

Objectives

Investigate whether the **contrastive function of prenominal adjectives can affect perception of voicing** in initial plosives:

- effect on behavioral judgments on phonetic categorization?
- effect on online processing?

Background

Listeners integrate information from disparate domains:

- Top-down influence of lexical information on categorical perception (Ganong, 1980).
- Influence of pragmatic inferences regarding upcoming coreference on phonetic perception. (Rohde & Ettliger, 2012).

Pragmatic information comes in many forms: we look at the contrastive function of prenominal adjectives (Sedivy et al. 1999).

Methods and participants

28 native monolingual speakers of American English.

Visual World Paradigm eye tracking:

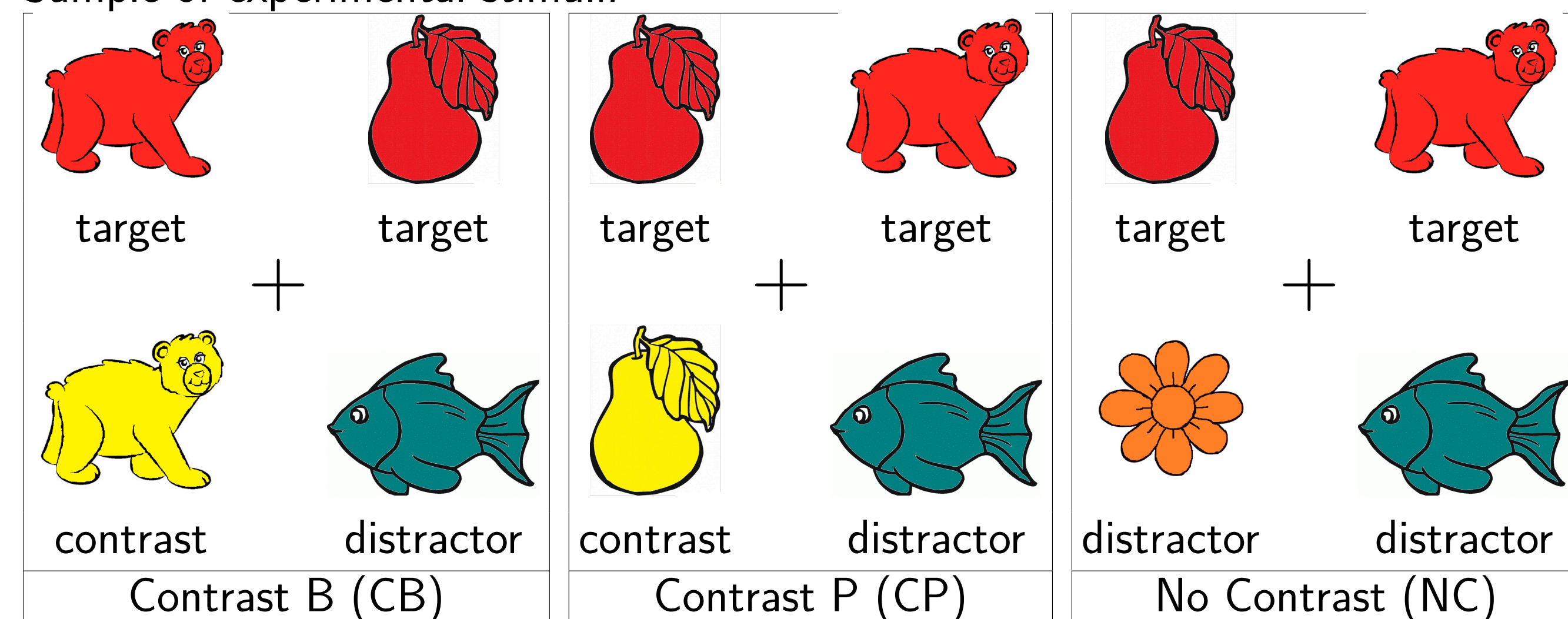
Participants presented with a visual display while hearing a sentence with the form "Click on the ADJ NOUN"

- NOUN: one of the words from two minimal pairs {bear/pear, bees/peas}
- ADJ: one of {red, gold, grey, teal}

3 × 7 design

- Target stimuli: two 7-step VOT continua (bear to pear, bees to peas); the initial labial ranged from /b/ to /p/ in 7 ms increments.
- Three conditions: all contained two objects with the same color, both temporarily compatible with the instruction.
 - CB: contrasting object with a different color, from the "B" category.
 - CP: contrasting object with a different color, from the "P" category.
 - NC: control condition, no contrasting object.

