Investigating whether discriminability predicts lexical encoding accuracy of phonemic length for American English learners in second language Japanese
(Proposed Dissertation)

Quality is a distinctive feature on both vowels and consonants in Japanese, forming frequent lexical contrasts. Table 1 shows a set of real words that are primarily distinguished by length. When American English speakers learn Japanese, they must become able to discriminate between short and long sounds, as well as remember which sounds are associated with which words, a process known as lexical encoding. It was previously often assumed that a second language (L2) learner’s ability to discriminate between two L2 sounds reliably would be strongly related to that learner’s ability to encode those sounds lexically. However, recent research has shown that learners who could discriminate sounds easily still performed poorly on lexical decision tasks focusing on those same sounds (Daidone & Darcy, 2014; Han, 2009), and conversely, learners who could not discriminate sounds reliably nevertheless showed evidence of establishing distinct lexical representations (Cutler, Weber, & Otake, 2006; Darcy et al., 2012). This has led some researchers to speculate that there may be only a weak or even no relationship between perception and L2 lexical encoding as cognitive processes, although this is an open, actively debated question (Llompart & Reinisch, 2018).

However, one of the hallmarks of these studies is variability: in both discrimination and lexical encoding behavior, there is large variability among learners, the reasons for which are not well understood. Moreover, most studies only examine one or two contrasts at a time, which prevents a full understanding of the relationship between perception and lexical encoding. Because Japanese uses the length contrasts widely, with a large number of contrasts within “short” vs. “long,” it is a perfect test case to examine this relationship, taking into account learner-specific variation. Variation in discrimination performance is theorized to result from differing degrees of perceptual similarity and/or from categorical assimilation effects. For lexical encoding, one possible source of variation is discrimination performance. I will thus examine the relationship between variability in these aspects of the perception of length in learners of Japanese by using five tasks:

- Perceptual similarity (Free Classification task)
- Discrimination performance (Oddity task – pick the odd one)
- Categorization (Forced Choice Identification task)
- Lexical encoding (two lexical decision tasks)

Then, using regression models, I will examine the extent to which performance on one task predicts performance on the other(s).

In a pilot study, I examined discriminability of 10 length-related contrasts in L2 Japanese on a battery of five tasks to examine variability in discrimination, variability in the robustness of lexical encoding, and the relationship between the two. Nine students enrolled in second-year
courses were compared to six native Japanese speakers and three naïve listeners who had never
studied Japanese on an Oddity task, Free Classification task, and Forced Choice Identification
task. In addition, learners and native speakers were tested on their lexical representations using
both a Forced-Choice Lexical Decision task, in which participants decided which of two
pronunciations was a real word, and a Picture Matching task, in which participants decided
whether or not the pronunciation they heard matched the picture they saw on the screen.

Native Japanese speakers had near ceiling performance on all tasks, but the performance
of learners and naïve listeners varied considerably by contrast. The results strongly suggest that
variation in perceptual similarity is a strong predictor of discrimination performance, and that
discrimination in turn does strongly relate to lexical encoding when examined within individual.
However, learners who perform better than their peers overall at one task do not necessarily
perform better than others across tasks. The full dissertation will also provide key descriptive
data on the range of Japanese contrasts involving phonemic length, and through a comparison
with naïve participants, provide evidence on how length is acquired and stored in the L2
learner’s mental lexicon.

<table>
<thead>
<tr>
<th>Length Template</th>
<th>Japanese Word</th>
<th>Romanization</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CVCV</td>
<td>ここ</td>
<td>koko</td>
<td>‘here’</td>
</tr>
<tr>
<td>2. CVVCV</td>
<td>公庫</td>
<td>kooko</td>
<td>‘a corporation’</td>
</tr>
<tr>
<td>3. CVCCV</td>
<td>国庫</td>
<td>kokko</td>
<td>‘the treasury’</td>
</tr>
<tr>
<td>4. CVCVV</td>
<td>糊口</td>
<td>kokoo</td>
<td>‘bare subsistence’</td>
</tr>
<tr>
<td>5. CVVCVV</td>
<td>高校</td>
<td>kookoo</td>
<td>‘high school’</td>
</tr>
<tr>
<td>6. CVCCVV</td>
<td>国交</td>
<td>kokkoo</td>
<td>‘diplomacy’</td>
</tr>
</tbody>
</table>

References

mapping of acoustics to phonology: On the lexical encoding of front rounded vowels in L1 English-L2
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