



# Inhibition of Return in Native vs. Foreign Language Processing

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## Introduction

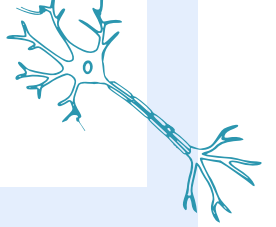
Spatial attention enables interaction with the environment through voluntary (endogenous) and involuntary (exogenous) orienting (Klein, 2004). Exogenous attention is often studied using the Posner Paradigm (Posner, 1980), revealing the phenomenon of Inhibition of Return (IOR): after an initial facilitation (~200-300 ms), responses to previously cued locations slow down at longer intervals (>300 ms) (Posner & Cohen, 1984; Lupiáñez et al., 2006). IOR helps make visual search more efficient. While IOR has been studied with simple cues (usually a brightening), little is known about how linguistic cues especially in foreign languages affect it (Chasteen et al., 1999). Because processing a foreign language (L2) requires more cognitive effort and different attention allocation than a native language (L1), this study tests whether IOR differs for Hebrew (native) versus Chinese (foreign) words. We predict reduced IOR for Chinese due to higher cognitive load or slower attentional disengagement

## Methods



### Sample

- 30 randomly recruited participants.
- Mother tongue: Hebrew.
- No attention deficit/hyperactivity disorder (ADHD).
- Normal or corrected-to-normal vision.
- Unaware of the experiment's purpose



### Instruments & Stimuli

- Posner Paradigm (Posner, 1980):
- Designed using E-Prime and run on a computer.
  - Consists of 2 blocks, totaling 288 experimental trials (2 languages x 6 SOA x 2 validity x 12 trials) and 18 catch trials.
  - Each trial includes 3 boxes: central fixation point, 2 side boxes.
  - Stimuli shown in white on a black background.
  - Participants fixate, then a cue word appears.
  - After varied SOA a target (\*) appears.
  - Target presented until response is given; participants only detect the target.
  - Cue validity: Half valid (cue in same box as target), half invalid (cue opposite target) to remove predictive information. (figure1)

### Stimuli Words

- 72 neutral words (36 Hebrew, 36 chinese ).
- Drawn from Bertels et al.
- Consistent letter count (3-4 letters) and syllable count (1-3 syllables).
- Neutral words and detection task chosen to prevent cognitive overload and avoid interaction between attentional networks or emotional confounds.

### Design

- Dependent Variable: IOR, calculated as the difference in mean RTs between valid and invalid trials.
- Independent Variables:
  - Cue language (Hebrew/chinese)
  - SOA (100, 250, 300, 350, 400, 750 ms).
- anlysis done using three-way within-subject ANOVA.

## Results

| Effect       | df           | MSE    | F    | ges   | P-value |
|--------------|--------------|--------|------|-------|---------|
| Language     | 1,29         | 617.46 | 3.22 | 0.006 | 0.083   |
| SOA          | 4,19, 121.42 | 878.04 | 2.31 | 0.024 | 0.059   |
| Language:SOA | 3,31, 96.04  | 685    | 0.35 | 0.002 | 0.811   |

