Effects of Distinctiveness Encoding and Typicality on Retrieval Monitoring

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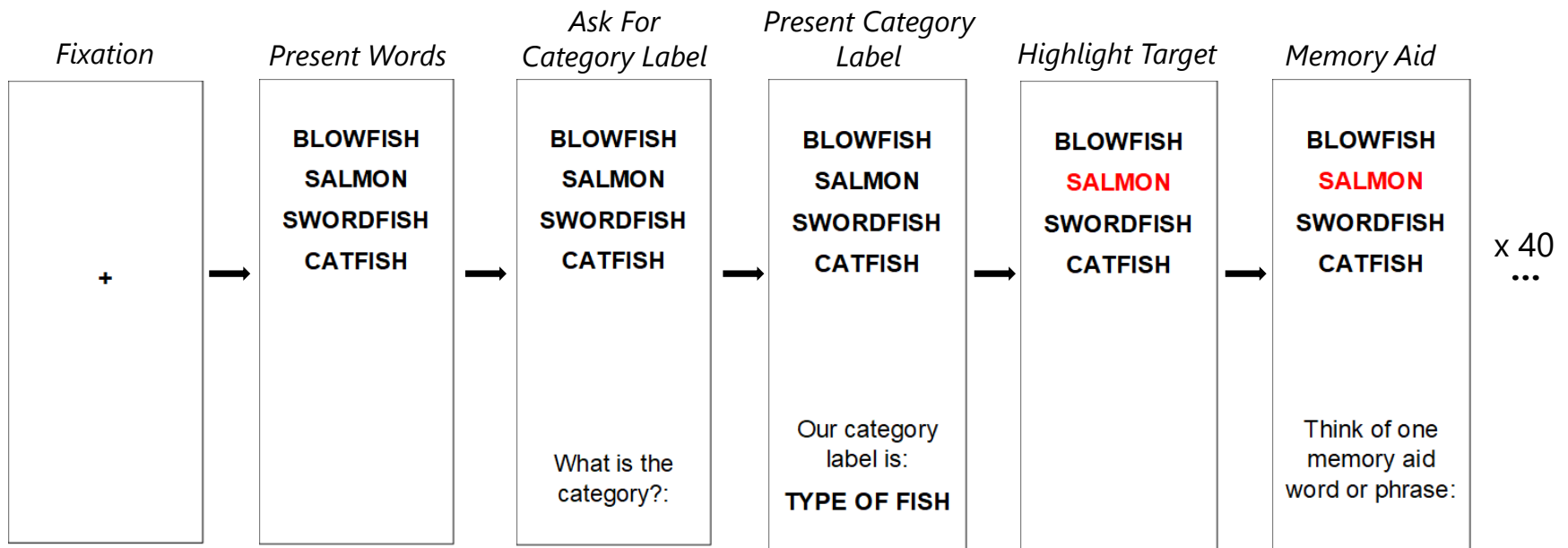UNIVERSITY

High Confidence Memory Errors

- Retrospective Confidence Judgments (RCJs) after recognition memory tests are often relatively accurate with standard materials

- However, false memories are often characterized by high subjective confidence in incorrect memory responses

- DRM paradigm: critical lure recalled or recognized with high CJs

- Encoding for *item distinctiveness* (Hunt & Worthen, 2006) is one means of reducing false memories
  - (Hunt & Smith; Thomas & Summers;

Distinctiveness and Metacognition

- We follow the approach of Reed Hunt, Rebekah Smith, and colleagues in evaluating distinctiveness effects

- Distinctiveness: Distinctiveness can be created by processing item differences in the context of item similarity (Hunt, 2013)

- General question: will manipulating item distinctiveness affect RCJ resolution in a manner that reduces the magnitude of false memory effects?

First Session

- 4 concrete nouns drawn from taxonomic category presented in column

- Category queried, then explicitly presented exactly as cued in future

- One element highlighted in RED FONT to designate it is the target for future recall

Fixation	Present Words	Ask For Category Label	Present Category Label	Highlight Target	Memory Aid
+	BLOWFISH SALMON SWORDFISH CATFISH	BLOWFISH SALMON SWORDFISH CATFISH What is the category?:	BLOWFISH SALMON SWORDFISH CATFISH Our category label is: TYPE OF FISH	BLOWFISH SALMON SWORDFISH CATFISH	BLOWFISH SALMON SWORDFISH CATFISH Think of one memory aid word or phrase:

x 40
...

