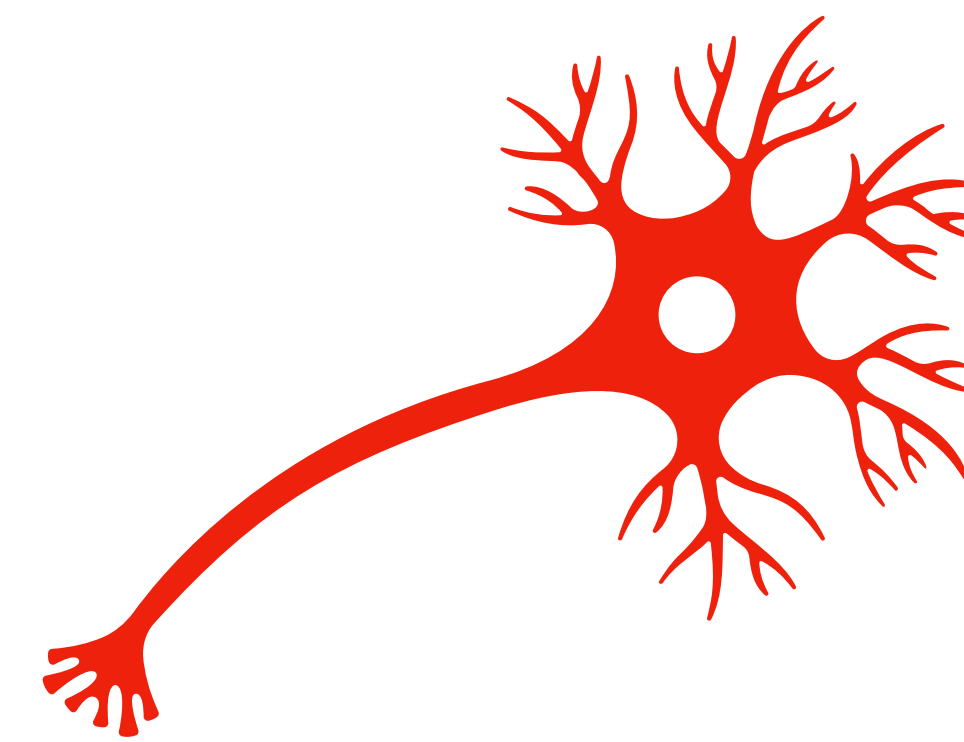


Confirmation bias: the structure of information influences the temporal integration of evidence

—Under what circumstances do humans exhibit a confirmation bias?

