Retrieval practice based on recognition memory: testing the retrieval effort hypothesis
Pierre-Yves Jonin, Audrey Noël, Gabriel Besson, Sophie Muratot, Serge Belliard, Christian Barillot, Emmanuel Barbeau

To cite this version:

Pierre-Yves Jonin, Audrey Noël, Gabriel Besson, Sophie Muratot, Serge Belliard, et al.. Retrieval practice based on recognition memory: testing the retrieval effort hypothesis. UC Irvine International Conference on Learning and Memory, Apr 2018, Irvine, United States. 2018. inserm-01939069

HAL Id: inserm-01939069
https://www.hal.inserm.fr/inserm-01939069
Submitted on 29 Nov 2018

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L’archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.
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= Group S
  - 2 successive study trials= Group T
  - Test × Group
- Main outcome: Performance at final test (25 min. delay)

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).

Experiment 1 provides 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.

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.
- Use of the SAB procedure for all test phases

4. Results 2

- 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

- 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 (ms) were achieved in both groups, well below 400ms, strongly constraining responses to familiarity-based recognition memory
- 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), this being mostly familiarity-based, the generation of elaborative retrieval cues and ‘or’ effortful (controlled) processing are quite unlikely. Even there, extensive restudyng 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 similar to restudying, thus challenging a core prediction of the « Retrieval Effort Hypothesis »

References