



# Serial or parallel dual-task language processing: Production planning and comprehension are not carried out in parallel

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## Introduction

People appear to engage in the dual-task of planning speech while comprehending others [1]. This suggests that the process of **lexical selection** may occur in parallel with comprehension processes. Dual-tasking research finds that lexical selection does not occur in parallel with a secondary non-linguistic task if that task requires an overt response [2], but does occur in parallel if a covert response is required [3]. However, little dual-tasking research investigates dual-tasking with two linguistic tasks [4]. Thus, here we ask:

1. Is lexical selection carried out serially or in parallel in a dual-task?
2. How does overtly responding to the second task affect serial/parallel processing?
3. How does a secondary linguistic vs. non-linguistic task affect serial/parallel processing?

## Dual-tasking experiments

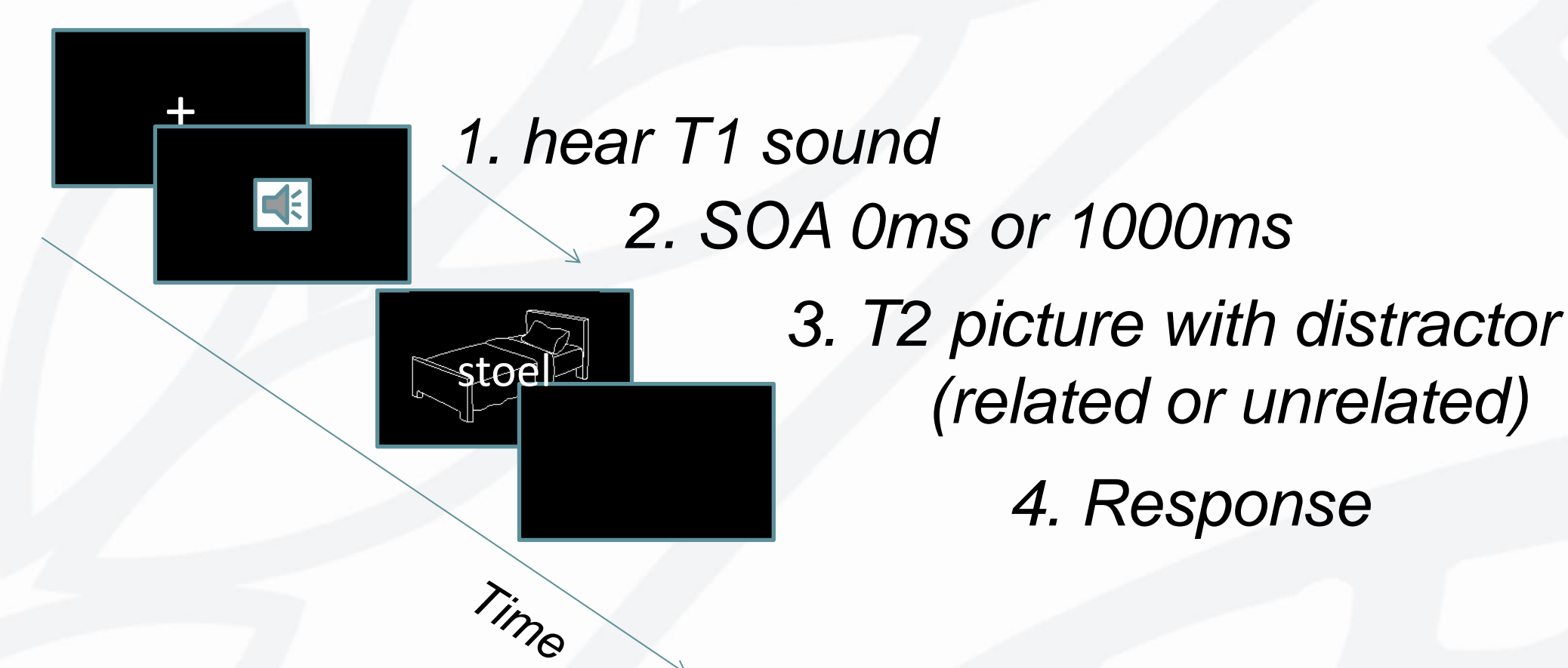
Task 1 (T1): tone or syllable identification/choice

Task 2 (T2): picture naming with distractors

**Lexical selection** is indexed by semantic interference:

Presence of interference = serial processing

Absence of interference = parallel processing [2,3]



Experiment 1: T1 – button press; T2 – picture naming.

