Cognate word recognition: the role of orthographic and phonological similarity in two different tasks

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TWO MAIN PROPOSALS ON COGNATES REPRESENTATION AND PROCESSING:

A lexical-morphological hypothesis (Davis et al., 2010)
- Cognate words have developed a special kind of morphological representation due to their form and meaning overlap.
- Differences in the degree of orthographic or phonological overlap will not influence the processing of cognate words.

A symbolic, localist connectionist framework (Dijkstra et al., 2010)
- It argues the existence of a different lexical status in the bilingual memory, emphasizing the orthographic and phonological similarity as the cause of the particular processing of cognates.

AIM: Explore whether the processing of cognate words is modulated by the degree of the phonological (P) and orthographic (O) overlap in two different tasks (Silent Reading Task and Lexical Decision Task).

Participants
- 14 Portuguese – English (L1 – L2) bilinguals
- Mean age = 22.36 years, SD = 4.18
- Mean age of acquisition = 8.91, SD = 1.45
- Mean years of instruction = 9.86, SD = 2.76

Self-ratings (Mean and SD) of L2 proficiency based on a 7-point Likert scale (from 1-low to 7-high)
- Skills Mean SD
  - Reading 5.87 (0.52)
  - Writing 5.43 (0.54)
  - Speaking 5.36 (0.51)
  - Listening 6.02 (0.51)

Tasks
- Experiment 1
  - Silent Reading Task (SRD) combined with masked translation priming paradigm
- Experiment 2
  - Lexical Decision Task (LDT) combined with masked translation priming paradigm

Methods

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Method

Experiment 1: Silent Reading Task

Overall ANOVA
- 2 (Status: CG vs. NCG) x 2 (Prime: Trans. vs. UnRel.) x 2 (O overlap: O+ vs. O-) x 2 (P overlap: P+ vs. P-)

RTs
- Main effect of Status (CG – 675ms vs. NCG – 652ms)
  - F(1, 13) = 4.40, p = 0.05, ηp² = 0.26
- Interaction of Status x Prime x P overlap
  - F(1, 13) = 5.80, p = 0.03, ηp² = 0.31

ANOVA for CG words
- 2 (Prime: Trans. vs. UnRel.) x 2 (P overlap: P+ vs. P-) x 2 (O overlap: O+ vs. O-)

RTs
- Interaction effect of Prime x O overlap x P overlap approached the significance
  - F(1, 13) = 4.03, p = 0.07, ηp² = 0.24

Experiment 2: Lexical Decision Task

Overall ANOVA
- 2 (Lexicality: Word vs. Pseudo-Word) x 2 (Status: CG vs. NCG) x 2 (Prime: Trans. vs. UnRel.) x 2 (O overlap: O+ vs. O-) x 2 (P overlap: P+ vs. P-)

RTs
- Main effect of Lexicality (Words 748ms vs. Pseudo-Words 896ms)
  - F(1, 13) = 159.3, p < 0.001, ηp² = 0.90
- Main effect of Status (CG 811ms vs. NCG 835ms)
  - F(1, 13) = 15.61, p < 0.001, ηp² = 0.53
- Main effect of Prime (Trans. 814ms vs. UnRel. 833ms)
  - F(1, 13) = 6.73, p < 0.05, ηp² = 0.34
- Main effect of Status x Prime Interaction
  - F(1, 13) = 36.01, p < 0.001, ηp² = 0.72

Errors Rate
- Main effect of Lexicality (Word 5.03 ms vs. Pseudo-Word 6.07 ms)
  - F(1, 13) = 9.46, p < 0.05, ηp² = 0.43
- Main effect of Status (CG 0.04 ms vs. NCG 0.06 ms)
  - F(1, 13) = 10.34, p < 0.05, ηp² = 0.46

ANOVA for CG words
- 2 (Lexicality: Word vs. Pseudo-Word) x 2 (Status: CG vs. NCG) x 2 (Prime: Trans. vs. UnRel.) x 2 (O overlap: O+ vs. O-) x 2 (P overlap: P+ vs. P-)

RTs
- Main effect of Prime (Trans. 814 ms vs. UnRel. 833 ms)
  - F(1, 13) = 10.74, p < 0.05, ηp² = 0.46
- Main effect of Status x Prime Interaction
  - F(1, 13) = 2.05, p = 0.19, ηp² = 0.15

Errors Rate
- Main effect of Prime (Trans. 0.02 ms vs. UnRel. 0.04 ms) approached the significance
  - F(1, 13) = 3.21, p = 0.09, ηp² = 0.21
- Interaction effect of Prime x O overlap x P overlap approached the significance
  - F(1, 13) = 2.07, p = 0.19, ηp² = 0.15

RESULTS

Translation Priming in CG Words by conditions
- CG words were divided in 4 experimental conditions according to their degree of O and P overlap
- CG words were recognized faster than NCG words
- Rate Prime (Trans. conditions of Prime conditions)

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CONCLUSION
- The degree of orthographic and phonological overlap influenced the visual recognition of CG words:
  - Masked translation priming for O+P+ and O-P+ conditions in the SRT and for O-P+ condition in LDT.
- The type of task affected the visual recognition of CG words:
  - SRT - CG words were recognized slower than NCG words
  - LDT - CG words were recognized faster than NCG words

The data supports the symbolic, localist connectionist framework (Dijkstra et al., 2010)

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