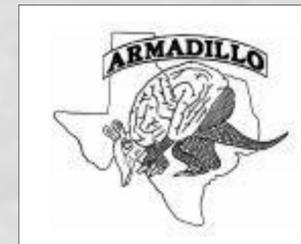


Incidental object memory during low and high target-prevalence search

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The Low-Prevalence Effect (LPE)

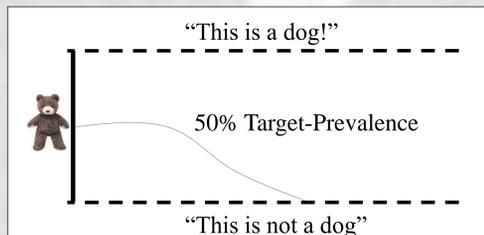
- The LPE occurs when observers miss rare targets more frequently than common targets (1).
- It is robust, and replicates across multiple contexts, such as: Radiology (2), baggage screening (3), and ID verification (4).

Casual Factors of the LPE

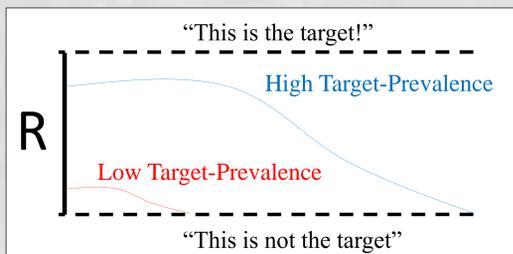
- The Multi-Decision Model of Visual Search (5) explains miss rates through two mechanisms:
 - Reduced quitting thresholds
Selection errors: Search is terminated before fully inspecting the search display (6,7).
 - Conservative shifts of the identification criterion
Perceptual errors: Rare targets become “harder to see” due to the stricter threshold (8, 9).

Shift in Identification Criterion

- Under ideal conditions (e.g., 50% target-prevalence), observers are unbiased, and processing time for targets and distractors is similar.



- If target-prevalence *decreases*, observers adopt a conservative criterion, slowing target identification, but speeding distractor-rejection.
- If target-prevalence *increases*, observers adopt a liberal criterion, speeding target identification, but slowing distractor rejection (9).



The Present Study

- We examined incidental memory for distractors from *low* and *high* target-prevalence search.
- If rejected distractors are processed more exhaustively during *high target-prevalence* conditions, incidental encoding should be stronger.

Experiment 1

Does high target-prevalence search facilitate incidental distractor encoding?

- Target Prevalence (between-groups): 25%, 50%, 75%

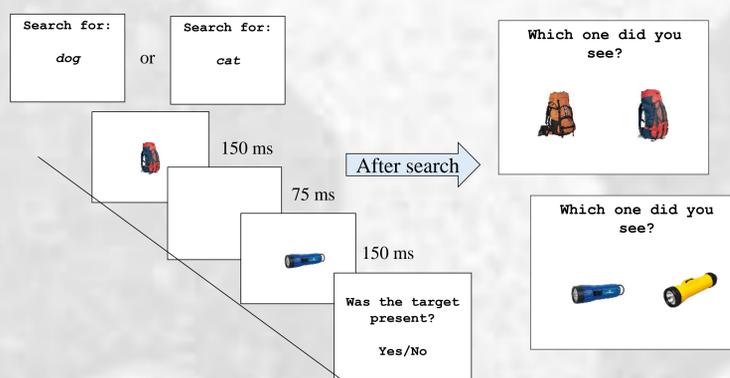


- Two blocks:
 - Block 1: Induce criterion shift
 - Block 2: Present to-be-tested distractors.
- After the search task, observers completed a *surprise* 2-AFC recognition test for search distractors.



Experiment 2

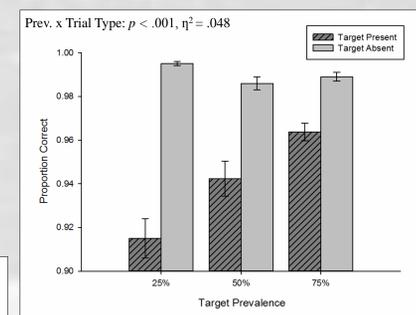
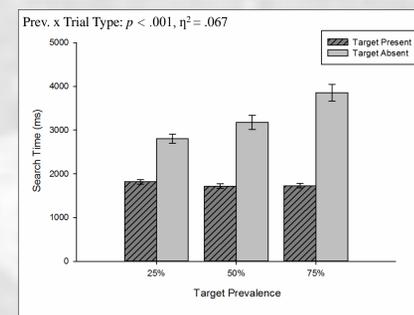
When selection errors are eliminated, does target prevalence influence distractor memory?



- Only distractors presented *before* RSVP targets were included in the recognition test.

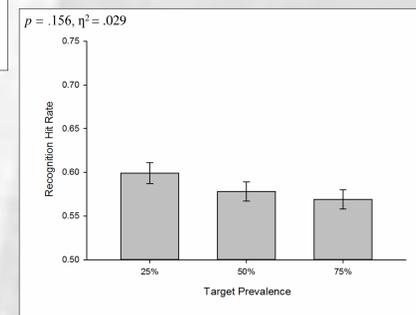
Results Exp. 1

- Replicated the LPE in hits and misses (right), reflecting shifts in the ID criterion.

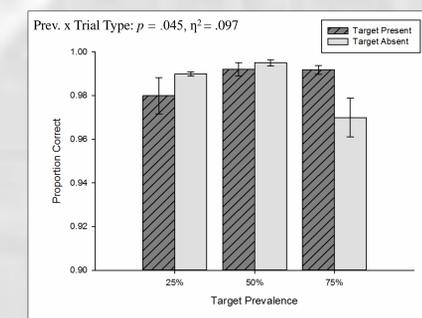


- Less evidence for exhaustive search in the 25% condition (left; consistent with 5, 6, and 7).

- No effect of target-prevalence on distractor recognition (right).
- Fewer “target present” trials in LP search means more distractors were examined.

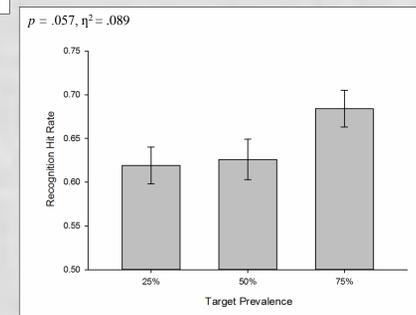


Results Exp. 2



- False-alarms increased with target-prevalence, but misses did not reliably differ across groups (left).

- Distractor recognition was marginally higher following high-prevalence, relative to low-prevalence, search (right).



Discussion

Experiment 1

- Although target-prevalence influenced search performance in Exp.1, distractor memory was not affected.
- In Exp. 1, observers examined more distractors during low target-prevalence, search due to greater target-absent trials.

Experiment 2

- In Exp. 2, the number of distractor processed was equated across prevalence conditions.
- Higher HP false-alarm rates were accompanied by elevated recognition hit rates, confirming our hypothesis.

References

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