

Theoretical motivation

- Lateral inhibition is a core part of many cognitive processes such as attention, decision making, categorization and language.
- Example: inter-lexical competition during spoken word recognition.
- Is this inhibition susceptible to change?

Background

- During spoken word recognition more active words suppress less active words (Dahan et al, 2001; McClelland & Elman, 1986).
- Inter-lexical inhibition is established from the earliest moments of word learning (Kapnoula et al, 2013, though see Dumay & Gaskell, 2007).
- However, there are individual differences in the pattern of competition resolution with clinical populations having greater **difficulty suppressing competitors**.
- Adolescents with **poor language abilities** have greater difficulty suppressing lexical competitors (McMurray, Samelson, Lee & Tomblin, 2010; Mainela-Arnold, Evans & Coady, 2008).



Question:

- Can lateral inhibition change via training?
- Could provide avenues for remediation
- Reveals multiple paths to plasticity within spoken word recognition.

Method

Design:

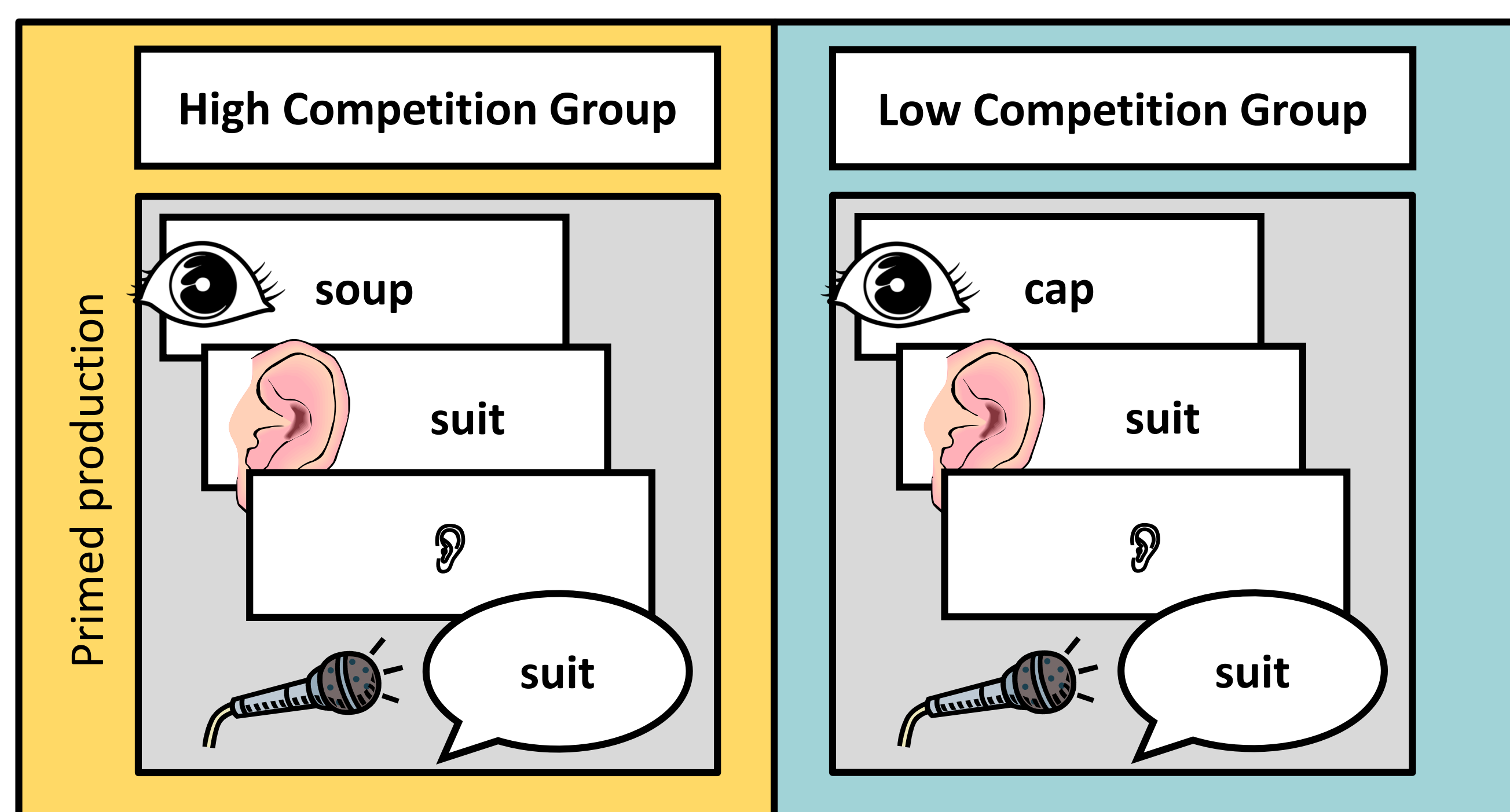
- We **manipulated training** (btw subjects) to induce higher versus lower levels of competition between word pairs .
- Then tested the effect of training on lateral inhibition between words using the visual world paradigm.

