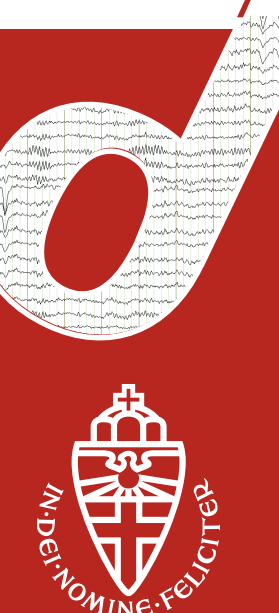


How listeners process accentuation of referential utterances in visual and linguistic contexts: An ERP study

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Introduction

Question: Are listeners sensitive to accents marking contrasts in visual or linguistic contexts?

Missing Accent Hypothesis: listeners are sensitive to missing, but not superfluous accents

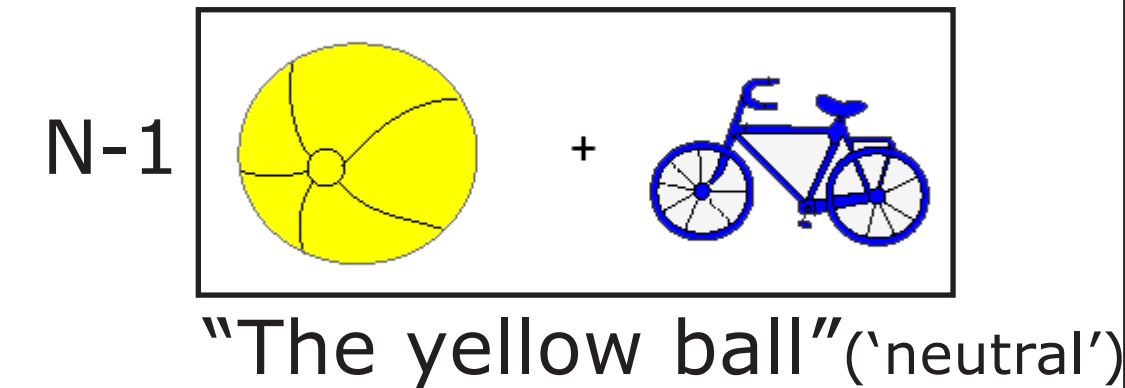
ERPs: A few comprehension studies found processing difficulties for accentuation that does not match the preceding linguistic context [1,2]. No ERP studies on accents in visual contexts.