Between-Subjects Manipulation

- At final stage of item study individuals prompted to type in a feature that is shared by all 4 nouns (similar) or distinguishes the target from its companions (item distinctiveness)

Think of one memory aid word or phrase that you know is SHARED between the word in red and the other words:

OR

Think of one memory aid word that you know is DISTINCT about the word in red compared to the other words:

Second Session

- Hart Recall-Judge-Recognize task

- FOK after category-cued recall attempt for all items

- 5-Alternative Forced Choice recognition test (target, 2 OLD lures (presented at study), 2 NEW lures from category norms)

- RCJ collected after each recognition response
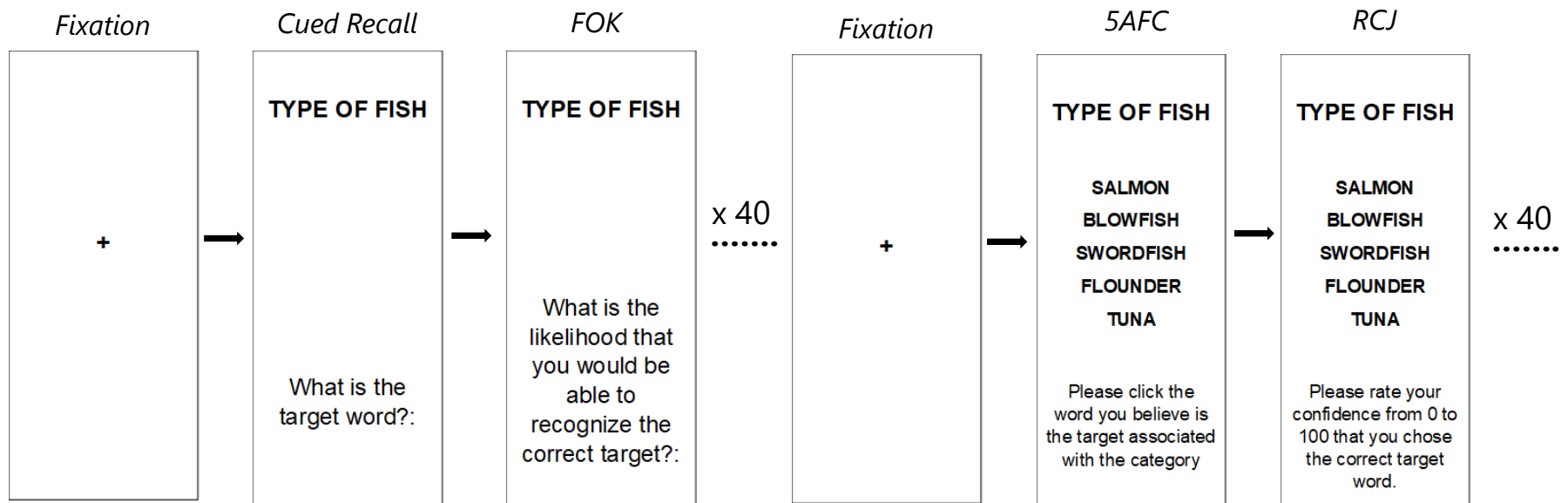
- Participants (**N = 86**) volunteers from Psychology participant pool randomly assigned to: Similar (**N = 43**) vs. Difference (**N = 43**) encoding

- 7-day delay between Session 1 and 2 to bring memory performance for Difference encoding off ceiling
  - (selected after pilot data & based on previous experiment in our lab manipulating repetition; Hertzog, Dunlosky, & Sinclair, 2010)

- Stimuli constructed from van Overschelde et al. (2004) noun category norms, omitting 2 highest typicality items but allowing typicality of selected nouns to vary

- Items selected at random to serve as target, co-presented nouns, and new lures in 5AFC test

Hypotheses

- Generating Distinctive feature (relative to Shared feature) at encoding will:

    1) Increase RCJ accuracy, (resolution: gamma correlations) for all items by reducing false memory effect

    2) Reduce high-confidence 5AFC false alarms (false memories)

