

Durational hand gestures facilitate the learning of L2 vowel length contrasts

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Previous studies have shown the benefits of observing or producing pitch gestures (or hand gestures mimicking pitch movements) to acquire novel L2 tonal and intonational contrasts (see Morett & Chang, 2015; Baills et al., 2018 in press for the learning of lexical tones; see Yuan et al., 2018 for the learning of intonational patterns), as well as the benefits of observing and producing beat rhythmic gestures for improving L2 pronunciation (Kushch et al., submitted and Gluhareva & Prieto, 2017). By contrast, some studies have shown null effects for gestures representing vowel length contrasts in the perceptual discrimination of Japanese vowel length contrasts (e.g., Hirata et al., 2014; Kelly et al., 2017). Yet in practice, some teachers have suggested that visuospatial gestures (encoded horizontally in space rather than vertically) representing duration help learning vowel length contrasts (Roberge et al., 1996; Klein et al., 2010). The main goal of this study is to further investigate the role of durational gestures in the acquisition of L2 vowel length contrasts in Japanese by using a horizontal hand gesture that encodes syllabic differences in length and also by expanding the scope from perceptive measures to potential effects on L2 pronunciation.

In a between-subject experiment with a pre- and post-test design, 50 adult Catalan dominant participants without Japanese knowledge were trained to perceptively identify the Japanese vowel length contrasts and to orally imitate Japanese sentences containing a set of words only contrasting in vowel length. They were assigned to one of the following two training audio-visual conditions, namely (a) Gesture group (i.e., where materials were presented audio-visually with gestures encoding durational information); and (b) No-Gesture group (i.e., where materials were presented audio-visually with no gestures). The experimental procedure is presented in Figure 1. Before and after training, all participants performed both a discrimination task and an imitation task. In the discrimination task, participants were asked to listen to 20 Japanese sentences in which disyllabic target words were embedded, and to decide the length of the second syllable of the target word. In the imitation task, they were asked to repeat 20 Japanese sentences with the target word embedded in the middle position. The speech production of the participants was acoustically analysed for the duration of the target vowel and the mean duration ratio of the long vowel to short vowel was calculated.

The results (see Figure 2) showed that while both groups improved in both tasks after training, the Gesture group yielded larger improvements than the No-Gesture group in perception and production. Two GLMM analyses revealed that there was a significant interaction of Condition*Test for the production, while no such significant interaction was observed for the perception. These results suggest that durational gestures help beginners boost the learning of L2 vowel length contrasts, and that the benefits can be immediately observed in word pronunciation patterns.

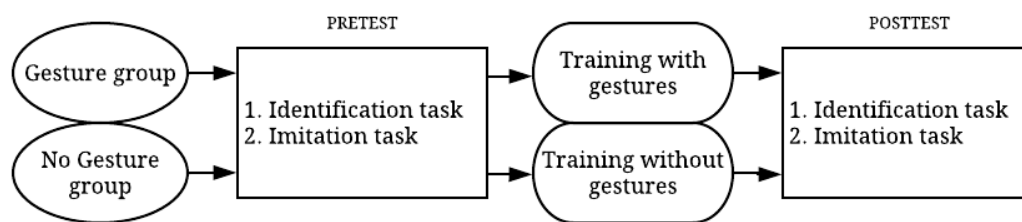


Fig. 1 Experimental procedure

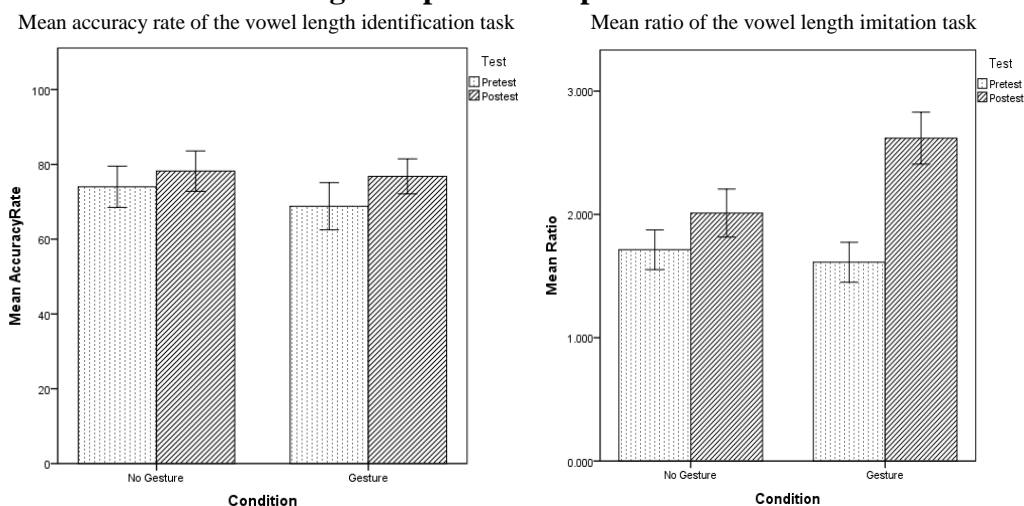


Fig.2 Results of the identification task (left panel) and the imitation task (right panel) across gesture and no-gesture groups in the pre-and post-tests.

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