

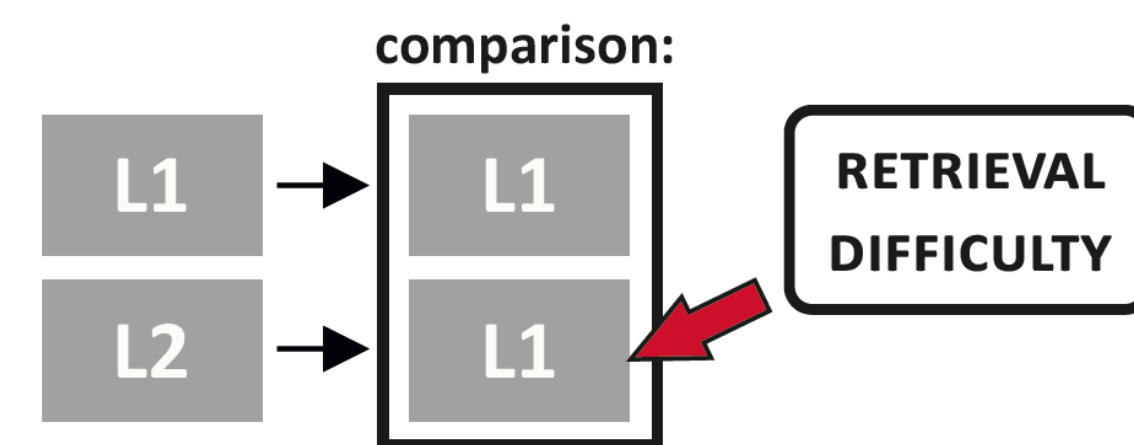
The origins of the second language after-effect in bilingual language production: an ERP investigation

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Background

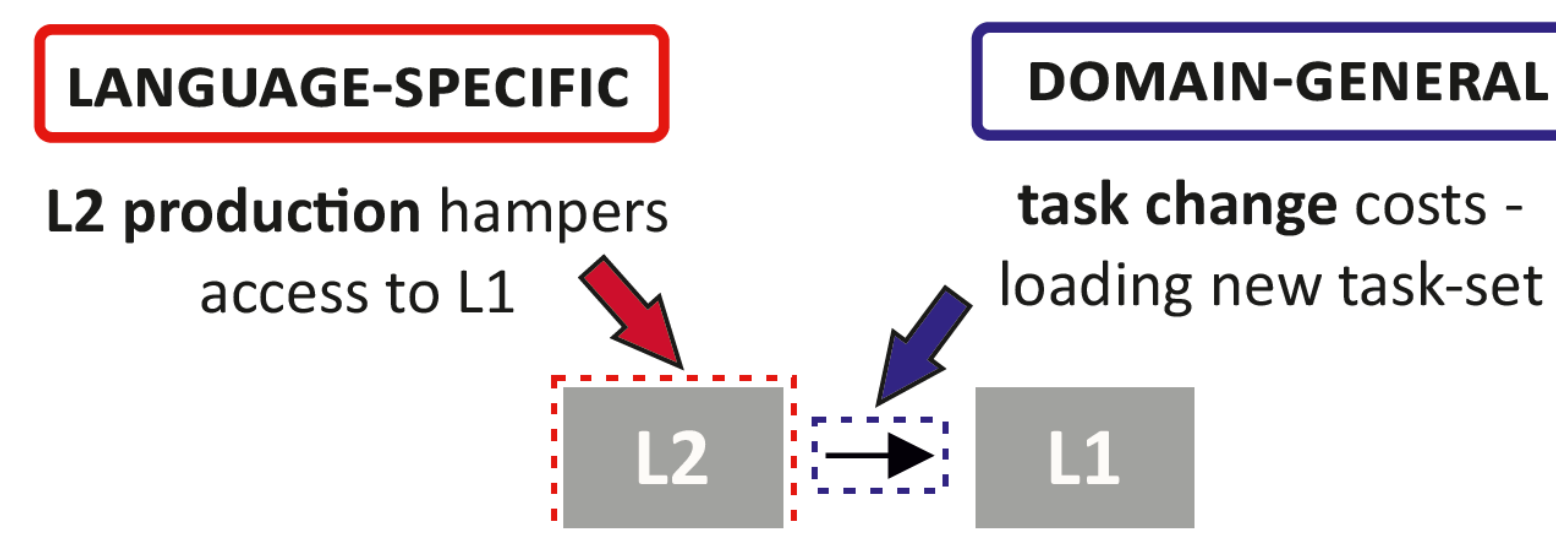
- Speaking in L1 after using L2 results in a word-retrieval difficulty → **L2 after-effect** [1,2]



- L2 after-effect** can be observed:
 - **behaviourally**: longer naming latencies (RTs)
 - **in ERPs**: modulation of components sensitive to word-retrieval difficulty (**P2** [2], **N300** [1])

Research question

IS THE WORD-RETRIEVAL DIFFICULTY DRIVEN BY PREVIOUS EXPOSURE TO L2 OR BY A MERE CHANGE OF TASK?