Methods

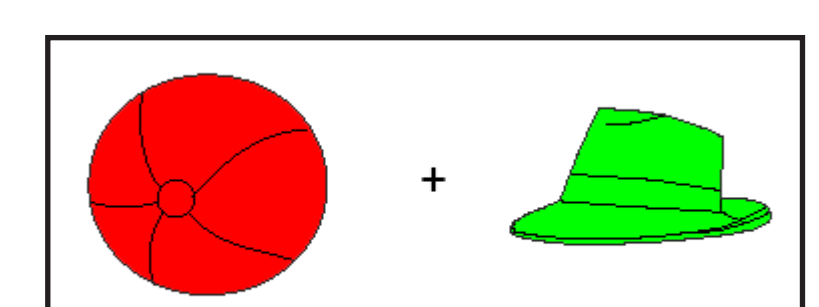
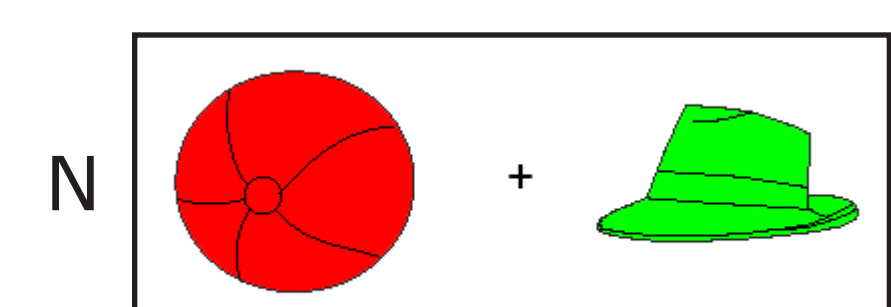
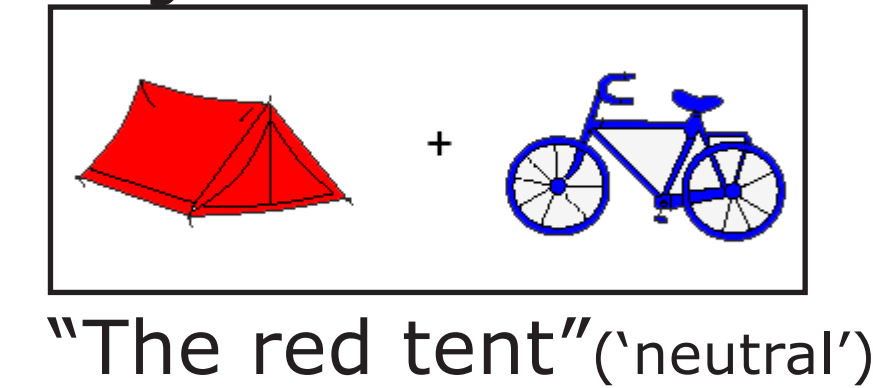
- 24 participants: right-handed, native Dutch
- trial sequence:
 - 2 object display (1500 msec)
 - pause with fixation (500 msec)
 - auditory NP referring to one of the objects
- ERPs time-locked to NP onset
- factors: (for linguistic and visual context)
 - contrastive information (color, object)
 - accent: (on adjective: H*L -;
on noun: - H*L; 'neutral': H*L !H*L)

Linguistic context

color contrastive



object contrastive



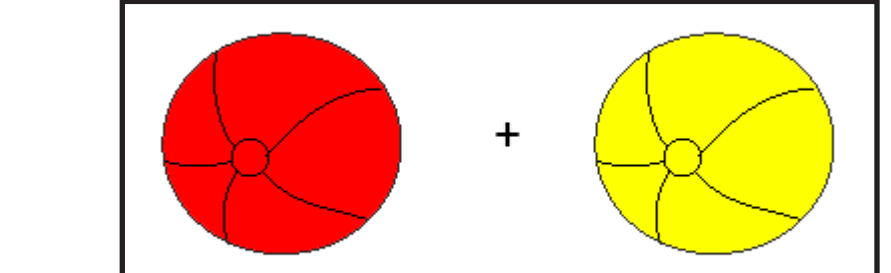
✓ "The RED ball"
✗ "The red BALL"
"The red ball" ('neutral')

✗ "The RED ball"
✓ "The red BALL"
"The red ball" ('neutral')

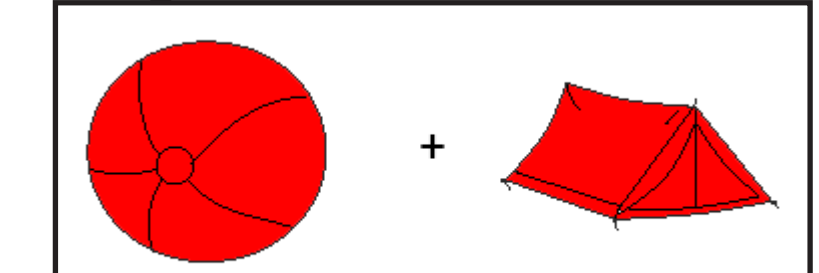
✓ match
✗ mismatch

Visual context

color contrastive



object contrastive



✓ "The RED ball"
✗ "The red BALL"
"The red ball" ('neutral')

