Lab Design

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**Language of Interest:** Japanese

**Research Question:** What is the interaction between VOT of word initial stops, place of articulation, voicing and subsequent vowel height? Does this relationship change between borrowed and native words in the language?

**Hypothesis:**

H0: There is no measurable interaction between VOT, place, voicing, following vowel height, or lexical origin.

H1: There is some interaction between place, voicing and/or vowel height on the VOT of word-initial stops, but there is no significant difference in this relationship between borrowed and native words.

H2: There is some interaction between place, voicing and/or vowel height on the VOT of word-initial stops, but there is a significant difference in this relationship between borrowed and native words.

H3: There is no significant interaction between place, voicing and/or vowel height on the VOT of word-initial stops for native words, but this interaction mimics the language of origin for borrowed words.

**Variables:**

VOT: We will measure voice onset time as the temporal distance between the

Place of Articulation: There are three places of articulation for Japanese stops: bilabial, dental-alveolar, and velar (Kubozono 2015).

Voicing: There is a binary voicing contrast in Japanese, with voiceless stops having a small degree of aspiration, and contrasting with voiced stops (Riley 2007). We will judge voicing based on the prescence/absence of a voice bar in an elicited spectrogram.

Vowel Height: There is a three-way vowel height contrast in Japanese. Vowels can either be high, mid, or low. We will measure vowel height based on the value of F1 at the midpoint of the vowel.

Borrowed/Native words: We will treat lexical origin as a binary nominal feature, where lexical items can either be native or non-native. We will base the categorization for each lexical item on its etymology.

**Research Design:**

Have native speakers record from a word list of lexical items that vary in all dimensions of the variables. There is a limitation by the language for place/manner of the stop (discussed in rationale) and vowel height. Japanese has a five-vowel system (Kubozono 2015), with three-way height distinction, but there is no minimally contrastive triple for height: The only low vowel is central, and the only high- and mid- vowels are either front or back.

**Rationale:**

Japanese has a large inventory of loan words, which can contain phonological segments not native to the language (Kay 1995). What’s more, these borrowed words can be governed by phonological rules outside of the native rule inventory (Kubozono 2015). For example, the process of consonant gemination differs between loan words and the native lexicon (Shirai 1999). This native/loan alternation also shows some bearing on the VOT of segments (Dohlus 2013), although this relationship hasn’t been experimentally quantified. The problem of borrowed vs. native inventory is also remarkable because Japanese allowed segments in borrowed words that aren’t in the native inventory. For example, [p] can only occur word-medially in Japanese but is allowed word-initially in non-native words (Kubozono 2015).

**References:**

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