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Background

Incidental learning can occur during visual search, facilitating search performance for repeated displays (*Contextual Cueing*: Chun & Jiang, 1998, *Cognitive Psychology*, 36, 28-71).

Improvements in performance might result from:

- Context guidance: context guides attention to target location.
- Response selection: context aids target recognition and decision.

(Kunar, Flusberg, Horowitz & Wolfe, 2007, *JEP: HPP*, 33, 816-828).

Can we separate these two processes? YES!

We tried to reproduce Contextual Cueing in a different kind of task (Comparative Visual Search) and analyzed eye movements separating Search and Verification Fixations.

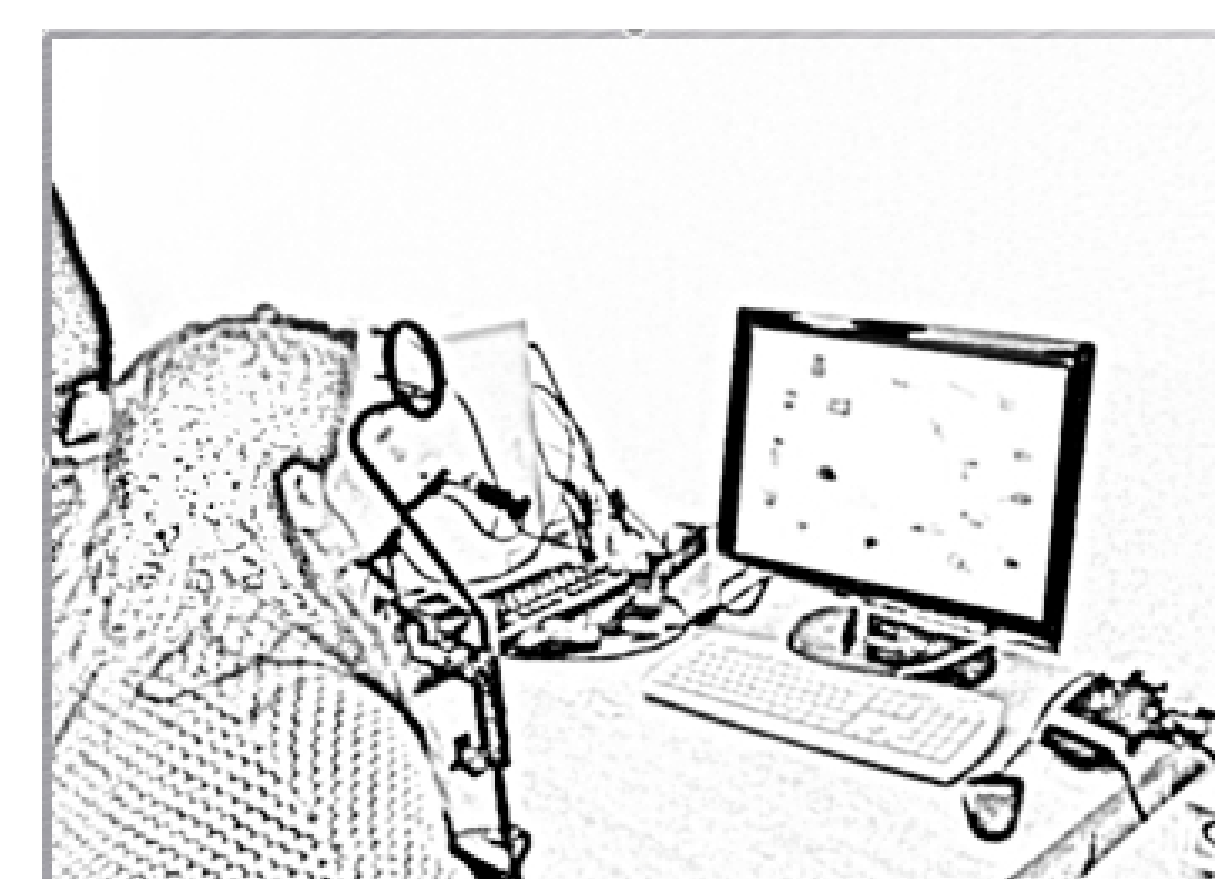
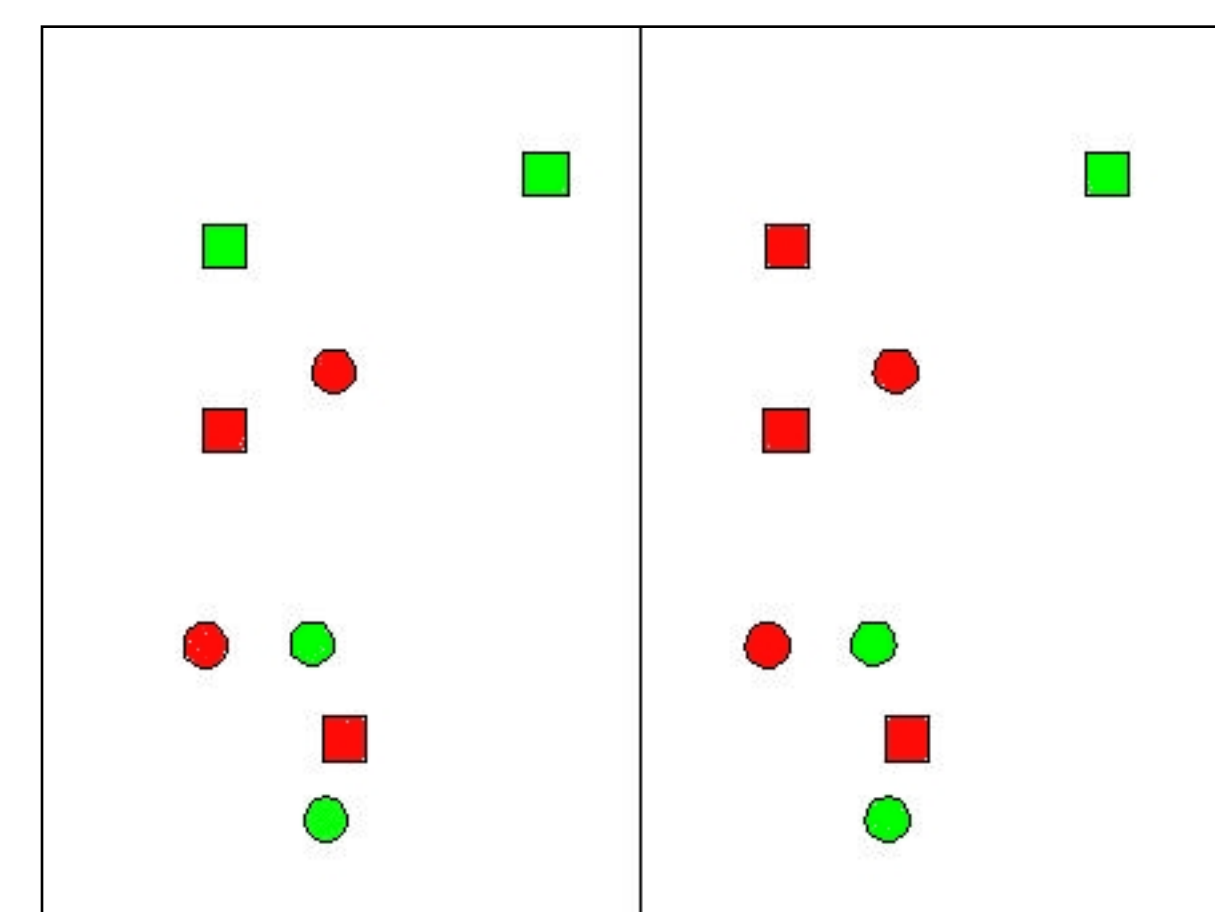
Methods

Comparative Visual Search Task:

- Find object that is different.
- Indicate if difference is in shape or color.

