The effect of lexical stress on the phonetic realization of voicing contrast in Tagalog: Native and Heritage comparison
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Background: Languages that contrast voiced and voiceless stops differ in how they implement the contrast along the VOT (Voice Onset Time) continuum. For example, English contrasts aspirated voiceless stops (long-lag VOT /p t k/) and unaspirated voiceless stops (short-lag VOT /b d g/) while Spanish contrasts unaspirated voiceless stops (/p t k/) and prevoiced stops (negative VOT /b d g/). Previous studies that examined the effect of phrasal boundary, speech rate and clear speech on voicing tend to show that the VOT contrast is hyperarticulated for aspirated or prevoiced stops—aspiration and prevoicing are further lengthened in prominent contexts—but the VOT of short-lag stops are generally unaffected by hyperarticulation (Cho & Keating, 2009; Kessinger & Blumstein, 1997; Smiljanic & Bradlow, 2008). Studies that probe the effect of lexical stress on VOT realization, however, are relatively sparse, particularly for languages with prevoiced stops (Lisker & Abramson, 1967; Simonet, et al., 2014). The current study examines the effect of lexical stress on the phonetic realization of short-lag vs. prevoiced stop contrast in Tagalog. We also examine how the effect differ for the heritage speakers’ speech to examine if and how the bilinguals’ dominant language (i.e., English) influence the interaction of stress and voicing contrast.

Data: Ten native and ten heritage speakers of Tagalog were recruited in Toronto. Disyllabic words with 6 stops in word initial, medial, and final positions, with the position of stress varying between the first and the second syllables, were selected. The word list was randomized and the speakers produced each word three times in isolation. In this abstract, we report on the results of the word-initial stops only.

Analysis: For each stop token, a VOT was measured, as defined as the time from the release of stop constriction to the onset of voicing. Each token was categorized into “Voiced” vs. “Voiceless” realizations depending on whether the VOT was positive or negative. The results reported below are based on statistical tests using mixed-effects models (linear and logistic).

Results: There was a clear difference in the realization of voiced stops by the two speaker groups. The native speakers produced most tokens of voiced stops with prevoicing while heritage speakers showed a mixture of positive and negative VOT realizations as shown in (a). There was a significant interaction of group and stress such that while native Tagalog speakers produced more prevoiced voiced stops in stress position than in unstressed position, heritage speakers showed a stress effect in the opposite direction. When the VOT values for the voiced stops were compared (b), we also found a significant interaction of stress and group. While native speakers did not show much difference in VOT between stressed and unstressed conditions, heritage speakers produced a significantly shorter prevoicing in stressed position. For voiceless stops, the overall VOT values were much longer for the heritage group than the native group and the effect of stress also differed for the two groups. While native speakers produced the voiceless stops with a shorter VOT in stressed position, heritage speakers did the opposite, which is the pattern expected for English (c). The result shows that the dominant language of heritage speakers not only affects the level of absolute VOT values of stops but also their interaction with stress. Also notable is the fact that the stress effect in the native speakers is generally in the right direction expected from previous studies but very minimal in it effect size highlighting the need to examine the stress effect in more languages.
References


