The Influence of Distractor Expectancies on Visual Working Memory Interference Across and Within Feature Dimensions

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1. INTRODUCTION

- The match between memoranda and distractors modulates the nature and magnitude of interference experienced during visual working memory retention.
  - At the dimensional level, distractors that overlap with maintained information produce greater interference than those that do not.[1]
  - Within the memorized dimension, distractors that resemble studied items lead to perceptual distortions, while dissimilar distractors produce memory erasure.[2]
- **Research Question:** Can distractor expectancies counter these forms of interference?

2. METHOD – EXPERIMENT 1

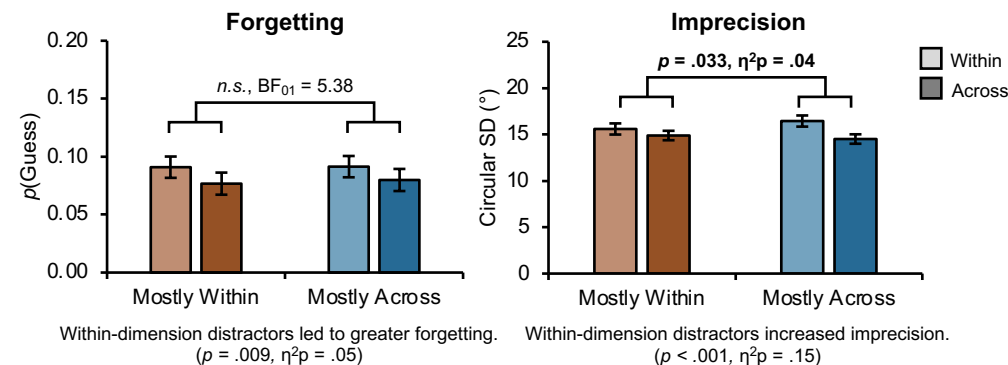*Within- versus Across-Dimension Interference*
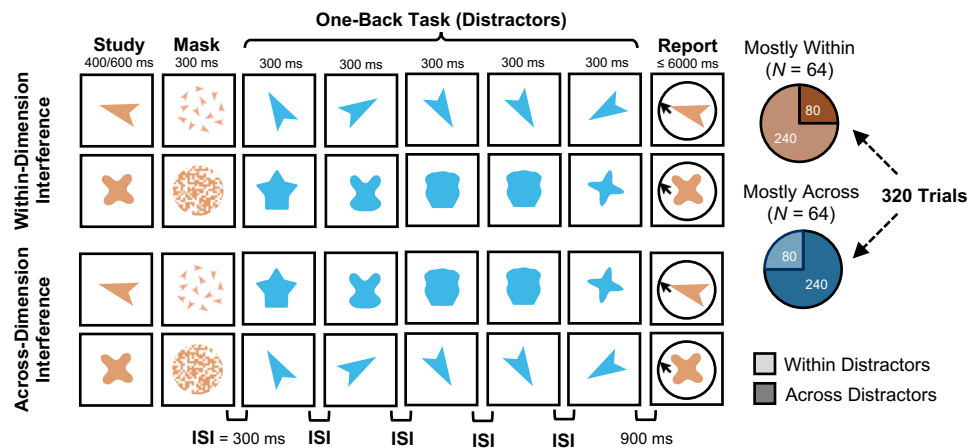
Primary Task: Memorize and report either the orientation (*N* = 64) or form (*N* = 64) of studied objects.

