Cognate status, syllable position and word length on bilingual Tip-Of-the-Tongue states induction and resolution

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Tip-Of-the-Tongue (TOT) phenomenon

- Strong frustrating feeling caused by the incapability of retrieving a familiar word in a particular moment;
- Its study discloses the different components of speech production - It is possible to retrieve some semantic, syntactic and phonological information but not the entire word;

Transmission Deficit Hypothesis (TDH) (Burke, Mackay, Worthley, & Wade, 1991)

- TOTs occur due to a problem in the inter-level connection from the semantic and syntactic level to the phonological level.
TOT in Bilinguals

- Universality of cognitive processes and constraints of the existing models
- Bilinguals have more TOTs than monolinguals
- Frequency lag hypothesis (Gollan & Acenas, 2004; Gollan et al., 2011)
  - Bilinguals spend less time using words of each language and because the strength of the connections depends on frequency and recency of use, they have more TOT
  - More TOTs in L2 than in L1
Bilingual TOT states induction and resolution

- Cognate status
- Word length
- Syllable position
Cognate status

- Cognate vs. Noncognate words
  - Papel (EP) - Paper (English) vs. Colchão (EP) – Mattress (English)
  - The difference between bilinguals and monolinguals in the number of induced TOTs is only present for noncognate words (Gollan & Acenas, 2004)
  - What is the cognate status’ role in TOT resolution?
James & Burke (2000) – a single phonologically related syllable embedded in an alternative prime word is enough to facilitate TOT resolution.

The relevance of the syllable unit in TOT:
- Low frequency words more sensitive to syllabic effects than high-frequency words (Jared & Seidenberg, 1990).
- Abrams et al. (2002; 2003) - English:
  - The first syllable is more relevant for TOT resolution than the middle or the last syllable embedded in words.
  - The last syllable embedded in pseudowords was more relevant for TOT resolution when compared with the first syllable, especially for four-syllable long words.
Syllable position

- First vs last? English vs. EP?
- Languages with different syllabic structures and definition of syllable boundaries

- Bilinguals:
  - Proficient speakers of both languages
Word length

- Pureza et al. (2013)

- More TOT induction for longer words:
  - Shorter words are produced faster and more accurately than longer words
  - Harley & Bown (1998) – longer words produce more TOT states than shorter words
  - Node Structure Theory – less nodes allows faster production

- More TOT resolution for longer words:
  - Different mechanisms take action in TOT induction and resolution
  - Higher baseline of activation + phonologically related primes - resolution
Syllabic Pseudohomophone Paradigm

- The syllable embedded in pseudowords in a LDT
- Allows to highlight the phonological connections
- Pseudohomophones: Maintenance of phonology and different orthography
  - Ex: PINCEL

<table>
<thead>
<tr>
<th>First syllable group</th>
<th>Last syllable group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>• pintro</td>
<td>• crissel</td>
<td>• limpapodor</td>
</tr>
<tr>
<td>• pimpota</td>
<td>• tranecel</td>
<td>• mostola</td>
</tr>
<tr>
<td>• pintri</td>
<td>• cassel</td>
<td>• estrupe</td>
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<tr>
<td>• pimbrano</td>
<td>• malinacel</td>
<td>• aufestino</td>
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Procedure

I. Written picture naming
   - Answer:
     - Know (write the name)
     - Don't know
       - I know what it is but can't remember the name (TOT)
         - II. Lexical decision task
     - Still don't remember
   - III. Recognition task (after all pictures presented)
Procedure

• 120 EP-English bilinguals vs. 55 EP monolinguals

• Bilinguals performed the task in EP (40) and English (40)

• 80 experimental targets:
  • 40 cognates (20 three syllables; 20 two syllables)
  • 40 noncognates (20 three syllables; 20 two syllables)

• 3 syllabic groups: first, last, control
Results: TOT induction

9.5% of TOT in general (70.3% of positive TOTs)
7.9% of TOT in EP
10.9% of TOT in English
Results: TOT induction

- More TOTs for:
  - L2 than for L1 ($F_1 (1, 120) = 8.66, p = .004; F_2 (1, 152) = 8.23, p = .005$)
  - Bilinguals than for monolinguals ($F_2 (1, 36) = 6.53, p = .015$)
  - Noncognates than for cognate words ($F_1 (1, 120) = 11.01, p = .001; F_2 (1, 152) = 4.38, p = .038$)

- Frequency lag hypothesis
  - Words used less frequently in each language – weaker connections
  - L2 – less dominant and less frequently used language
  - Shared features of cognates: more activated connections
Results: TOT induction

- Language x word length marginally significant effect ($F_1 (1, 120) = 3.40, p = .068$)
  - In EP, three-syllable long words had more TOTs than two-syllable long words

- Word length effect in EP but not in English
  - Different mechanisms of lexical access and word retrieval based on the different role of words’ syllabic structure.
  - In EP, the role of syllables is more relevant and influences the make-up of word forms
Results: TOT resolution

- Syllable position effect ($F_2 (2, 304) = 7.64, p = .001$)
  - More TOTs resolved for the First Syllable Group than the Control Group ($p < .001$) and marginally different from the Last Syllable Group ($p = .074$)
  - Result opposed to the obtained previously with EP monolinguals and in line with Abrams et al. (2002; 2003)

- ANCOVA including the positional syllable frequency as covariate
- Syllable position effect is maintained
  - The syllable frequency should always be considered in parallel
Results: TOT resolution

- Cognates with 3-syllables had more TOT resolution than cognates with 2-syllables ($F_1 (1, 117) = 4.04, p = .047; F_2 (1, 152) = 3.39, p = .068$).

- Higher contact between languages, integrating information to facilitate word retrieval (cognate status) + higher baseline activation due to the selection of a higher number of nodes (word length).
Results: TOT resolution

- Bilinguals vs. Monolinguals
  - Absence of any significant differences between bilinguals and monolinguals in TOT resolution
  - When in a TOT state, they are both equally able to retrieve the target word, equally susceptible to the manipulated variables
Conclusions

- Establishment of new relevant variables in TOT induction and resolution:
  - First syllable is more relevant for TOT resolution when syllable frequency is controlled for.
  - Word length shows different has an important role in languages with well-defined syllable boundaries.
  - Cognate words induce less TOTs and facilitates TOT resolution when associated with longer words.

- The role of phonology:
  - Phonological syllable-sized units in the process of lexical access, facilitating TOT resolution.
  - Syllabic structure differs across languages and involves different mechanisms in lexical access and word retrieval.

- Different mechanisms in TOT induction and resolution:
  - Lexical access different in bilinguals and monolinguals according to language syllabic features.
  - Word retrieval similar in bilinguals and monolinguals.
Thank you for your attention!