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Retrieval Practice Based On Recognition Memory: Testing the Retrieval Effort Hypothesis

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3. 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 unfamiliarity-based recognition memory (5)
- Use of the SAB procedure for all test phases
- Between-subjects design, N = 30
- Manipulation of the learning schedules: 1, 2 or 3 repetitions of study trials
- Study group
- Matching for Age, Education, FSIQ, Verbal Memory
- Main outcomes: Performance at short- and long-term final tests

4. Results

- 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 (5)
- Repeated retrieval was therefore based on automatic & fast processing, rather than slow, effortful, recollection
- Still, repeated testing proved as beneficial as restudying for short-(A) and long-term(B) retention
- This did not came with an extra false alarms cost (C&D)

Time spent studying does not drive learning efficiency. Instead, Experiment 2 provides unique evidence that learning occurs through repeated familiarity-based retrieval, i.e. even when retrieval is automatic

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 outweigh retrieval practice
- Repeated automatic retrieval yields similar learning levels than extensive restudying, up to a 6 months delay
- Familiarity-based recognition memory can support a retrieval practice effect, and resists to a 6 months delay similarly to restudying, thus challenging a core prediction of the « Retrieval Effort Hypothesis »

References

(3) Pyk & Besson (2006) Testing the retrieval effort hypothesis. Does greater difficulty correctly recalling information lead to higher levels of memory? Journal of Memory and Language, 58, 437-447

1. Experiment 1: recognition memory vs. restudying

- Between-subjects design, N = 76
- Recognition memory vs. typical Old/New task
- Matching for Age, Education, FSIQ, Verbal Memory

- Manipulation of the intervening tasks:
  - 2 successive study trials
  - Study group
  - 2 successive test trials
  - Test group

- Main outcome: Performance at final test (25 min. delay)

2. Results

- Before final test, study duration was on average 11 minutes in the « Study-Test » group, 7.4 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 « Test » condition led to better 25 minutes – retention (D)

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

- Main evidence that learning occurs through repeated familiarity-based retrieval, i.e. even when retrieval is automatic

3. Experiment 1: recognition memory vs. restudying

- The finding that taking memory tests improves long-term memory and overcomes repeated studying is called retrieval practice effect or « testing effect ». 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?

- The first evidence for a retrieval practice effect based on recognition memory. However, a contribution of controlled recollective processes cannot be ruled out, which is addressed in experiment 2