Real-time pragmatic processing with a novel lexicon

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What mechanism supports the predictive, contextually situated process of online sentence processing?
Prenominal scalar adjectives (e.g., large) trigger anticipatory eye-movements to the target noun (Sedivy et al., 1999).
[Possibility 1] With visually presented referents, listeners encode an entire NP (e.g., large cup) to predict the use/non-use of an adjective.
[Possibility 2] Listeners can incrementally generate expectations for the use/non-use of an adjective independent of the following noun.
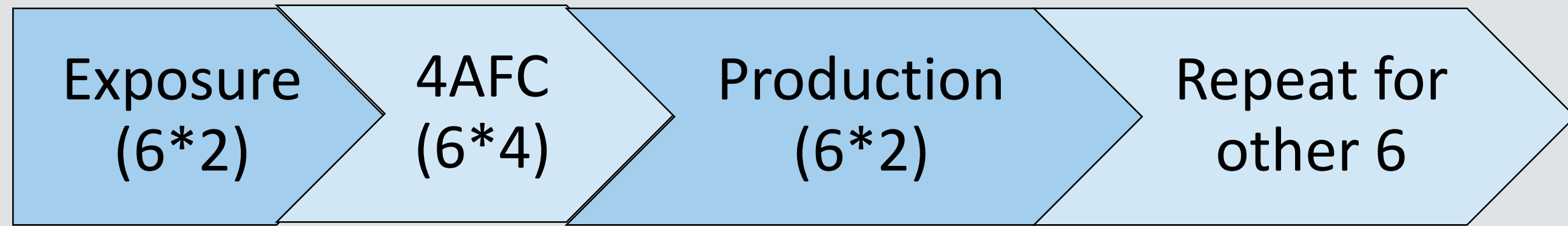We address this question by making the head noun of the NP less available → **Replicating Sedivy et al., (1999) with an artificial lexicon.**
Can native listeners make contrastive inferences based on scalar adjectives with novel nouns?
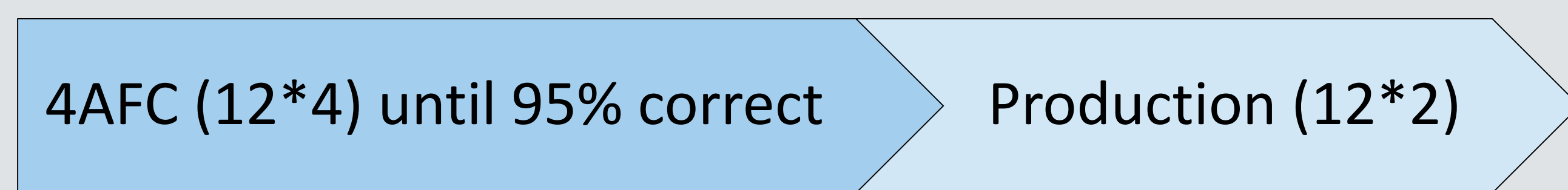
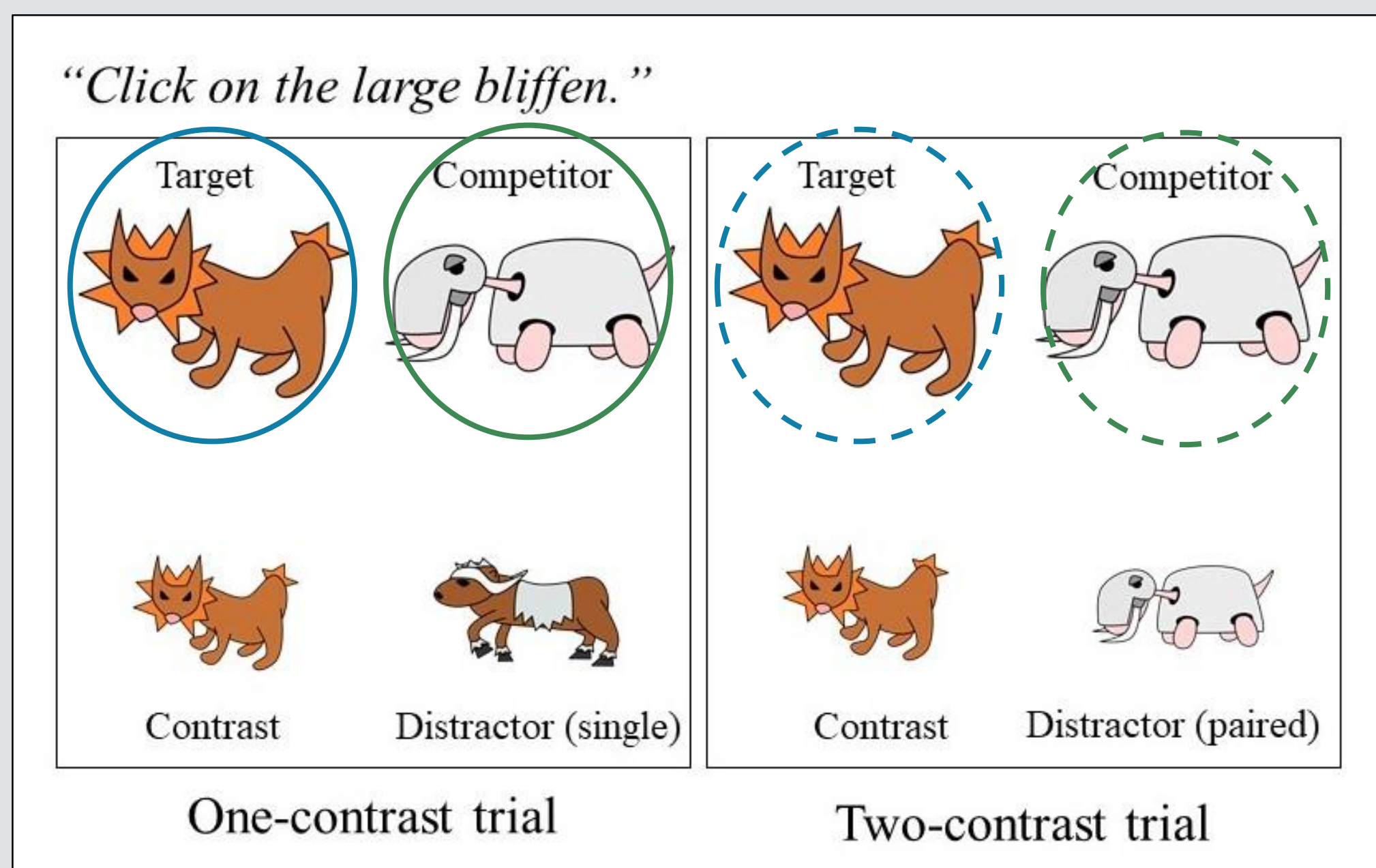## Experiment 1: Learning