Subjects: 74 undergraduate students/paid subjects

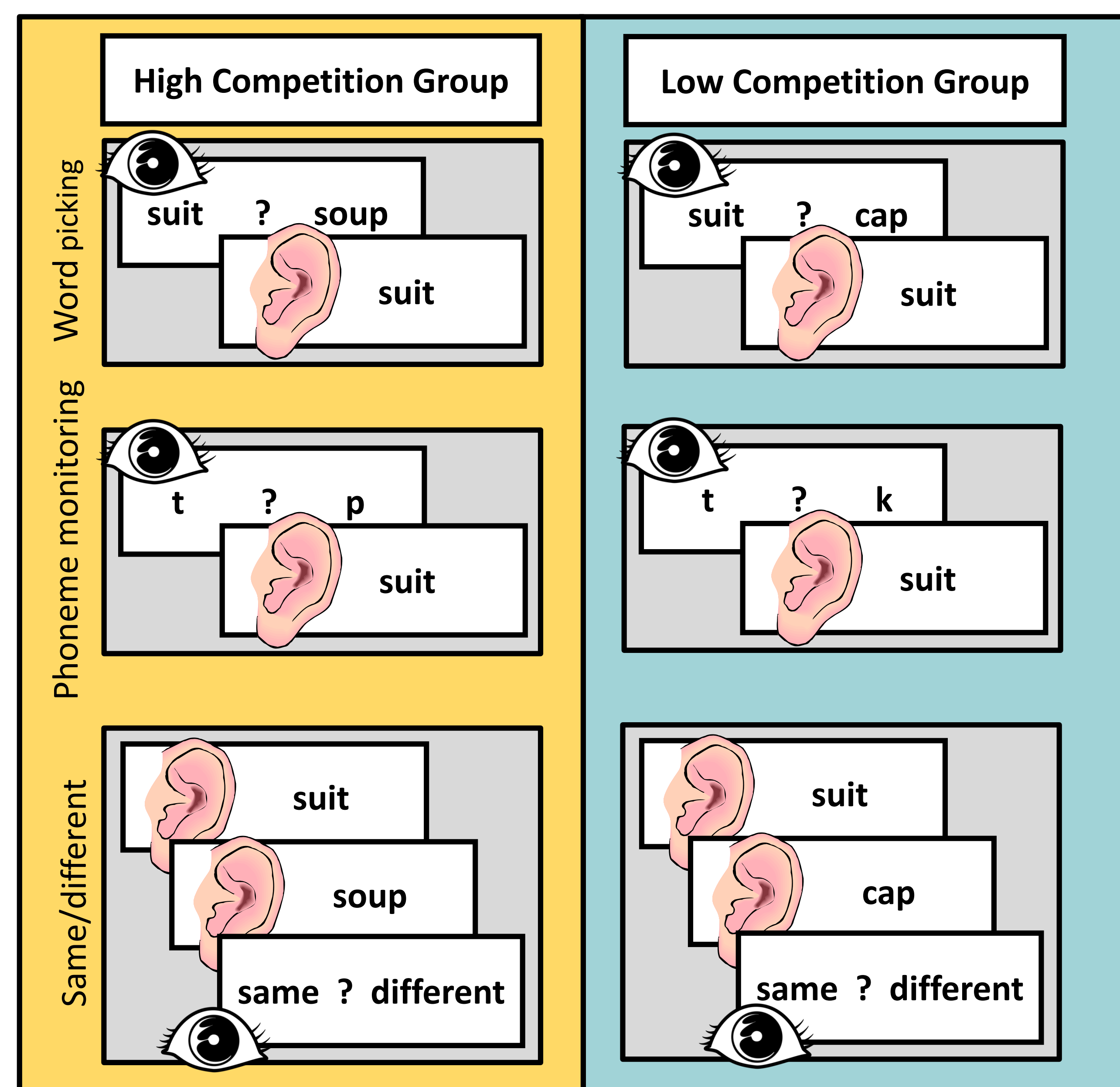
Materials: 28 monosyllable word pairs (e.g. suit-soup)