figure 2

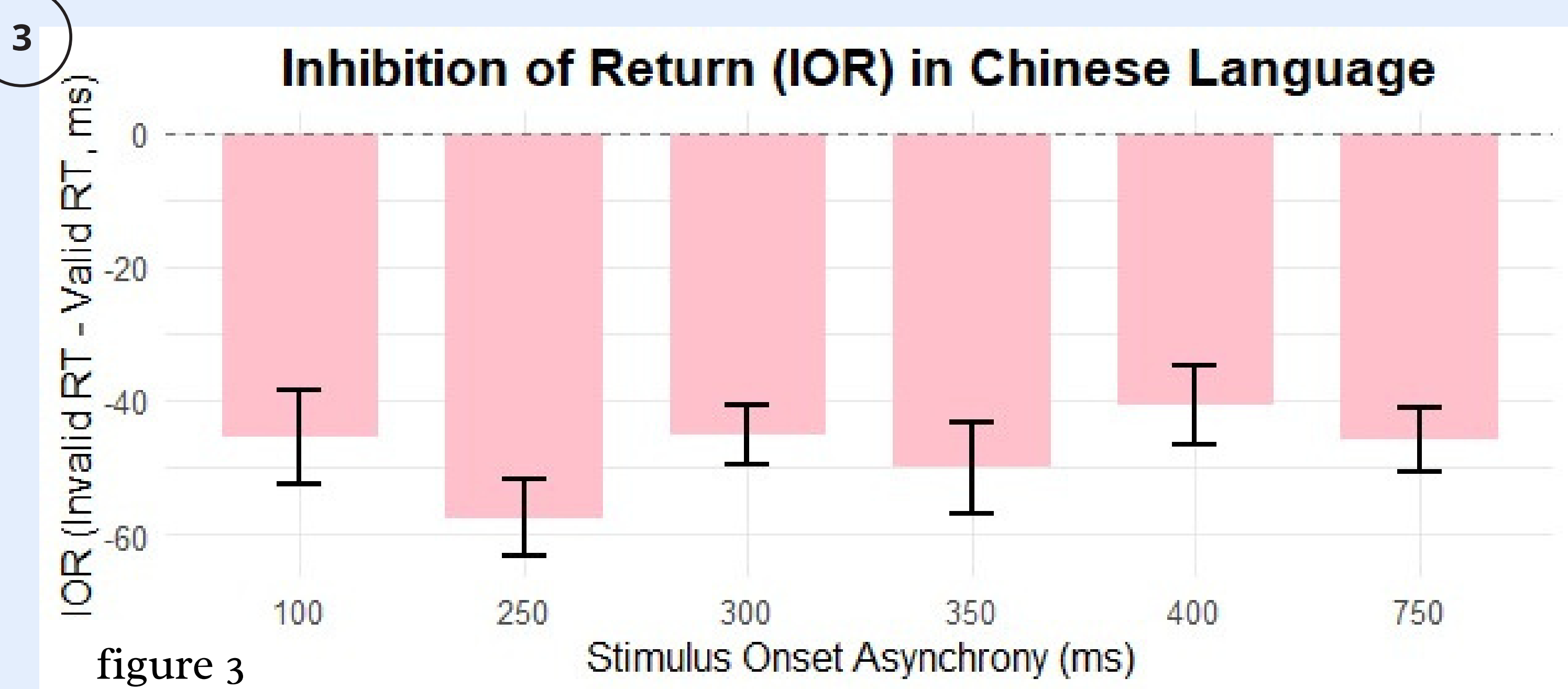


figure 3

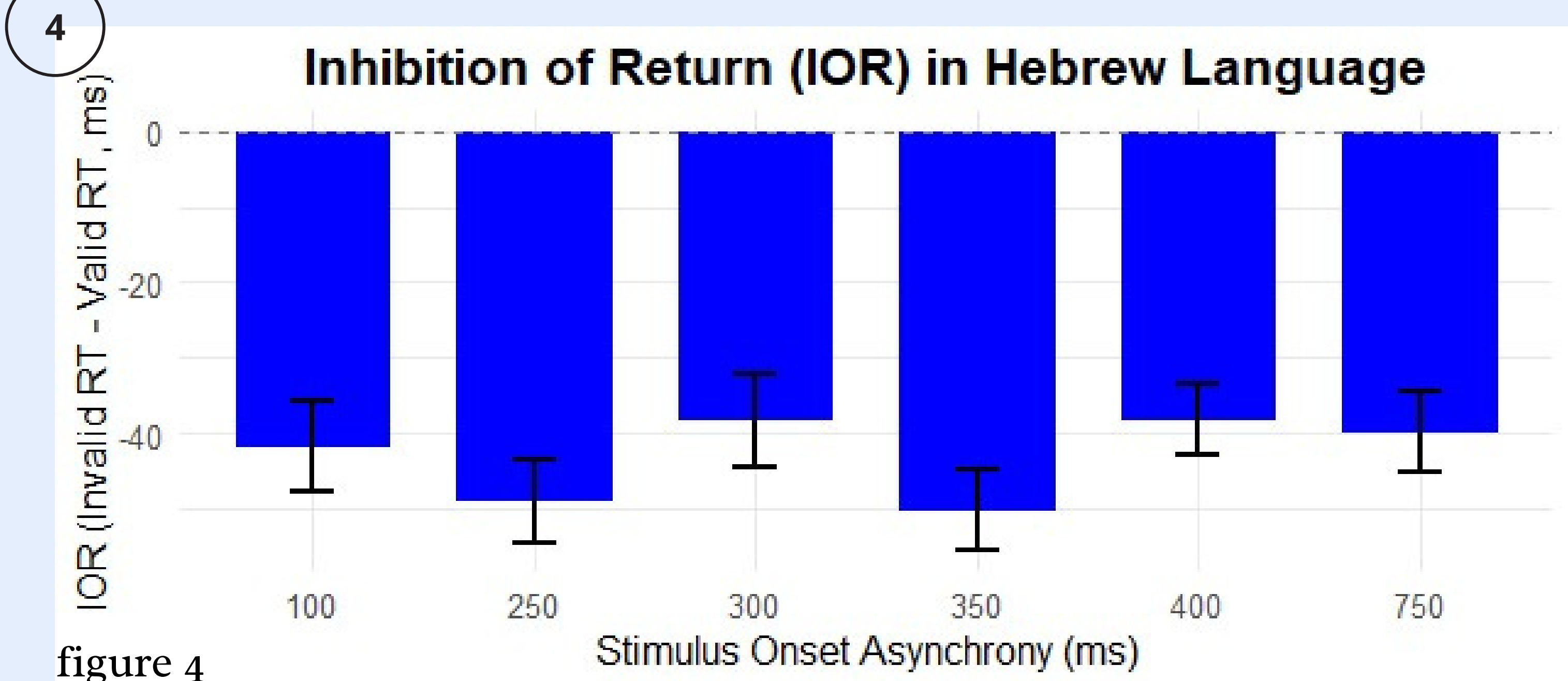


figure 4

## Discussion

We observed IOR patterns, where reaction times were slower for valid trials compared to invalid trials in all the SOAs longer. This pattern is found in both languages. our hypothesis that foreign language (L2) processing would modulate the magnitude of IOR was not supported . This lack of modulation is likely due to our use of a simple detection task using an asterisk target (Chao, 2010). The clear perceptual difference between the linguistic cues (words) and the asterisk target, combined with the task's low cognitive demands, may have prevented the linguistic cues from imposing sufficient differential cognitive load to influence spatial attention or the IOR mechanism (Chasteen et al., 1999). This suggests that when linguistic cues act exogenously in a low-demand detection task, their influence on IOR or foreign language processing effects might be diminished, an area largely unexplored in the literature

## Reference

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