Methods (N=48)

Part 1: Artificial Lexicon Learning (12 nonce animals/insects)

Part 2: Artificial Lexicon Testing

Part 3: Eyetracking (12 nonce and 12 real nouns)

"Click on the large bliffen."

Target   Competitor

Contrast   Distractor (single)
One-contrast trial

Target   Competitor

Contrast   Distractor (paired)
Two-contrast trial

24 critical trials
split between
- 12 nonce & 12 real
- one-contrast & two-contrast
- large and small

12 filler trials

Results

Response Accuracy in Part 3

Participants have mastered the 12 nonce nouns after training

Response Latency in Part 3

Their responses to novel words are slower compared to real words

Nonce Words
"Click on the large bliffen."

Real Words
"Click on the large zebra."

Target
— 1-contrast
- - 2-contrast
Competitor

For the nonce words, looks to the target increase prior to the noun more in the one-contrast condition than in the two-contrast condition
→ Distinct interpretations of scalar adjectives depending on visual scenes
→ Contrastive inferences of adjectives even with nonce nouns.

Support for Possibility 2: incremental generation of expectations rather than holistic encoding of an entire NP

Is this because of the particularly high level of mastery and familiarity with the nonce nouns?
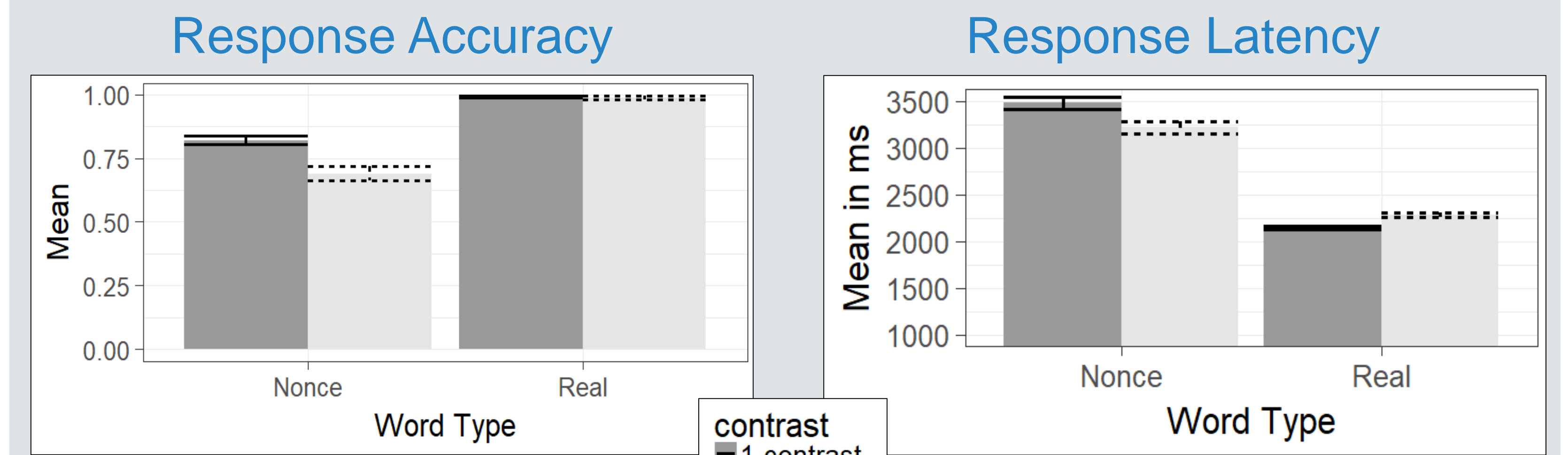
Experiment 2: No Prior Learning