Training

Participants in both groups were exposed to the **same words** and performed the **same (4) tasks**, however:

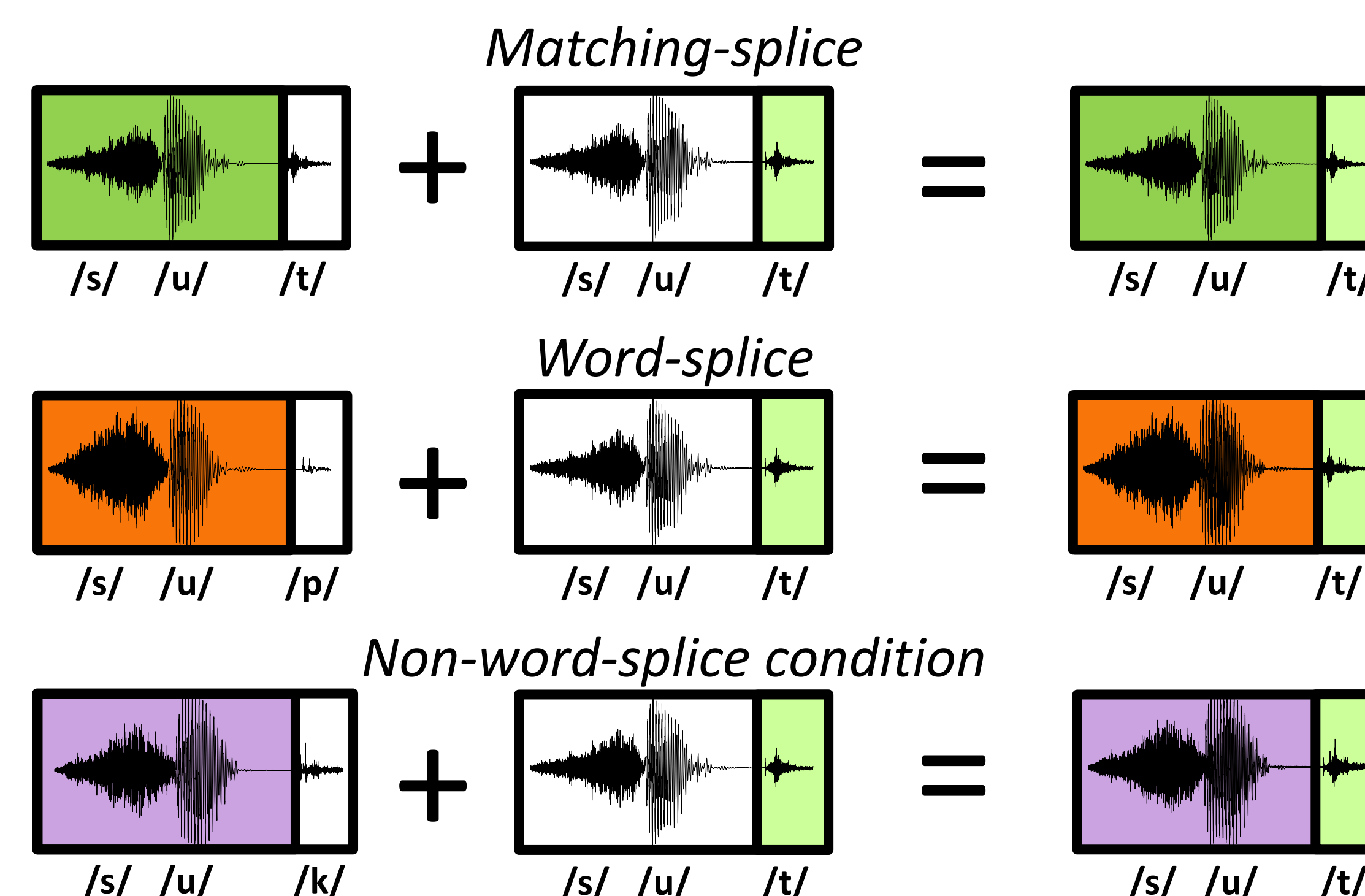


Method (continued)

