

Introduction

Fidelity of feature representations is **stable** across memory subsystems (Brady et al., 2013). Long-term memory (LTM), compared to short-term memory (STM), has different **temporal properties** (Born & Wilhelm, 2012; Murayama et al., 2014). Thus, the difference between fidelity in LTM and STD **may emerge with time** and repeated retrieval.

Hypotheses

- The fidelity limit in long-term memory **changes over time**
- Repeated retrieval from LTM leads to **higher percentage of guesses**
- Retrieval from LTM leads to **replacement of true memories** with recalled ones.

What did we actually do?

Color report task



Fig. 1 Subjects choose color of an object they saw on a color wheel.

Experimental design

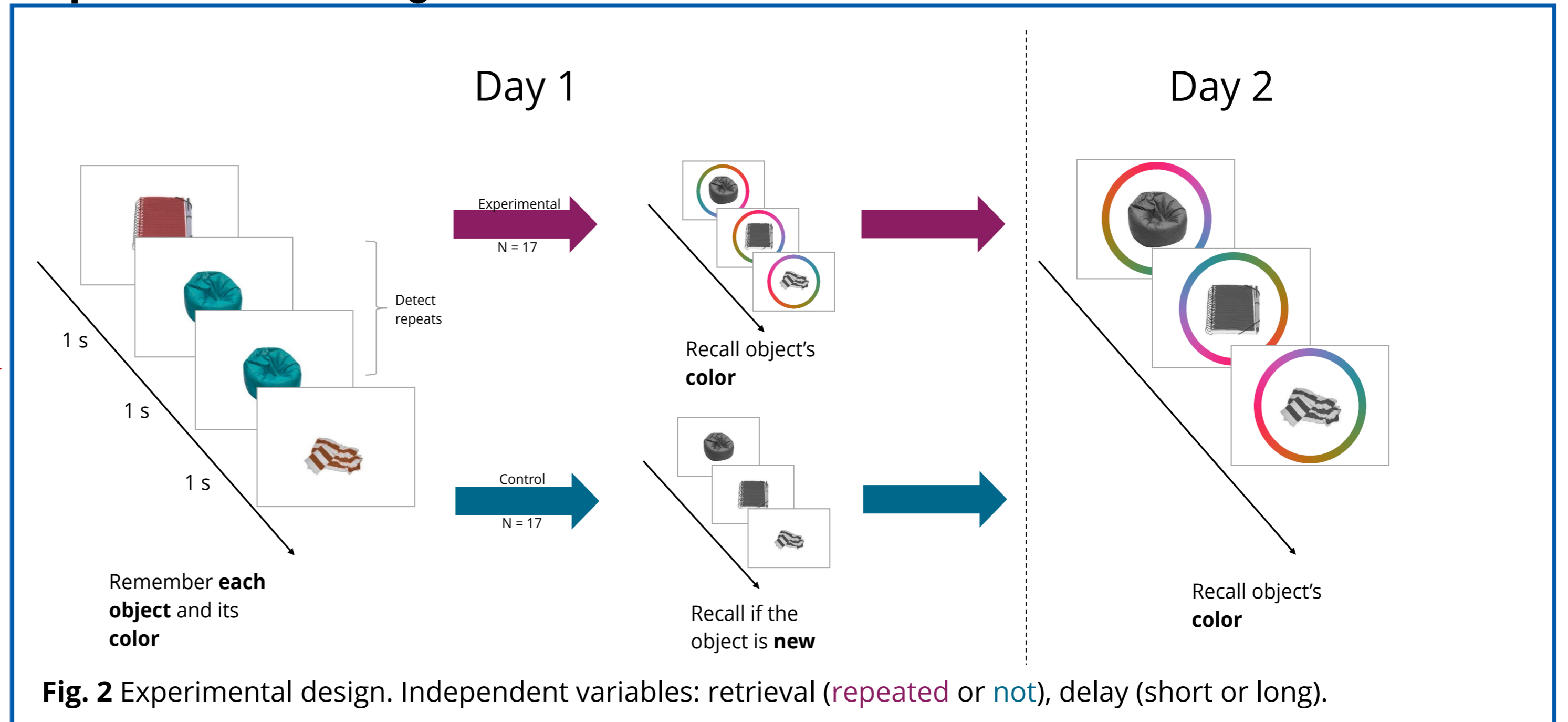


Fig. 2 Experimental design. Independent variables: retrieval (repeated or not), delay (short or long).