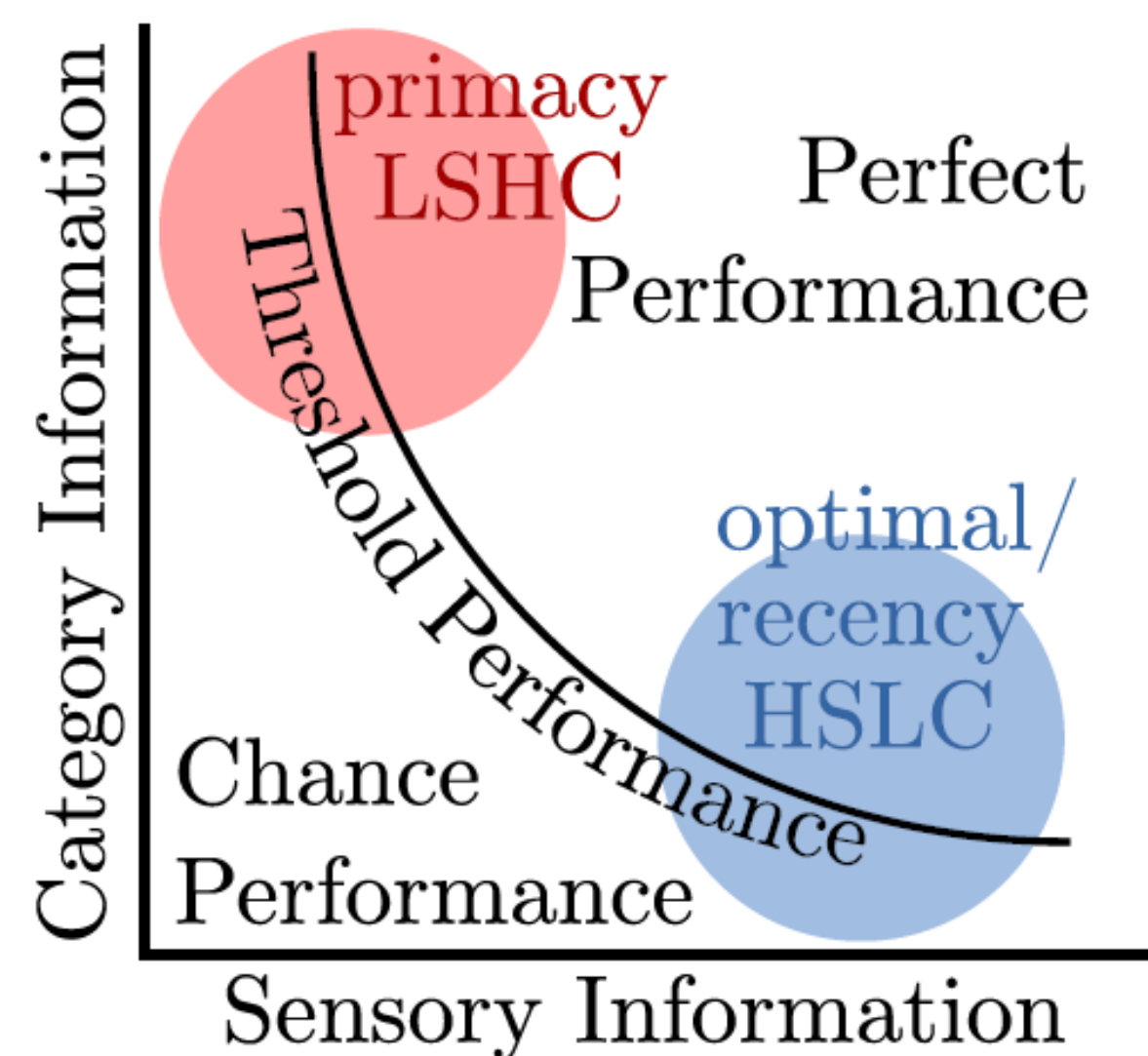
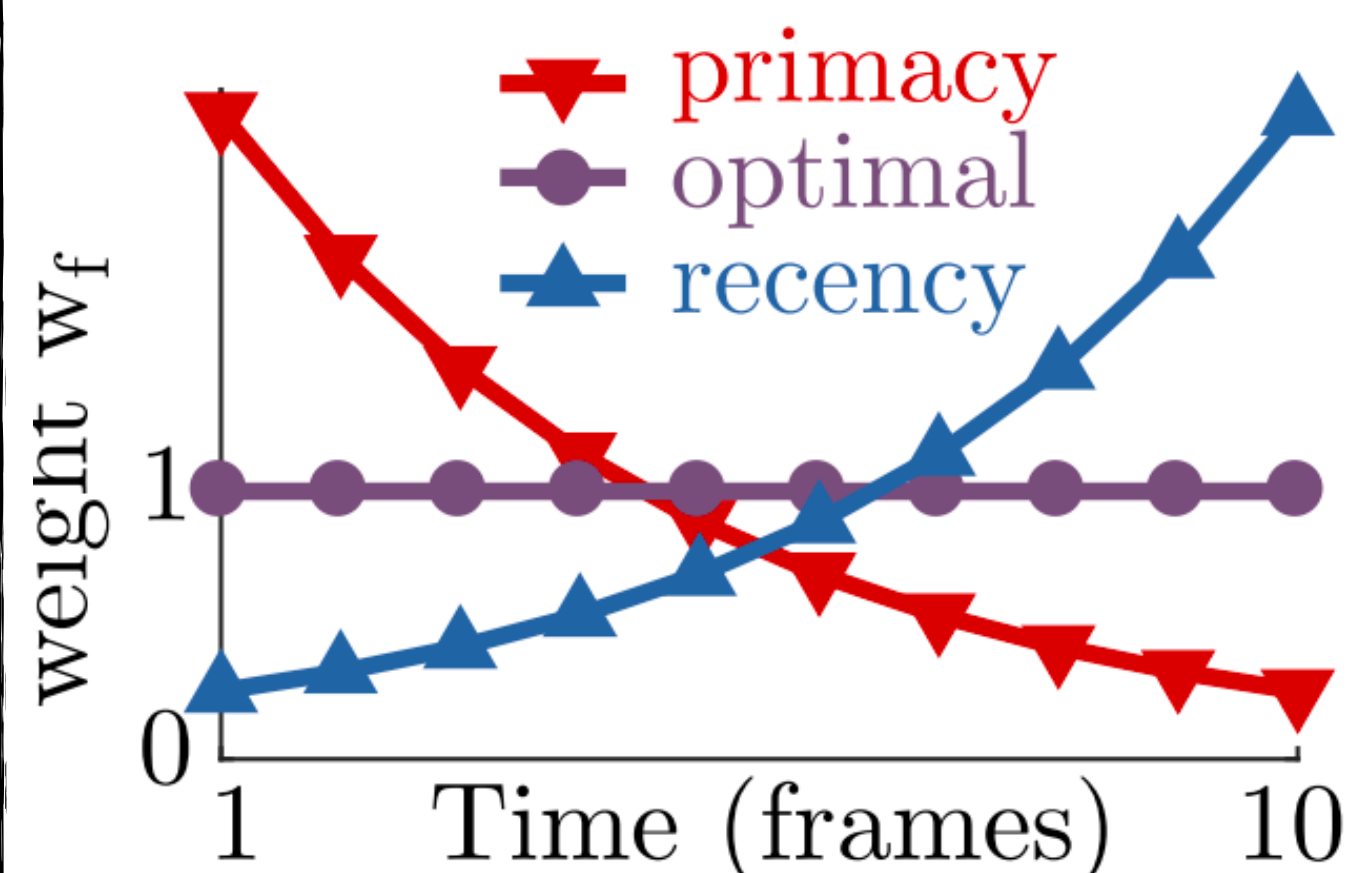
Ruolan Li, Ankani Chatteraj, Ralf Haefner
r.li@rochester.edu

Dept. of Brain & Cognitive Sciences, University of Rochester
Undergraduate Research EXPO, U of R, 4/19/2019