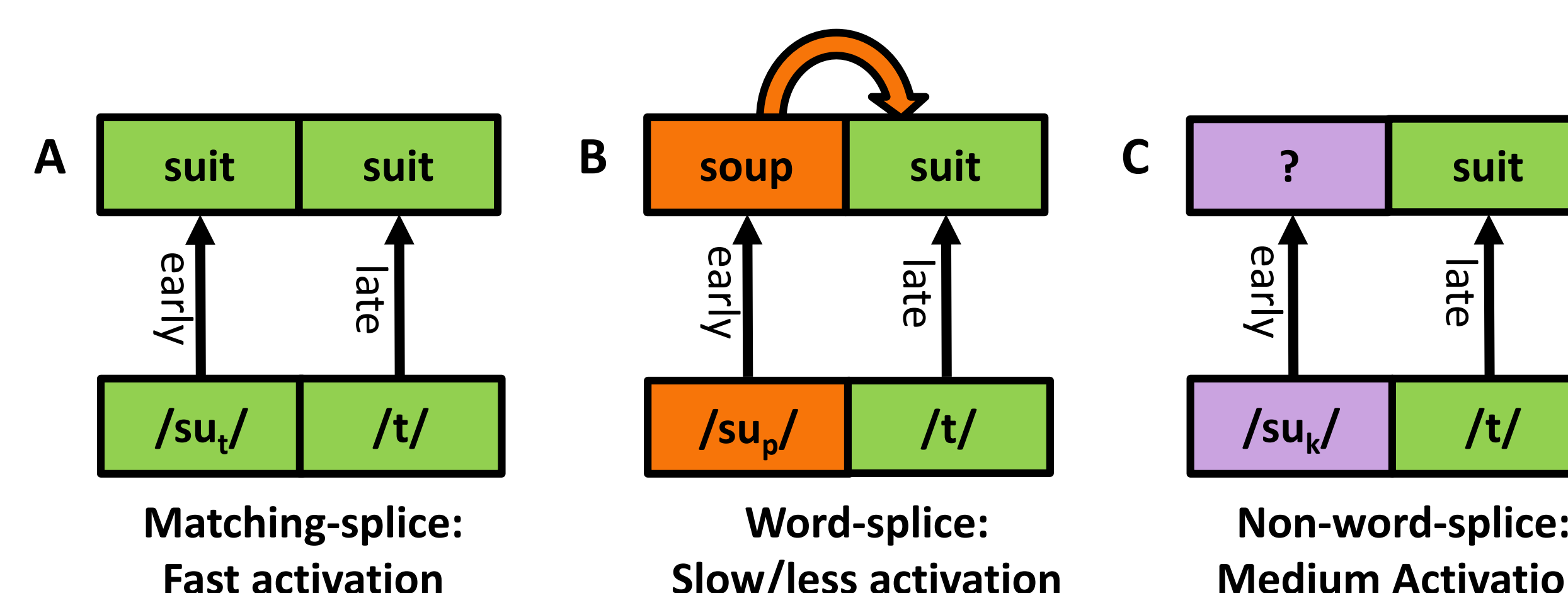


Testing

- Following the Dahan, Magnuson & Tanenhaus (2001) paradigm, the target word was presented in **three splicing conditions**:

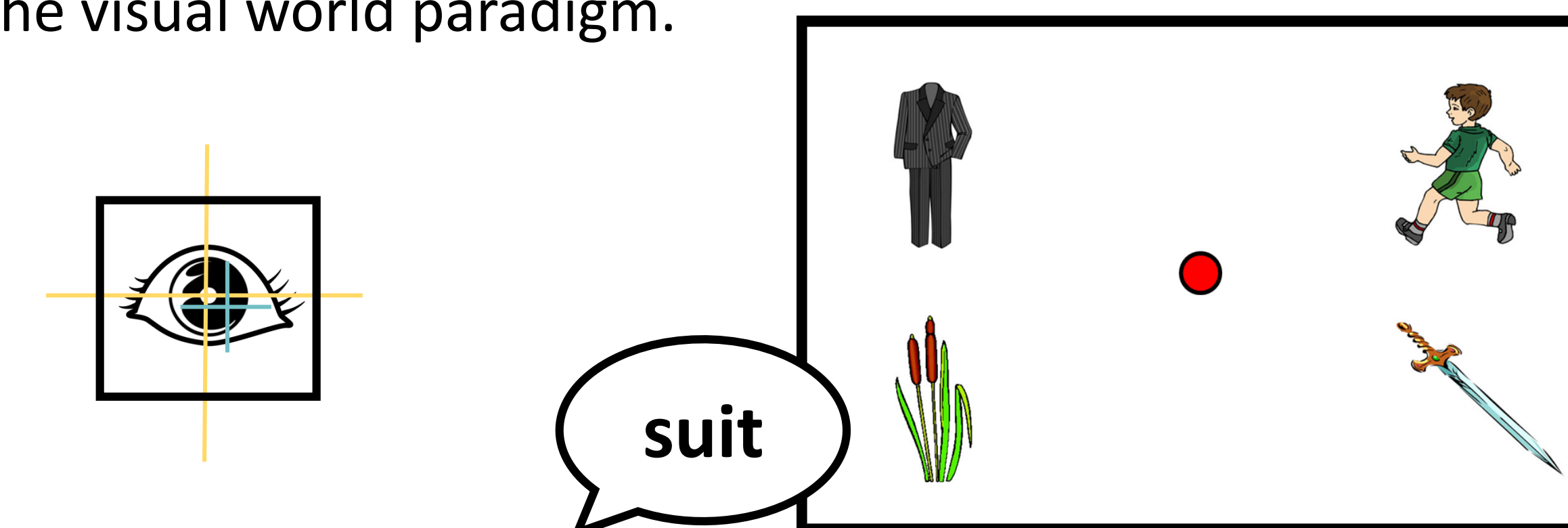


- Splicing → **co-articulatory mismatch** btw vowel and final consonant
- In the **word-splice** the competitor (*soup*) is more active and inhibits the target (*suit*) → less/slower target activation (see B).



