Tug of war between top-down and bottom-up processing in bi-alphabetism

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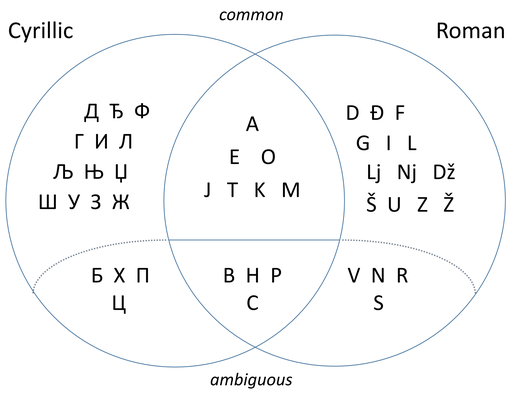
Introduction



Bi-alphabetism: The existence of two orthographically different, but partially overlapping scripts with the same phonology.

VISUAL WORD RECOGNITION

Most models of the visual word recognition propose interactive activation which includes both top-down and bottom-up activation.

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Question: When orthographic and semantic levels are in conflict, which activation (bottom-up or top-down) will prevail?

Method

Participants

- N = 44
- Undergraduate students, University of Belgrade
- Users of both writing systems

Stimuli

- Words created using **shared** and **unique** letters
- n = 400

Four groups of stimuli:

- Real words ➡ ČE**Š**ALJ
- Mixed words ➡ ČE**Ш**ALJ
- Real non-words ➡ ČE**Đ**ALJ
- Mixed non-words ➡ ČE**Ђ**ALJ

- All of the words were the same length (5 letters)
- Containing 2 or 3 unique letters
- Highly familiar/typical (M = 6.81, SD = 0.205)
- Medium to high frequency (M = 5.62, SD = 0.85)

Procedure

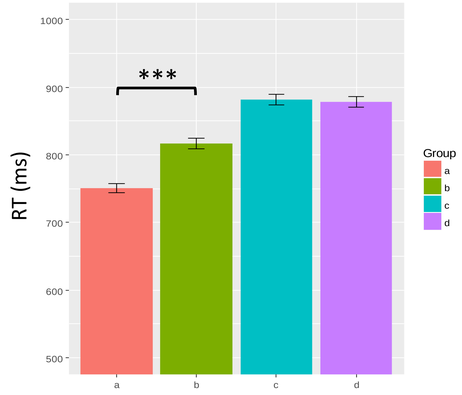
Lexical decision task ⬇ Focus on the meaning

- Real words ➡ ČE**Š**ALJ
- Mixed words ➡ ČE**Ш**ALJ
- Real non-words ➡ ČE**Đ**ALJ
- Mixed non-words ➡ ČE**Ђ**ALJ

CORRECT INCORRECT

Results

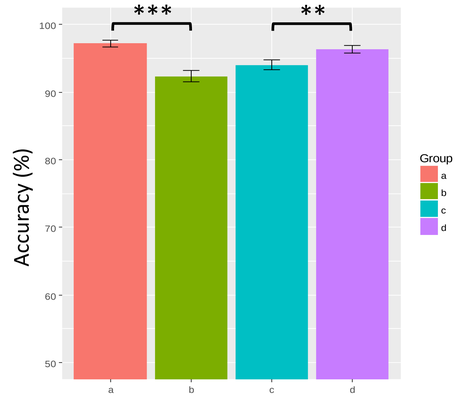
Reaction time



Real words elicited shorter reaction times than Mixed words (β = 0.11, *SE* = 0.01, *z* = 9.32, *p* < .001).

No significant difference emerged between Real and Mixed non-words (β = -0.02, *SE* = 0.01, *z* = -1.38, *p* > .05).

Accuracy



Real VS. Mixed words (β = -1.19, *SE* = 0.16, *z* = -7.27, *p* < .001)

Real VS. Mixed non-words (β = 0.54, *SE* = 0.16, *z* = 3.43, *p* < .05).

Discussion

In the present study the emphasis was put on the meaning of the word (semantic level).

The results indicate that orthography plays an important role in accessing the meaning of the word in Serbian.

Longer RTs and less accuracy in the **mixed word group**, indicate that participants did access the meaning, but with more difficulty compared to the **real word group**.

When it comes to non-words trials, where semantic level doesn't play a role, mixing two alphabets increases the probability of giving the correct answer.

Next step will be to investigate the effect in the opposite direction, more precisely, when the focus is put on the orthographic level.

Conclusion: Even though both scripts are used equally and have the same phonology, interference between them has an inhibitory effect on top-down processes, as observed through direct comparison between real words and mixed words, as well as real non-words and mixed non-words.

References

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