Fitting a mixture model

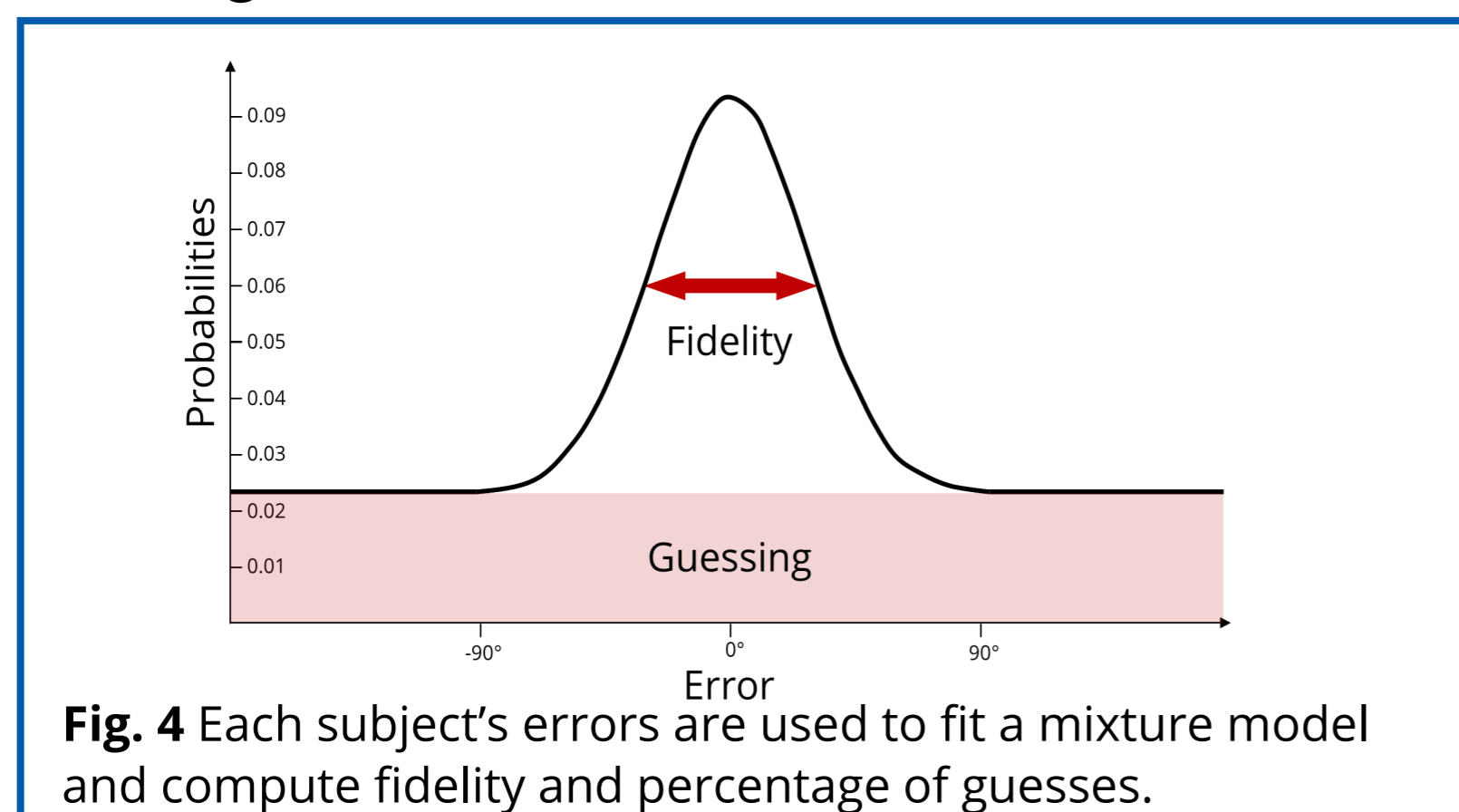


Fig. 4 Each subject's errors are used to fit a mixture model and compute fidelity and percentage of guesses.

