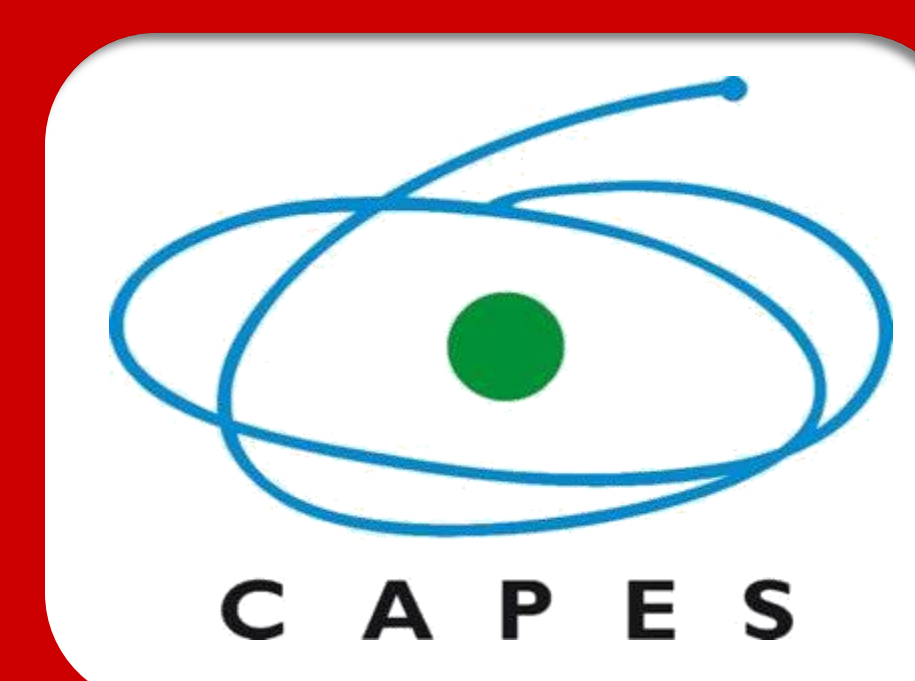
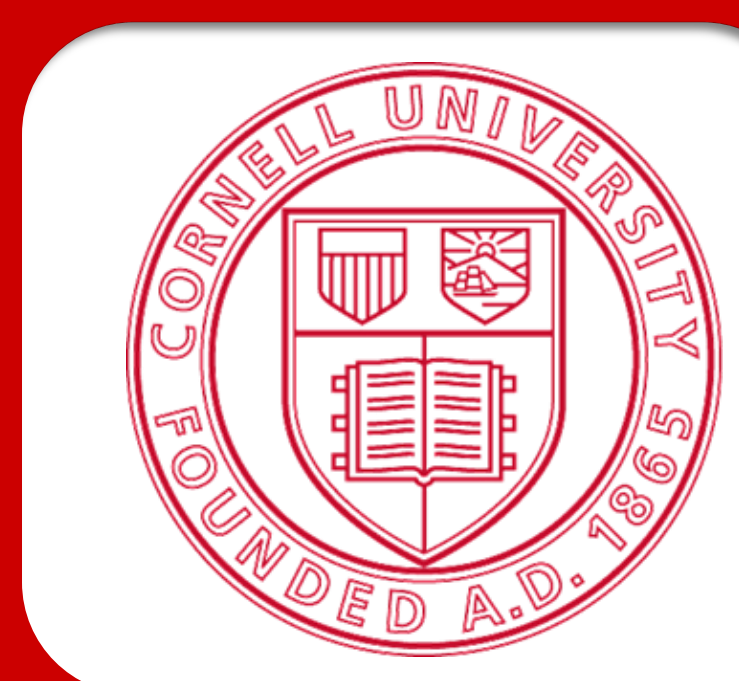


Dual-Retrieval Conceptions of Free Recall

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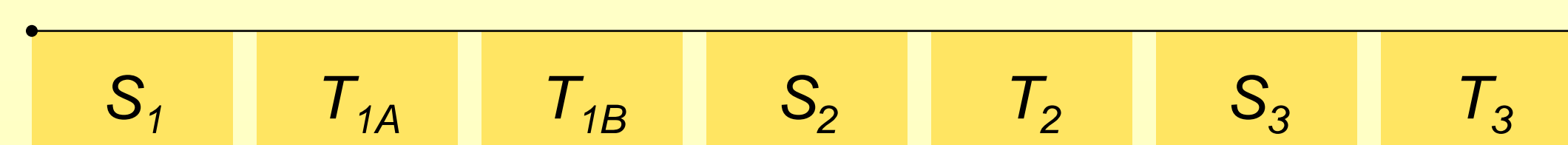