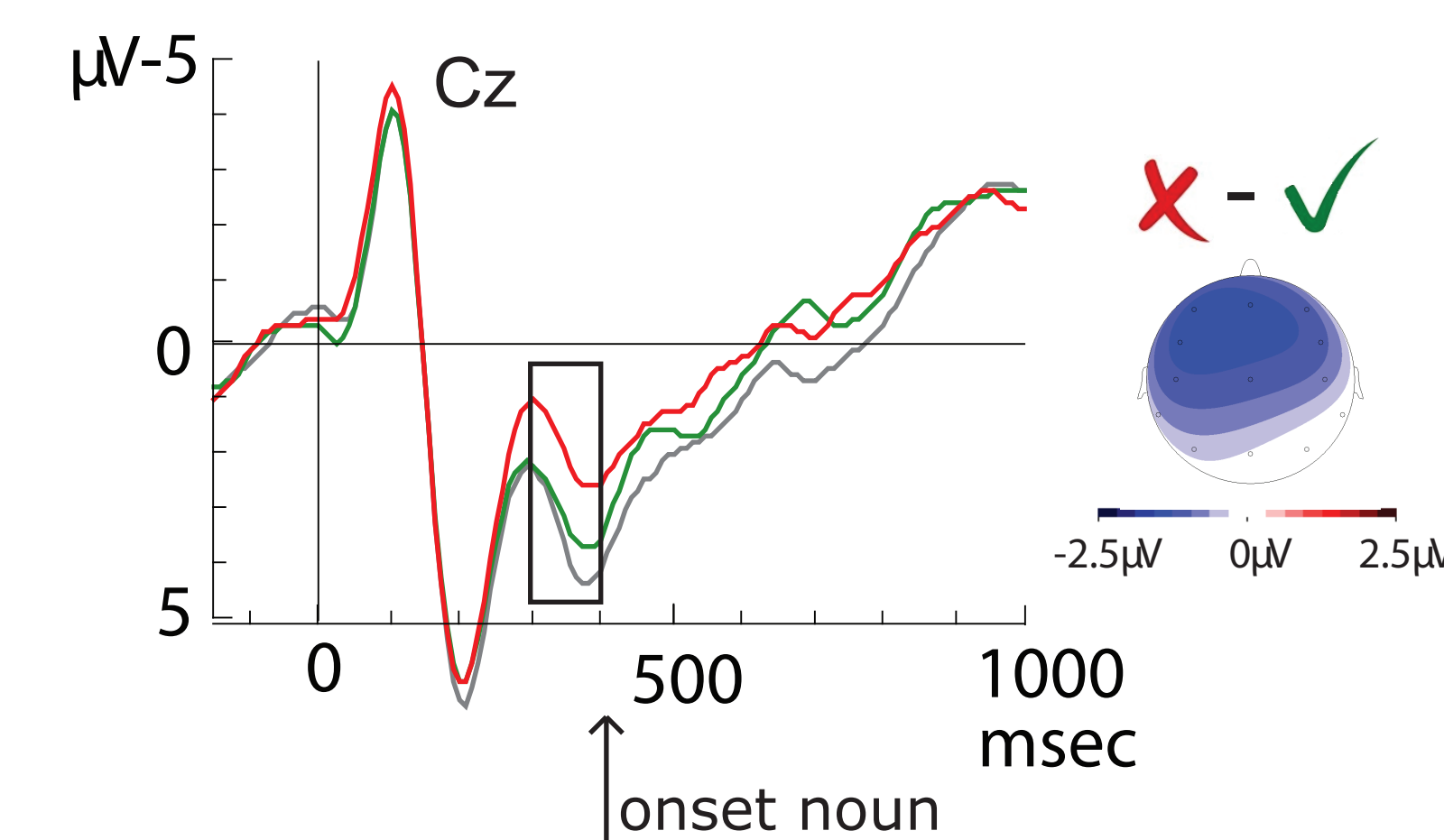
✗ "The RED ball"
✓ "The red BALL"
"The red ball" ('neutral')

- task: (20% of trials) on which side was the referred-to object (left/right)?