Manipulation:

- Four configurations were repeated 14 times.
- Each epoch: 4 new + 4 old configurations (8 trials per block, 112 in total).
- In repeated configurations target appears at the same location, but differential feature varies.



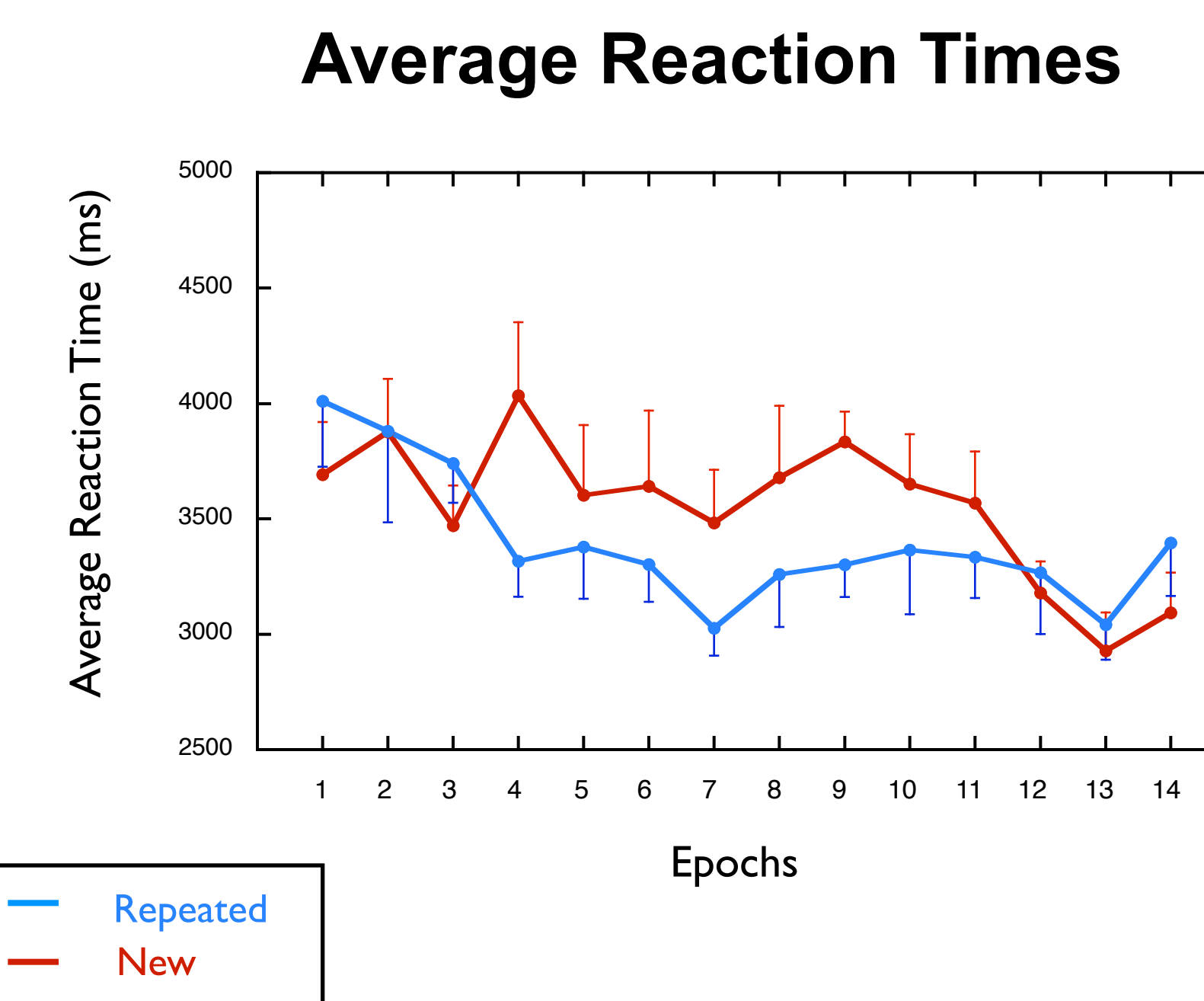
Measures:

- RT
- Eye Movements (ASL 6000, 60HZ)

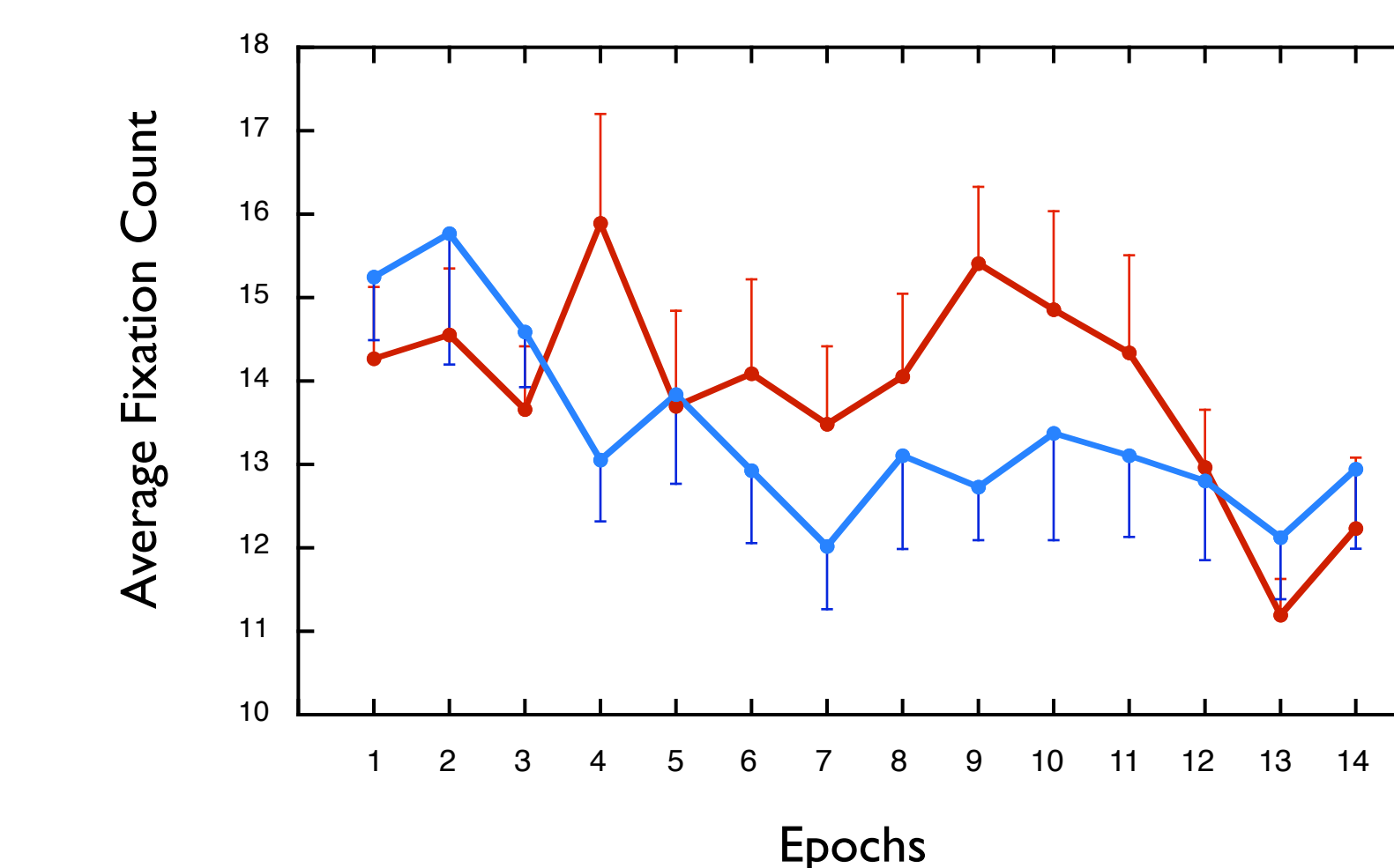
N=14

Results

1 RT and Number of Fixations



Average Number of Fixations



-RT: significant effects of Repetition ($p=0.039$) and Epoch ($p<0.001$).

