Indirect Reward Does Not Capture Attention

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Background

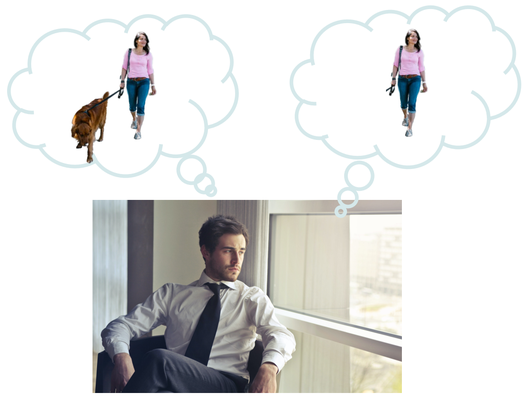
Indirect reward can impact memory and decision-making.
(Anderson et al., 2014; Patil et al., 2016; Wimmer & Shohamy, 2012).

However, whether features that are indirectly rewarded can bias selective attention remains to be explored.

How does spreading the reward value to non-rewarding items affect the automatic capture of attention?

Direct reward

Indirect reward



We hypothesized that spreading of reward value to the items that are not themselves rewarding will lead them to automatically capture attention later on.

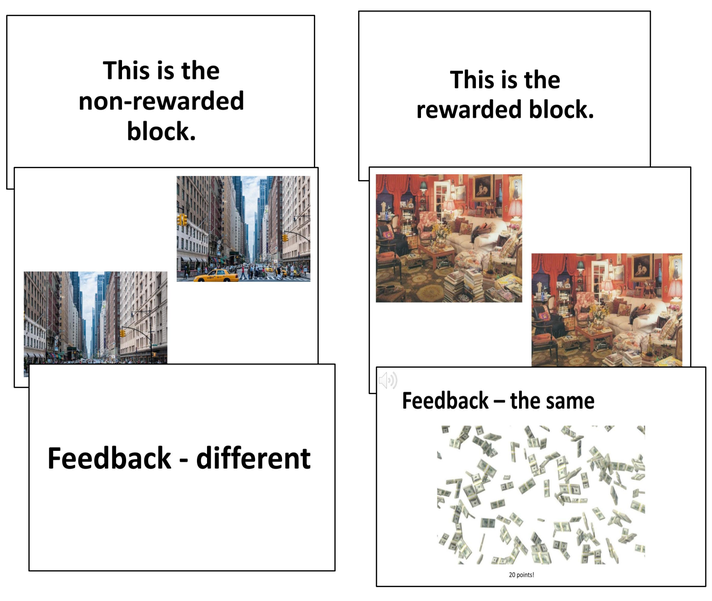
Methods

Phase 1

Form associations between backgrounds and targets (e.g., balloon in cities, bottles in rooms).

Phase 2

Associate a particular background category (e.g. rooms) with reward.



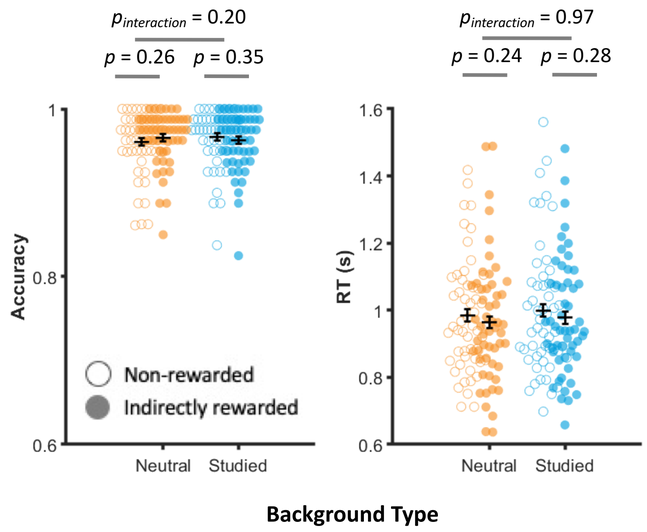
Phase 3 – test attentional capture by indirectly rewarded targets

Phase 3 included background types **studied** in Phase 1 & 2 (e.g., rooms and cities) as well as unstudied **neutral** backgrounds (e.g., libraries and amusement parks) – counterbalanced across participants.