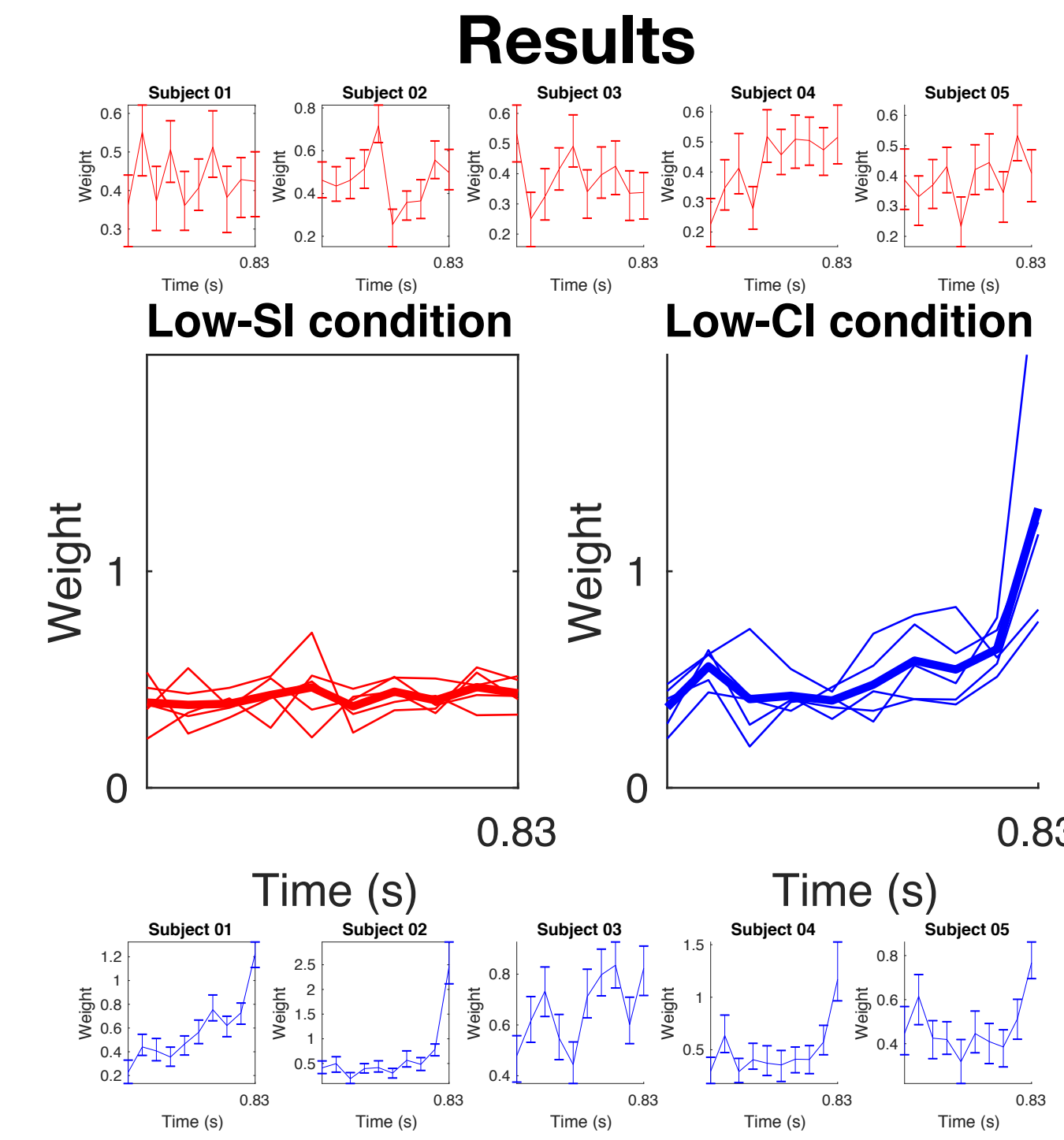
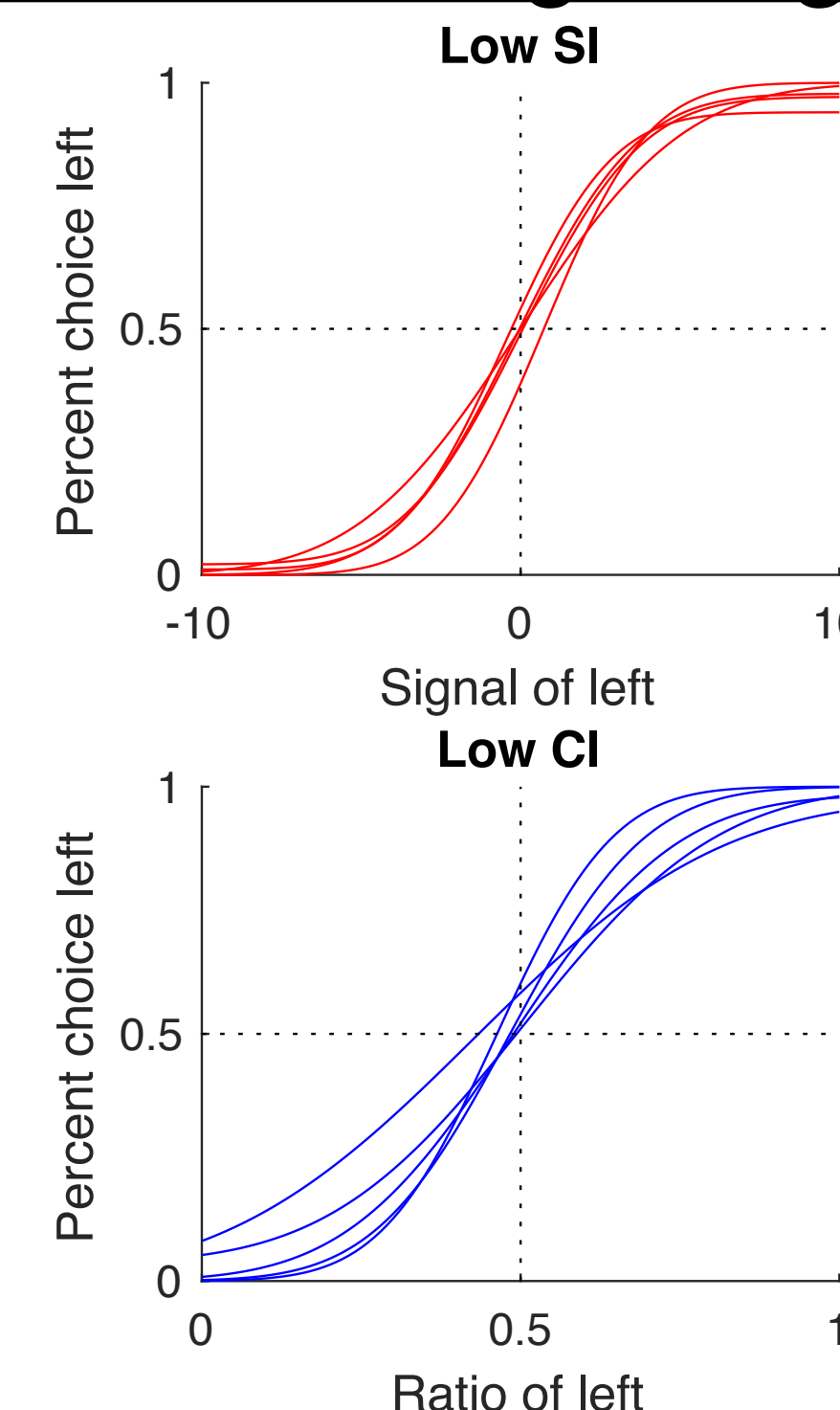