Methods (N=48)

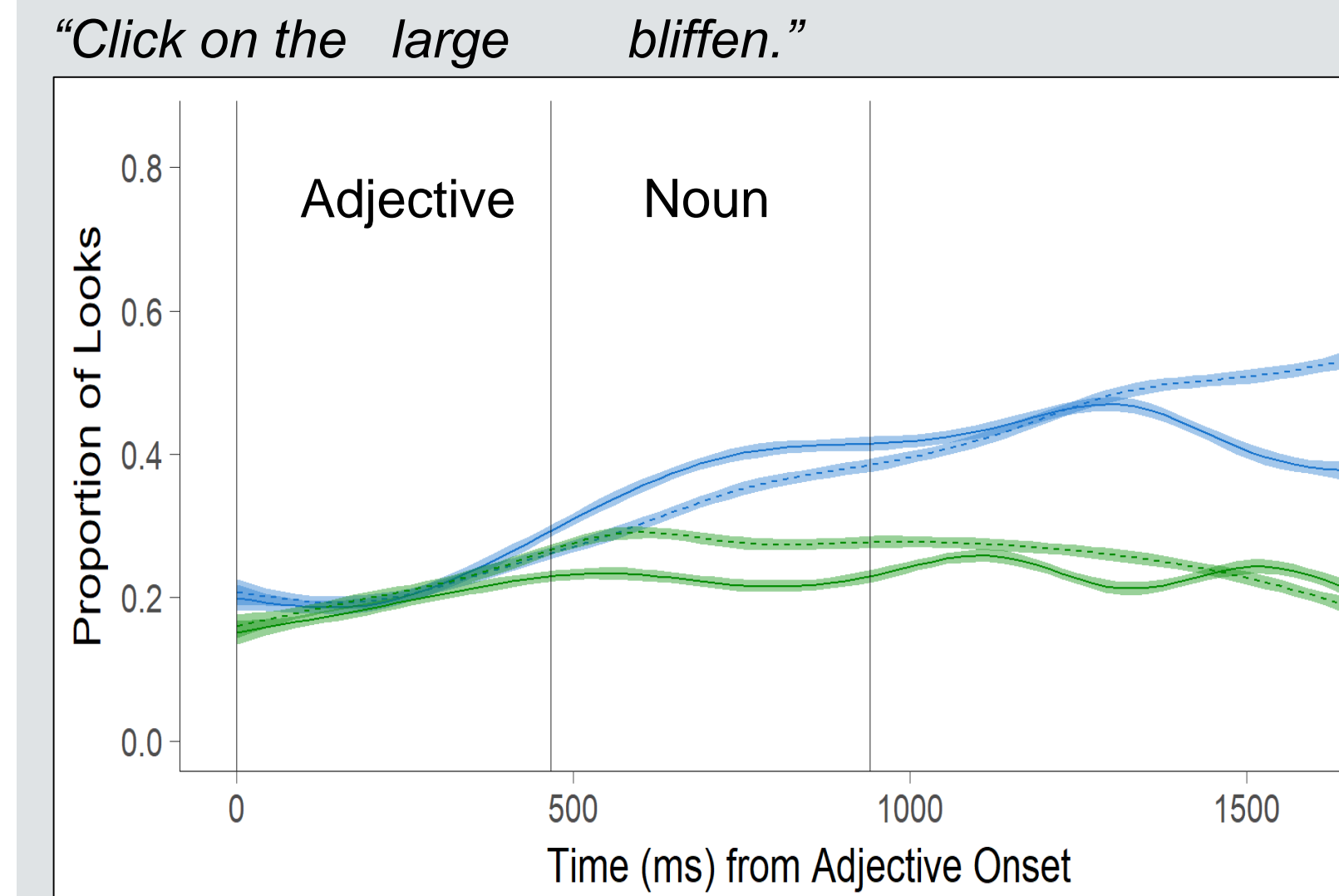Identical to eyetracking in Exp.1 with only brief exposure (12*2)

