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Retrieval Based On Recognition Memory: Testing the Retrieval Effort Hypothesis

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1. Experiment 1: recognition memory vs. restudying

- Processing forward

- The « Retrieval Effort Hypothesis » states that controlled (effortful) retrieval (e.g. recall) supports more elaborative 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

2. Results 1

- 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)

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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 familiarity-based recognition memory (S).
  - Use of the SAB procedure for all test phases

- Between-subjects design, N = 3D
- Manipulation of the learning schedules: 1, 2 or 3 repetitions of study trials
- Matching for Age, Education, FSIQ, Verbal Memory
- Main outcomes: Performance at short- and long-term final tests

4. 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 400 ms, 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 come 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 there, extensive restudying does not outreach 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 (2000) Testing the retrieval effort hypothesis: Does greater difficulty correctly recalling information lead to higher levels of memory? Journal of Memory and Language, 42, 437-447