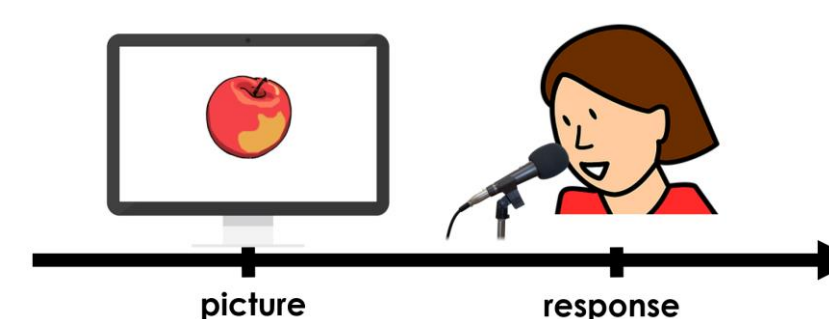


Is the word-retrieval difficulty driven by **previous exposure To L2** or is it also influenced by the mere **change of task**?

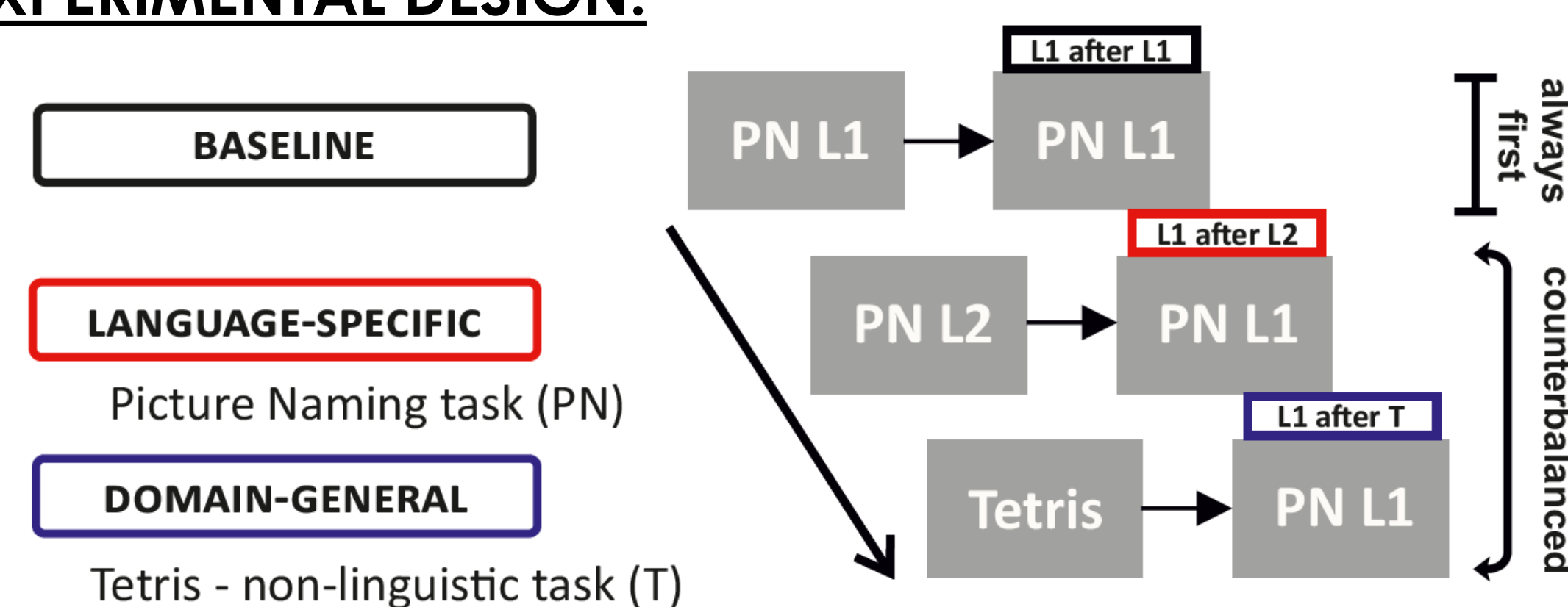
Method

PARTICIPANTS: 33 Polish (L1) – English (L2) unbalanced bilinguals

CRITICAL TASK: blocked Picture Naming



EXPERIMENTAL DESIGN:

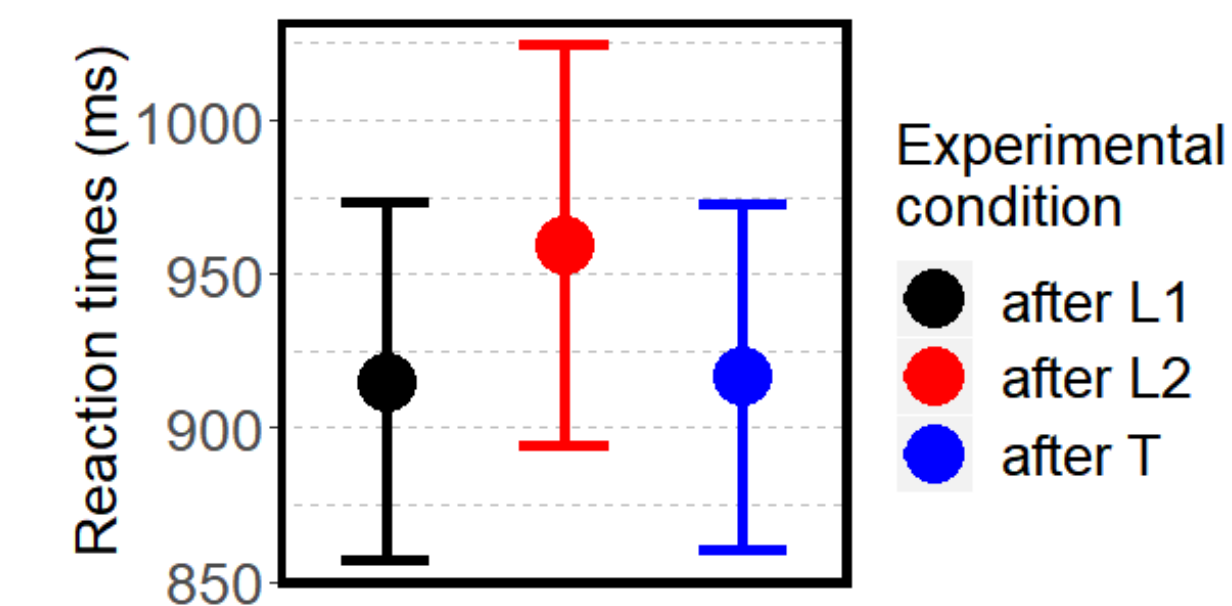


Results

L2 after-effect: language-specific or domain-general?

BEHAVIOURAL RESULTS:

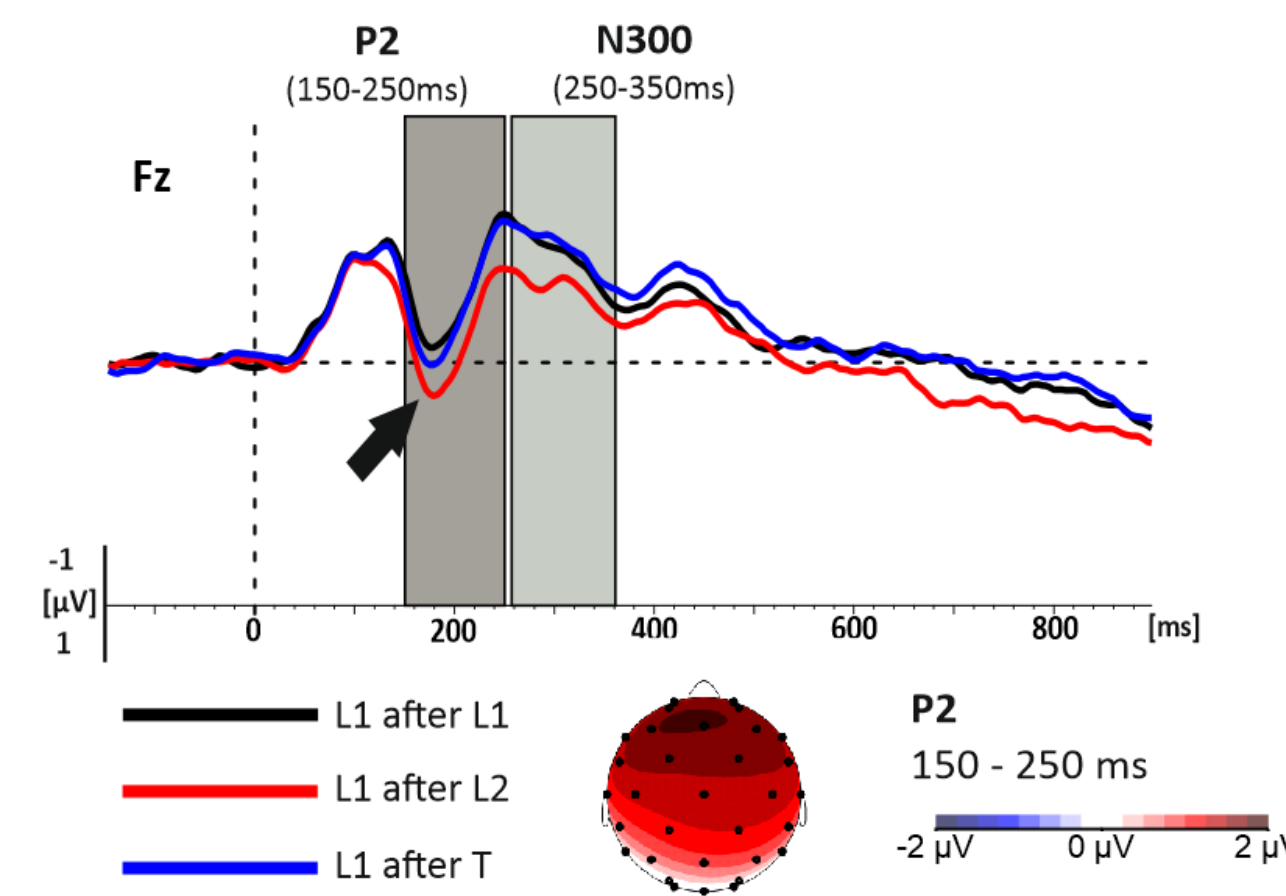
- No** slow-down of naming **after L2**
- No** slow-down of naming **after NLT** → Significant effect of **trial number**: systematic rise of naming latencies throughout the experiment



ELECTROPHYSIOLOGICAL RESULTS:

P2 time-window (150-250 ms):

- Significant effect of preceding language:**
 - L1 after L2 more positive than baseline
- No significant effect of task-change:**
 - no difference between L1 after NLT and baseline amplitude



N300 time-window (250-350 ms):

- Uninterpretable due to spill-over of the earlier effect

SUMMARY:

- **Inconclusive behavioural results:**
 - No differences between L1 after L2 and L1 after NLT → **trial effect**
 - Trial effect** might conceal the L2 after-effect and task-change effect due to lack of full counterbalance: **baseline condition was always completed first**
- **Electrophysiological results:** what drives the effect in P2 time-window?
 - **lexical access difficulty** – „production P2” [4]?
 - **trial-effect** – **cumulative semantic interference** [3]?