Interference Task: Detect one-back repetitions from either the memorized dimension (**within**) or non-memorized dimension (**across**). One interference-type occurred three times as often (240:80) as the other.
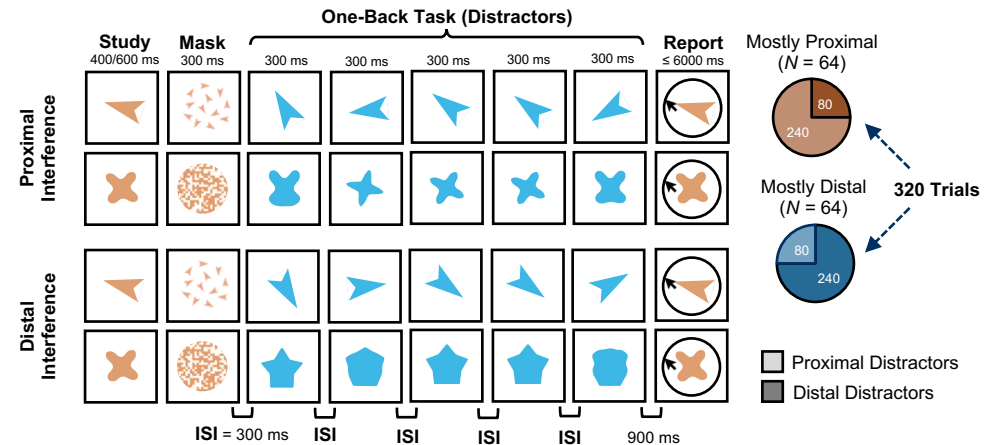
3. RESULTS – EXPERIMENT 1

Error bars = ±1 SEM

Within-dimension distractors led to greater forgetting. (p = .009, $\eta^2 p$ = .05)

Within-dimension distractors increased imprecision. (p < .001, $\eta^2 p$ = .15)

Distractor expectancies moderated the interference effect on imprecision.
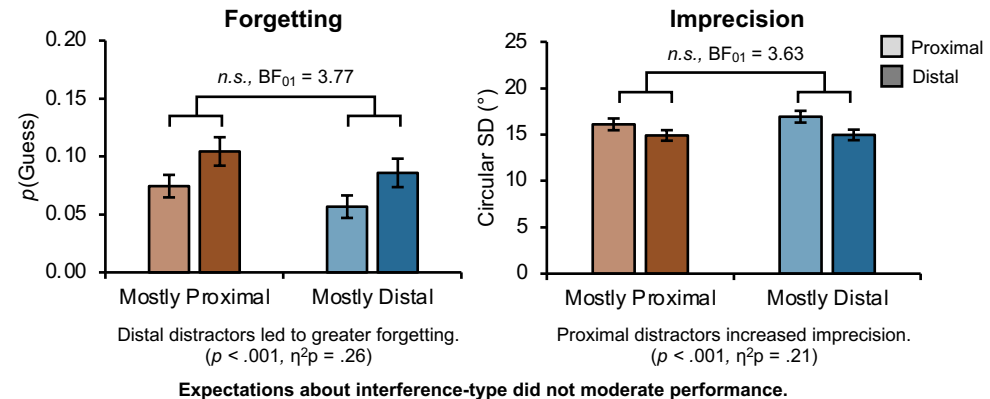
4. METHOD – EXPERIMENT 2

Proximal versus Distal Interference (Within Memorized Dimension)

In contrast to Experiment 1, all distractors were chosen from the memorized dimension and were either near (**proximal**) or far (**distal**) from the memorized value.

5. RESULTS – EXPERIMENT 2

Distal distractors led to greater forgetting. (p < .001, $\eta^2 p$ = .26)

Proximal distractors increased imprecision. (p < .001, $\eta^2 p$ = .21)

Expectations about interference-type did not moderate performance.

6. DISCUSSION

- Expectations about memory-distractor similarity mitigate interference at the dimensional level (i.e., within vs. across; Exp. 1), but not at the level of features (i.e., proximal vs. distal; Exp. 2).
- When across-dimension distractors are expected, individuals may rely on sensory-based maintenance to improve recall precision[3], but become more susceptible to within-dimension interference.
- Those who expect within-dimension interference may rely less on sensory-based recruitment, constraining precision-based adjustments.

References: 1. Lorenc, E. S., et al. (2021). *Trends in Cogn Sci, 29,* 416–424; 2. Sun, S. Z., et al. (2017). *J Exp Psychol Gen, 146,* 1606–1630; 3. Emrich, S. M., et al. (2013). *J Neurosci., 33,* 6516–6523.