Sample of experimental stimuli:



Predictions

Contrast objects trigger pragmatic Gricean reasoning → facilitate the disambiguation of two potential targets (Sedivy et al. 1999).

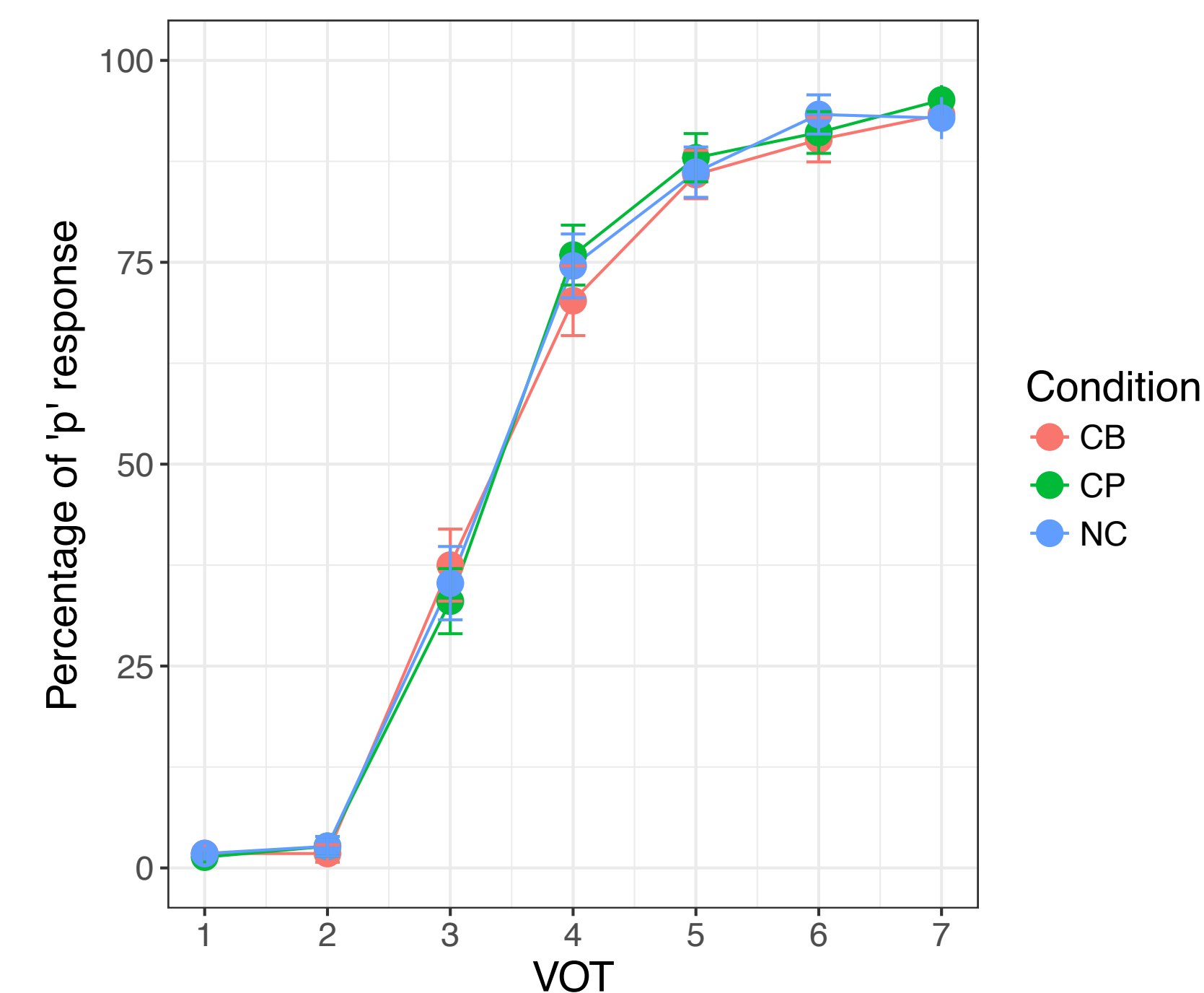
Participants should be **biased towards the object that has a contrast** comparison: bear/bees under CB and pear/peas under CP.

- Different categorization as compared to NC.
- More looks to the target as compared to NC.