-Fix: significant effect of Epoch ($p<0.001$).

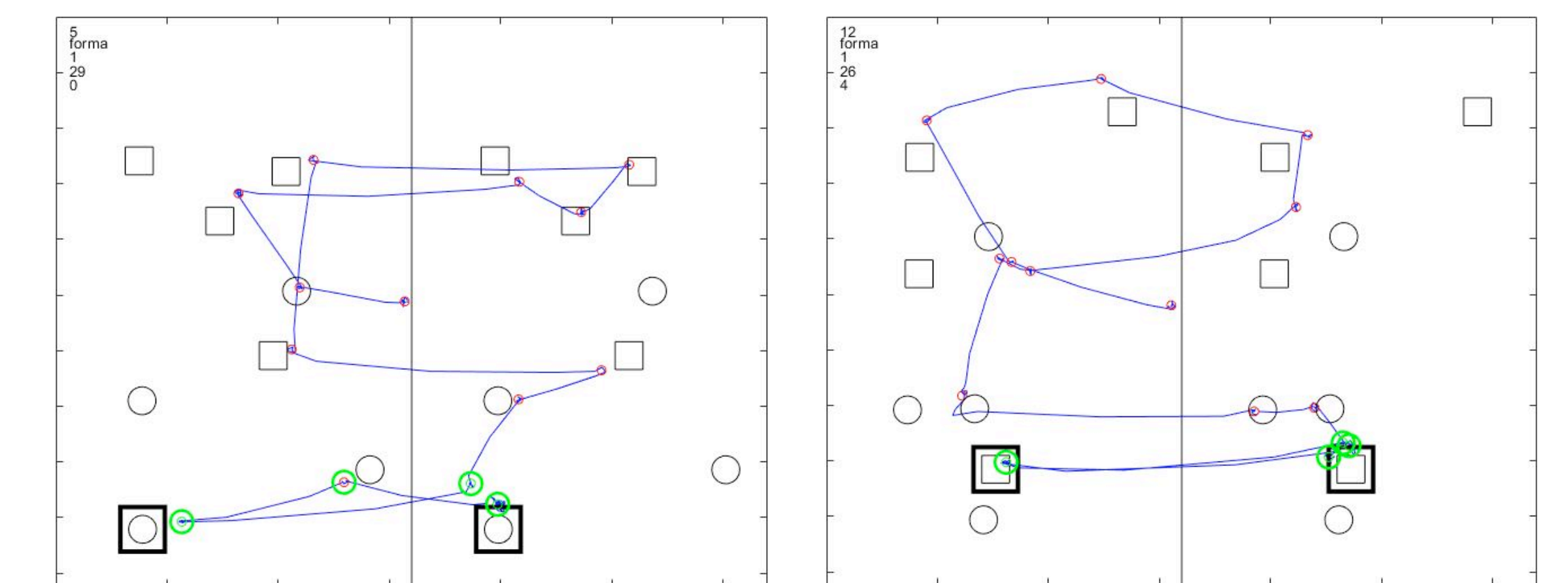
2 Search vs. Verification

Trials were divided in two phases: *Search* and *Verification* (Pomplun et al, 2001, *Cognitive Science*, 25, 3-36).