ERP results: Linguistic Context

Color contrastive

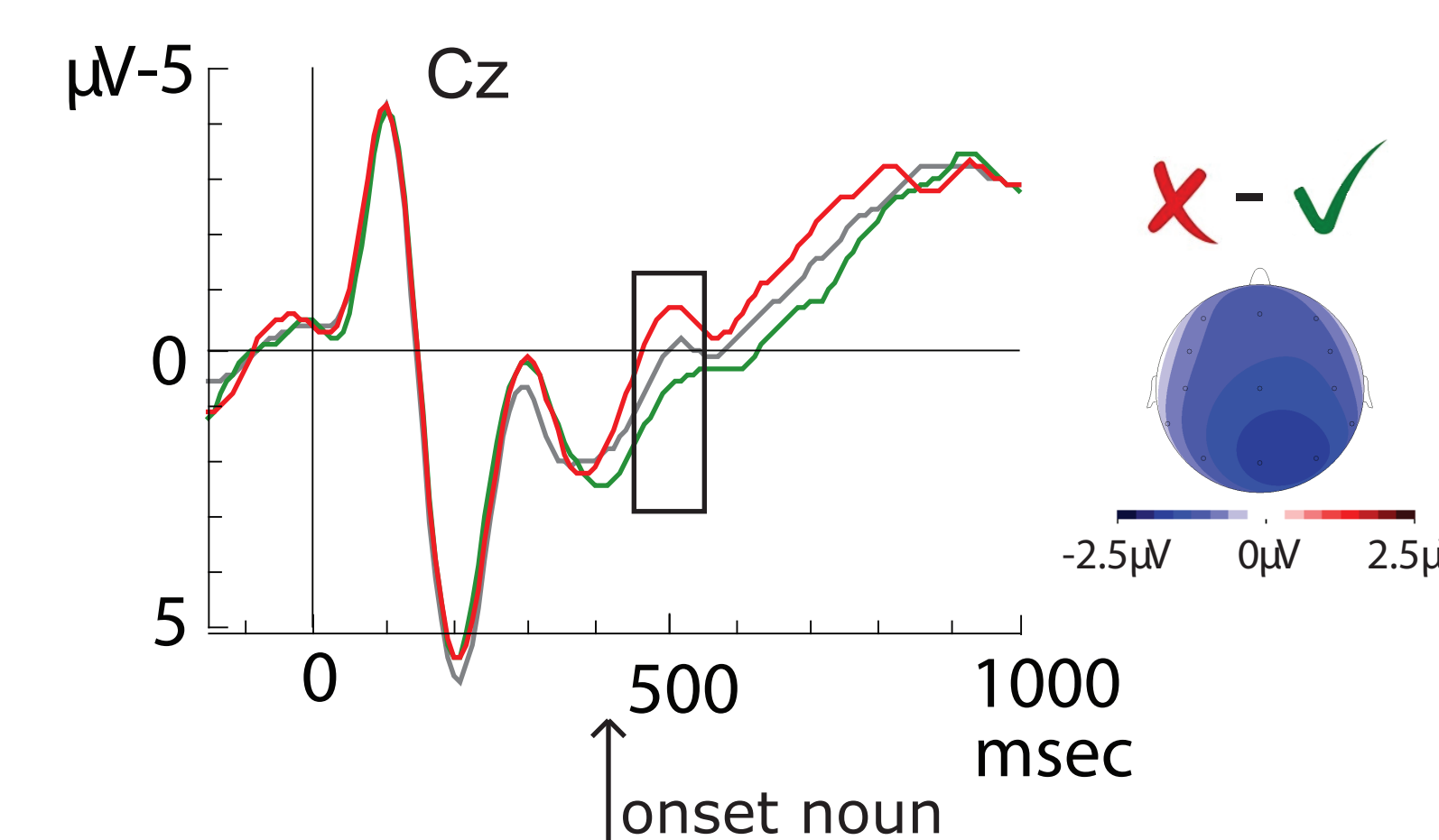
- "The RED ball" ✓
- "The red BALL" ✗
- "The red ball" (neutral)



Early negativity (300-400 msec) for a MISSING accent on the adjective ("red") relative to an expected contrastive accent ("RED") or neutral accent.