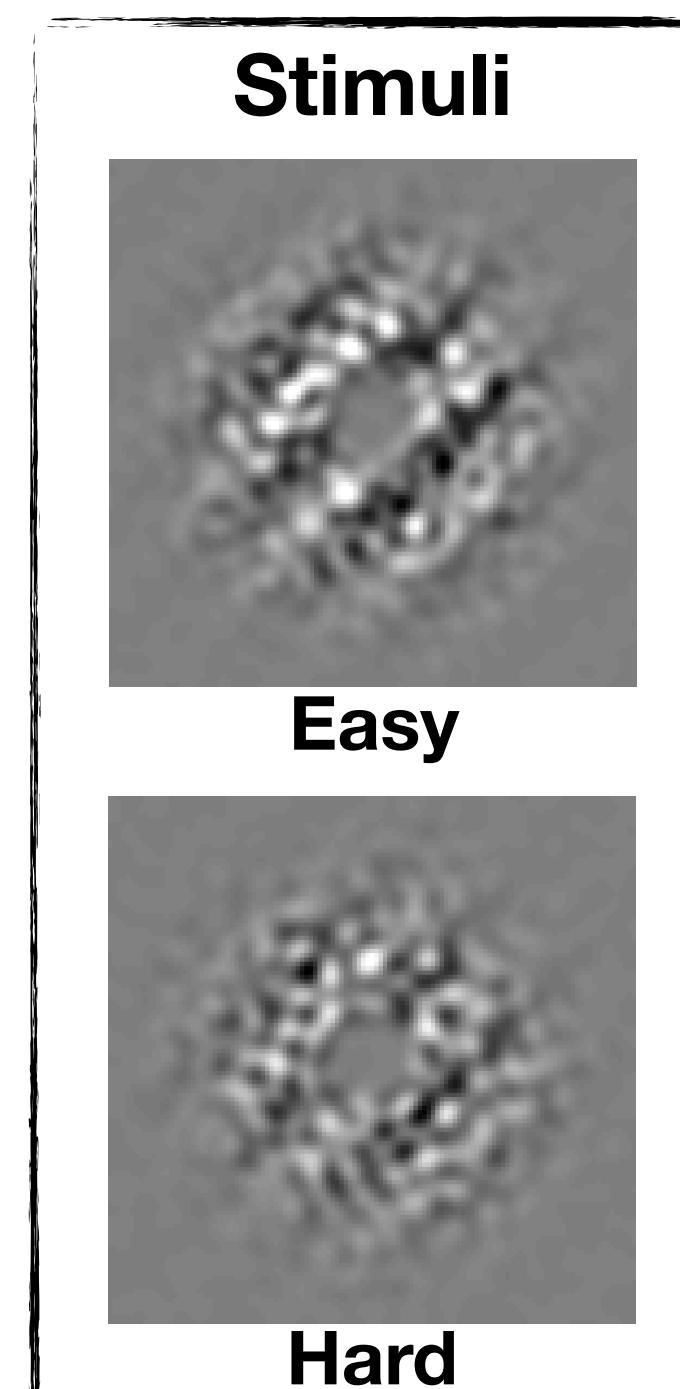
Theory