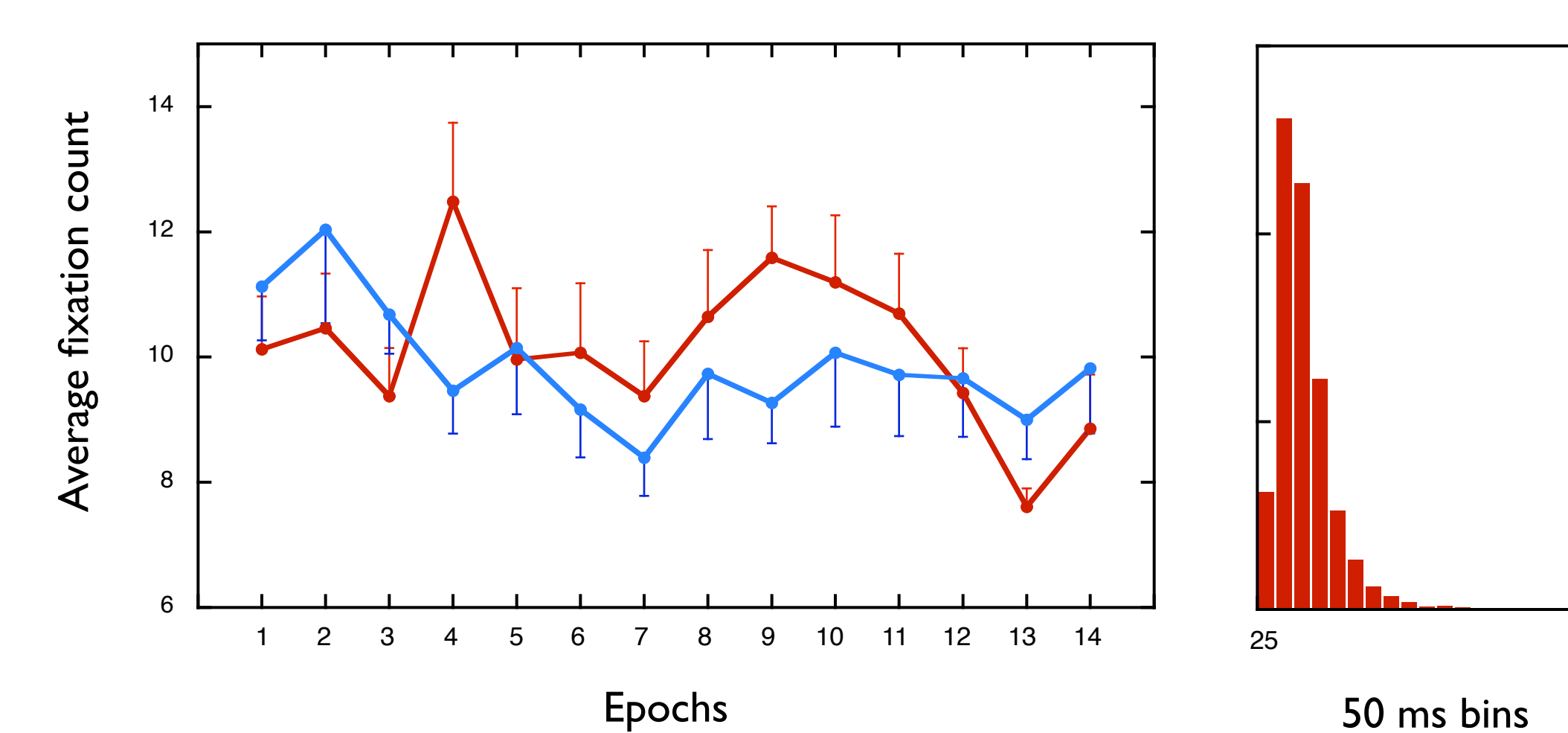
Verification Fixations: a subgroup of consecutive fixations, from the last six fixations of that trial, at a distance of less than 100 pixels from the critical items (maximum 2 intermediate fixations).

Search Fixations: All other fixations.