Dependent variables

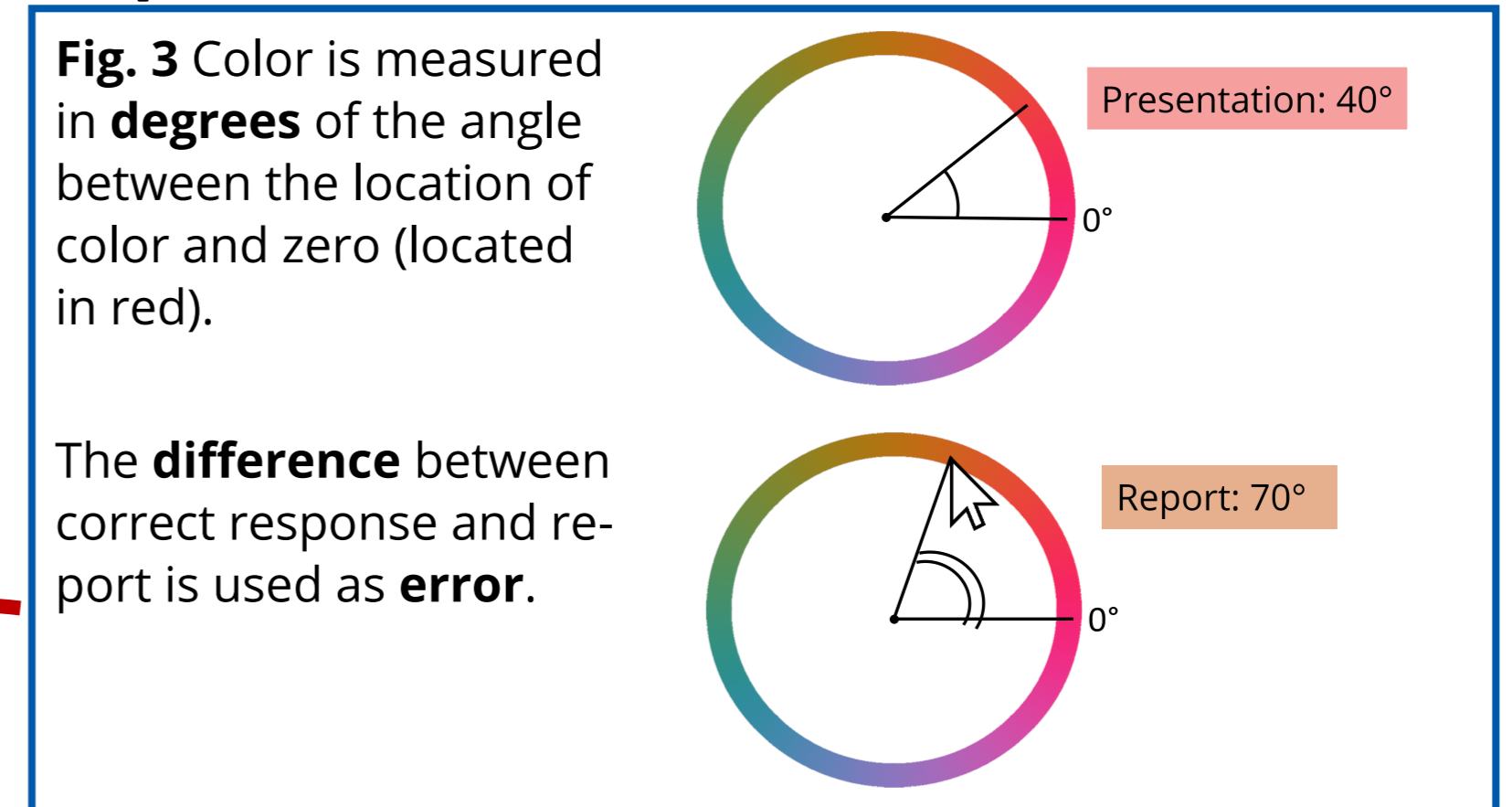


Fig. 3 Color is measured in degrees of the angle between the location of color and zero (located in red).