- Primacy effect → confirmation bias
- Sensory information (SI): information in each frame
- Category information (CI): consistency of frames



Theory prediction: primacy effect arises when sensory information is low and category information is high.

Experiment 1. Sinusoidal grating embedded in noise

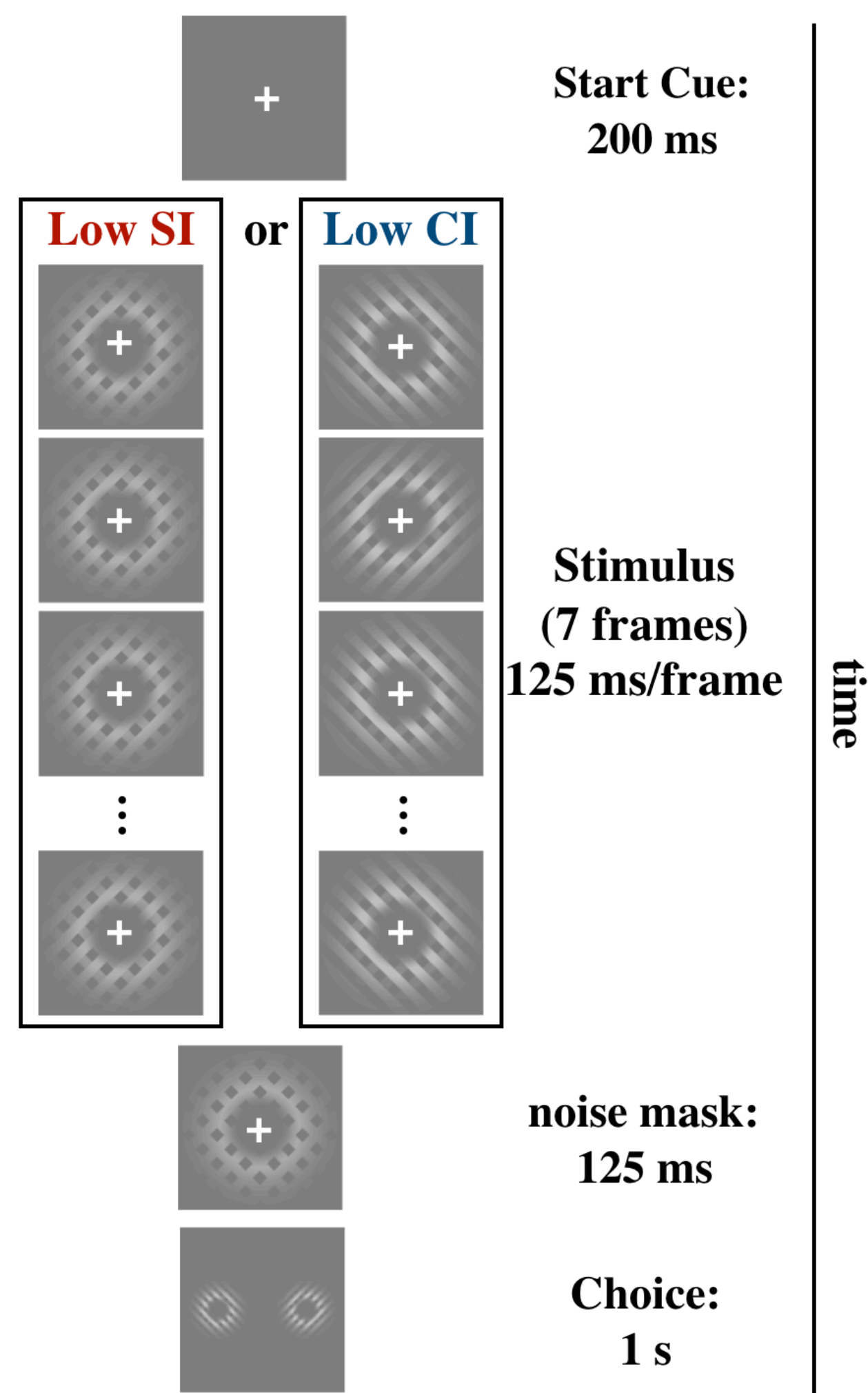


Interpretation:

- No primacy effect in Low SI condition (flat kernel)
- Large effect of the last frame in Low CI condition
- Results inconsistent with Lange et al. (2018), no replication.
- Confirmation bias may be sensitive to the nature of stimulus and noise.