Object contrastive

- "The RED ball" ✗
- "The red BALL" ✓
- "The red ball" (neutral)

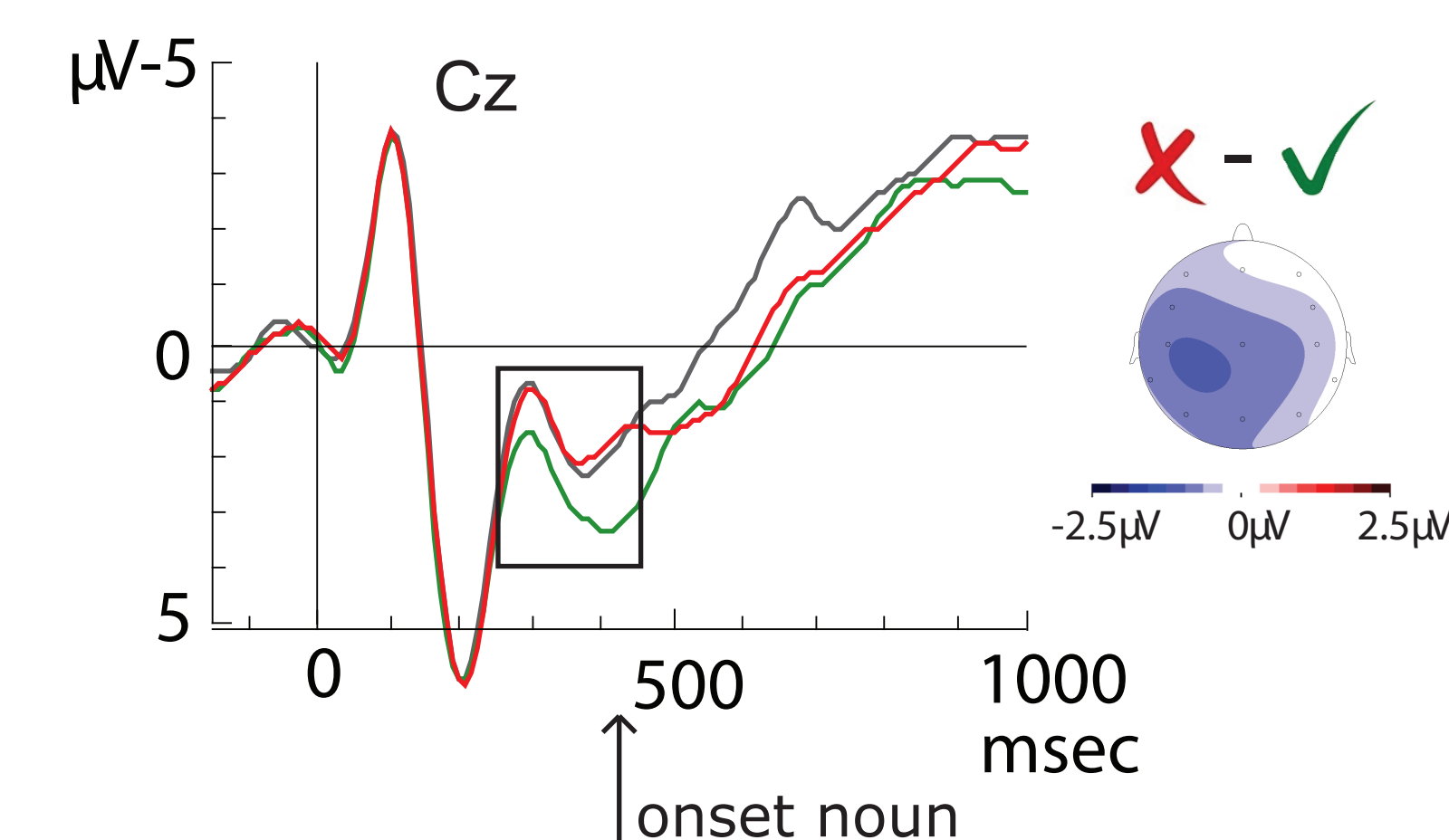


Later negativity (450-550 msec) for a MISSING accent on the noun ("ball") or a neutral