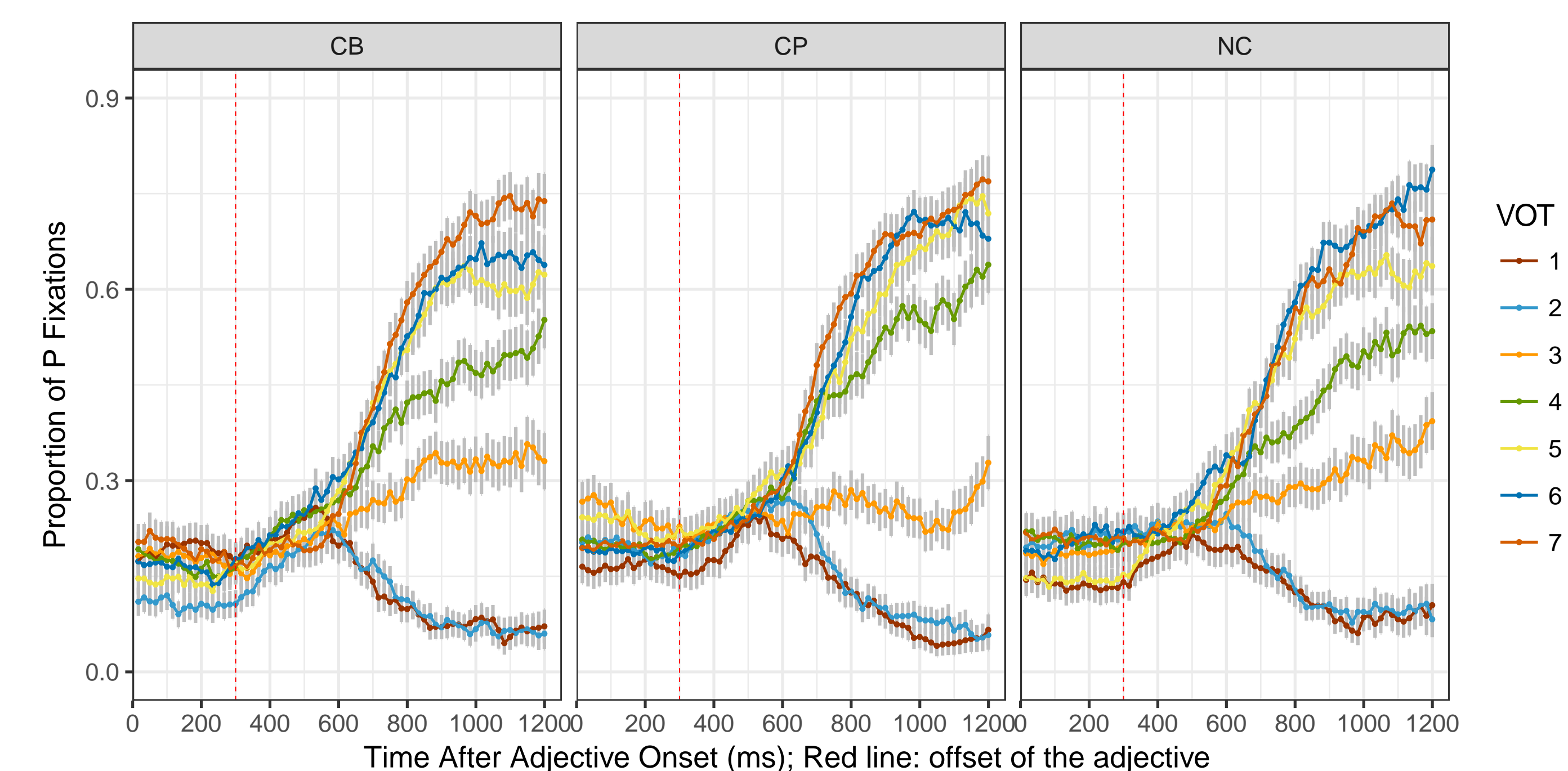
Results

Behavioral: probability of clicking on the "P" objects:

- significant effect of VOT ($p < .0001$)
- pragmatic contrast manipulation non-significant



