

Rhythmic patterning in Vietnamese quadrisyllabic reduplicative words

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There is an ongoing debate on issues related to prosody like stress, prominence or prosodic units above the syllable level in Vietnamese, a tonal monosyllabic language – roughly, three positions can be identified. First, the claim that each syllable has equal energy [1,3] or that no prominence asymmetry is found in disyllabic words of different morphosyntactic structures [2] may imply a ‘flat’ prosodic structure in the language. Second, claims about different levels of stress in pause groups [10,11] or about stress on the last syllable of disyllabic and trisyllabic speech chunks regardless of their morphosyntactic structures [7,9] may show evidence for stress at the phrasal level and imply the lack of prosodic word or foot domains. Third, the tendency of an iambic pattern in disyllabic or polysyllabic words [4,5,6] and the cliticization of function words to their host on the left [8] supports the presence of prominence at the word level and existence of prosodic words or feet between syllables and phonological phrases. This lack of consensus motivates further investigation into rhythmic patterning in Vietnamese. For instance, the finding of prominence asymmetries above syllables and below phonological phrases would provide evidence for stress or prominence in the language and justify the presence of an intermediate level.

The current study aims at examining the rhythmic pattern of Vietnamese polysyllabic words of different morphosyntactic structures in various sentence contexts. 8 native speakers of Southern Vietnamese (4 male, 4 female) read a list of 8 quadrisyllabic reduplicative words. These reduplicative words are semantically left-headed or right-headed, which means the base carrying the principal meaning is on the left or on the right of the reduplicant, respectively. The syllables of each word share the same CV structure and mostly carry the same tone. They were embedded into three different carrier sentences varying in the number of syllables before and after the target words. We chose to vary the carrier sentences since this might influence the prominence patterns, certainly if Vietnamese phrasing is based on chunks of 2-3 syllables irrespective of morphosyntactic structure (as argued in [9]). The investigated acoustic correlates are syllable duration, intensity ratio (mean intensity of each syllable rhyme over mean intensity of the whole word) and mean rhyme F0 at five equidistant points.

The general findings support the existence of an iambic pattern in terms of syllable duration rather than intensity ratio and mean F0. In detail, regarding syllable duration, headedness tends to play a role in iambic patterning. The second syllables are significantly longer than the first in the left-headed reduplicative words, and the fourth are significantly longer than the third in the right-headed words. Furthermore, being embedded in different carrier sentences does not change the overall iambic pattern of the reduplicative words; in fact, it has some effect on syllable duration, i.e., some syllables in the third carrier are significantly shorter than those in the first and second carriers. The intensity ratio and mean F0 of the first syllable are found to have the highest values with a gradual decrease towards the end. This might be the effect of fixed carrier sentences in which the participants may single out the target words and/or the possibility of marking the left edge of a higher prosodic domain. There is no significant effect of carrier sentences on intensity ratio and mean F0.

The finding that carrier sentences do not change the overall iambic pattern of the reduplicative words may imply their status as prosodic words. More support for the prosodic word domain comes from the observation that the second syllable is longer than the first in left-headed reduplicative words and the fourth syllable is longer than the third in right-headed reduplicative words. This suggests a word-level layer with one iambic foot corresponding to the morphosyntactic head above syllables and below phonological phrases. One potential caveat is the repetitive nature of the carrier sentences (e.g., ‘Please say X now.’); therefore, it may be worthwhile to also elicit reduplicative words in more natural sentence contexts. Moreover, further research on other types of polysyllabic words (e.g., Vietnamese compounds) may bring additional insights into questions regarding the rhythmic pattern of Vietnamese words and existence of prosodic word or foot domains.

Statistical analysis: Three-way repeated measures ANOVAs (Dependent variables: syllable duration, intensity ratio, mean F0; Independent variables: syllable position, headedness, carrier)

Syllable duration: syllable position ($F(3,21)=14.6, p<0.001$), headedness ($F(1,7)=14.1, p<0.01$, carrier ($F(2,14)=5.9, p<0.05$), syllable position*headedness ($F(3,21)=8.4, p<0.001$), syllable position*carrier ($F(6,42)=3.2, p<0.05$)

Intensity ratio: syllable position ($F(3,21)=14.3, p<0.001$), headedness ($F(1,7)=63.8, p<0.001$)

Mean F0: syllable position ($F(3,21)=8.5, p<0.001$), headedness ($F(1,7)=13.3, p<0.01$, syllable position*headedness ($F(3,21)=7.1, p<0.01$)

Figures (reported based on the significant statistical results)

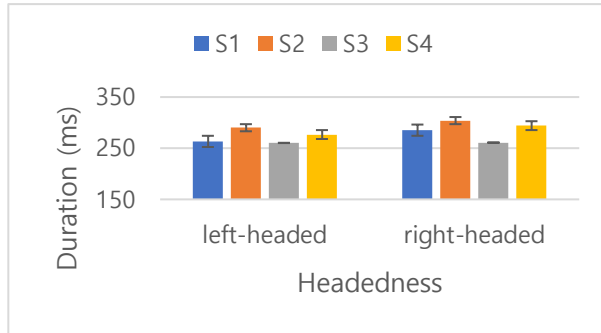


Fig. 1. Mean syllable duration for all speakers based on headedness

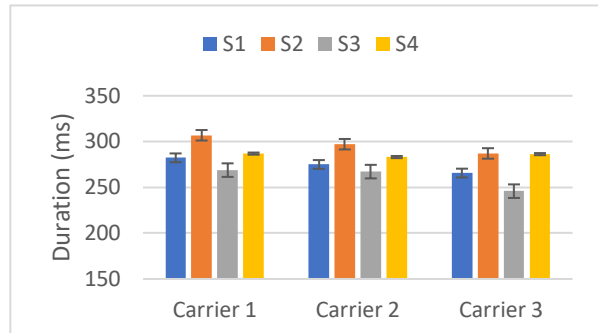


Fig. 2. Mean syllable duration for all speakers based on carrier sentences

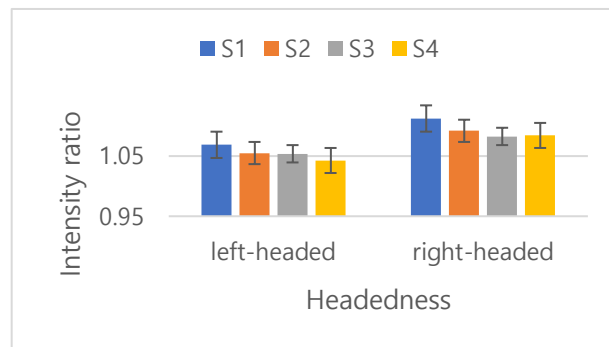


Fig. 3. Mean intensity ratio for all speakers based on headedness

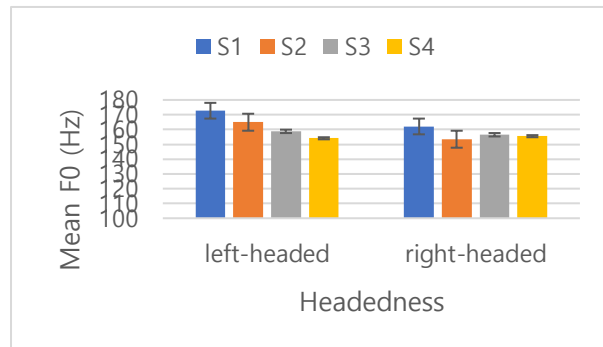


Fig. 4. Mean F0 for all speakers based on headedness

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