Results

Response Accuracy
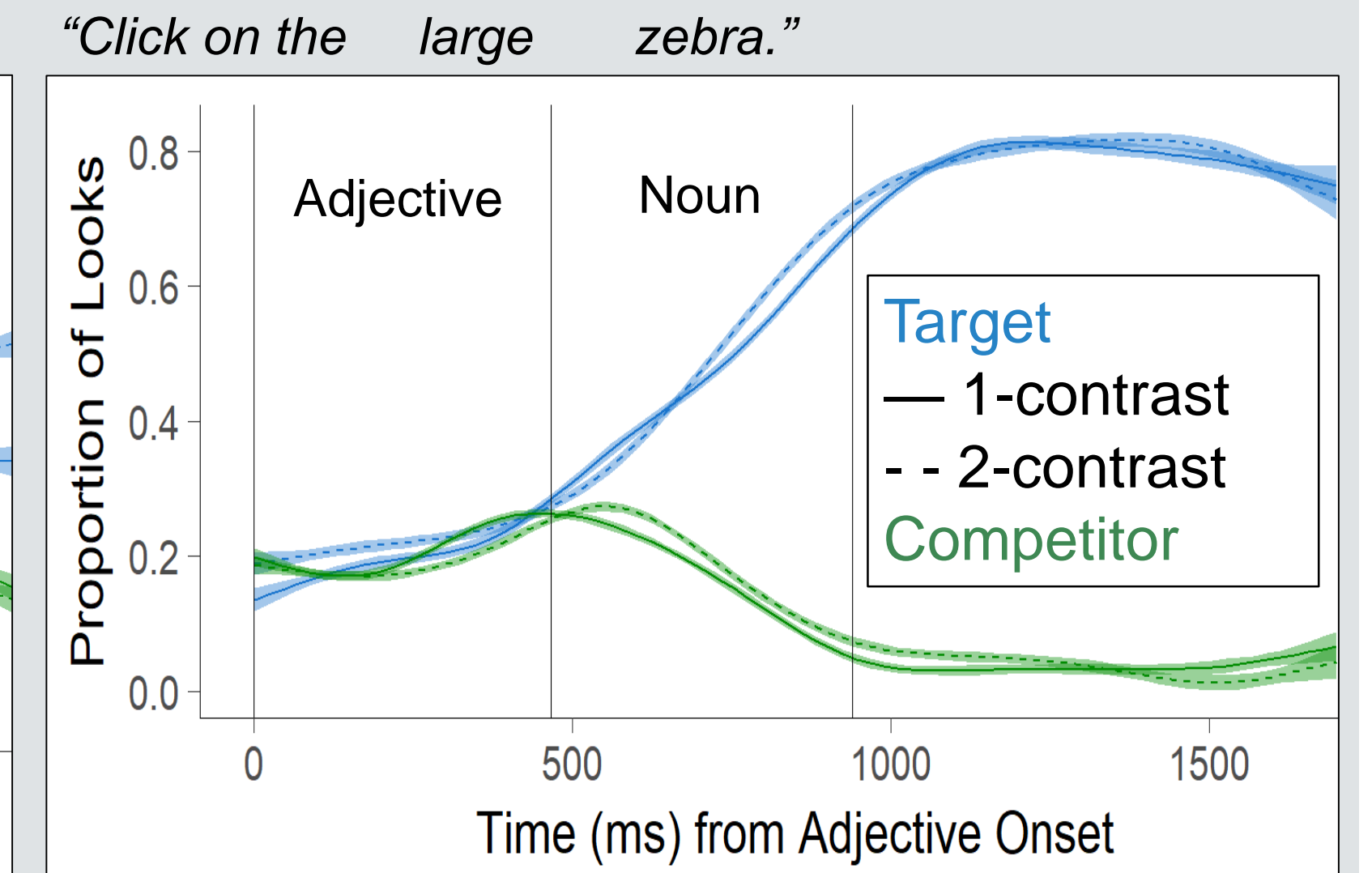

contrast
1-contrast
2-contrast

Accuracy is higher than chance for nonce words, even in the 2-contrast condition

Response Latency

Reaction times for clicks are slower in the nonce trials, while the eyetracking data shows no delay

Nonce Words
"Click on the large bliffen."

Real Words
"Click on the large zebra."

