UNIVERSITÉ DE GENÈVE
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SIMULTANEOUS INTERPRETING AND COGNITIVE CONTROL:
ARE THE MEASURES UP TO PAR WITH THE COMPLEXITY OF THE TASK?

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Abstract

Domain-general cognitive benefits of multi-lingualism are a longstanding topic of debate. Evidence increasingly indicates that the impact on cognitive control mechanisms depends to an important degree on individual differences in language biography and use (DeLuca et al., 2019; Lehtonen et al., 2018; Titone et al., 2017).

Simultaneous interpreting (SI) as a complex form of multi-language processing (Seeber, 2015; Paradis, 1994) involves high cognitive demands (Hervais-Adelman et al., 2015) and provides a particularly intriguing paradigm to investigate language-use induced cognitive control changes.

The complexity of the SI task and the lack of a complete understanding of the subtasks and skills (i.e. comprehension and production), however, pose a challenge with regard to the choice of measures and the interpretation of results.

Introduction

CONTEXT

Simultaneous interpreters:

- Highly proficient in multiple languages
- Highly apt at regulating language activation levels
- Must assure production in target language (TL) only

PRESENT STUDY

- **WHAT:** Extract presented for illustration purposes
- **AIM:** Investigating language variety co-activation and non-verbal cognitive control in simultaneous interpreters and multilinguals without SI training
- **RESEARCH QUESTION: Does SI expertise change the activation levels of a task-irrelevant language variety?**
- **HOW:** In a comprehension task, participants were instructed to identify a target image presented on a screen by clicking on it. The instructions were given in Standard German. The activation of a phonological competitor was gauged by measuring gaze fixations on the object whose name shared a phonological onset with the target object name. This phonological competitor either belonged to the same variety used for the instructions or to a parallel variety only spoken by half of the participants and not relevant to the task (Swiss German). The same set-up was also used for a translation task from English to German.
- **FOOD FOR THOUGHT: How reliably can a complex task as SI be broken down and how informative are subsequent measures?**

Methods and Materials

PARTICIPANTS
N = 64 | L1 = DE, L2 = EN, L3 = FR
normal/corrected-to-normal vision
4 sub-groups of n = 16:

1: SIs (diglossic): M = 44.8y, SD = 13.6; 13F
2: SIs (non-diglossic): M = 43.8y, SD = 12, 11F
3: Non-SIs (diglossic): M = 33.0y, SD = 9.8, 13F
4: Non-SIs (non-diglossic): M = 43.1y, SD = 11.2, 11F

PROCEDURE
Example: Visual World object-identification task
Please click on [target]

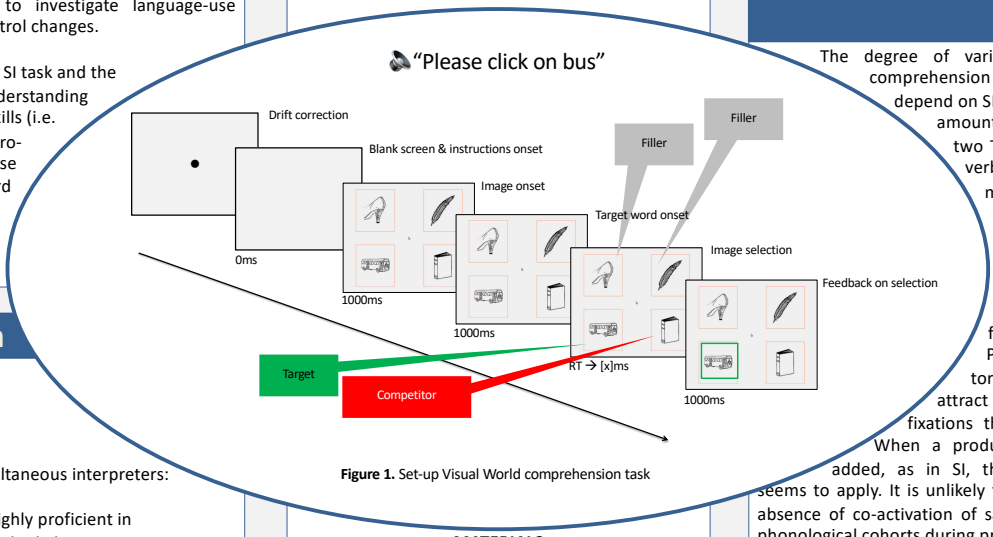

Figure 1. Set-up Visual World comprehension task

MATERIALS
75 item sets with 4 black-and-white line drawings + 1 spoken target word, 25 items for each of the 3 conditions

- *Condition 1:* 1 target, 1 phonological cross-variety competitor, 2 fillers
- *Condition 2:* 1 target, 1 phonological same-variety competitor, 2 fillers
- *Condition 3:* 1 target, 3 fillers (baseline)

APPARATUS
Desktop mounted SR Research EyeLink® 1000

Results I

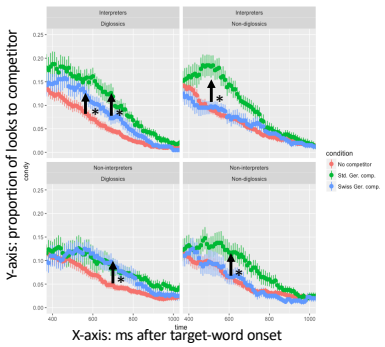

Figure 2. Fixation proportions per condition

Results II

Time-course analysis of fixation distributions:

→ *both diglossic groups co-activated the task-irrelevant variety during comprehension*

An identical analysis on data gathered during a task that was set up like the comprehension task, but required participants to simultaneously interpret a whole sentence or translate the target word from English to German:

→ *data provide no indication of the competitor being processed*

Discussion

The degree of variety co-activation in comprehension did not appear to depend on SI expertise, but on the amount of active use of the two TL varieties. The non-verbal cognitive control measure was unaffected by SI or diglossia status.

During comprehension, the patterns of activation observed follow the predictions: Phonological competitors of both varieties attract significantly more fixations than unrelated fillers. When a production component is added, as in SI, the same no longer seems to apply. It is unlikely that this is due to an absence of co-activation of same- or cross-variety phonological cohorts during production.

Therefore:

→ ***If there is a discrepancy between phenomenon and measure, where does the measure fail?***

→ ***How could the reliability of the measure be verified?***

Conclusions

- Applying new methods and measures to SI research requires an in-depth understanding of the measures and their limitations
- New methods and measures do not solve the initial problem of breaking down complex tasks such as SI for experimental purposes

References

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