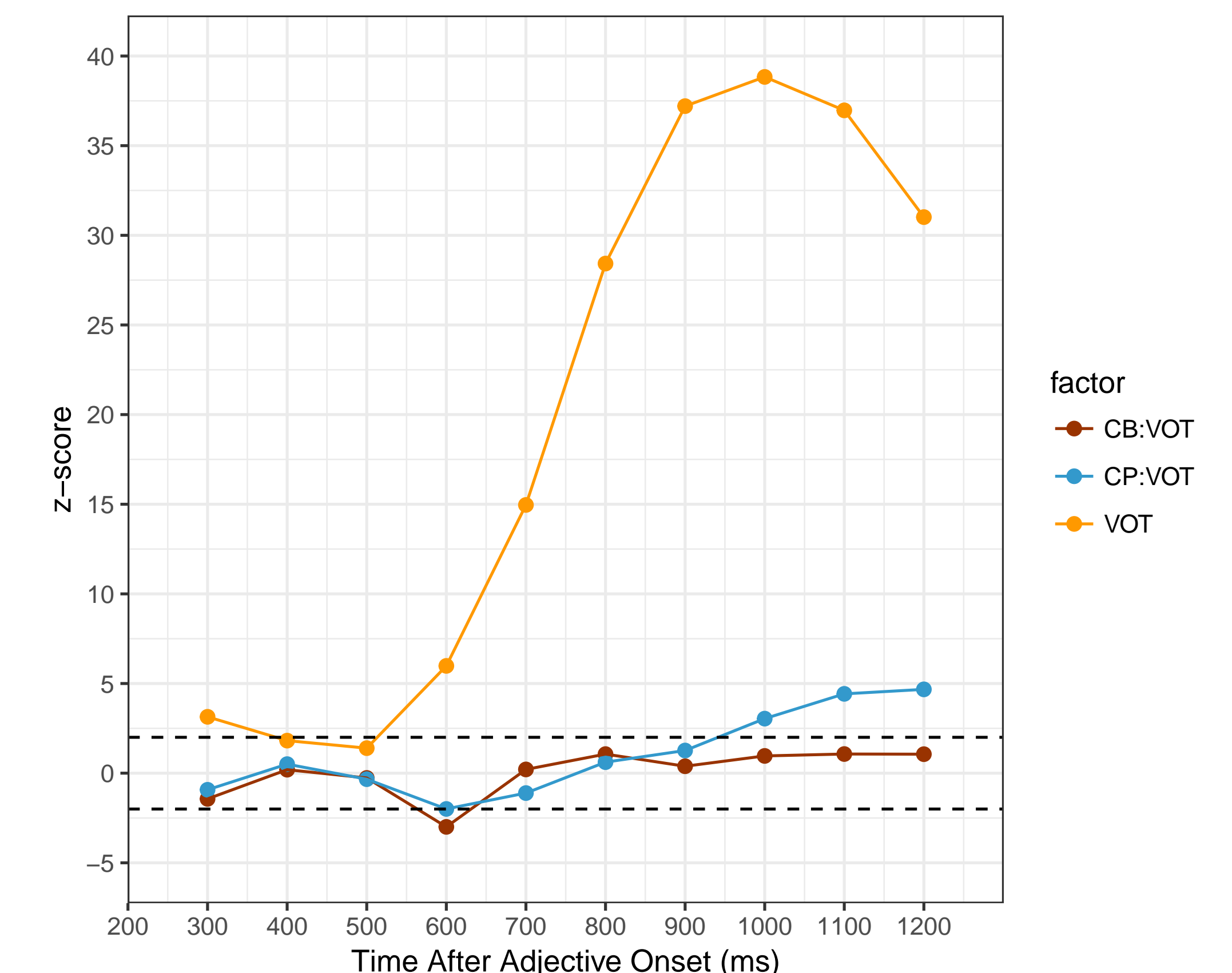
Online: proportion of looks to the "P" objects:



Running logistic regression models (fixations to the "P" objects in NC as baseline)

