

The Assimilation of L2 Australian English Vowels to L1 Japanese Vowel Categories: Vocabulary Size Matters

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Abstract

Theory strongly suggests that L2 perception is influenced by the L1. More recently, it has also been proposed that L2 vocabulary size may be related to the perception of non-native phones. Japanese (JP) learners of Australian English (AE) identified AE vowels using JP vowel categories and provided goodness-of-fit ratings. Results show systematic perceptual assimilations of L2 to L1 vowels and learners with a larger L2 vocabulary provided more consistent identifications.

Index terms: perception, vowel, Japanese, Australian.

1. Introduction

The notion of L1 influence on the perception of L2 phones is central to theories of the perceptual difficulties experienced by L2 learners [1, 2]. It is also proposed that L2 vocabulary size may be related to the development of L2 phonology [3].

JP learners of AE must relate their L1 vowels (/i, e, a, o, u/) in single-double mora pairs and bi-moraic combinations to accommodate all AE vowels, which vary in terms of vowel quality and duration. JP speakers are sensitive to durational differences due to JP single-double mora contrasts [4].

To our knowledge, the assimilation of the entire L2 AE vowel inventory to L1 JP vowels has not previously been studied. We examined the assimilation of the AE vowel system to JP learners' L1 system and the relationship between the size of learners' AE vocabulary and their perception of AE vowels. We predicted that learners with a smaller L2 vocabulary would categorise fewer L2 phones than learners with a larger L2 vocabulary and more established L2 phonology.

2. Method

Three male AE speakers produced three repetitions of the 11 AE stressed monophthongs (/i, ɪ, ε, ɜ, æ, ʌ, a, ɔ, u, ʊ, ɒ/) and seven diphthongs (/ɪə, εə, aɪ, eɪ, ɔɪ, aʊ, oʊ/) in a /hVba/ context in citation (C) and in a carrier sentence (S). The 11 native JP listeners (8 female) ($M_{age} = 26.4$ years) had all studied English in Japan ($M = 7$ yr, $M_{onset\ age} = 11.6$ yr) and spent less than 12 weeks in Australia ($M_{stay} = 7$ wk).

Participants heard AE vowels ($N = 324$) in C and S contexts and identified them using a grid of JP kana symbols for single and double vowels and bi-moraic combinations. Additionally, they rated goodness-of-fit from 1 (poor) to 7 (excellent) and then completed a vocabulary size test [5].

Table 1: The assimilation of AE (left) to JP (right) vowel categories.

Categorised to L1			Uncategorised
Single mora	Double mora	Bi-moraic combinations	
/ɪ/ → /i/	/i, ɪə/ → /ii/	/aɪ/ → /ai/*	/ɜ/
/ε/ → /e/	/εə/ → /ee/	/eɪ/ → /ei/	/æ/
/ʌ/ → /a/	/a/ → /aa/		/ɔ/
/ɒ/ → /o/		/ɔɪ/ → /oi/	/aʊ/
/ʊ/ → /u/	/u/ → /uu/		/oʊ/

*Unassimilated for the low vocabulary group

3. Results and Discussion

Thirteen of 18 AE vowels were consistently assimilated to JP categories. Five were uncategorised (i.e. not identified as any one category for more than 50% of tokens) (see Table 1).

Pattern of assimilation did not differ for C and S presentations; both reflected the learners' sensitivity to spectral and durational information. However, goodness ratings differed for C ($M = 4.96$) and S ($M = 5.25$). It appears that durational information in the S context helps learners disambiguate phonological duration information and improves the rating of L2 vowels relative to L1 categories.

Participants were divided into a high vocabulary (HV: $n = 5$, $M_{vocabulary} = 7200$) and a low vocabulary group (LV: $n = 6$, $M_{vocabulary} = 5017$) ($t(9) = 5.40$, $p = .001$). The HV group selected a smaller number of L1 categories than the LV group (HV-LV C: $t(17) = 2.77$, $p < .001$, HV-LV S context: $t(17) = 2.40$, $p < .001$). AE /aɪ/ was categorised as JP/ai/ more often by HV than LV (C: $F(1,11) = 12.66$, $p = .006$, $\eta^2 = .585$, S: $F(1,11) = 7.01$, $p = .027$, $\eta^2 = .438$) and AE /ɔɪ/ more often as JP /oi/ (C: $F(1,11) = 9.69$, $p = .012$, $\eta^2 = .519$, S: $F(1,11) = 9.05$, $p = .015$, $\eta^2 = .501$). Interestingly, bi-moraic JP /ae/ and /oe/ were the second most popular assimilation categories for AE /aɪ/ and /ɔɪ/ for LV but were largely avoided by the HV group. This may reflect phonotactic learning in the HV group, as AE does not contain any diphthongs ending on /e/.

4. Conclusions

This study indicates that JP learners of AE are able to perceive the durational and spectral differences of most AE vowels and exploit a large number of their JP vowel categories in the identification of AE vowels. This is in line with claims that L2 perception is affected by L1 phonetics/phonology. We further show that learners with a larger L2 vocabulary are more consistent in their L2 identification, and that vocabulary size positively correlates with the ability of a learner to assimilate L2 phones to their native categories in a manner that conforms to L2 phonotactics and phonology.

5. References

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