Patterns of misaccentuation of unaccented words in English speakers'Japanese

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Background. This study investigates the production of lexically unaccented words in Japanese as a second language (L2) by learners whose first language (L1) is English. Previous studies have suggested that prosodic errors are the main source of perceived foreign accentedness in English speakers' Japanese [1], in which the misaccentuation of unaccented words is particularly noticeable [2]. Japanese pitch accent is characterized by a sudden fall in fundamental frequency (*f*o) from the accented mora to the subsequent mora, which should be absent in unaccented words [3]. However, English learners of Japanese tend to place a pitch/stress accent and thus show a decrease in *f*o when pronouncing unaccented content words, presumably because English lacks stressless content words [4]. This is problematic because it can unintentionally change the meaning of the word (*hashi* /ha-si/ LH 'edge'; *hashi* /há-si/ HL 'chopsticks'; the hyphens indicate a mora boundary). One of the understudied issues related to this problem is whether the patterns of misaccentuation (i.e., where the accent actually falls) in unaccented words are predictable, which the current study aims to address using a bilingual speech corpus.

Method. Data were obtained from the J-AESOP corpus [5], in which 20 L1 English learners of L2 Japanese (15 female, 5 male) and 183 L1 Japanese speakers (115 female, 68 male) read aloud the Japanese version of "The North Wind and the Sun" [6]. The recordings were previously rated by another group of L1 Japanese listeners (n = 26) for the degree of perceived foreign accentedness on a 100-point scale [7]. In the interest of space, the current analysis focuses on 4-mora unaccented (LHHH) words that occur multiple times in the reading text: *gaitoo* /ga-i-to-o/ 'cloak' (*n* = 607), *kitakaze* /ki-ta-ka-ze/ 'North Wind'(*n* = 1015), and *tabibito* /ta-bi-bi-to/ 'traveler'(*n* = 609). Based on the segment-level annotation of the corpus, the mean *f*o of a vowel interval (V1, V2, V3, V4) was measured for each token using Praat. The *f*o ratios of two adjacent vowels (V2:V1, V3:V2, V4:V3) were then calculated to estimate the magnitude of *f*o change from the preceding vowel to the following vowel per token. Since the target words are all unaccented, the ratios are expected to be close to 1 in native Japanese speech, where the *f*o is kept relatively constant. In contrast, the ratio may be less than 1 in learner speech, where the *f*o may decrease due to misaccentuation.