Target
— 1-contrast
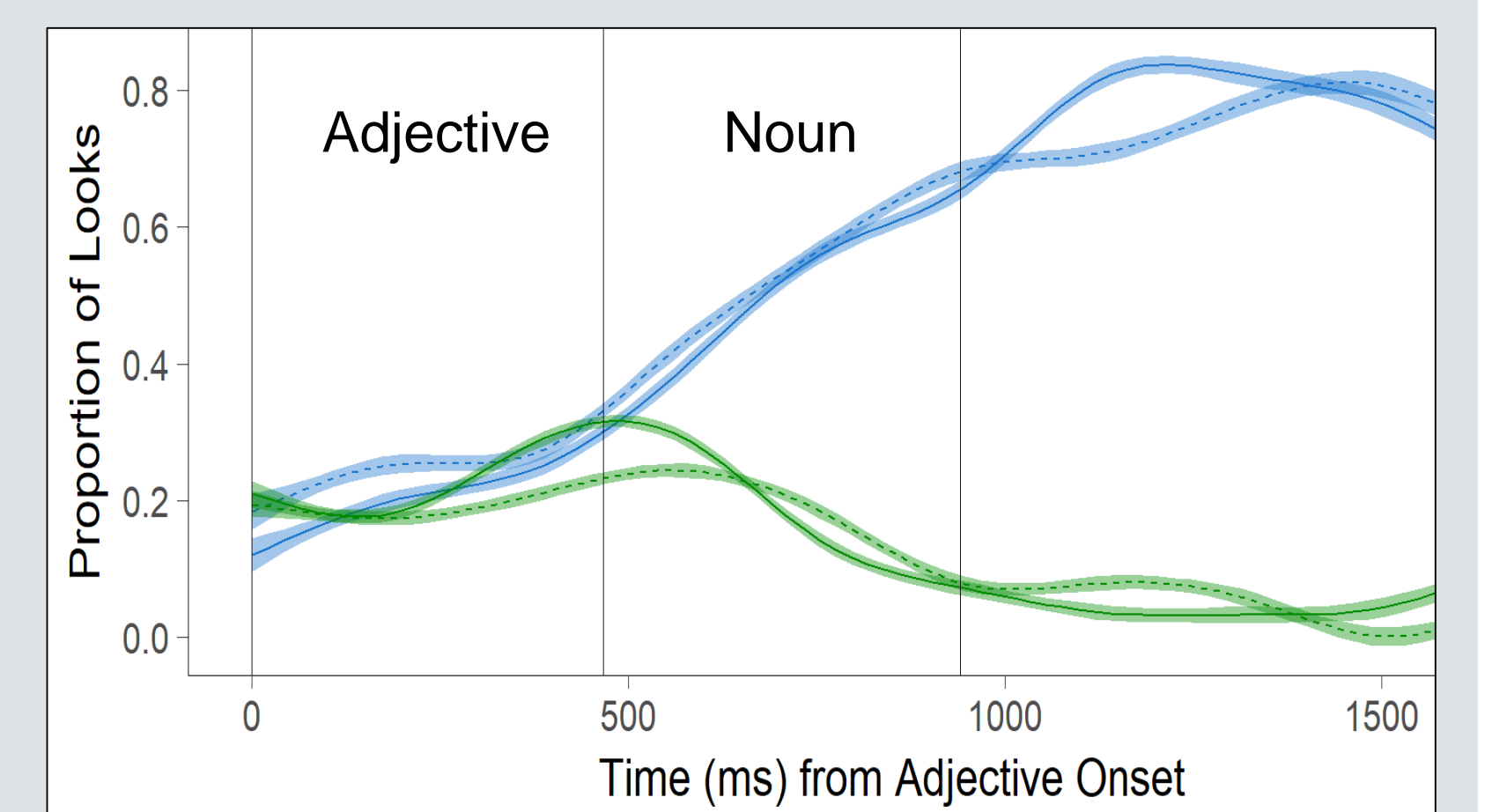- - 2-contrast
Competitor

Results similar to those in Experiment 1, but with more uncertainty.
→ Listeners may be generating contrastive inference even with nonce nouns.

No effect of one- vs. two- contrast display in the real word trials?

Contrastive inferences become more evident during the second half of the experiment. Is the overall task difficulty initially interfering with the processing of otherwise familiar lexical items?

