Discovering the perceptual boundary between vocalized /l/ and dark /l/ 

Nicole Wong  
MA/PhD candidate in Linguistics at UIUC  
nwwong2@illinois.edu  
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/l/ vocalization occurs when historical instances of /l/ are realized as vowels or similarly, as a [w]-like sound segment (Knowles, 1987; Tollfree, 1999). A literature review conducted on this topic has revealed that while the production aspect of vocalization has been studied (Johnson and Britain, 2007), perception of vocalization has been neglected. Moreover, it is often noted that it is difficult to judge vocalization impressionistically (Horvath and Horvath, 2001; Tan, 2005).

To address this issue, I ask the following question: if an acoustic continuum between dark /l/ and vocalized /l/ is created, at what point do we perceive an ambiguous phoneme as a vocoid as opposed to a lateral approximant? Specifically, this study tests for categorical perception of a synthesized acoustic continuum between coda /l/ and [w]. This is the primary research question, with two derived questions concerning the strength of the F3 cue and categorization of /l/ and [w]. Additionally, pertaining to the secondary research question, a rhotic and non-rhotic variety of English was chosen to study the effects of rhoticity.

To answer the questions given above, a continuum between /l/ and [w] was synthesized such that the F3 frequency varied in 50 HZ increments along a 15-point continuum which began at 3100 Hz to 2400 Hz. 10 subjects have participated in a forced-choice identification task, with 5 American English (AmEng) speakers and 5 New Zealand English (NZE) speakers. Each of the 15 tokens was presented 10 ten times, for a total of 150 presentations per participant. Participants were asked to respond L or W for each presentation, by pressing the left or right shift key. To measure degree of confidence, the response times were recorded as well.

As a result of this study, it was found that both AmEng and NZE speakers are able to categorically perceive dark /l/ and demonstrated similar category boundaries when F3 is within 50 Hz of 2700 Hz, given F2 is 950 Hz (see Fig. 1). This demonstrates the strength and reliability of the F3 cue when discriminating dark /l/ in the coda position, for both groups of speakers. While AmEng speakers demonstrated greater variation than the NZE speakers (see Fig. 2), whether these effects are due to rhoticity remains uncertain. It is clear however that presence of rhoticity does not affect the category boundary of dark /l/. It is possible that the high variation observed in the AmEng speakers is a characteristic of AmEng speakers in general, while the relative lack of variation in NZE speakers (see Fig. 2) may be a result of the high rate of monolingualism in New Zealand. This paper aims to provide a starting point for the study of the perception of vocalization by speakers of varieties of English.
Figures and references


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**Figure 1**: Stars represent the boundary points of 2735 Hz and 2659 Hz. NZE is on the left, AmEng is on the right.

**Figure 2**: Individual NZE results, graphed together.

**Figure 3**: Individual AmEng results, graphed together.