STATISTICAL LEARNING OF DISTRACTOR SUPPRESSION IS CONTEXT-DEPENDENT

JASPER DE WAARD, LOUISA BOGAERTS, JAN THEEUWES

VU UNIVERSITY AMSTERDAM

Introduction

- Statistical learning (SL) is the implicit learning of regularities in space and time from sensory input.
- E.g., if a distractor occurs more frequently in one location than the other locations, subjects will learn to suppress this location.[1]
- Related paradigms (reward learning[2], contextual cueing[3]) have shown context-dependent effects.
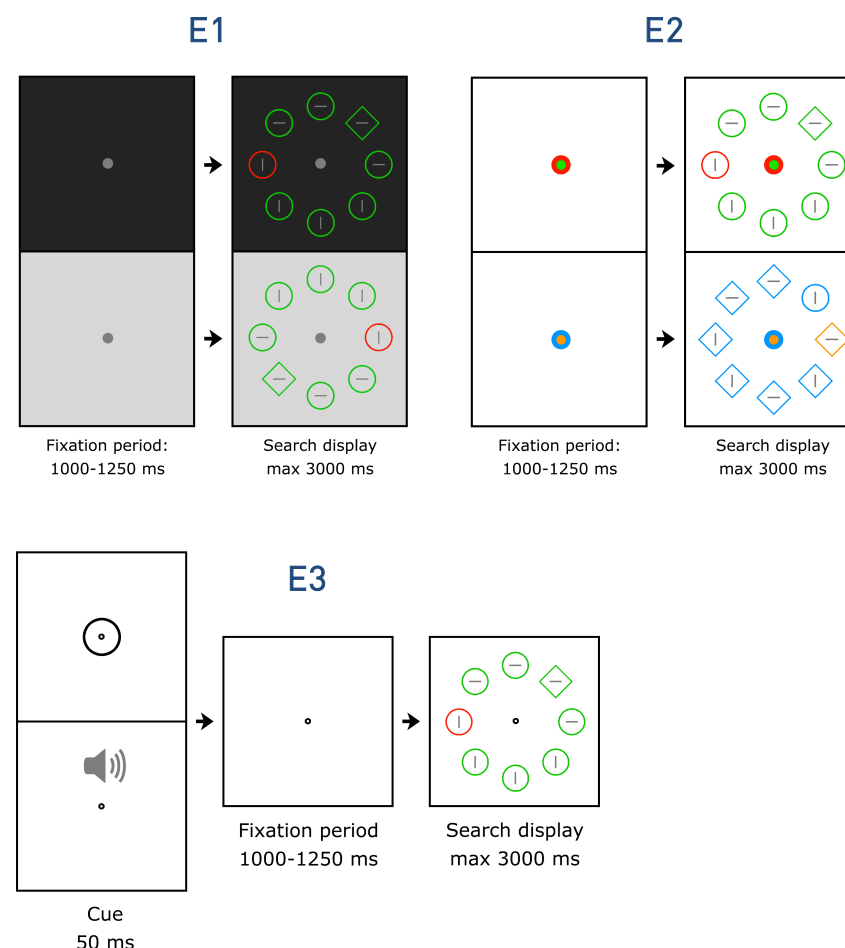- Does SL of distractor suppression also occur in a context-dependent way?

Conclusions

- We observed generalized (experiment-wide) as well as context-specific suppression effects in all experiments, beyond the effects of intertrial priming.
- Subjects had little or no awareness of the regularities (Questionaire: **E1** BF = 14.4, **E2** BF = 7.9, **E3** BF = 8.7)
- Our findings support a context-dependent conception of history-based attentional biases.

Literature

1. Wang, B., & Theeuwes, J. (2018). Statistical regularities modulate attentional capture. *Journal of Experimental Psychology: Human Perception and Performance, 44*(1), 13.
2. Anderson, B. A. (2015). *Value-driven attentional priority is context specific. Psychonomic Bulletin & Review, 22*(3), 750–756.
3. Brooks, D. I., Rasmussen, I. P., & Hollingworth, A. (2010). The nesting of search contexts within natural scenes: Evidence from contextual cuing. *Journal of Experimental Psychology: Human Perception and Performance, 36*(6), 1406.

Methods

- We performed 3 online RT experiments, using an adapted additional singleton paradigm.
- Participants ignored a uniquely colored distractor, and searched for a uniquely shaped target, responding to its line orientation on the keyboard.
- We created two experimental contexts. Within each context, one distractor location occurred 14x more often (high-probability) than the other locations.
- The two high-probability locations (one for each context) were located opposite each other.

E1 — E2

Fixation period: 1000-1250 ms | Search display max 3000 ms

E3

Fixation period 1000-1250 ms | Search display max 3000 ms

Cue 50 ms

Results

- We performed a linear mixed model analysis.
- We found significant contextual effects for the distractor (**E1** p = .013, **E2** p < .001, **E3** p = .027), as well as the target location (**E1 E2 E3** p < .001).
- Trial-to-trial distractor, target, and context repetitions were controlled for by inclusion in the model.

E1 (N=55)

= The high-probability distractor location that matches the *current* context

High prob. match

= The high-probability distractor location that matches the *other* context

High prob. mismatch

E2 (N=54)

E3 (N=93)