Experience with Difficult Dual-Color Search Can Promote a Shift to a Single Range Target Representation
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BACKGROUND
• Certain kinds of visual experience can influence the guidance of attention on a subsequent search (e.g., priming, value-driven attention, contextual cueing)¹.
• Attentional guidance based on experience can interact with top-down control, improving or impairing search performance.

AIMS
• Explore the effect of experience with difficult search on top-down guidance of attention.

RESEARCH QUESTIONS
• Does experience with difficult color search modulate observer’s search strategy?
• If so, what is the most effective search strategy?

STUDY DESIGN

Colors Used in Search Stimuli

Two subject groups
EASY search experience group
• 100% easy search trials (8 colors used).
HARD search experience group
• 50% difficult search trials (16 colors used and target-similar colors frequently used as distractor colors.) + 50% easy search trials (8 colors used)
• These two different search trials were intermixed.

RESULTS & DISCUSSION

How does experience with difficult dual-color search affect search strategy and performance?
(Only easy search trials were used for statistical analyses)

Experiment 1: Consistent targets (n = 64)

Behavioral Data

Eye Movement Data

• No group difference in both error rate and RT, ps > .05

Experiment 2: Varied targets (n = 64)

Behavioral Data

Eye Movement Data

• Higher error rate for HARD group than EASY group in target-present trials, p < .001.

WHEN TARGET COLORS WERE CONSISTENT, the HARD group showed 1) higher fixation rate for the HARD group than the EASY Group, ps < .01.
• Outer colors: no significant difference between the groups, ps > .1.
• Target: Higher fixation rate for the HARD group than the EASY group, p < .05.

WHEN TARGET COLORS WERE VARIED, we could not find any significant effect on eye movement data, but found higher target miss rate for the HARD group than the EASY group.

The experience with difficult dual-color search encouraged observers to build a single range target representation, leading to poorer attentional guidance and target verification, but this range target representation only occurred when that representation could be stored in Long-Term Memory.

REFERENCES

Lab website http://blogs.umass.edu/vcalab