Method

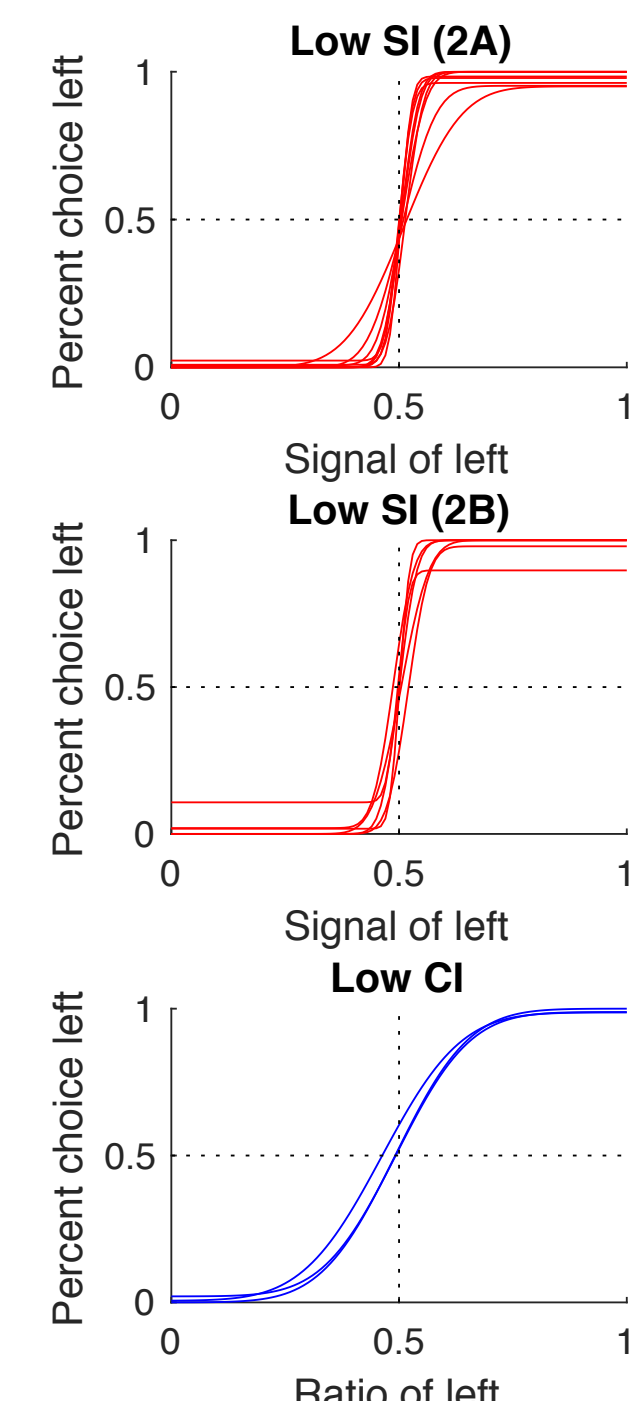
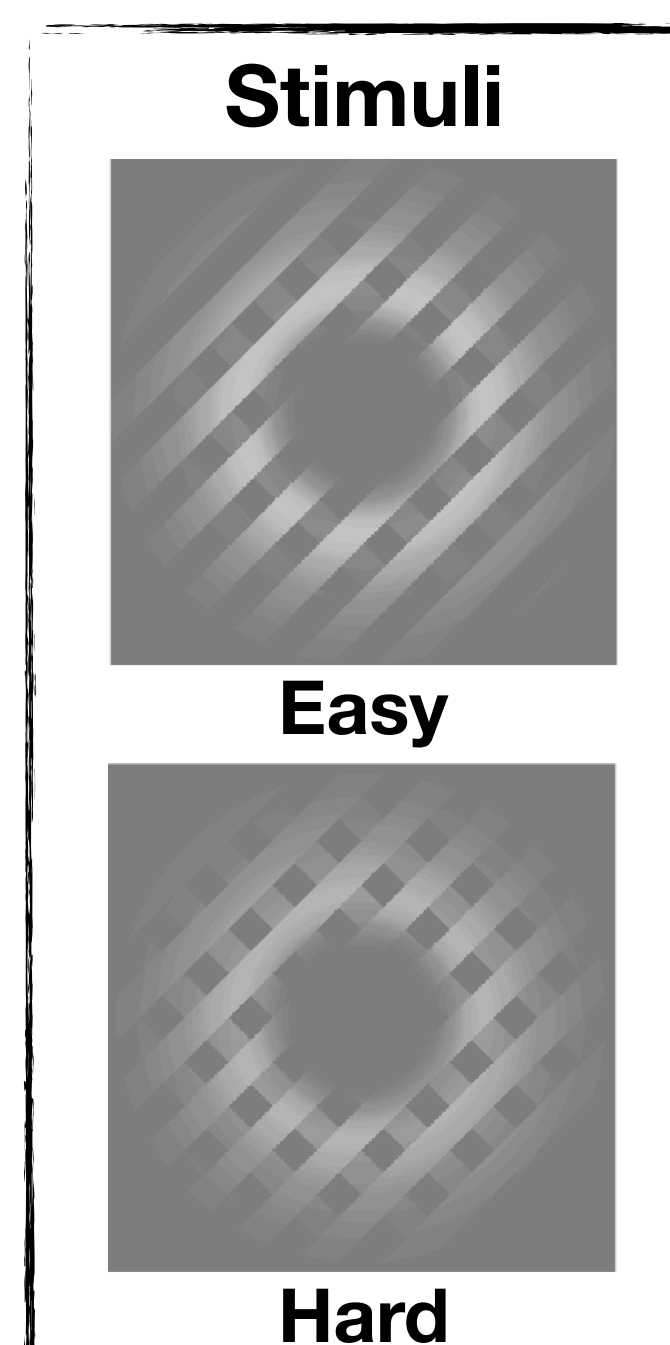
- Low SI (2–3 hrs) vs. Low CI (1 hr) condition
- 100 trials per block, ~8 blocks per hour
- 2:1 staircase method



