Retrieval practice based on recognition memory: testing the retrieval effort hypothesis
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Background

- The finding that taking memory tests improves long-term memory and overcomes repeated studying is called retrieval practice effect or a testing effect (1). While it has been much replicated within recall paradigms, a mechanistic account is still lacking. One way to move forward is to test predictions derived from current accounts.

- The « Retrieval Effort Hypothesis » states that controlled (effortful) retrieval (e.g. recall) supports more elaborate and integrative processing than passive restudying, thus increasing the available retrieval cues (3,4).

- Since recognition memory involves much less controlled retrieval than recall, repeated recognition should not yield a retrieval practice effect, especially if familiarity alone supports recognition.

Aim

Can recognition memory support a retrieval practice effect?

1. Experiment 1: recognition memory vs. restudying

- Between-subjects design, N = 76.
- Recognition memory= typical Old/New task.
- Matching for Age, Education, FSIQ, Verbal Memory.
- Manipulation of the intervening tasks:
  - 2 successive study trials=
    - Study-Test group.
  - 2 successive test trials=
    - Test-Test group.
- Main outcome: Performance at final test (25 min. delay).

Results 1

- Before final test, study duration was on average 11 minutes in the « Study-Test » group, 7 minutes in the « Study » group and only 6.3 minutes in the « Test » group.

- Still, « Study-Test » & « Test » conditions yielded better long-term memory (A,B), without increase in False Alarms (C), and a « Test » condition led to better 25 minutes – retention (D).

2. Experiment 2: familiarity practice vs. restudying

- Probing familiarity-based recognition memory:
The « Speed and Accuracy Boosting procedure » (SAB) is a speeded Old/New memory test providing a direct estimate of familiarity-based recognition memory (S).
- Use of the SAB procedure for all test phases.

3. Results 2

- Subjects in the « Study » group spent twice as much time studying AND had up to three times more opportunities to encode the stimuli.

- Similar minimal reaction times (minRTs) were achieved in both groups, well below 400ms, strongly constraining responses to familiarity-based recognition memory (S).

- Repeated retrieval was therefore based on automatic & fast processing, rather than slow, effortful, recollection.

Discussion

- Experiment 1 shows that the retrieval practice effect can be observed when retrieval is based on recognition memory rather than recall. Thus, learning does occur during recognition testing.

- Importantly, both experiments show that the benefits of memory retrieval based on recognition memory are immune to negative side effects like extra false alarms.

- When retrieval is constrained to fast and automatic processes (around 320 ms), thus being mostly familiarity-based, the generation of elaborative retrieval cues and/or effortful (controlled) processing are quite unlikely. Even then, extensive restudying does not outreach retrieval practice. Repeated automatic retrieval yields similar learning levels than extensive restudying, up to 6 months delay.

- Familiarity-based recognition memory can support a retrieval practice effect, and resists to 6 months delay similarly to restudying, thus challenging a core prediction of the « Retrieval Effort Hypothesis »

References

(3) Pye & Runson (2000) Testing the retrieval effort hypothesis: Does greater difficulty correctly recalling information lead to higher levels of memory? Journal of Memory and Language, 40, 437-447.