The effect of postvocalic voicing on durational characteristics of vowels in Japanese and L2 English

Mafuyu Kitahara and Kiyoko Yoneyama (Waseda University/Daito Bunka University)

The current study aims to investigate whether the vowel duration conditioned by postvocalic consonant voicing is universal or language-specific. This voicing effect on vowel duration in English is interpreted as a part of its phonology acquired by native speakers of the language (House, 1961). A contrasting hypothesis is that the effect is a function of the universal articulatory process (Ko, 2007). To test these views, a corpus study of Japanese infants and adults, and an English production study of Japanese adults who were at different proficiency levels were conducted. The results of the current study showed that the postvocalic voicing effect on vowel duration has a clear universal basis, which can either be suppressed and/or enhanced by language-specific grammars.

Corpus analyses of NTT infant database (Amano, Kondo & Kato, 2008) and CSJ (Maekawa, 2003) reveal that the L1 phonology partially suppresses the voicing effect in long vowels. As seen in Figure 1, infants' production of short vowels generally showed the postvocalic voicing effect: vowel duration was shorter in the voiceless condition (left). However, the effect became less obvious in long vowels as infants grew up. Infants at 40 months of age or older showed a non-significant difference between voiced and voiceless conditions (center). Adults' data for long vowels even showed the reversed effect in some cases (right). Our interpretation of these results is that there is a universal basis for the voicing effect as seen in infants' data of short vowels and that the acquisition of Japanese phonology has *suppressed* the voicing effect. Establishing long vowels as a phonemic category in the course of L1 acquisition may have caused this suppression.

In the production study of L2 English, we investigated two groups of Japanese adults divided by their English proficiency levels. Based on our preliminary study of the voicing effect, more subjects were recruited to form a balanced set of groups. The advanced group (12 undergraduate and graduate students) has at least 3 months of stay in English speaking countries, while the basic group (12 undergraduate students) has less than 3 months of stay. Sixteen minimal pairs ending with a voiced/voiceless consonant, such as "bet"-"bed", were used for stimuli. The voicing effect was consistently observed in both groups, but the difference between the voiced and the voiceless conditions was significantly larger in the advanced group. This suggests that the L2 phonology now *enhances* the underlying universal trend of the voicing effect which is *suppressed* in their L1 phonology.

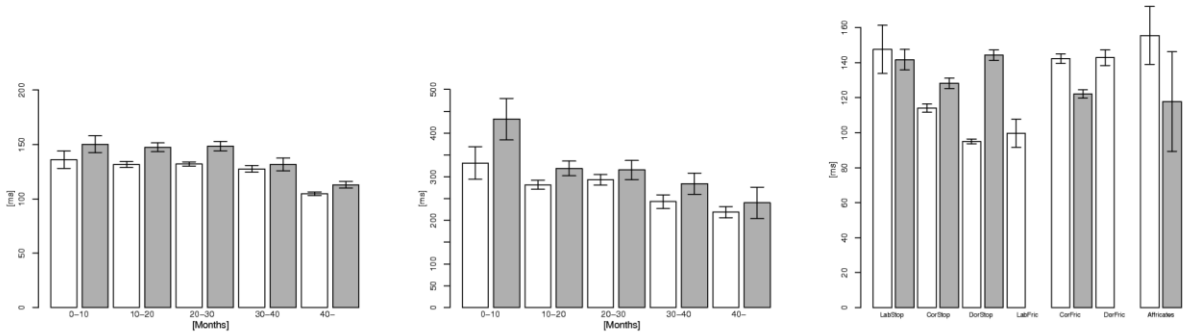

Figure 1: Vowel durations in voiceless (white) and voiced (gray) conditions. Short vowels by infants (left); Long vowels by infants (center); Long vowels by adults (right)