Prosodic end-weight effect in Malay echo reduplication: A learnability study

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Background: Echo reduplication involves copying of a word with some minor alternation, such as a change in onset consonant (e.g., *helter-skelter*) or a change in vowel (e.g., *pitter-patter*). It often respects prosodic end-weight, whereby the prosodically heavier constituent tends to come second. Several prosodic factors have been shown to contribute to prosodic end-weight (Ryan, 2019:193). The present study will focus mainly on the effects of syllable count (SC), onset sonority (OS) and vowel height (VH). Typologically speaking, more syllables, less sonorous onsets and lower vowels induce prosodic end-weight more than fewer syllables, more sonorous onsets and higher vowels do.

Motivation: Malay echo reduplication is theoretically interesting because natural and unnatural statistical patterns coexist in the lexicon. As shown in Table I, the SC factor is predominantly natural in that 35 out of 38 forms have the member with more syllables placed second (e.g., *terang-benderang* 'ablaze'). Figure 1 gives the same observations expressed as percentages. In contrast, the OS and VH factors go against the typology, meaning that there are more forms whose second member contains a more sonorous onset (e.g., *sayur-mayur* 'vegetables') or a higher vowel (e.g., *warna-warni* 'colourful') than the first member. Are the typology-matching patterns more readily internalized and extended to novel contexts by Malay speakers than the typology-defying patterns?

Method: 54 Malay speakers residing in Malaysia were recruited and completed an online wug test in which they had to choose between two orders (e.g., *madik-madak* vs. *madak-madik*) for 45 echo-reduplicated wug items. All the wug items obeyed Malay phonotactics and were created by manipulating the prosodic factors discussed above. Only a subset of the wug items (3 for SC, 12 for OS, 8 for VH) is relevant for the present study.

Results: The results for the wug test are given in Figure 2. Overall, the subjects' responses matched the lexical trends but with some divergences. The SC factor is relatively well-learned, as 74% of the time the subjects chose the order that was typologically natural. However, the unnatural OS factor is under-learned if not unlearnable. The subjects' responses were close to

the 50% chance level baseline, which suggests that they had no strong preference for either order for the OS factor. Interestingly, the equally unnatural (but highly attested) VH factor is learnable, as more than 60% of the time Malay subjects chose the order that was typologically unnatural, closely matching the statistical distribution in the lexicon. The results mentioned above were confirmed with a mixed-effects logistic regression model.

Implications: The present study points towards a blended view concerning how language learners apprehend patterns from language data. On the one hand, the current findings lend support to the "Law of Frequency Matching" (Ernestus & Baayen, 2003; Hayes et al., 2009; Zuraw, 2010) in that to a fair degree participants' responses reflect the patterning of the Malay lexicon. This includes the unnatural pattern of VH. On the other, there appear to be substantive effects in that the unnatural OS pattern goes unlearned (Wilson, 2006).

Table I: Lexical Statistics (Raw Counts)

Prosodic factor	Natural	Unnatural
Syllable Count (SC)	35	3
Onset Sonority (OS)	3	41
Vowel Height (VH)	40	89

Figure 1: Lexical Statistics (%)

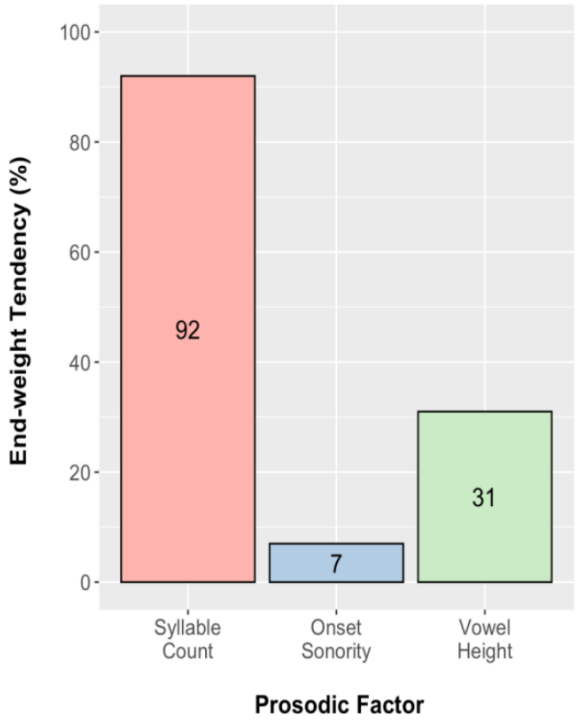
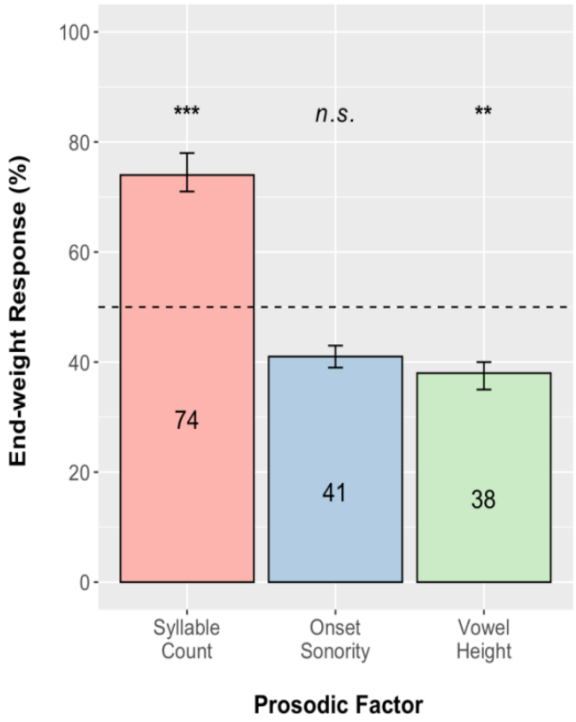


Figure 2: Experimental Results



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