Overview

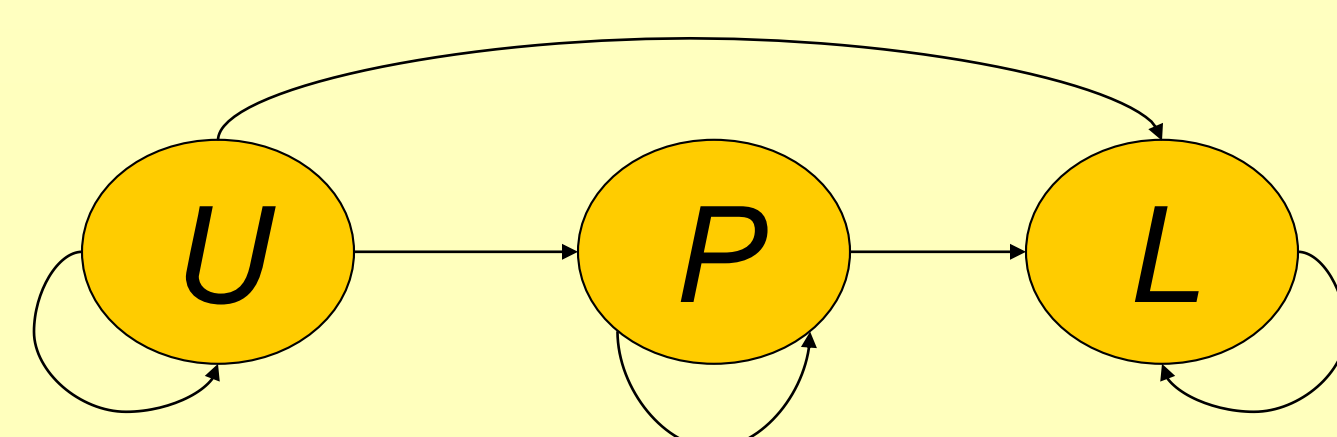
- ▶ Recall has been regarded as a process-pure marker of recollective retrieval:
 - The traditional definition of recollection implies that it is a recall-like process
 - In recall, test probes are not presented to generate familiarity signals
- ▶ This view is inconsistent with a family of Markov models of recall that assumes that recall is supported by a recollective operation (direct access) and two nonrecollective operations (reconstruction and familiarity judgment) (Brainerd, Reyna, & Howe, 2009; Gomes, Brainerd, Nakamura, & Reyna, 2014)
- ▶ Dual processes were measured with three traditional recognition-based methodologies (remember/know, confidence, and source judgments) and a dual-retrieval model, and the results compared
- ▶ Main findings:
 - Regardless of measurement method, the idea that recall is a process pure measure of recollection was rejected
 - Direct access was positively correlated with remember judgments and high confidence rather than know judgment and low confidence
 - However, there was no evidence that direct access involves retrieval of contextual details to any great extent

Dual-retrieval model of recall

Subjects receive three study (S) and test (T) cycles of the form:



The resulting sequences of errors and successes over trials are analyzed with a two-stage Markov chain. Learning to recall consists of making transitions through a discrete state space composed of three performance states:

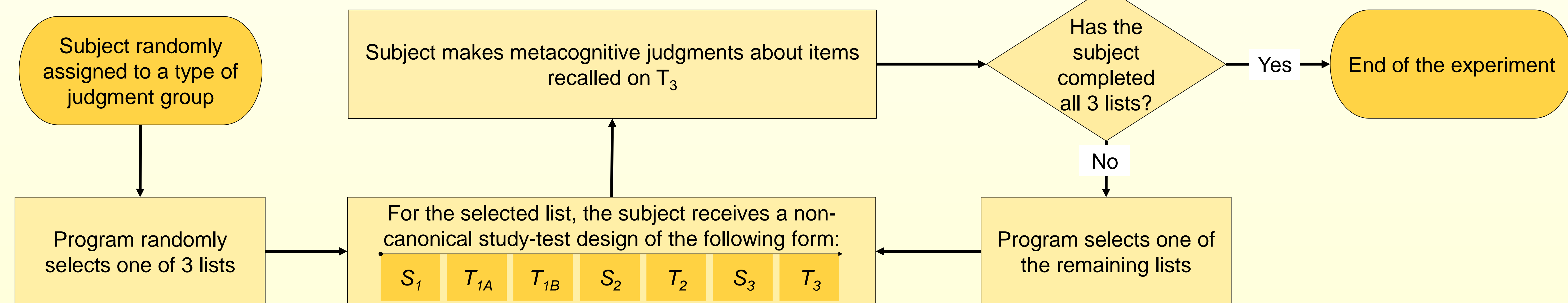


An initial unlearned state U, in which the probability of recalling the item is 0; an intermediate state P, in which the probability of recalling the item is some value $0 < p < 1$; and an absorbing learned state L, in which the probability of recalling the item is 1. Transition probabilities between states are governed by three mechanisms:

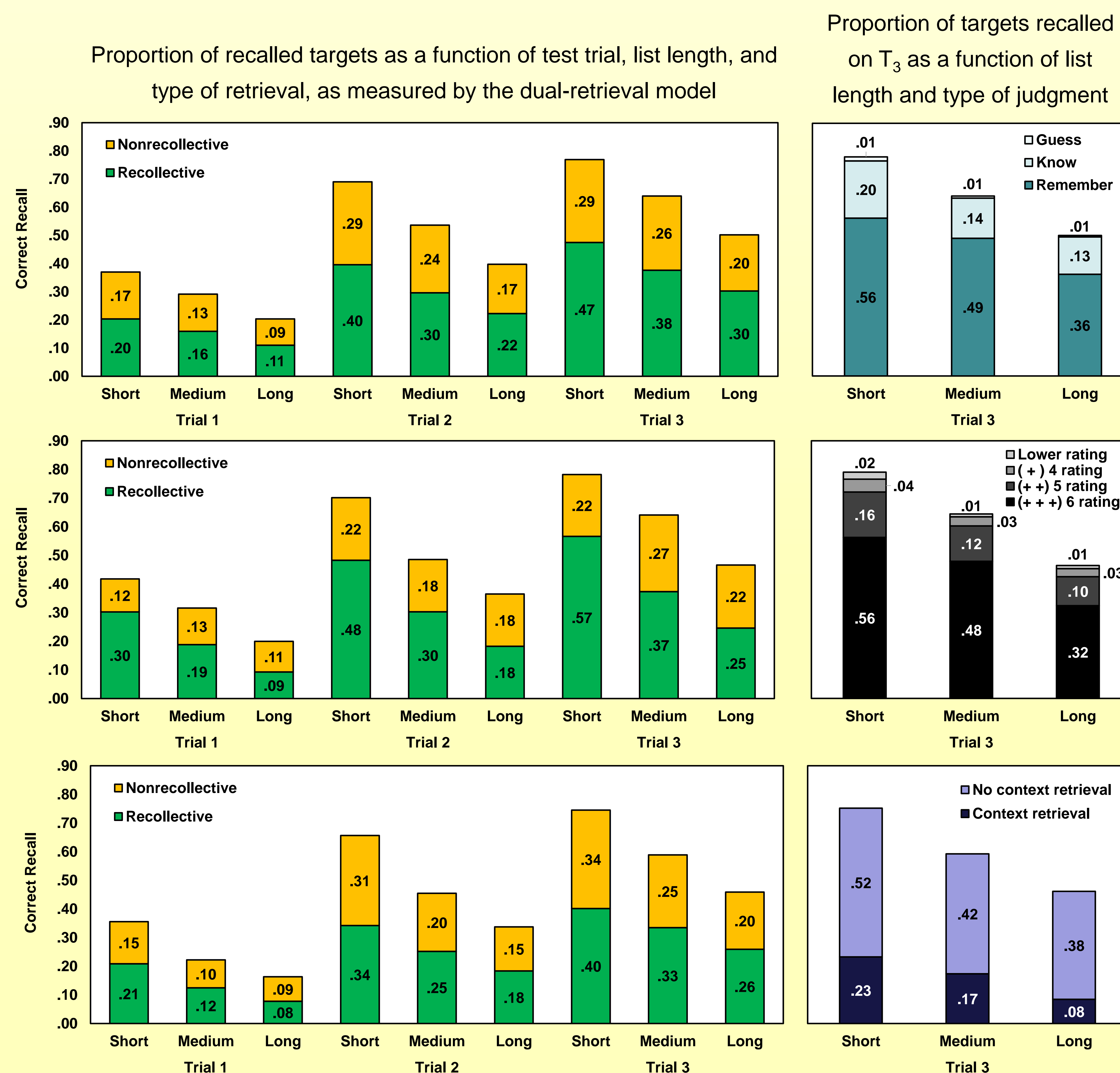
- **Direct Access** (entry state L): recollective retrieval operation that access targets' verbatim traces without searching through traces of other items
- **Reconstruction** (entry state P): nonrecollective retrieval operation that regenerates targets from partial information, such as semantic features
- **Familiarity Judgment** (within state P): slave operation that evaluates familiarity signals produced by reconstructed items

Method

- ▶ **Subjects:** 95 college students participated for extra credit
- ▶ **Materials:** Words selected from Toglia and Battig's (1978) word norms
- ▶ **Procedure:**
- ▶ **Experimental design:** 3 (list length: 16 words, 30 words, 60 words) – Within-Ss x 3 (type of judgment: R/K, confidence, source) – Between-Ss



Results



Discussion

- ▶ Recall is mostly recollective but far from being a process-pure measure of it
- ▶ Direct access correlates with remember judgments and high confidence, but not context retrieval (font color)
- ▶ R/K judgments deliver more liberal estimates of recollection than the dual-retrieval model, while source judgments deliver more conservative measures of recollection
- ▶ List length affects primarily the recollective form of recall. Contrary to recognition, however, list length also affects nonrecollective recall because reconstruction decreases as list length increases
- ▶ The four methods of measuring dual processes in recall should not be considered interchangeable

References

Brainerd, C. J., Reyna, V. F., & Howe, M. L. (2009). Trichotomous processes in early memory development, aging, and neurocognitive impairment: A unified theory. *Psychological Review*, 116, 783-832.

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