

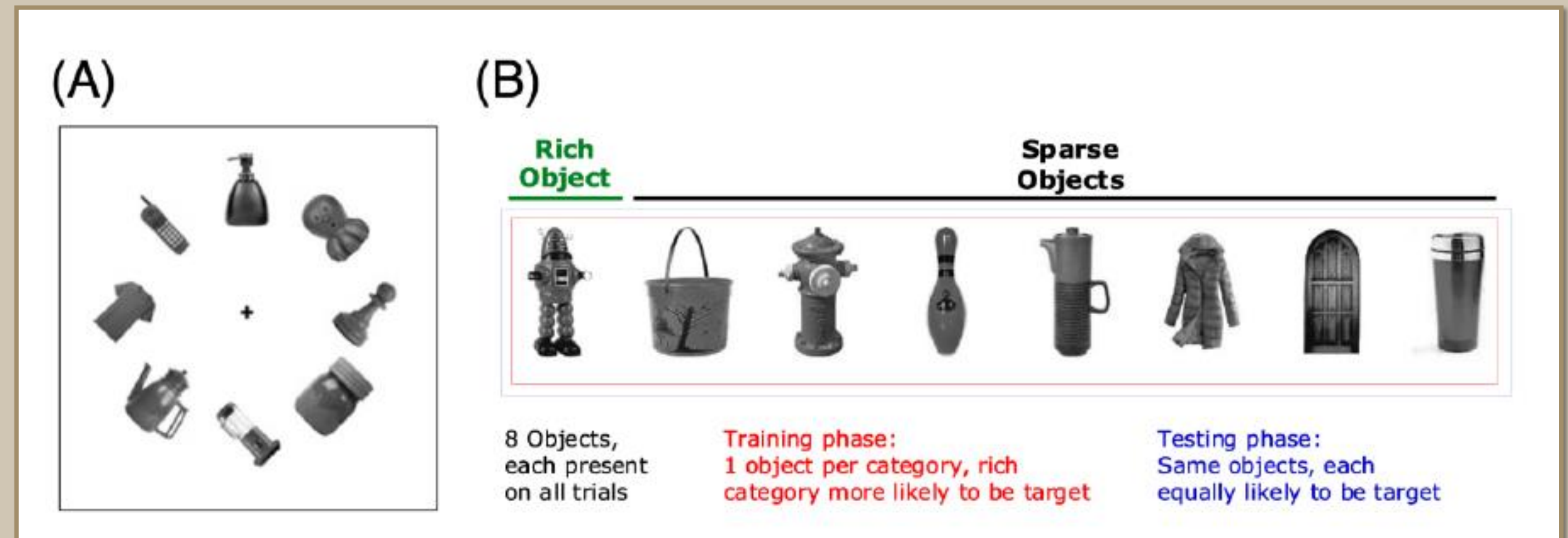
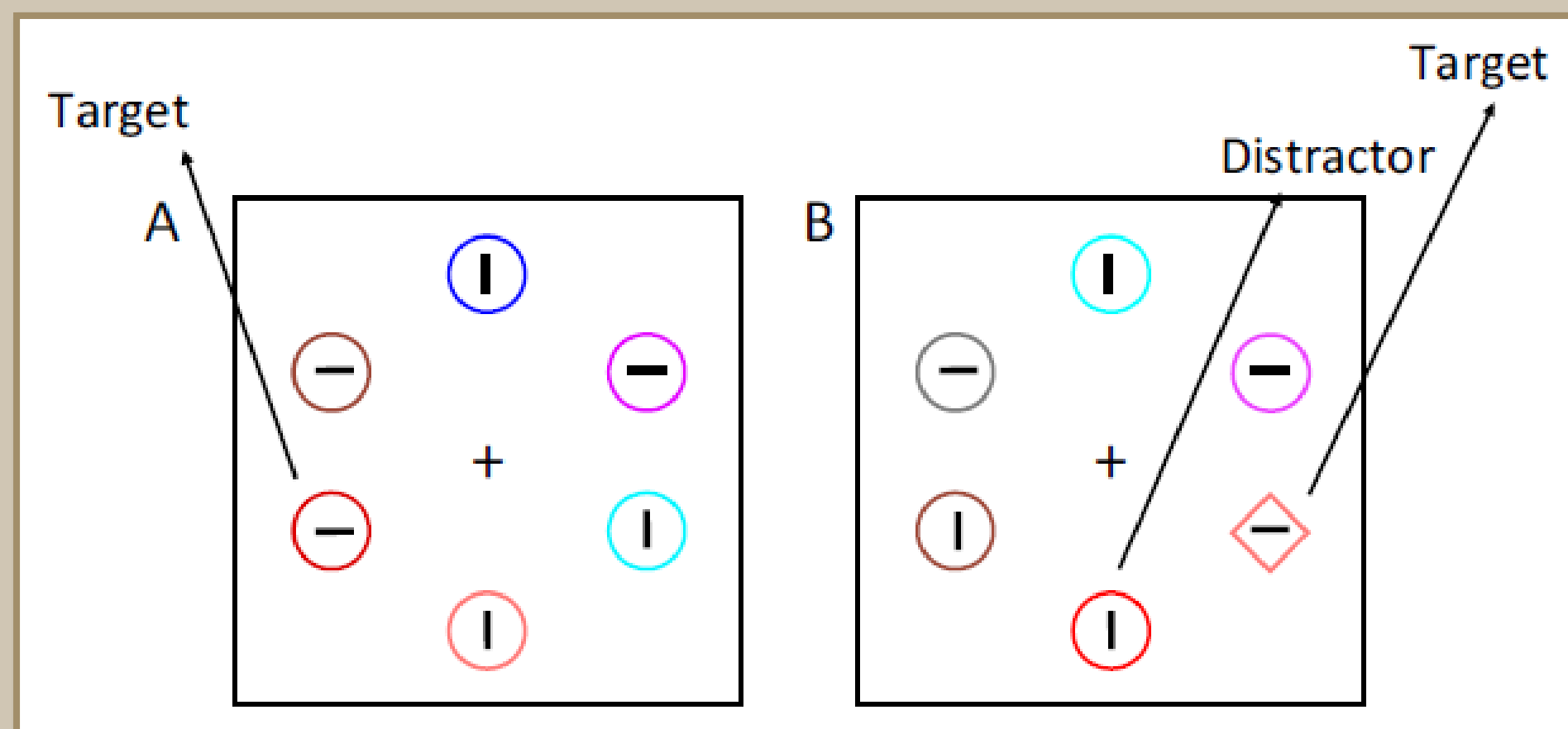
# Interaction of Selection History and Object Identity in Guiding Visual Attention

