Does the mode of presentation of stimuli affect modality-switching costs? A study with the lexical decision task

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INTRODUCTION

- Modality-switching costs with conceptual representations (e.g., switching from the sentence "blender is loud" to the sentence "banana is yellow") have been taken as evidence supporting the hypothesis that perceptual information is engaged in conceptual processing [1]
- So far, they have been found by means of the property verification task [2] and have been shown with both visual and aural presentation of stimuli [3].
- The present study aims to explore whether such semantic costs are independent from the mode of presentation of stimuli and from the depth of processing required by the task.

METHOD

Participants: 60 students (41 females; mean age: 22.31, SD: 2.05).

Task: lexical decision task (LDT) on concept-property target pairs presented either visually or aurally (see figure 1 for an example of the experimental conditions).

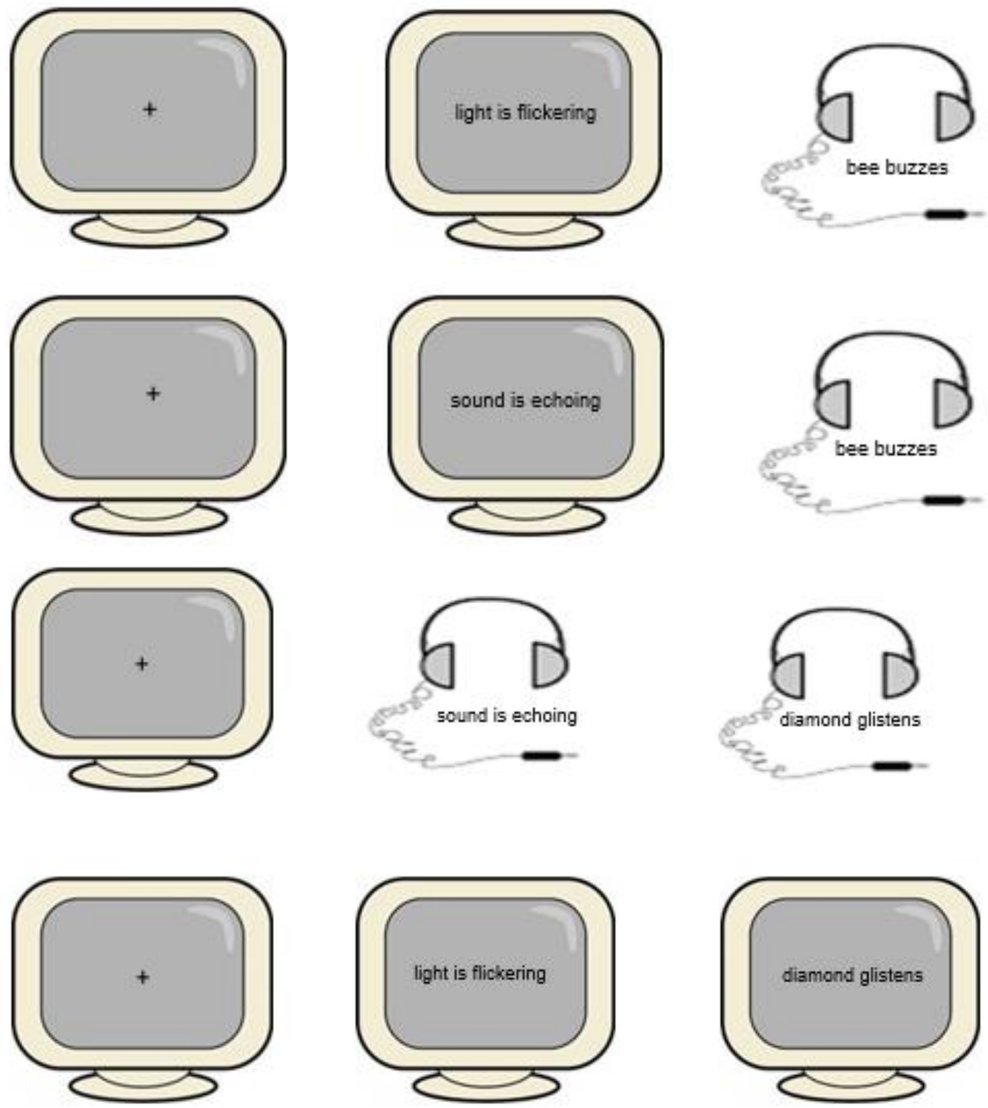

Figure 1: Example of written and spoken same and different-modality prime and target sentences in the Different-Different (DD) Different-Same (DS), Same-Different (SD), and Same-Same (SS) conditions.

