Interaction between Phonology and Semantics in different languages: Evidence from Speech Errors in English and Korean

In slips of the tongue (hereafter SOT) research, it is well known that lexical errors involve pairs of words which are semantically related more often than pairs which are only phonologically related (Butterworth 1982, Arnaud 1999, Jaeger 2005). And yet, many studies also showed that phonology plays an important role in retrieving words from mental lexicon (del Viso et al, 1991, Dell et al. 2000). However, different degrees of interactions between phonology and semantics in different languages in the organization of lexicon have not been examined.

In the current study, naturalistically collected 473 Korean and 299 English lexical SOTs were analyzed to see whether different languages show any differences in phonological influence on lexical processing. Lexical errors falling into lexical substitutions, lexical blends, and lexical misplacements were classified depending on whether the two words involved in the error had positive or negative values on the two parameters of [sem] ‘semantically related’ and [phon] ‘phonologically related’. In order to measure the values, the phonological relationship between a target and an error word was decided numerically using a rank ordering of importance of the phonological properties of the two words mutually involved in an error (Kim 2007), and semantic relationship was decided on the basis of Jaeger’s (2005) system. The four types of lexical errors resulting from assigning the values: 1)-[phon]/+[sem]; 2)+[phon]/+[sem]; 3)+[phon]/-[sem]; 4)-[phon]/-[sem].

As results, in Korean, in 83% of the lexical errors there was a semantic relationship between the target and error words regardless of whether or not there was also a phonological relationship; the figure for English was 71%. On the other hand, only 37% of the Korean errors and 56% of the English errors showed a phonological relationship between target and error regardless of semantic relationship. This replicates findings from previous studies: lexical processing highly relies on semantics, and meaning is the primary factor for lexical selection.

However, a difference in the effect of phonology was found between Korean and English: English speakers had more of an effect on phonological representation than did Korean speakers. This is made clear by looking at the difference between +[phon] and +[sem] in each language: 46% difference in Korean vs. 15% difference in English. This may be due to the fact that there are more prosodic phonological cues involved in lexical stress in English than in Korean, and one strong measure of phonological similarity between English words is having the same lexical pattern. Furthermore, in English 85% of malapropisms (only phonologically similar word pairs: +[phon]/-[sem]) involved word pairs which have derivational morphology in common, such as ‘perfection/perception’ and ‘intonation/intuition’, which causes phonological similarity by definition. This morphological similarity did not seem to be a factor in most Korean lexical errors (majority of malapropisms in Korean were environmentally influenced ones). This may be partially because derivational morphemes in Korean are more productive, and thus words that involve derivational morphology are less likely to be lexicalized, i.e. stored in the lexicon as fully derived words.

The results from the current study support the interactive three-level lexical processing model (Levelt et al., 1999), especially the bidirectional activation: high percentage of the +[phon]/+[sem] errors (both of [phon] and [sem] were cross-checked) in the two languages (31% in Korean vs. 36% in English) supports the interactive activation between phonology and semantics, which means form and meaning are not independent in lexical processing. However, the degree of interaction level seems to be attributed to language-specific organization (or tightness between form and lemma) of lexicon in different languages.

Future work examining a role of phonology in various languages (languages which have lexical stress, tone, pitch accent, or languages with no such suprasegmental factors) should provide a more comprehensive picture of structure and interaction in mental lexicon, and the lexical processing.
I. Examples of Four Types of Lexical Errors

1. -[phon]/+[sem] “O.K. I’m off the computer, no (shaking head), the xerox machine.”
2. +[phon]/+[sem] “I went to see an orthodontist, uh, an orthopedist.”
3. +[phon]/-[sem] “…establishing an imperial (laugh)…empirical base for…”
4. -[phon]/-[sem] “We’re in the middle of unloading the dishwasher, I mean, the groceries.”

II. Number and Percentage of Lexical errors determined by the features [phon] and [sem]

<table>
<thead>
<tr>
<th></th>
<th>KMSOTs</th>
<th>EMSOTs</th>
</tr>
</thead>
<tbody>
<tr>
<td>-[phon]/+[sem]</td>
<td>244 (52%)</td>
<td>105 (35%)</td>
</tr>
<tr>
<td>+[phon]/+[sem]</td>
<td>147 (31%)</td>
<td>107 (36%)</td>
</tr>
<tr>
<td>+[phon]/-[sem]</td>
<td>29 (6%)</td>
<td>61 (20%)</td>
</tr>
<tr>
<td>-[phon]/-[sem]</td>
<td>53 (11%)</td>
<td>26 (9%)</td>
</tr>
<tr>
<td>Total Errors (N)</td>
<td>473</td>
<td>299</td>
</tr>
<tr>
<td>+[sem]*</td>
<td>391 (83%)</td>
<td>212 (71%)</td>
</tr>
<tr>
<td>+[phon]**</td>
<td>176 (37%)</td>
<td>168 (56%)</td>
</tr>
</tbody>
</table>

* Numbers in this row are counted in both –[phon]/+[sem] and +[phon]/+[sem]
** Numbers in this row included both +[phon]/+[sem] and +[phon]/-[sem]

III. References