Ali Kachour, Neda Meibodi, Dominik Endres  
Psychology Department, Philipps University Marburg  
meibodi@staff.uni-marburg.de

## Introduction

Attention can be biased to a specific visual feature such as a red object based on the last experience. [Sha, 2016]

- Attentional biasing is not only limited to the feature level and can be expanded to the object level and even object categories. [Addleman, 2024]



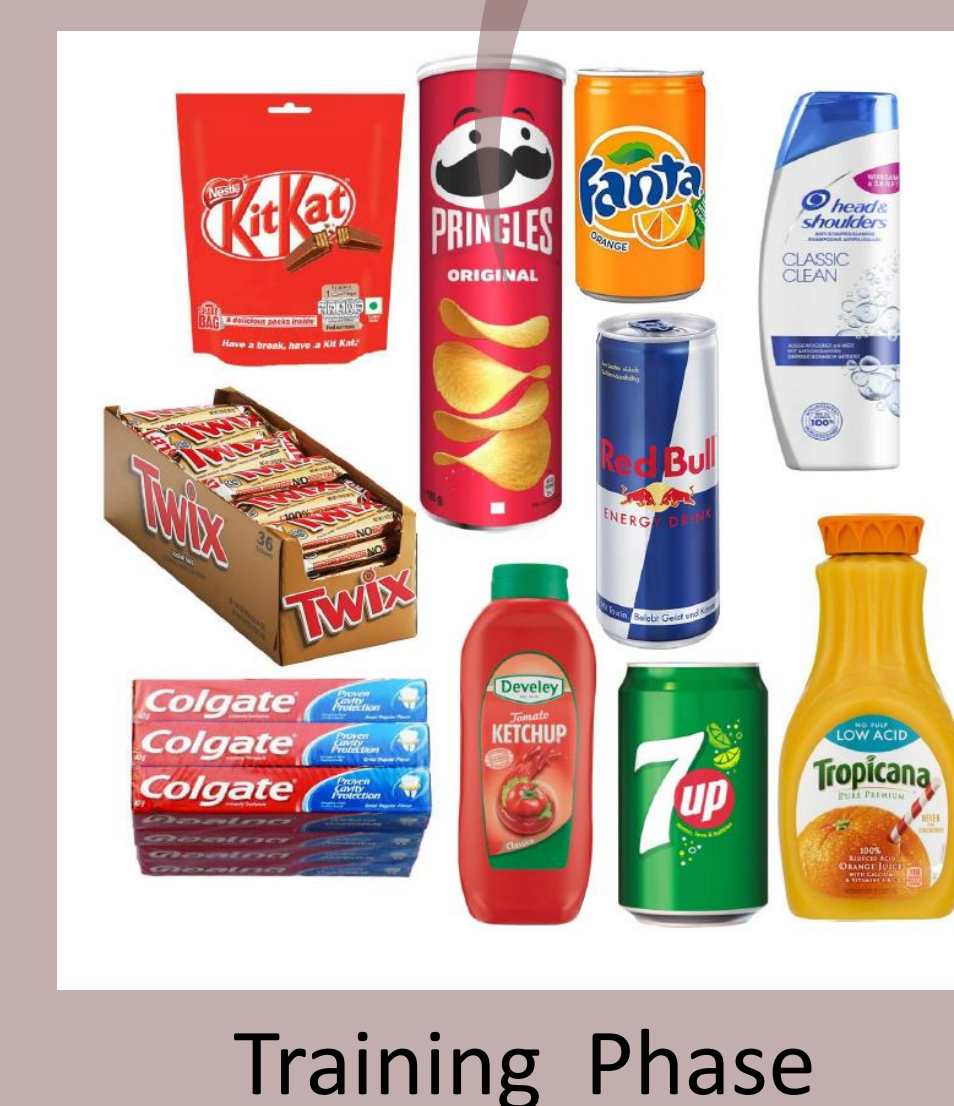
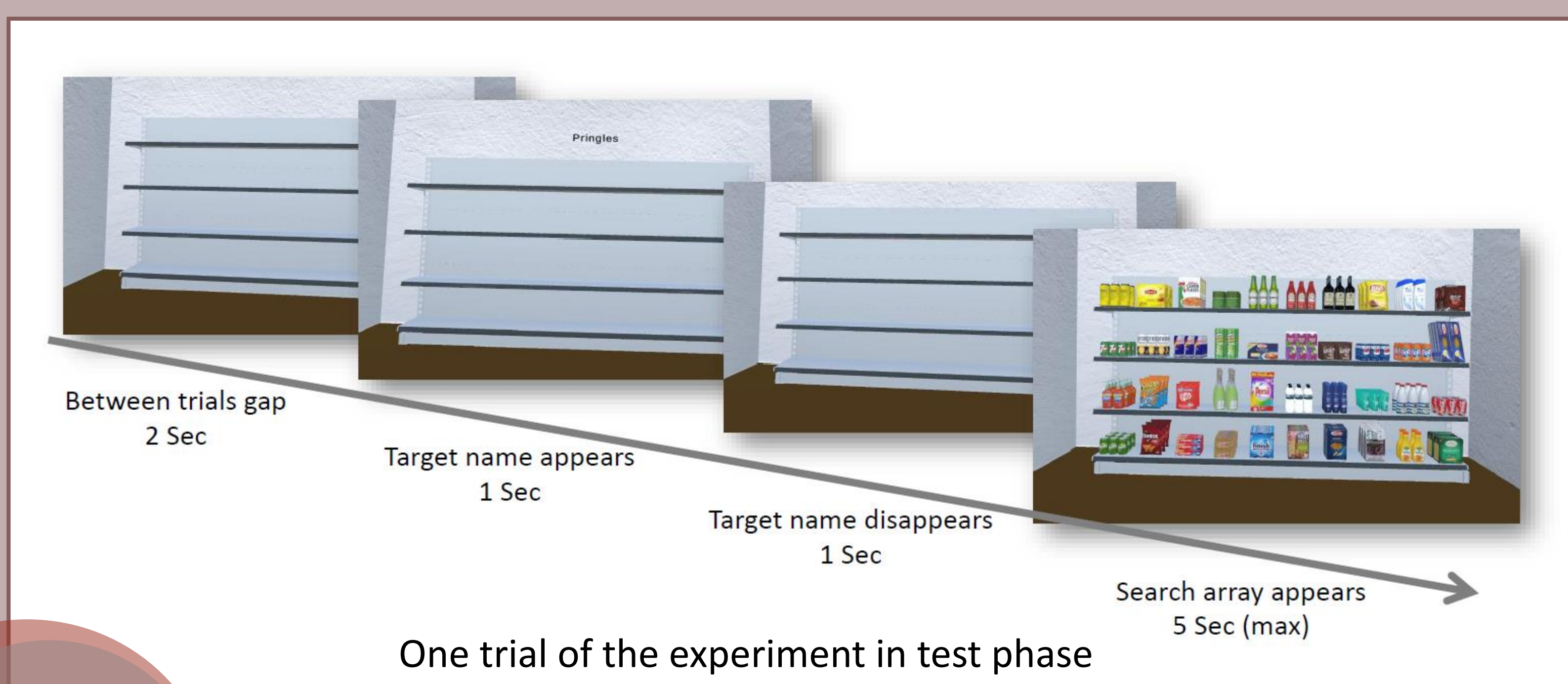
- For instance, if participants are trained to search for a specific coat, they will be faster in finding that in the next experiment.