Exploratory analysis: trial effect

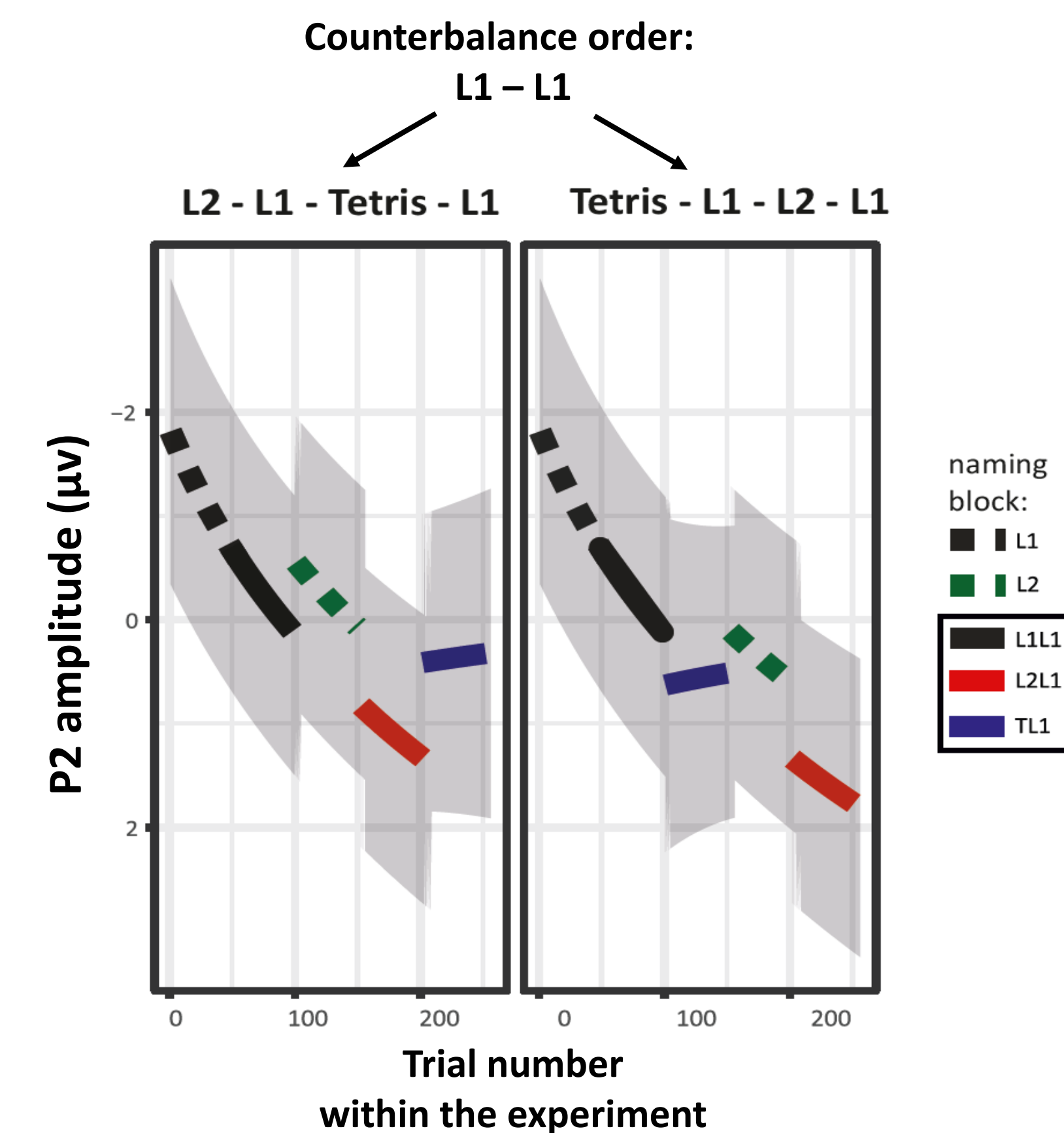
Comparison of **L1 after L2** and **L1 after T** against **L1 after L1** (baseline) can be **confounded by the trial number** since the baseline block was **always completed first** within the experiment.

AIM OF THE EXPLORATORY ANALYSIS:

- **identify factors which modulate the P2 amplitude**
 - Cumulative semantic interference? – **trial number**
 - Word-retrieval difficulty? – **preceding language**
 - Language of naming? – **L1 vs L1**

RESULTS:

- **Trial-base increase** of the P2 amplitude through the entire experiment
- **Word-retrieval difficulty:** no effect of preceding language
- **Language of naming:** overall - smaller amplitude of the P2 in L2 compared to L1
- **Additionally: disruption** of trial-base increase of the P2 amplitude in **L1 naming after Tetris!**



Conclusions

BEHAVIOURAL RESULTS:

- Task change did not result in word-retrieval difficulty of subsequent L1 naming
- No effect of **preceding language?**
- Trial-base increase of **RTs** can obliterate the **L2 after-effect**
 - It might reflect the uncontrolled cumulative semantic interference [3]

ELECTROPHYSIOLOGICAL RESULTS:

- Early processes in Picture Naming are strongly affected by **trial-based** effect:
 - Cumulative semantic interference [3]?
 - **Methodological implications** for ERP experiments using picture naming task:
 - conditions of comparison should **not be confounded with trial number**
- When controlling for **trial number**: **no L2 after-effect in P2 time-window**
 - **P2 modulation** does not reflect **word-retrieval difficulty** [4]
 - It is affected by **language of naming** – more positive for L1 than L2

OUTSTANDING QUESTIONS:

1. What is the ERP correlate of L2 after-effect?
2. Under which conditions can the L2 after-effect be reliably observed?