Examples: categorized fixations



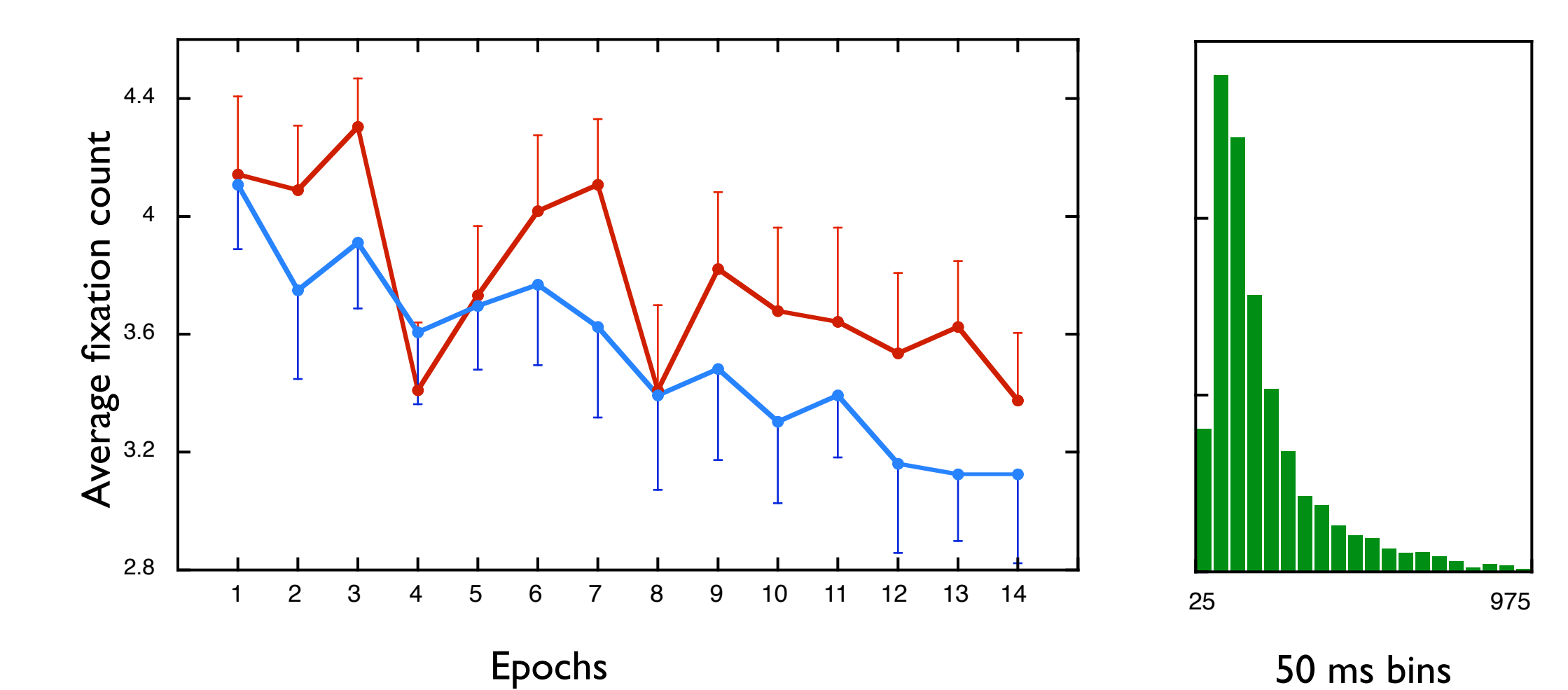
Search Fixations



-Search Fix: only significant effect of Epoch ($p=0.008$). Average Fixation Duration: 157 ms.

-Verification Fix: significant effects of Repetition ($p=0.037$) and Epoch ($p=0.005$). Average Fixation Duration: 229 ms.

Verification Fixations



Conclusions

-Search Fixations did NOT vary between repeated and new configurations.

-Verification Fixations decreased significantly more for repeated configurations.

-This suggests that, in comparative visual search, contextual cueing effects do not facilitate search, but optimize the verification process prior to response.

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