Polysemy Across Two Languages: Evidence From Word Recognition and Picture Naming

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Abstract

Bilinguals simultaneously activate words in both of their languages. However, the degree to which words become co-activated depends on their cross-linguistic similarity. For example, when words in two languages share multiple meanings, the degree of co-activation is likely to increase. In two experiments using word recognition and picture naming we found that lexical access in bilinguals was modulated by polysemy, such that polysemous words reliably co-activated their translation equivalents, while non-polysemous words did not. Thus, the amount of conceptual overlap between translations influences parallel activation of the bilingual lexica.

Polysemy Affects Lexical Access

- Polysemous words with many related meanings were recognized faster than words with a single meaning (e.g., Hino, Lupker & Pexman, 2002).
- Polysemous words with many unrelated meanings slowed recognition (e.g., Rodd, Gaskell, & Marslen-Wilson, 2002).
- Low-frequency polysemous names facilitated picture naming (e.g., Lichacz, Herdman, Lefevre, & Baird, 1999).

Polysemy Across Languages

Previous Findings:
- Bilinguals activate word representations in both languages (e.g., Duyck, 2005; Jared & Kroll, 2001; Van Hell & Dijkstra, 2002)
- Bilinguals translate abstract words with multiple translations slower than words with one translation (Tokowicz & Kroll, 2007).

Present Research:
- Polysemy as a tool to study bilingual language activation:
  - If polysemy modulates processing, then co-activation depends on the amount of conceptual overlap between translations.
  - If polysemy does not affect processing, then co-activation of translations is non-selective.

Primed Lexical Decision Task

Experimental Design

Participants
- 29 Spanish-English bilinguals (22 females) made word/nonword judgments.

Stimuli
- 52 English words and their Spanish translations equated for frequency and 104 readable non-words.
- English and Spanish words were either polysemous (M=3.64 meanings, SD=1.25) or non-polysemous (M=1.32, SD=.47) based on the number of meanings in each language.

<table>
<thead>
<tr>
<th>Spanish Prime</th>
<th>English Target</th>
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<tbody>
<tr>
<td>Polysemous</td>
<td>abrigo-COAT cielo-SKY</td>
</tr>
<tr>
<td>Non-Polysemous</td>
<td>corbata-TIE sonrisa-SMILE</td>
</tr>
</tbody>
</table>

Procedure

Fixation 150 ms  Mask 500 ms  Prime 75 ms  Target 5000 ms

Picture-Word Interference Task

Experimental Design

Participants
- 10 Spanish-English bilinguals (5 females) named pictures in Spanish.

Stimuli
- 52 experimental and 54 filler line drawings of objects, animals and people.
- The experimental stimuli were presented alone (e.g., picture of a dog), with their English name (DOG), with their Spanish name (PERRO), with an English distractor (BOX), or with a Spanish distractor (CAJA).
- The experimental stimuli names were either polysemous or non-polysemous in English and Spanish.

Results

In Exp.1, polysemous Spanish primes speded recognition of English translations, suggesting that polysemous words activated conceptual representations of their translations in the other language.

In Exp.2, polysemous distractors in Spanish and English slowed picture naming in Spanish more than non-polysemous distractors. This suggested that polysemous words activated more competitors within and across languages than non-polysemous words.

Polysemous words are more likely to share conceptual features across languages. Such conceptual similarity facilitates co-activation of translations equivalents in two languages.

Discussion

In Exp.2, polysemous distractors in Spanish and English slowed picture naming in Spanish more than non-polysemous distractors. This suggested that polysemous words activated more competitors within and across languages than non-polysemous words.

Polysemous words are more likely to share conceptual features across languages. Such conceptual similarity facilitates co-activation of translations equivalents in two languages.