Real Words: First Half

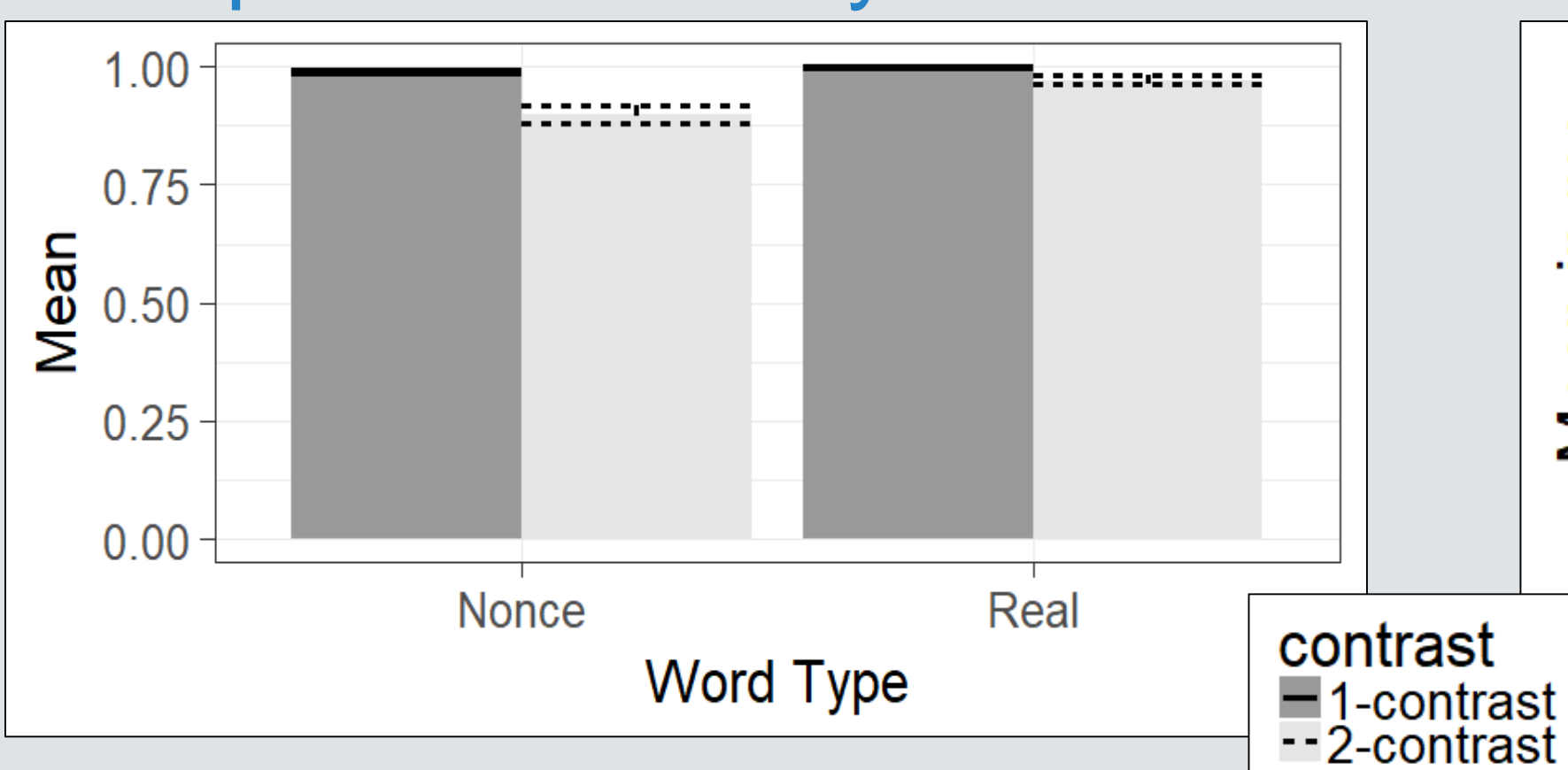**Real Words: Second Half**
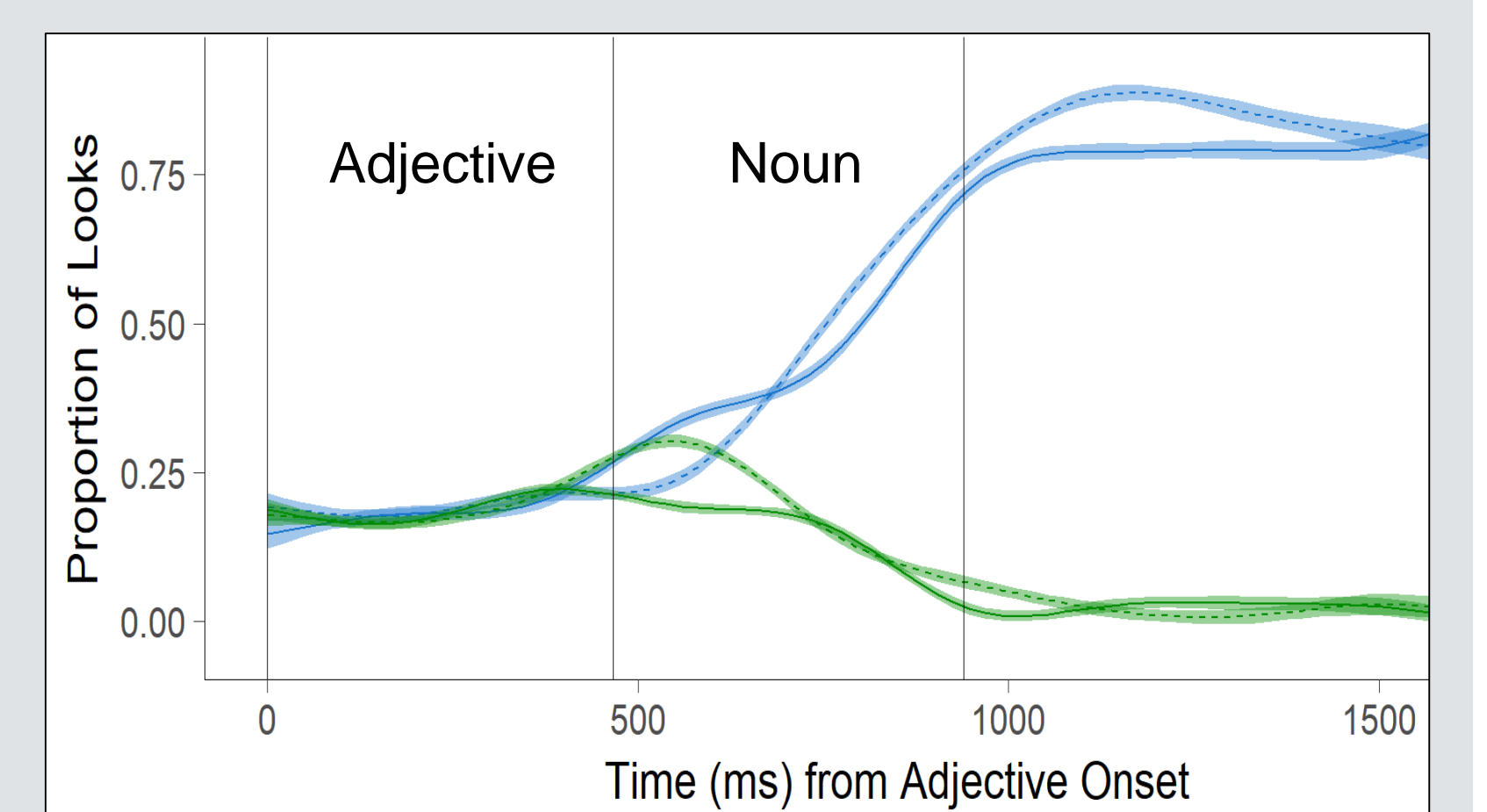
Conclusion
Phonological encoding of an entire NP does not seem to be necessary for successful derivation of contextually situated contrastive inferences in real-time sentence comprehension.
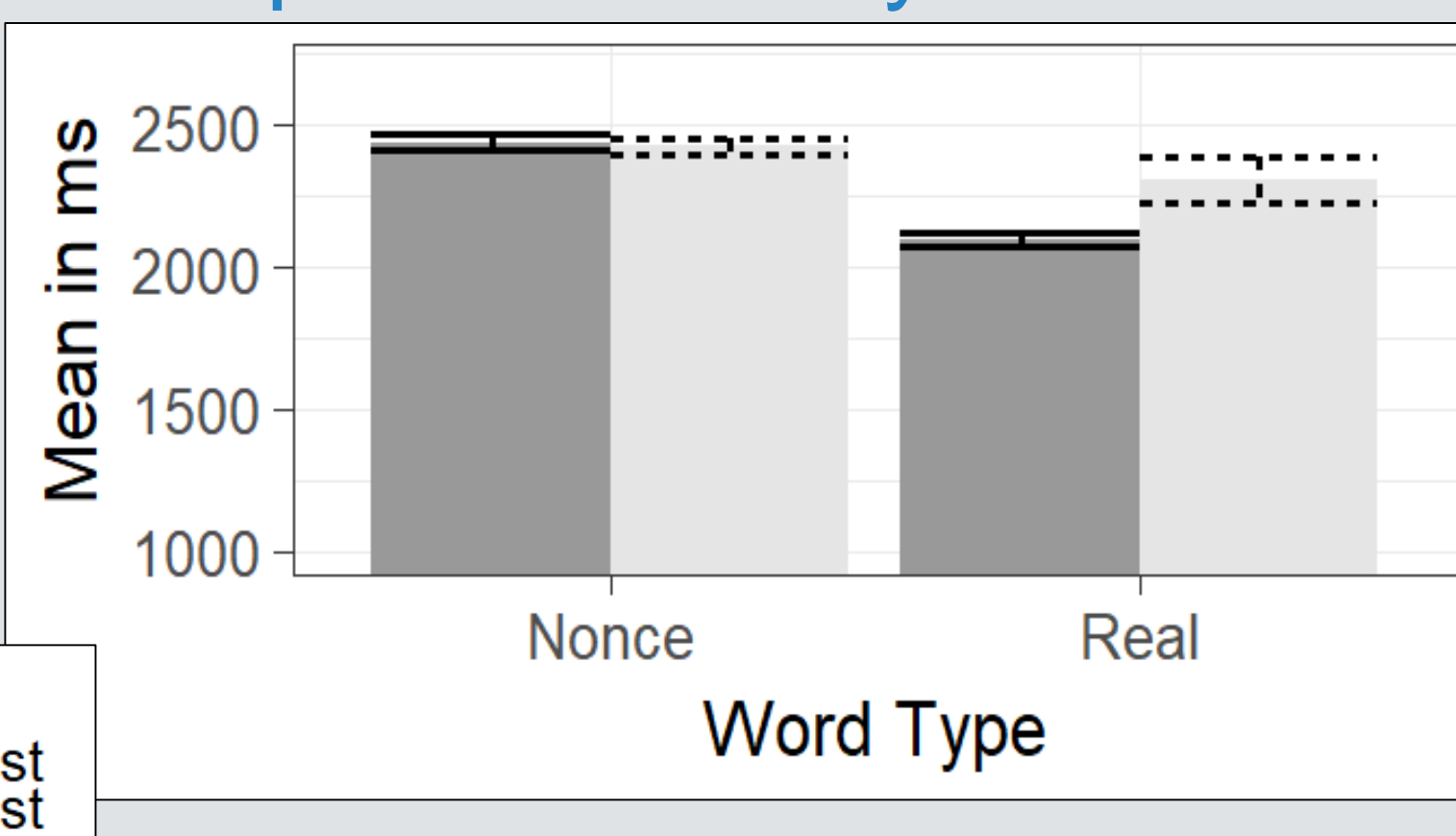
Future Plans for Additional Conditions
- Are the real word trials (with informative uses of scalar adjectives) necessary? → condition with no real words for a comparison.
- Do listeners have prior expectations about what size adjectives should refer to animals/insects? → condition with abstract shapes as visual stimuli, but same audio

