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.
The finding that taking memory tests improves long-term memory and overcomes repeated studying is called retrieval practice effect or the testing effect (1,2). 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 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.

### Aim

Can recognition memory support a retrieval practice effect?

### 1. Experiment 1: recognition practice 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 T
- 2 successive test trials = Group C
- 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).

### 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 = 50
- Manipulation of the learning schedules: 1, 2 or 3 repetitions of study trials = Group S
- 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 (mRTs) 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
- This did not come with an extra false alarms cost (C&D).

### 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 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