Different than Phase 1, there was a distractor. It was either on the same side or the different side as the target.

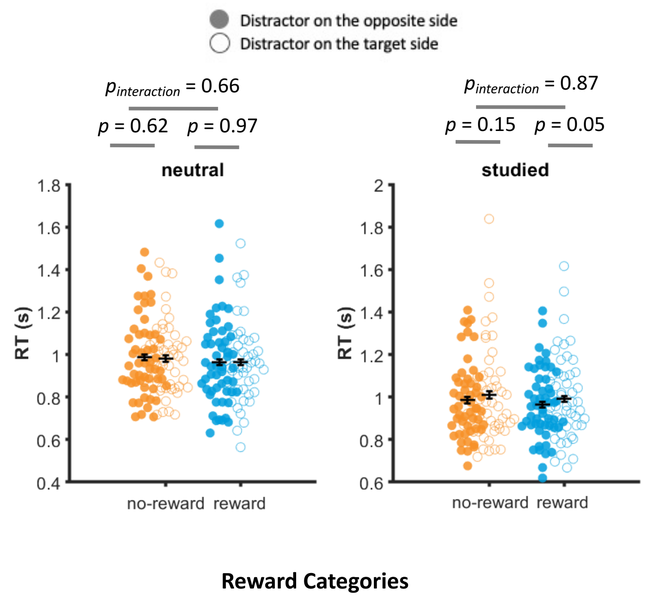
Results (N = 53)

Accuracy and reaction times across non-rewarded and indirectly rewarded targets for different scene types



Accuracies and reaction times were not different for indirectly rewarded vs. non-rewarded targets.

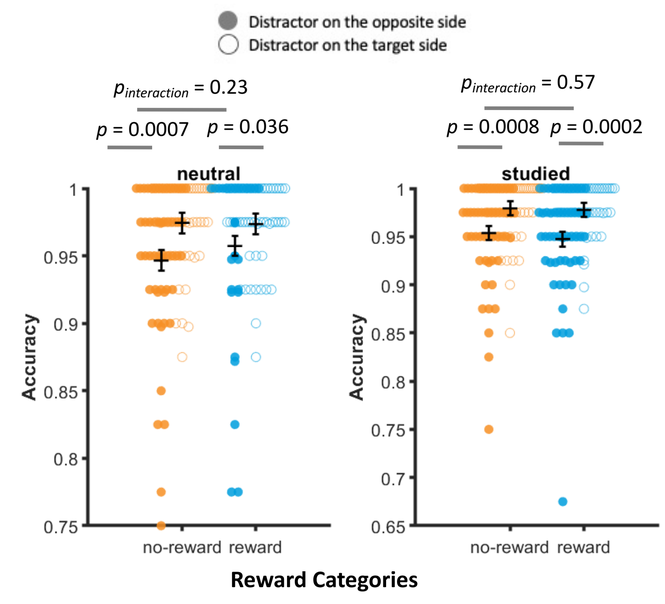
Reaction times separately for different distractor locations (same or different side than the target) across reward categories



Distractor side (same vs. opposite of the target) had no effect on RTs for neutral backgrounds.

Reaction times were smaller when the distractor was on the opposite compared to the same side for studied backgrounds.

Accuracy in different scene types by distractor location



Higher accuracy when the distractor is on the same side as the target.

This side benefit was not different across reward and no-reward targets.

Conclusion

Indirectly rewarding stimuli does not capture attention involuntarily. This suggests that indirect reward does not generalize to items in a way to impact the guidance of selective attention.

This is consistent with recent work that challenge the indirect retrospective spread of reward to associated items *(Kalbe & Schwabe, 2022).*

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