The time course of serial dependence: an interplay between perceptual decisions and task relevant representations

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INTRODUCTION

In **serial dependence** (SD), perceptual decisions are biased toward prior stimuli.

SD is often explained by a continuity field (CF) that combines similar stimuli in time (~15 s), supporting perceptual stability[1].

Research questions:

I. Is the combination of similar stimuli mandatory?

II. Does it occur for both relevant and irrelevant stimuli?

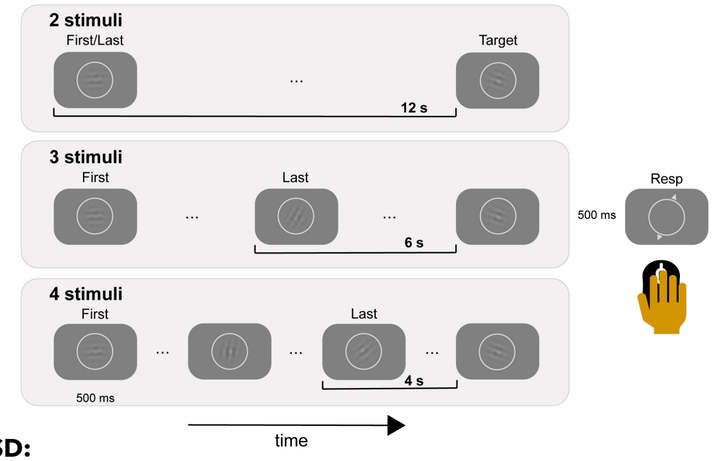
III. Does it depend on the time interval between two sensory events or on the number of stimuli within the interval?

METHODS

Orientation adjustment task:
Pay attention to the sequence of Gabors.
Reproduce the orientation of the last one via adjustment response.

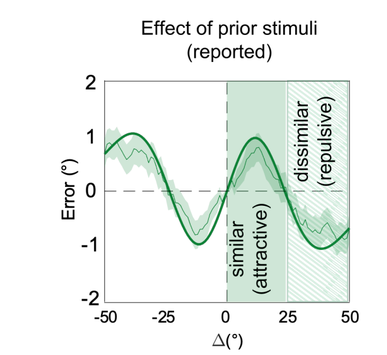
Conditions:

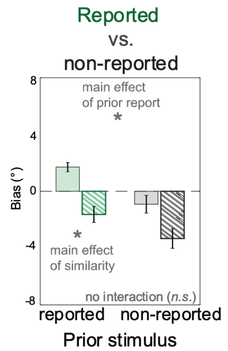
- 3 intervals between Gabors (12 s, 6 s, 4 s);
- Varying number of Gabors within 12 s (2, 3, 4);
- 20% of catch trials with shorter sequences.

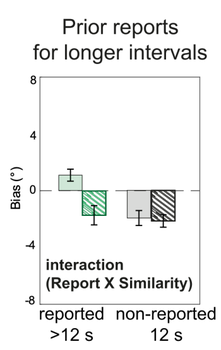


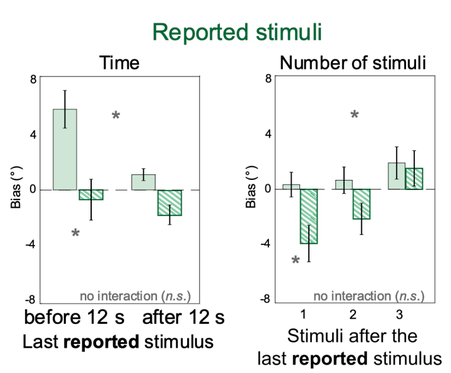
SD:
The deviation of adjustment errors toward previous orientations. Considering irrelevant orientations in the sequence (**non-reported**) and the relevant one in the last trial (**reported**).

RESULTS

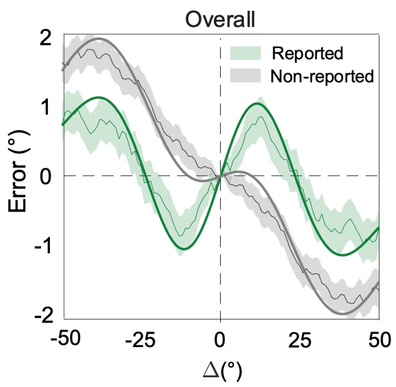


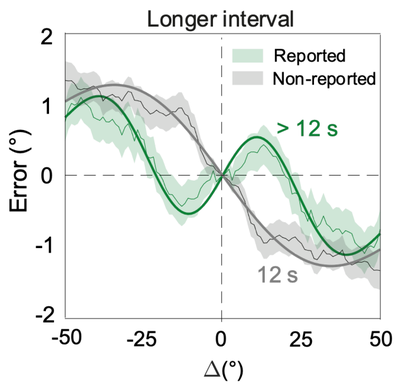


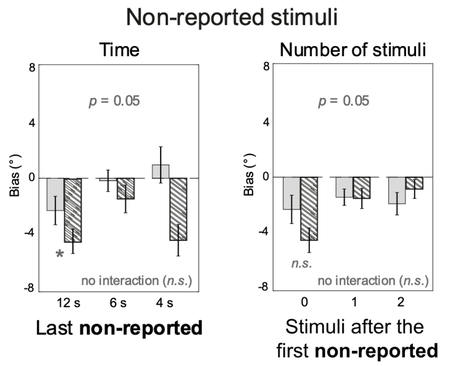




- Stimuli **reported** in the past caused **attraction** when they were similar to present stimuli.
- Attraction was larger after short intervals.
- Attraction increased with the number of irrelevant stimuli between two perceptual reports.







- **Non-reported** stimuli (irrelevant) caused **repulsion**.
- Repulsion was larger after long intervals.
- Repulsion decreased with the number of intervening irrelevant stimuli.

Similar range (+/- 25°) | Dissimilar range (+/- 26-50°) | model free estimate of SD mean(Δ^+ - Δ^-)

results after FDR correction all η_p^2 for sig. results > 0.14

N = 17

CONCLUSION

- The combination of visual features within the CF is not mandatory.
- Biases in adjustment tasks are determined by at least two independent components[2,3]:
  1. a systematic and broad repulsive bias induced by prior stimuli;
  2. a positive bias for similar stimuli boosted by prior reports.
- The two can interact, generating attraction for similar and repulsion for dissimilar stimuli (**but the mechanisms are not the same!**).
- Negative biases can be wiped out by additional (irrelevant) stimuli, eventually enhancing attraction toward prior reports.

REFERENCES

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