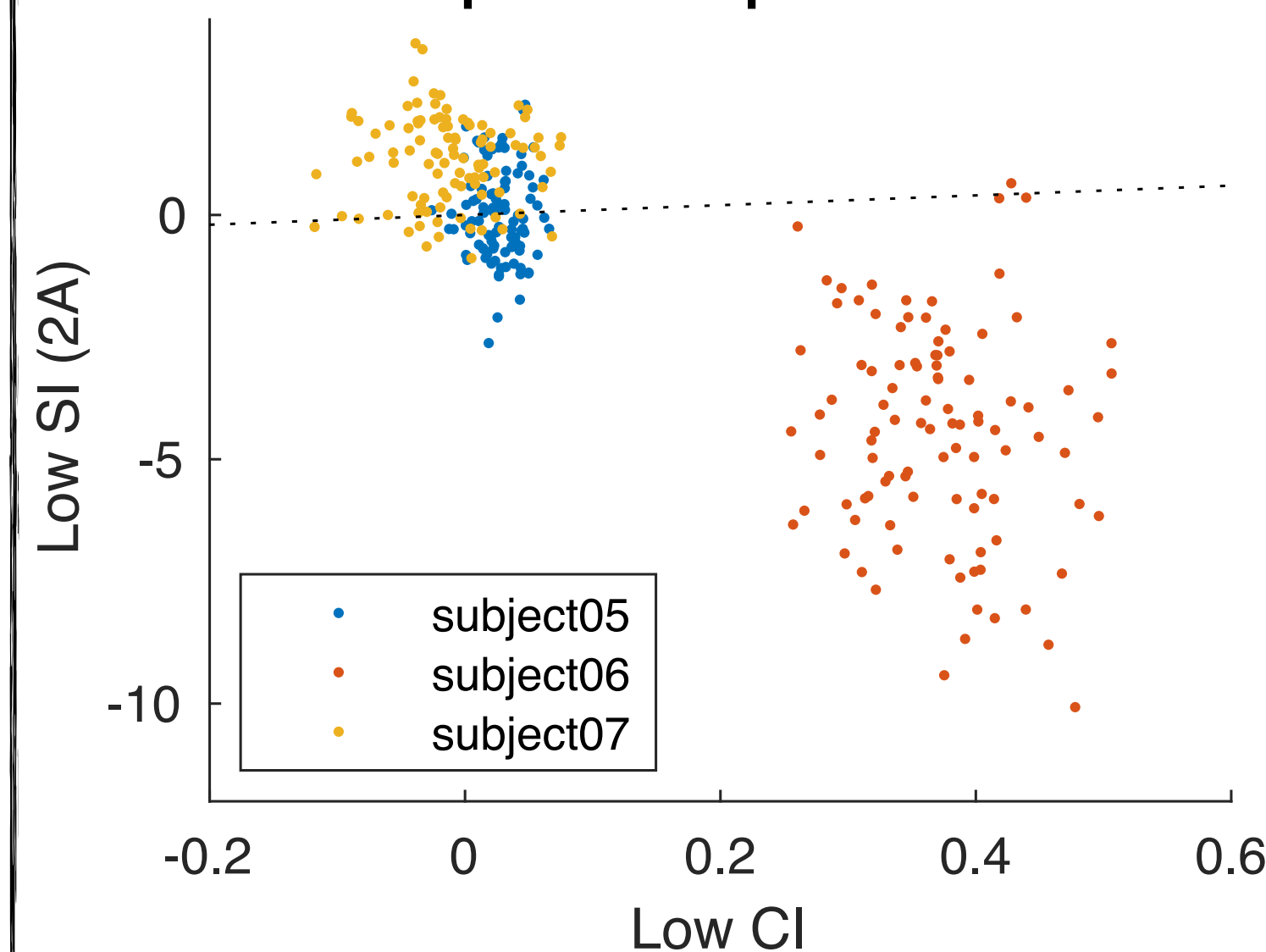
- Statistical analysis: logistic regression

$$p(\text{choice} | \vec{x}) = \frac{\alpha}{2} + \frac{1-\alpha}{1+e^{-b-\sum_{k=1}^7 s_k x_k}}$$

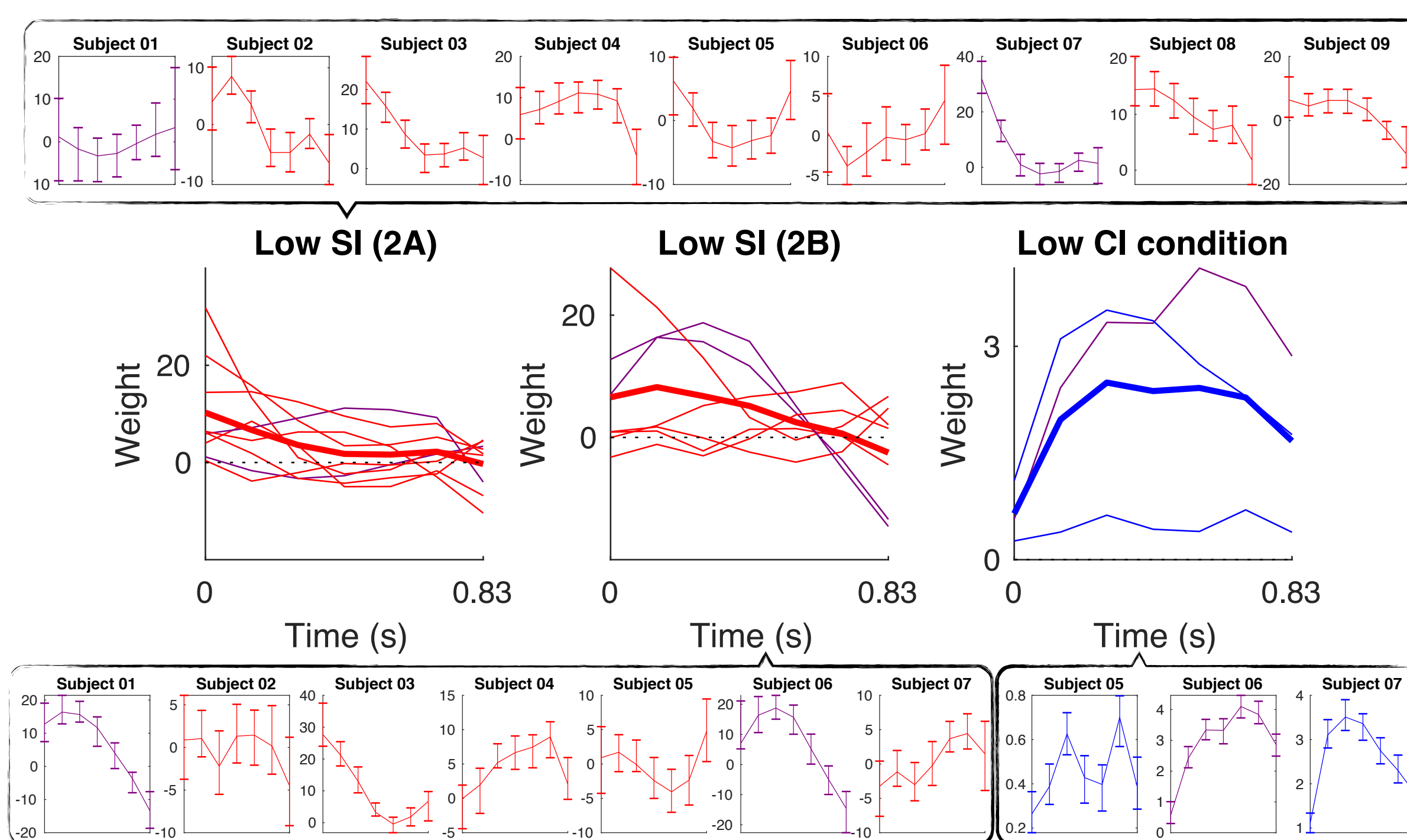
Experiment 2. Foreground-background segregation