Distinctive encoding improves both recall and recognition memory with large effect sizes
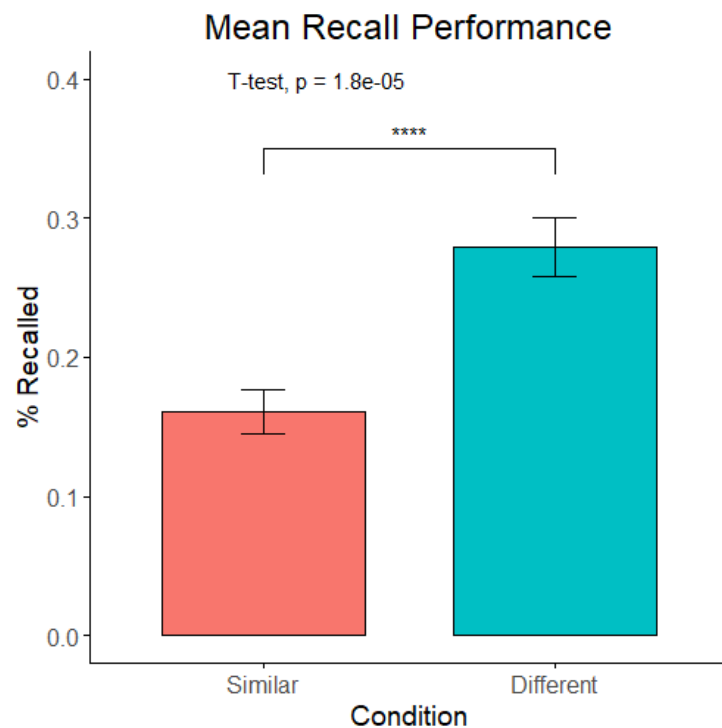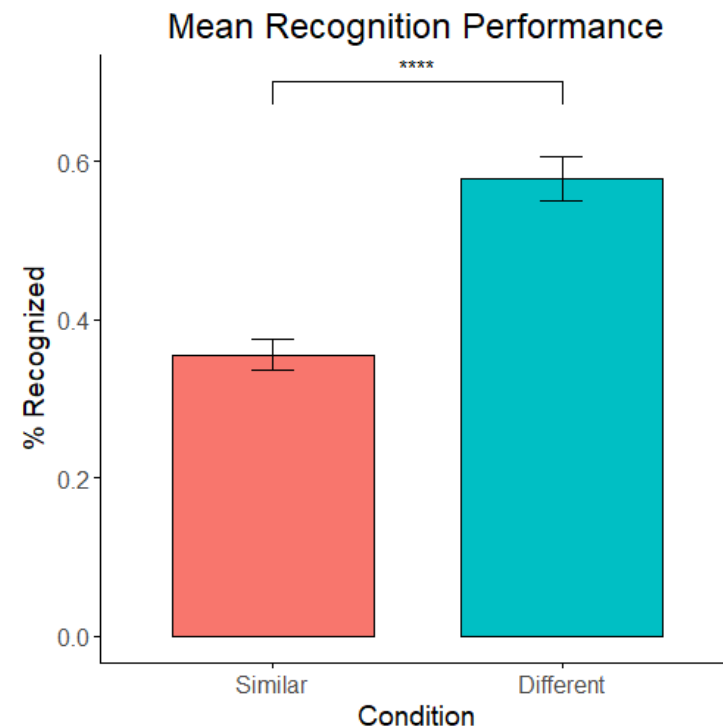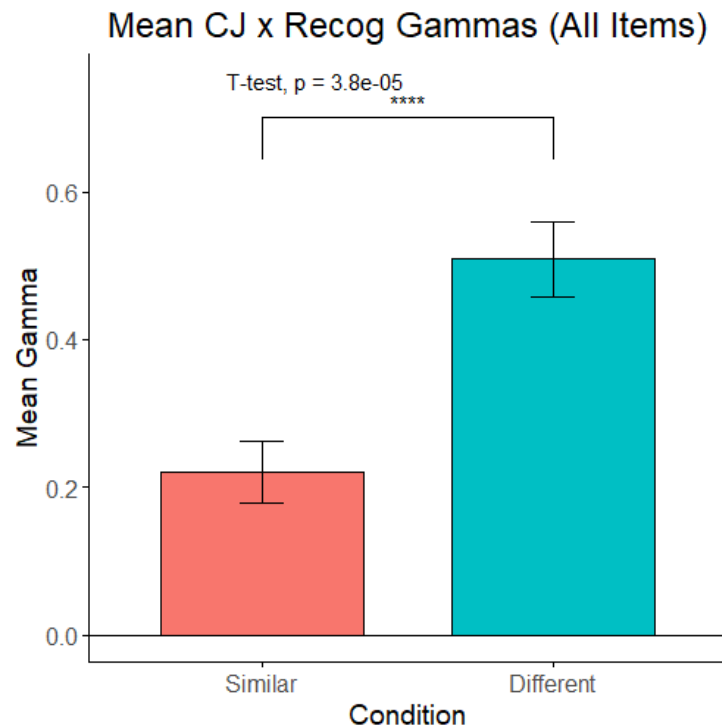