accent relative to an expected contrastive accent ("BALL").

ERP results: Visual Context

Color contrastive

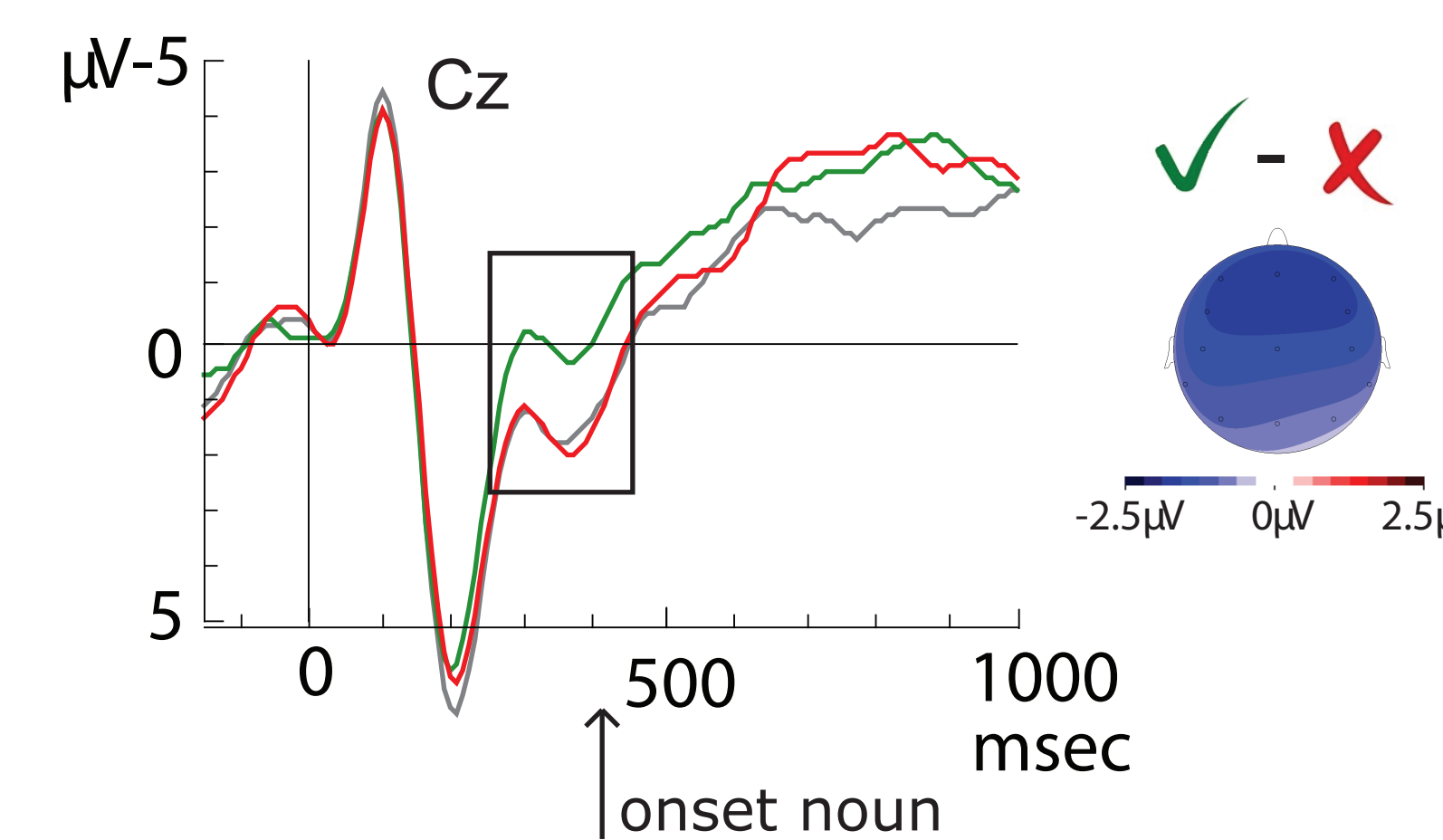
- "The RED ball" ✓
- "The red BALL" ✗
- "The red ball" (neutral)