What if the target comes with a different feature (e.g. different color) in the next experience?  
How does it affect visual search? How fast are the participants in updating their search strategy since other features such as shape are not altered?

## Method

- We have designed an VR experiment using real size natural stimuli (e.g. bottles of drinks and food boxes).
- The experiment has two phases of training and testing. In the training phase, participants learn to associate specific features—such as color, shape, and size—with their target object.
- In the test phase, these features are altered, although the targets remain unchanged.
- On each scene there are 40 items available on a real size shelves.
- The location of the targets are randomized per each trial.
- Each participant performs 4 blocks of 80 trials in each phase of the experiment.

For the **learning** group, this item is the target in 77% of the trials.  
For the **Control** group, all items have the equal chance of being the target.



Training Phase

For all participants, these items are the target with equal probability.

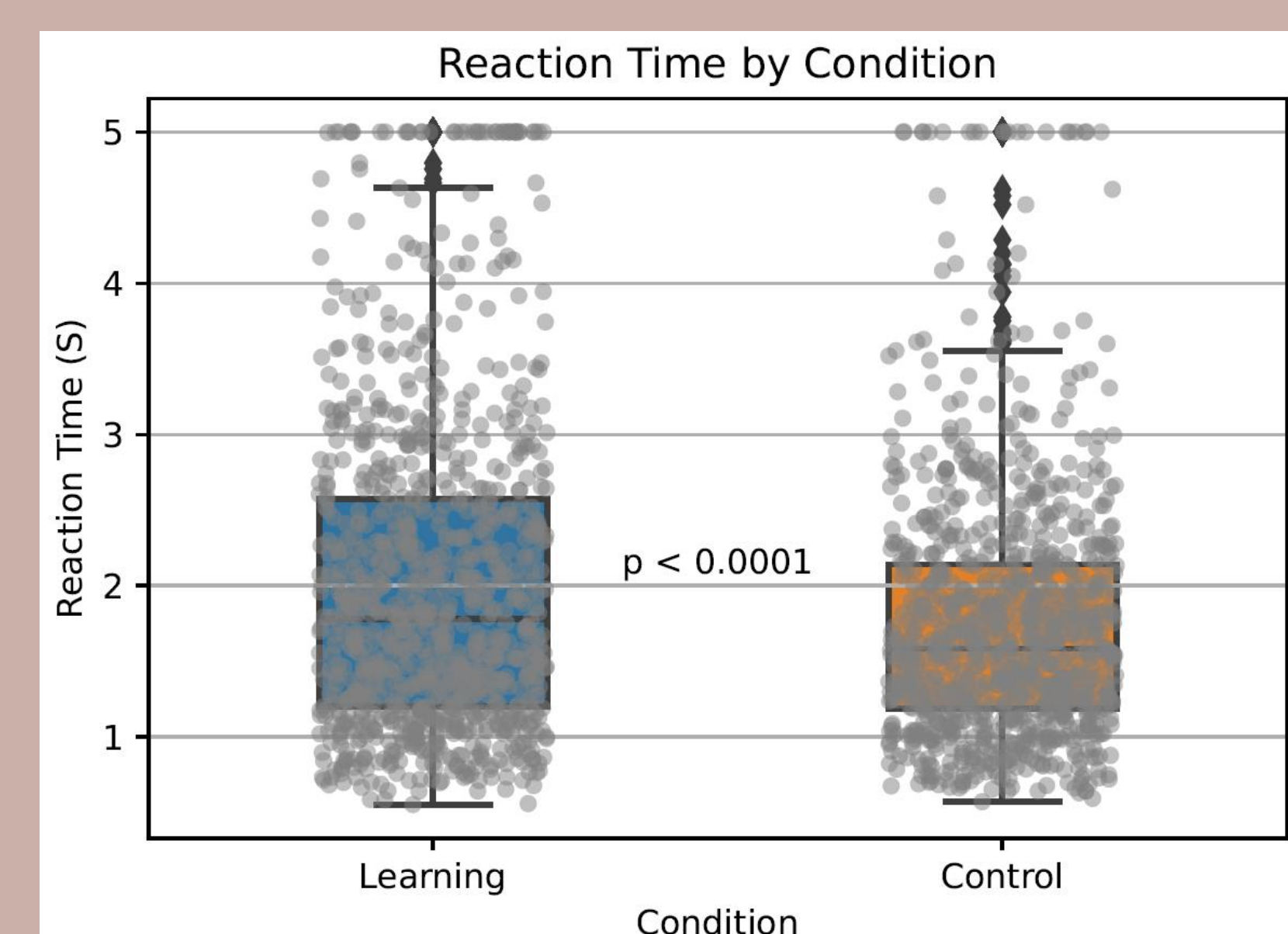


Test Phase

## Conclusion

- The search performance drops as the result of attention tuning to the color.
- Subjects update their attentional set over several trials.
- This, suggests a dynamic interplay between feature-based and object-based attention, where selection history influences initial search behavior but is quickly overridden by task demands and object familiarity.

## Results



- Subjects per condition = 3 (pilot stage)
- Learning group: Mean(RT) = 2033ms
- Control group: Mean(RT) = 1765ms

## References:

- Sha, L.Z., Jiang, Y.V. **Components of reward-driven attentional capture.** *Atten Percept Psychophys* **78**, 403–414 (2016). <https://doi.org/10.3758/s13414-015-1038-7>
- Addleman, D.A., Rajasingh, R., Stoermer, V.S. **Attention to object categories: Selection history determines the breadth of attentional tuning during real-world object search.** *Journal of Vision*, Vol.23, 5428 (2023). doi:<https://doi.org/10.1167/jov.23.9.5428>