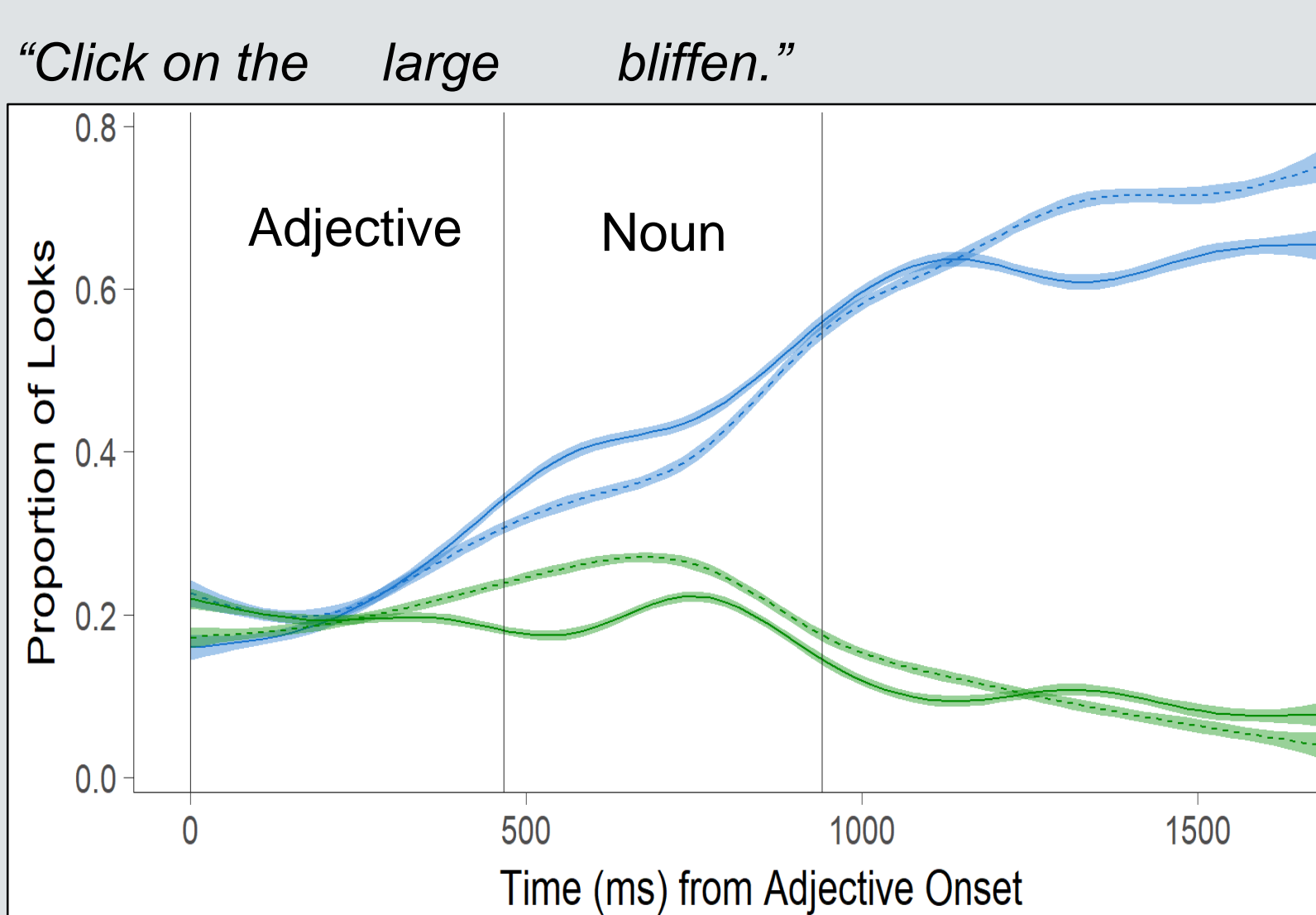**Listeners can generate contextually situated interpretations of known adjectives even with novel nouns (Exp. 1), even with little prior knowledge of them (Exp. 2)**