Early negativity (250-450 msec) for a MISSING accent on the adjective ("red") and a neutral accent relative to an expected contrastive accent ("RED").

Object contrastive

- "The RED ball" ✗
- "The red BALL" ✓
- "The red ball" (neutral)



Early negativity (250-450 msec) for a CORRECTLY absent accent ("red") relative to a SUPERFLUOUS accent ("RED") and a neutral accent.

Discussion

Linguistic context

Support for the Missing Accent Hypothesis:

- a missing pitch accent on a contrastive element leads to processing difficulties right at the position of the missing accent
- superfluous accents on repeated information do not lead to on-line processing problems

Intermediate ('neutral') accentuation:

- interpreted as an expected contrastive accent on the adjective due to strongly constraining linguistic context
- interpreted as a missing accent on the noun in the context of the overall accentuation of the utterance

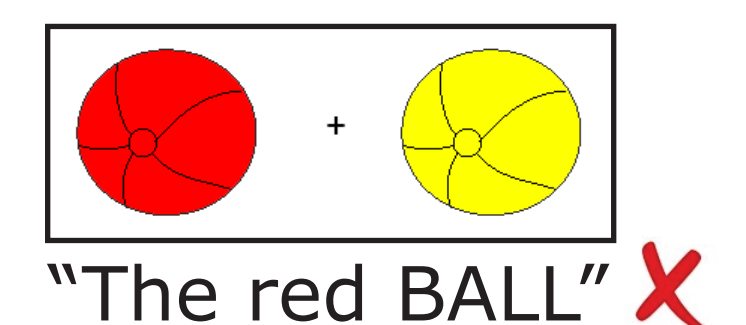
Support for the Missing Accent Hypothesis:
Listeners don't want to miss important information!

Visual context

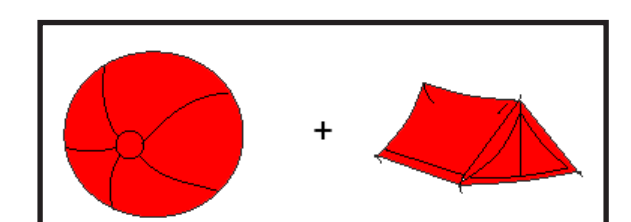
Some support for the Missing Accent Hypothesis

when color is contrastive relative to the context

- processing difficulty for missing and neutral accent on adjective



Different pattern when object is contrastive relative to the context



Speculation: related to overspecification of the color

- color is uninformative in this context
- some accent on adjective provides communicative reason for mentioning the color
- overspecification and deaccentuation lead to processing difficulty

No consistent pattern for the visual context but some support for the Missing Accent Hypothesis

References

- [1] Magne, C., Astésano, C., Lacheret-Dujour, A., Morel, M., Alter, K., & Besson, M. (2005). On-line processing of "pop-out" words in spoken French dialogues. *Journal of Cognitive Neuroscience*, 17, 740-756.
- [2] Hruska, C. & Alter, K. (2004). Prosody in dialogues and single sentences: How prosody can influence speech perception. In A. Steube (Ed.), *Information structure: Theoretical and empirical aspects*. De Gruyter: Berlin.

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