Experiments 2 & 3: T1 – task choice for T2 based on sound; T2 - name picture or read distractor.

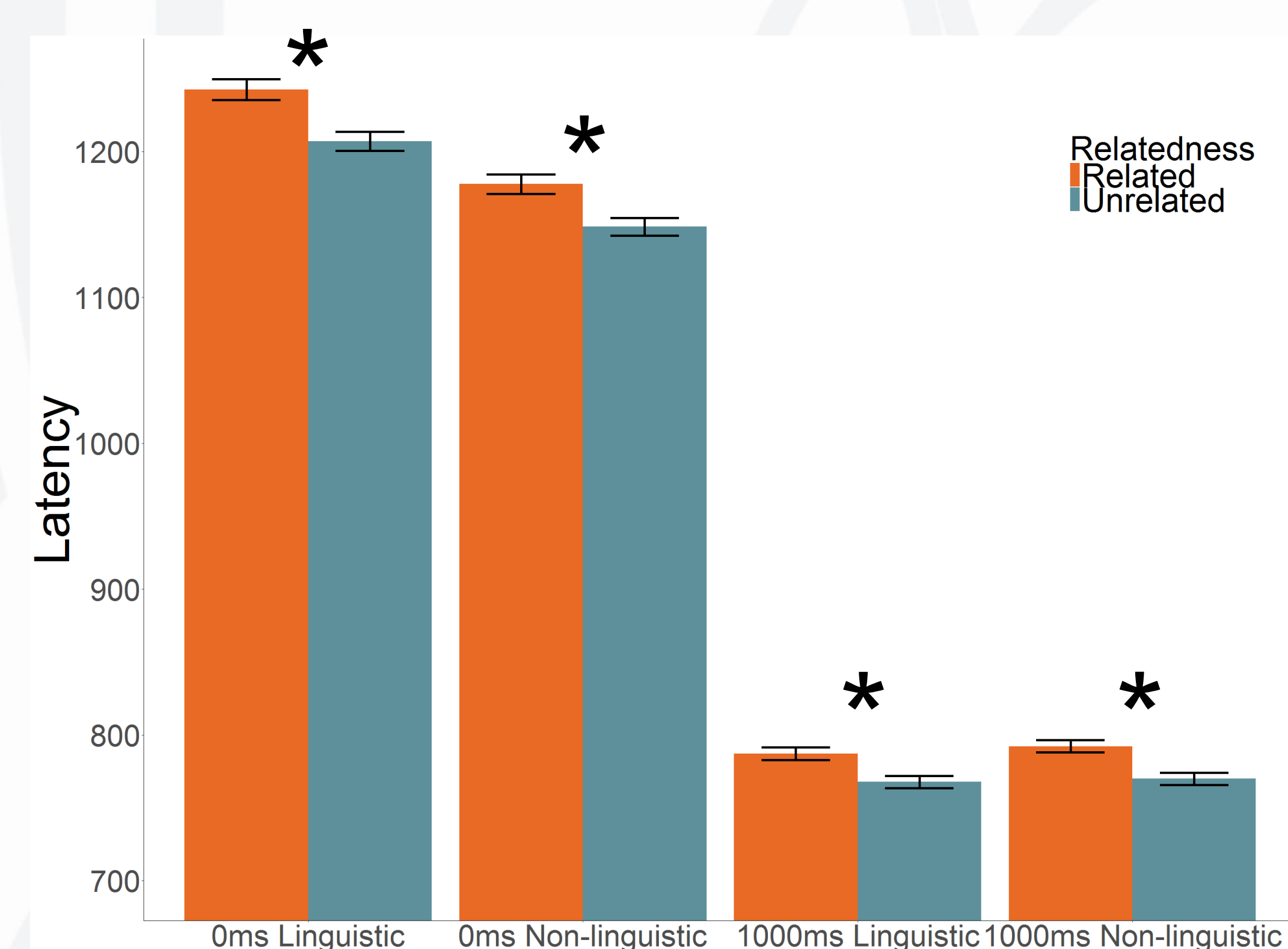
## Discussion

- Lexical selection is carried out serially, and not in parallel with another task, regardless of the type of response (overt or covert) given to task 1 (contrary to [3]), or of whether both tasks are linguistic or not.
- General interference arises when combining two linguistic tasks compared to one linguistic and one non-linguistic task.
- The task choice paradigm is susceptible to individual participant strategies.
- **Results suggest that lexical selection in dialogue should not happen in parallel with comprehension.**

REFS: [1] Bögels, Magyari, & Levinson. (2015). *Scientific reports*, 5. [2] Piai, Roelofs, & Schriefers. (2014). *JEP:LMC*, 40(1). [3] Piai, Roelofs, & Schriefers. (2015). *Acta Psychol*, 157. [4] Fargier, & Laganaro. (2016). *PLoS ONE*, 11(12).