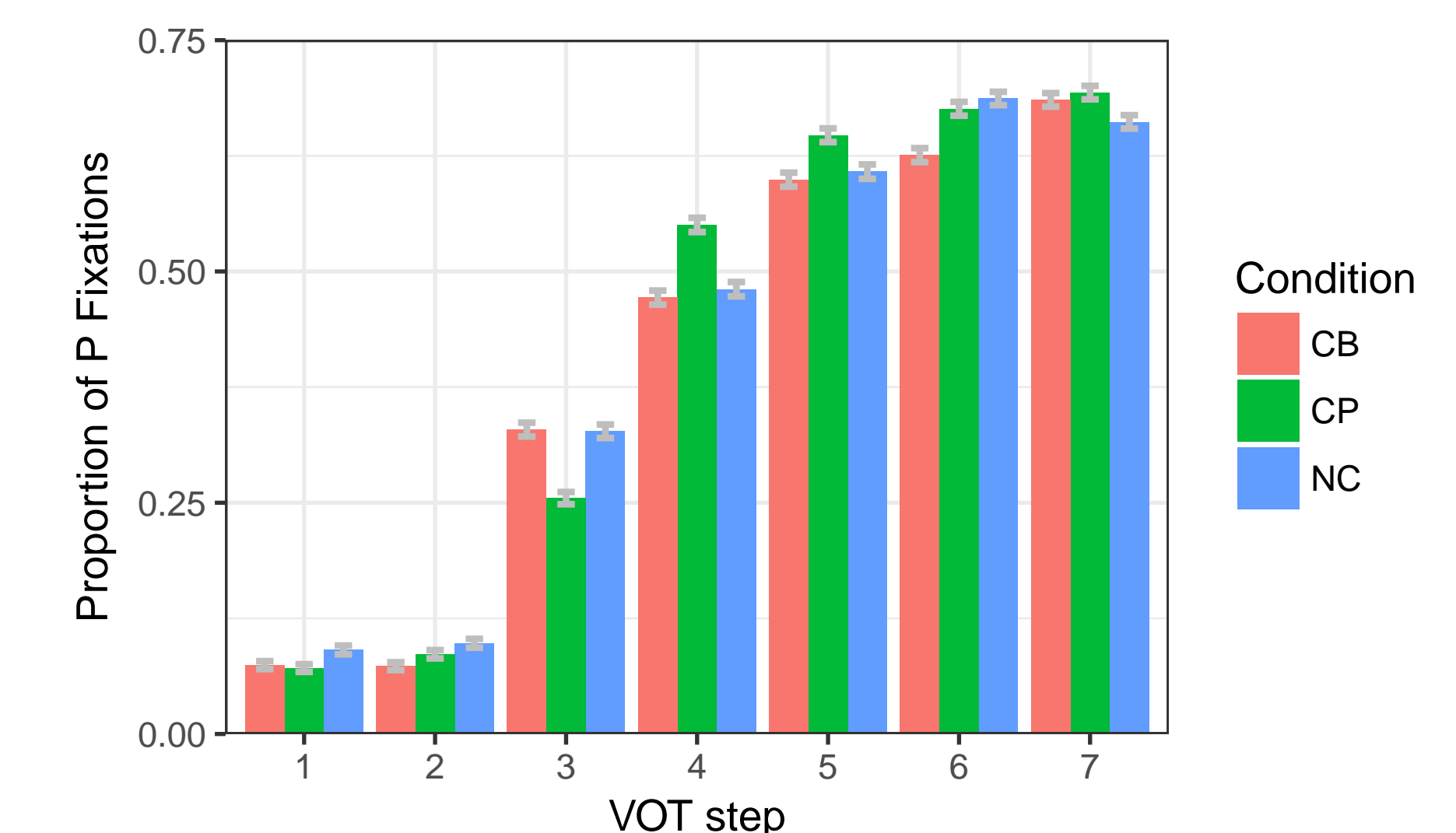
- a robust effect of VOT ($p < .0001$), starting from 500ms after the adjective onset (about 200ms after the noun onset), and continuing throughout the trial
- a significant interaction between VOT and CP ($p < .001$) in a relatively late time window (800-1200ms)

To pinpoint the time window where the interaction of VOT and CP is significant, we ran mixed effects models (or logistic regression models) on every 100ms time bin. Plotting the z-score of the coefficients for the effects VOT, CB:VOT, and CP:VOT:



Closer look at the later time window (800-1200ms, plotted below):

- facilitatory effect of CP at VOT step 4 ($p < .001$) and 5 ($p < .001$) and 7 ($p < .01$)
- inhibitory effect of CP at VOT step 1 ($p < .001$) and 3 ($p < .001$)



Discussion

Phonetic categorization output (behavioral judgment data) completely determined by the acoustic cues (VOT) → **no direct effect of pragmatic contrast.**

Constrained (facilitatory) pragmatic influence in online processing:

- Asymmetry: perception of "p", but not "b", is affected.
- Effect appeared late.
- Only present on certain VOT steps.

Conclusion

Pragmatic cues are secondary to the bottom-up acoustic information during consonant perception.

References