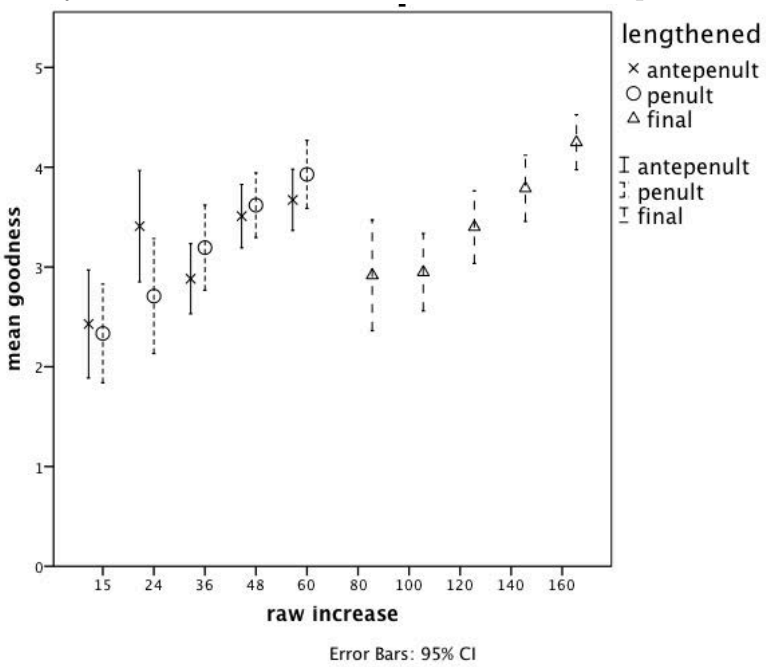


(3) Count correct as a function of proportional increase over same-position CV

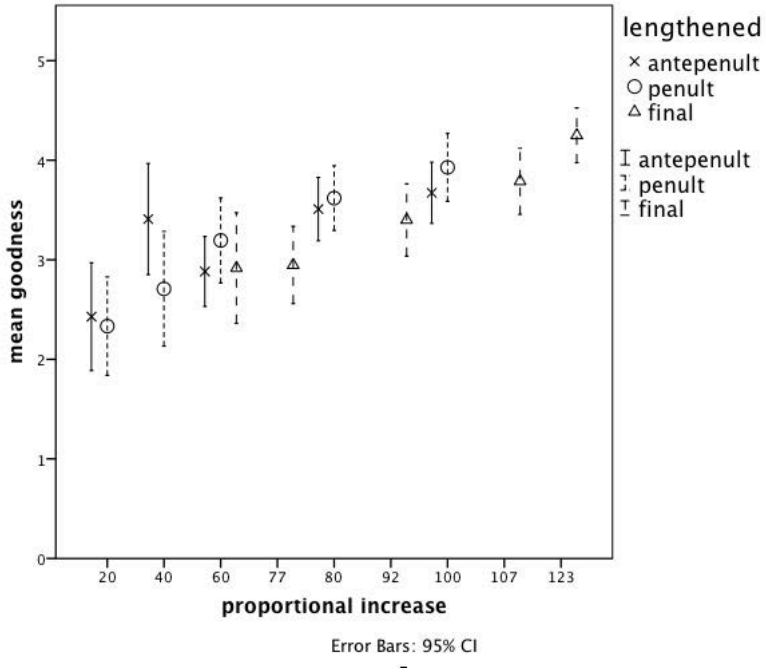


While the final syllable (different raw durations due to final lengthening) appears to behave differently from non-final syllables when examining the responses with respect to the raw increase in duration, they behave very similarly when examined with respect to the proportional increase involved. Similar results obtain from the clarity ratings, as shown in (4) and (5).

(4) Clarity as a function of raw increase over same-position CV



(5) Clarity as a function of proportional increase over same-position CV



Again, we see that responses to the final syllable increases are in line with those to responses to increases in non-final syllables only if the increases are considered in terms of their proportional increase over the basic light V rhyme in that position of the word. Strong support from speaker perception was thus found for the proportional theory of weight.

References

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