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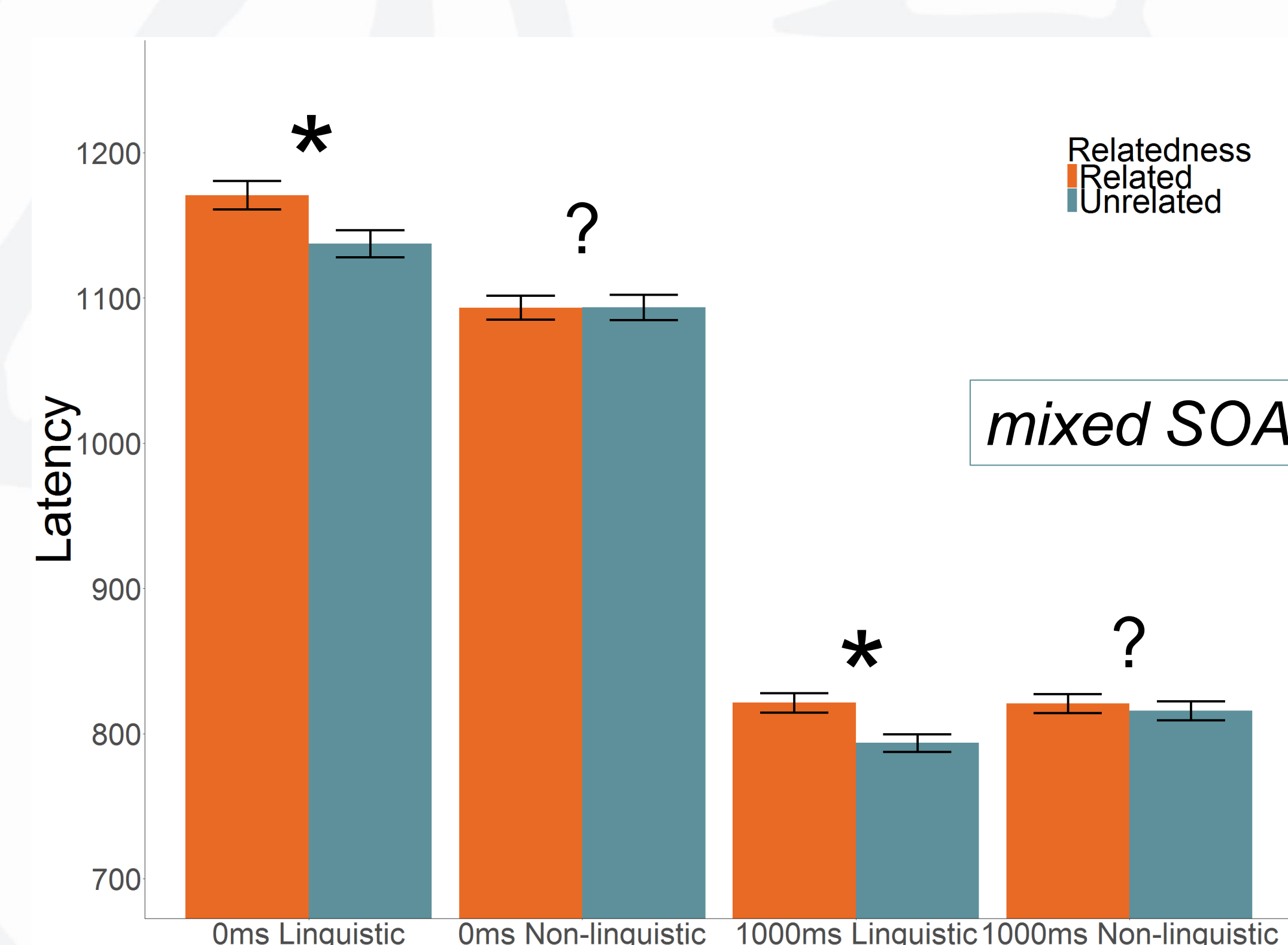
## Experiment 1: Two response



Semantic interference equally found in all conditions, suggesting that **lexical selection and identification are serial processes**.