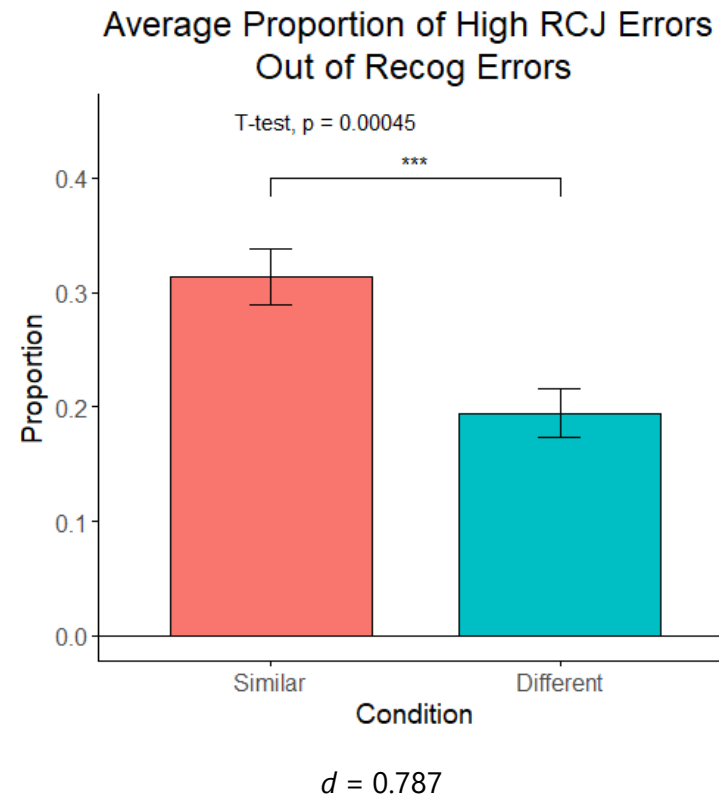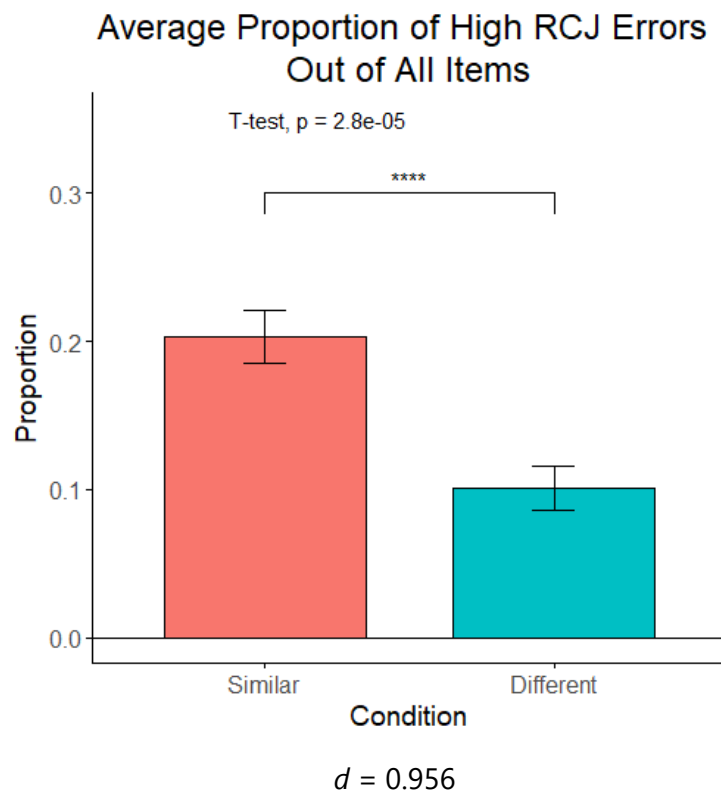d = 0.980   d = 1.387