The **difference** between correct response and report is used as **error**.

Results

Four types of models were fitted:

1. Error (E) = Presentation (P) - 1st Report (1R), **exp. group**
2. Error = Presentation - 2nd Report (2R), **exp. group**
3. Error = Presentation - 2nd Report, **control group**
4. Error = 1st Report - 2nd Report, **exp. group**

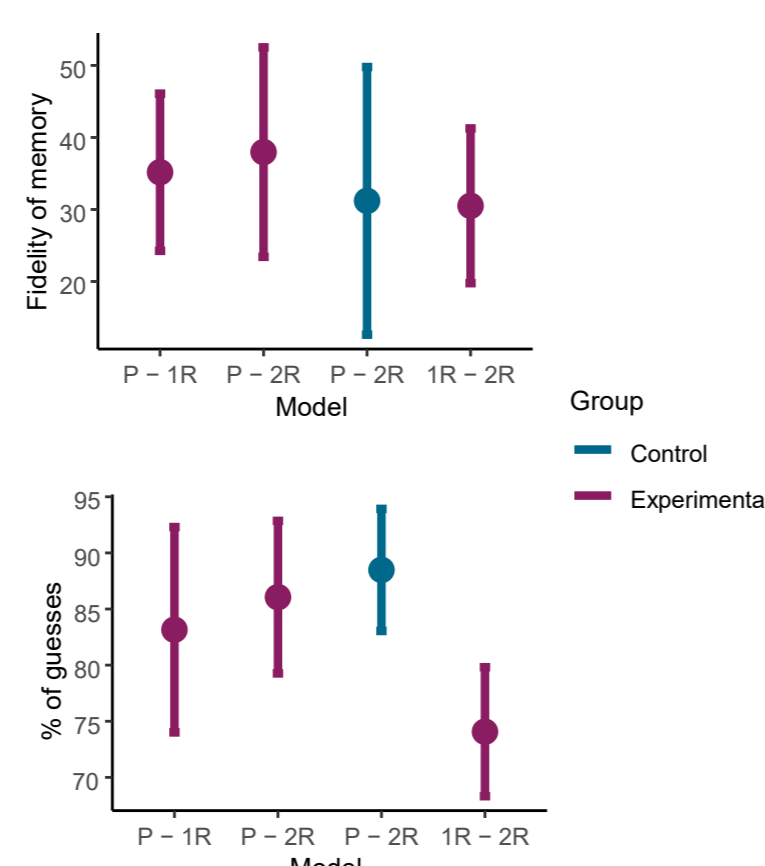


Fig. 5 Mean fidelity and % of guesses in different models.

Models in comparison		Welch's t-test, fidelity	Welch's t-test, guessing
E = P - 1R, exp.	E = P - 2R, exp.	$t(21) = -0.35, p = .74$	$t(21) = -0.55, p = .59$
E = P - 2R, exp.	E = P - 2R, control	$t(18) = -0.66, p = .52$	$t(18) = 0.61, p = .55$
E = P - 2R, exp.	E = 1R - 2R, exp.	$t(22) = -0.93, p = .36$	$t(22) = -2.99, p = .007$

Conclusions

- Fidelity in LTM **does not change** with time.
- Re-retrieval **does not influence** guessing in LTM.
- Re-retrieval induces **false memories**.

References

Brady, T. F., Konkle, T., Gill, J., Oliva, A., & Alvarez, G. A. (2013, 04). Visual Long-Term Memory Has the Same Limit on Fidelity as Visual Working Memory. *Psychological Science*, 24(6), 981-990. doi:10.1177/0956797612465439
 Born, J., & Wilhelm, I. (2011, 05). System consolidation of memory during sleep. *Psychological Research*, 76(2), 192-203. doi:10.1007/s00426-011-0335-6
 Murayama, K., Miyatsu, T., Buchli, D., & Storm, B. C. (2014). Forgetting as a consequence of retrieval: A meta-analytic review of retrieval-induced forgetting. *Psychological Bulletin*, 140(5), 1383-1409. doi:10.1037/a0037505