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Can second-language phonological models predict vowel adaptations in Malay loanwords?

Malay is an Austronesian language of Malaysia, Brunei, Indonesia, and Singapore. Throughout its history in contact with the English-speaking world, it has incorporated and adapted many of loanwords into daily speech. But the phonologies of the two languages are very different. English has a much larger inventory of vowels than Malay, which only has six (Clynes & Deterding 2011). This paper will attempt to predict how these vowels will be adapted into Malay using methods borrowed from the study of second language phonology. The two frameworks this paper will focus on are the Phonological Interference Module (PIM) and the Perceptual Assimilation Model (PAM). These frameworks both attempt to explain how non-native speakers perceive sounds in a language, but they approach the problem in two different ways.

PIM argues that speakers perceive differences in sounds based on the distinctive features present in their native language (Brown & Matthews 1997; Brown 1998). For example, a language that only has velar sounds and not uvular ones will have a more difficult time perceiving a difference in another language than a language such as Salish which does distinguish between [velar] and [open] (Brown 1998: 148-149). Unlike Malay, English has a distinctive feature of [+/- round] that distinguishes between rounded and unrounded vowels. However, Malay does have the distinctive feature of [+/- back]. Because of this, the PIM model would predict that Malay speakers would be able to distinguish English vowels by their [back] feature but not their [round] feature.

Instead of distinctive features, the PAM model focuses on the difficulty that speakers of one language have when differentiating between unfamiliar contrasts in another (Best 1994; Colantoni, Steele, & Escudero 2015). For example, Japanese speakers hearing French words have difficulty perceiving a difference between words with consonant clusters and those without (Dupoux et al 1999). Since Malay has fewer vowels than English, the PAM model would predict that some of the English vowels would be perceived as the same vowel in Malay. This paper predicts these convergences would occur where two vowels are close to each other in the vowel space.

In order to understand whether either of these frameworks can be used to predict how vowels in loanwords are adapted, I conducted a vowel-matching perception experiment using native Malay speakers modeled after those done by Escudero & Chládková (2010). The participants listened to nonsense-word stimuli containing one of twelve vowels from Standard Southern British English (See Figure 1 for tested vowels). They were then asked to match what they heard to one of the six vowels of Standard Malay. The predictions for each vowel in both frameworks can be seen in Table 1. Participants were recruited from twelve different universities in the USA and the UK.

The results of the experiment can be seen in Figures 2 and 3. Each black arrow indicated the most common choice made by the participants with blue arrows indicating other significant results. The results for the front vowels indicate that Malay speakers would perceive both English /i/ and /ɪ/ as Malay /i/ and both /e/ and /ɛ/ as /e/. There is also some convergence in the perception of back vowels, with several different vowels being perceived most often as /o/, however the participants were able to easily differentiate between the rounded and unrounded pair of /ɔ/ and /ʌ/, with the former being perceived as /o/ and the latter as /a/.

The results of this experiment show that although Malay speakers perceive several English vowels as one Malay vowel, they don't seem to have trouble differentiating between rounded and unrounded back vowels. This indicates that nonnative speakers' perception of vowels in loanwords do not follow the PIM method. There is however, evidence that supports the PAM method. Speakers perceived convergence of several English vowels into one Malay vowel. This information can be helpful to predict how new loanwords will be adapted into Malay.

Important Figures:

English Vowel	PIM	PAM
/ɪ/	/i/	/i/
/ʊ/	/u/	/u/
/ɛ/	/e/	/e/
/æ/	/a/	/a/ or /e/
/ʌ/	/a/ or /o/	/o/ or /ə/
/ɔ/		/o/
/ɑ:/	/a/ or /o/	/a/
/ɒ/		/a/ or /o/

Table 1: Predicted outcomes for each English vowel being adapted into Malay. PIM predictions based on distinctive features, PAM predictions based on proximity in the vowel space.

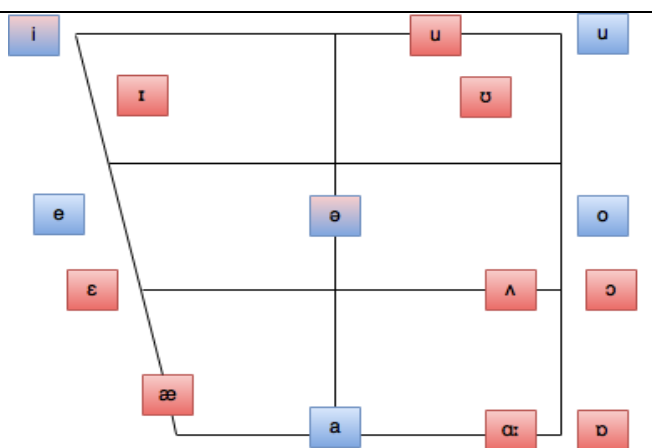
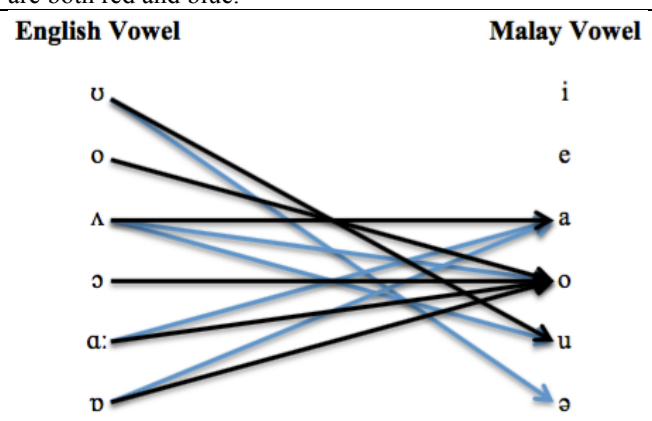
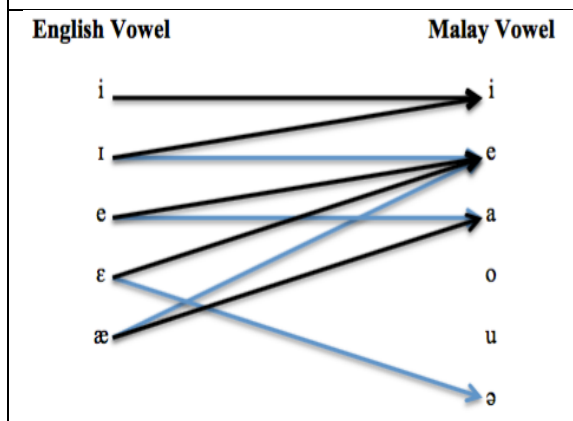


Figure 1: Comparison of English and Malay vowels. English vowels are in red, Malay in blue. Shared vowels are both red and blue.



Figures 2 and 3: Results of vowel mapping experiment. Black lines indicate most common vowel mapping. Blue lines show other significant results

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