Distinctiveness affects RCJ resolution for all items

- Surprisingly low magnitude of gamma in Similarity condition!

Mean CJ x Recog Gammas (All Items)

$d = 0.944$

False memory revealed by high-confidence memory errors that are more likely for Similarity encoding

d = 0.956

d = 0.787

False memory effect generated by familiarity of co-presented exemplars (Old lures vs New lures)

Effect reduced by Difference encoding

Average Proportion of High RCJ Errors
Out of All Errors By Condition and Error Type
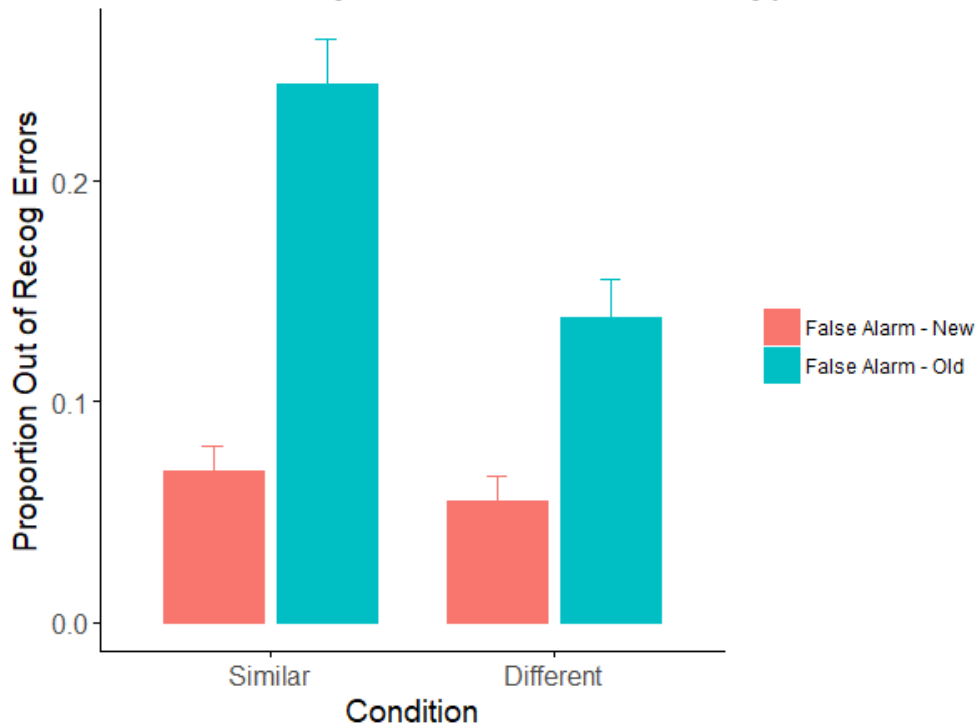
Main effect of Condition:
- $F(1,168) = 14.577$, p > .05, $\eta_p^2 = .080$

Main effect of Error Type:
- $F(1,168) = 68.203$, p > .05, $\eta_p^2 = .289$

Condition * Error Type Interaction:
- $F(1,168) = 8.559$, p = .004, $\eta_p^2 = .049$

Distinctiveness and False Memories

- Low RCJ resolution generated by familiarity of co-presented items (old lures), producing higher FA rates than for semantic associates (new lures)

- Difference encoding instructions reduces this effect (but does not eliminate it), increasing RCJ resolution

Conclusions

- Distinctive processing reduces false memories

- Degree of false memory in Similarity condition is large

- High-confidence false recognition in Similarity condition largely attributable to high-familiarity lures

QUESTIONS