Slopes of temporal kernel



Results

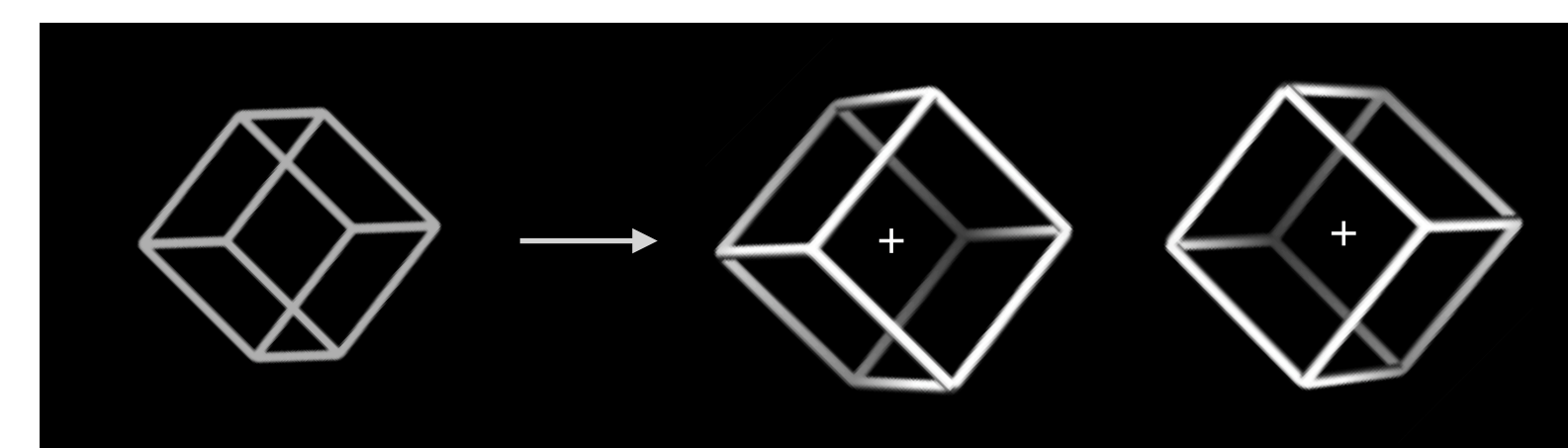
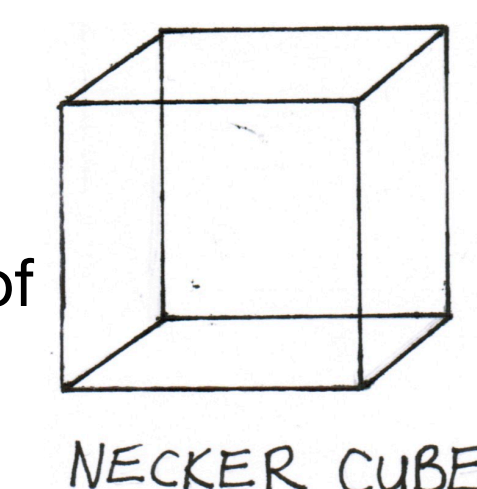


Interpretation:

- Primacy effect in Low SI (2A and 2B) condition
- Comparison with Low CI condition suggests a primacy effect in subject06
- Exp. 2A includes possible active confirmation bias

Next step

- The **Necker cube**.
- Similar to Exp. 2, different domain of perception – object recognition.



Conclusion

- No primacy effect observed in Exp. 1;
- however, primacy effect was observed in Exp. 2A & 2B.
- Implication 1: the primacy effect may be subject to the nature of stimulus & noise.
- Implication 2: the theory from Lange et al. is generalizable to another domain.

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Reference

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