Latencies longer at 0ms linguistic than 0ms non-linguistic, with no difference at 1000ms.

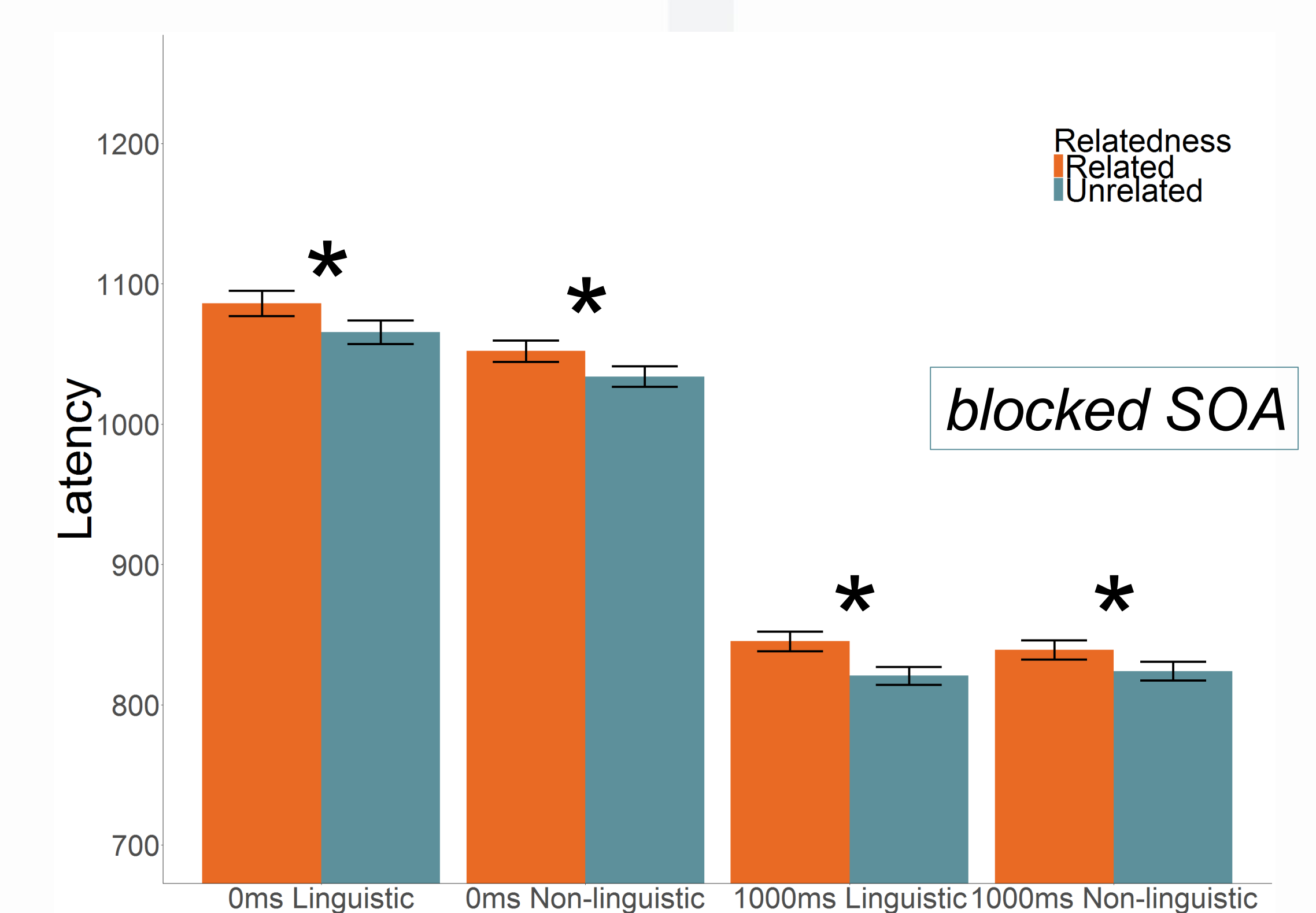
## Experiment 2: One response



Semantic interference only found in linguistic condition. **No replication of parallel lexical selection and tone decision [3]** – because of the SOA mixing?

Latencies longer at 0ms linguistic than 0ms non-linguistic, with no difference at 1000ms.

## Experiment 3: One response



Semantic interference equally found in all conditions, suggesting that **lexical selection and task decision are serial processes**.

Latencies longer at 0ms linguistic than 0ms non-linguistic, with no difference at 1000ms.