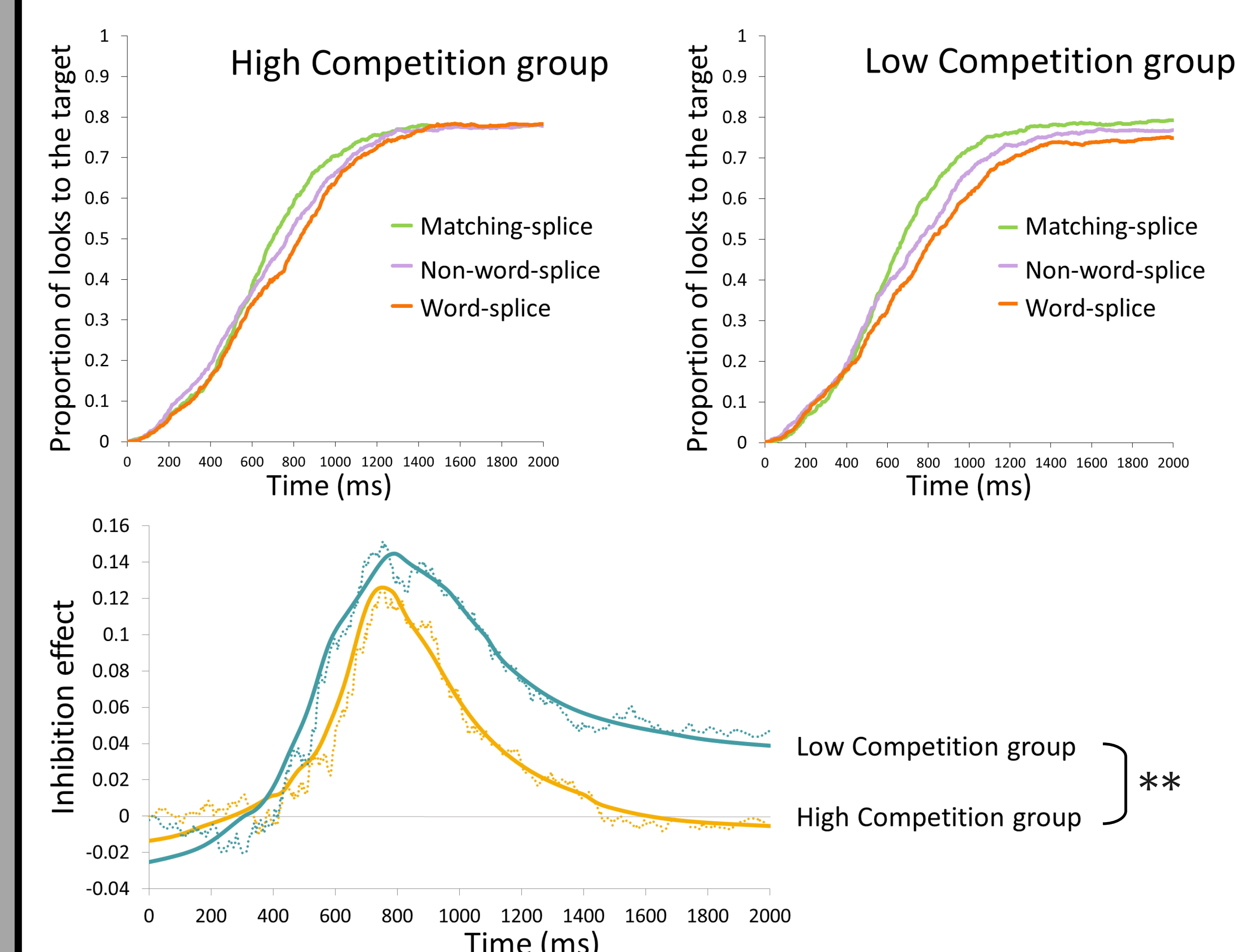
Method (continued)

- To measure on-line activation of words we used the visual world paradigm.



- **Will training alter the degree and/or timecourse of inhibition?**

Results



- By the end of the trial, suppression of the target was not significant from zero (0), but **only for the High Competition (HC) group**.
- The **HC group** seems to **recover better** from lexical competition.

Conclusions

- Training with more inter-lexical competition resulted in better competition resolution later in testing.
- These results suggest that training can alter the way lexical representations interact during online processing.

Implications and further directions:

- These results may help us understand impairments related to atypical patterns of inter-lexical competition.
- Clear implications for competition and competition resolution outside spoken word recognition.

References

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