Skill-Based Learned Oculomotor Avoidance

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Introduction

- Salient distractors (e.g., color singleton) capture attention during a visual search task for a target (e.g., shape singleton).[1]
- Evidence suggests experience can be used to learn to suppress salient distractors.[2]
- The mechanism underlying this suppression remains unclear.
- Hypotheses:
  - Oculomotor Suppression[3]
  - Rapid Disengagement[4]
  - Learned Oculomotor Avoidance[5]

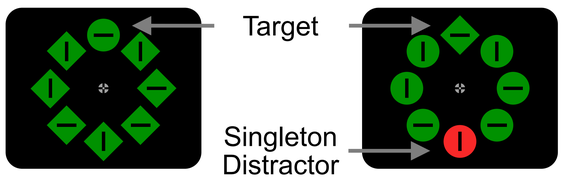


General Aim:

This study tests the real-time dynamics of *how* we learn to suppress color singletons using *eye tracking*.

General Method

Search Task

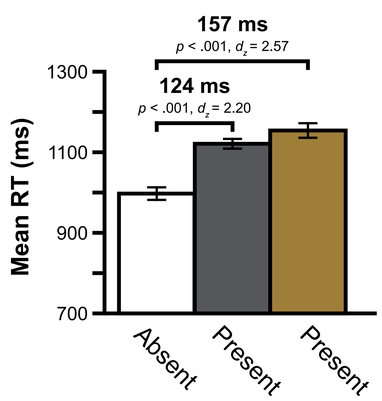


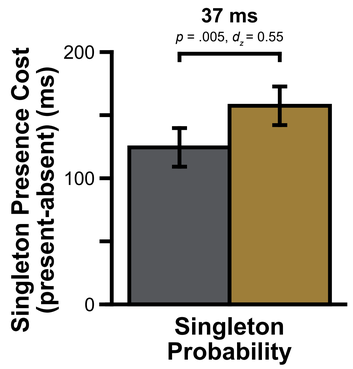
High-Frequency Singleton Color
75% of trials

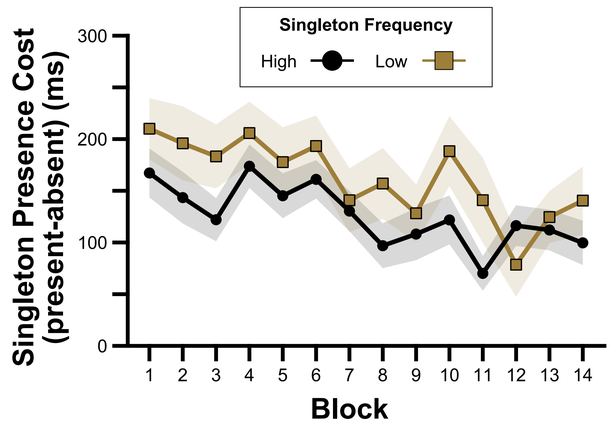
Low-Frequency Singleton Colors
25% of trials

Note: Colors counterbalanced across participants

RT Results



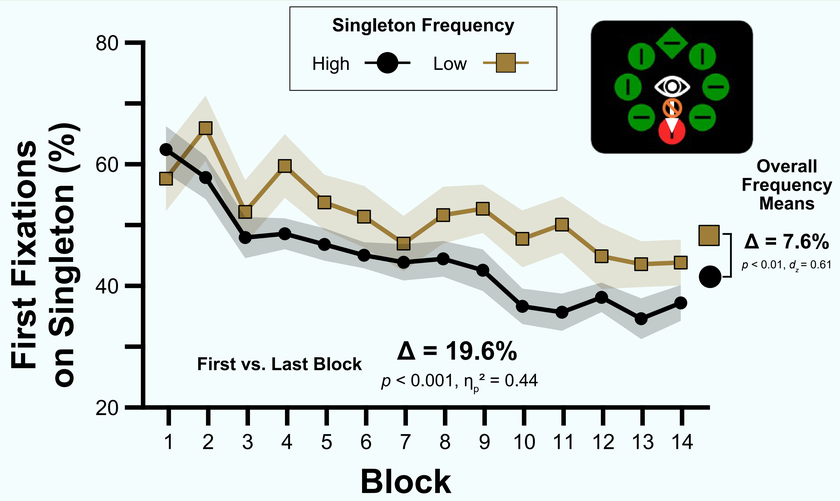




Key Finding

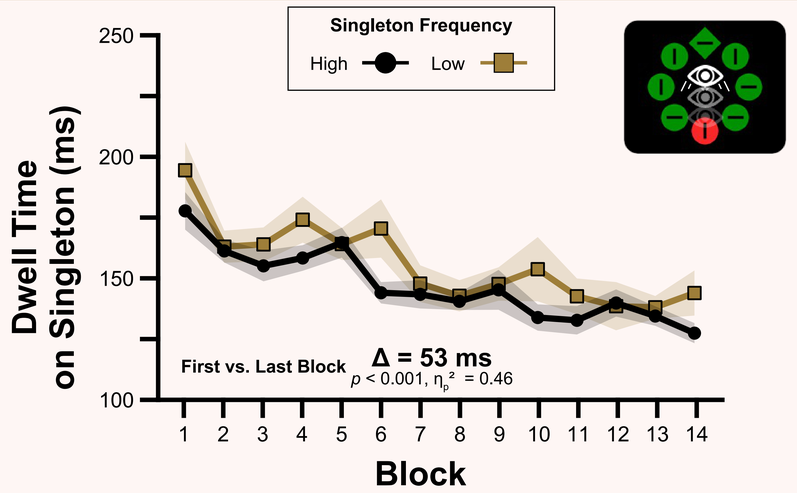
Participants were less distracted over time and more so for the high- than low-frequency colors.

First Fixation Results



Key Finding

Oculomotor Suppression: Participants got better at ***avoiding*** the singleton over time.



Key Finding

Rapid Disengagement: Participants got better at ***disengaging*** from the singleton over time.

Conclusions

These findings support ***both*** the ***oculomotor suppression hypothesis*** and ***rapid disengagement hypothesis***, which we and others have termed this combined mechanism as ***learned oculomotor avoidance***. This mechanism aligns with negative reinforcement in the animal learning literature, such as avoidance and escape learning.

Acknowledgements

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References

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