RESULTS

A Repeated Analysis of Variance (ANOVA) on RTs with *Mode of Presentation* (**same** vs. **different**), *Content Modality* (**same** vs. **different**) and *Target Congruency* (**congruent** vs. **incongruent**) as within-subject factors was performed. There was a main effect of *Mode of Presentation, F(1, 59) = 6.544, MS_e = 59889.45, p < .05, ηp2 = .1.*

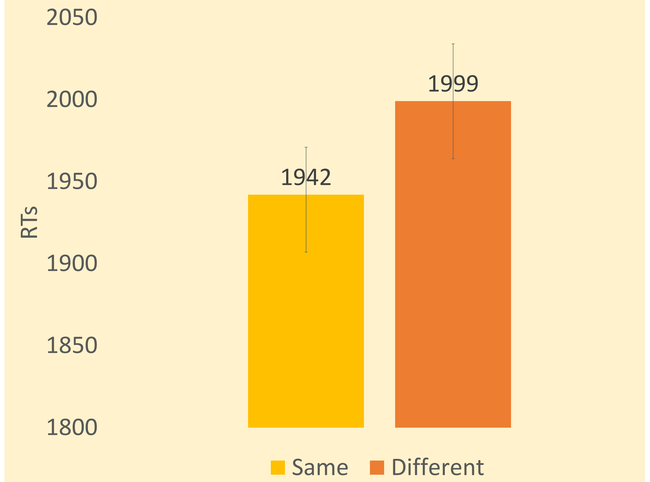

Figure 2: Mean Response Times (in Milliseconds) as a Function of *Mode of Presentation* (**same** vs. **different**). Bars are standard Errors.

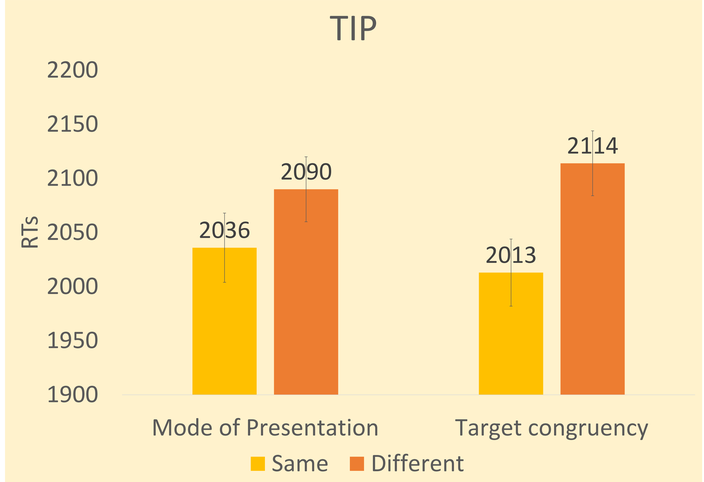

Figure 3: Mean Response Times (in Milliseconds) as a Function of *Mode of Presentation* (**same** vs. **different**), and *Target Congruency* (**congruent** vs. **incongruent**) in a previous property verification task. Bars are standard Errors.

DISCUSSION

- Results showed that with a more superficial task such as the LDT the mode of presentation is far more influential than the content modality of sentences in bringing about modality-switching costs.
- With a task that does not emphasize conceptual processing (i.e., LDT) there is no significant effect of the *Content modality* and of the *Target Congruency.* Therefore, it is likely that with LDT processing of target sentences only recruited the semantic system to a certain extent insufficient to generate interference between the perceptual and conceptual systems.
- We conclude that the MSE is a multilevel effect which can occur on two different levels of information processing, i.e., perceptual and semantic.
- We also conclude that the MSE is a task-related effect that hinges on the depth of processing required by the task.
- Taken together these results speaks in favor of the grounded account of knowledge [1, 2] which claims that the perceptual and conceptual systems are tightly interwoven.

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