Results and discussion. Figures 1 and 2 show by-word mean *f*o ratios of V3:V2 and V4:V3 as a function of the speakers'L1 and foreign accentedness score. The ratios of V2:V1 are not reported because the means were all above 1 (i.e., no *f*o fall from V1 to V2 was observed). As expected, the *f*o ratios for L1 Japanese speakers are kept constant around the value of 1 in all conditions. Although some L1 Japanese speakers were perceived as having a foreign accent in their L1 especially if they had an long-term overseas experience [7], their production of unaccented words did not involve a decrease in *f*o (i.e., they produced unaccented words as unaccented). In contrast, the results for L1 English speakers show evidence for misaccentuation, the pattern of which seems to depend on the word. As for *gaitoo*, those with a high foreign accentedness score show an *f*o ratio of V2:V3 smaller than 1, suggesting an *f*o fall from V2 to V3 and thus misaccentuation on V2. As for *kitakaze* and *tabibito*, those with higher foreign accentedness scores show a smaller *f*o ratio of V3:V4, suggesting that V3 was misaccented. These diverging patterns seem to be related to the syllable structure of the target words. Given that English nouns are stressed on the penultimate syllable when it is heavy [8] and that English listeners tend to perceive all Japanese vowels (including long /ii ee aa oo uu/) as tense or heavy [9], the results can be straightforwardly explained as a result of the penultimate heavy syllable being lexically accented (i.e., /ˈgai.too/, /ki.taˈka.ze/, /ta.biˈbi.to/). In other words, the default accent placement of L1 English was transferred to L2 Japanese production, especially in learners who were judged to be strongly foreign-accented.
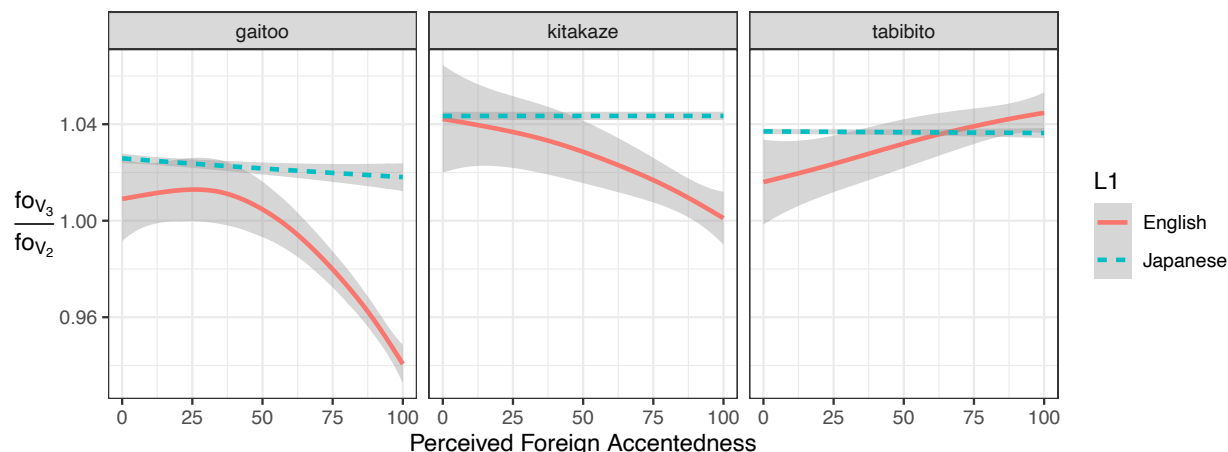
Figure 1: Smoothed means of *f*o ratio (V3:V2) per word type as a function of speakers' L1 and foreign accentedness score.
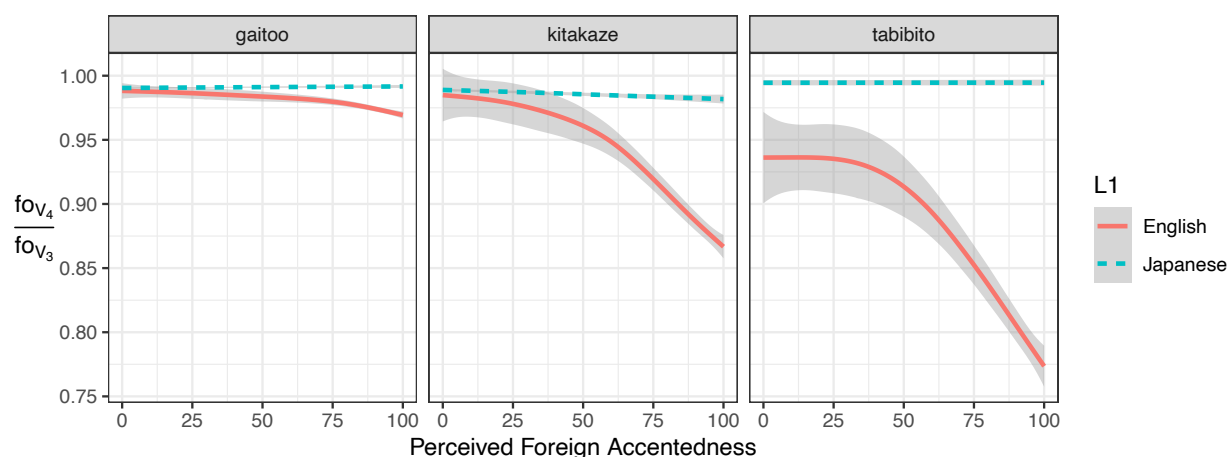

Figure 1: Smoothed means of *f*o ratio (V4:V3) per word type as a function of speakers' L1 and foreign accentedness score.

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