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1. Introduction

Handwriting vs. typing

In past decades, advancements in technology led to frequent use of electronic devices such as laptops in classroom to take notes in addition to traditional handwriting with pen and paper. It is therefore necessary to investigate the effect of typing and writing on subsequent memory, an area has been recently explored, with equivocal evidence supporting both sides.

Cognitive offloading

Cognitive offloading refers to the use of physical resources to reduce the cognitive demand of the task. Note-taking is a form of cognitive offloading as the information being noted down no longer need to be held in one's memory. The differences in the accessibility between typed notes on laptops and written notes on notebooks might influence one's tendency to cognitively offload those information.

The current study

The current study aims at: 1) investigating the effect of handwriting and typing for learning new vocabularies; 2) exploring the interactive effect of cognitive offloading on handwriting and typing.

2. Method

2.1. Participants

- 68 participants recruited via UCL SONA system
- second language learners of English
- aged 18-40 years

2.2. Design

- between-subject
- 2 (writing vs. typing) x 2 (access vs. no access)
- 4 groups: writing access; writing no access; typing access; typing no access

2.3. Procedure

Instructions: Read a passage and to learn new words from the passage. Take notes while learning new words. Knowledge of those words would be useful for next week’s reading.

Access group: Participants can look back to their notes when read another passage next week.

No access group: Participants cannot look back to their notes when read another passage next week.

2.4. Reading Material

The passage was taken from Nightwood by Djuna Barnes. A novel notable for its intense, gothic prose style. A paragraph is selected as an example below:

“Early in 1880, in spite of a well-founded suspicion as to the advisability of perpetuating that race which has the sanction of the Lord and the disapproval of the people, Hedvig Volkbein, a Viennese woman of great strength and military beauty, lying upon a canopied bed of a rich spectacular crimson, the varnish stamped with the bifurcated wings of the House of Hapsburg, the feather coverlet an envelope of satin on which, in massive and tarnished gold threads, stood the Vikhek armss—give birth, at the age of forty-five, to an only child, a son, seven days after her physician predicted that she would be taken...”

3. Results

3.1. Demographic Data

- Self-reported English Proficiency (SEP) is a significant predictor for word meaning test score (p<.031)
- SEP thus included as a covariate in main analysis

3.2. Main analysis (two-way ANCOVA)

- Significant main effect of modality (F(1,51)=4.833, p=.032, η² p =0.087)
  Writing (M= 794) > Typing(M= 707)

- Significant main effect of access (F(1,51)=4.324, p=0.043, η² p =0.078)
  No access (M= 787) > access(M= 717)

- Significant interaction (F(1,51)=6.437 p=0.014, η² p =0.112)

3.3. Follow-up analysis (Independent t-Test)

- Significant effect of access in writing condition (t=74, p=.023) but NOT in typing condition (t=95.5, p=.728).

4. Take-home messages

- Writing leads to better memory than typing ONLY when later access is not expected.
- No significant difference between writing and typing when access is allowed.
- The benefits of either note-taking modality are complex and interact with other variables such as expectation of future access, therefore one single theory is not sufficient to explain their relative superiority.
- The strategic use of either note-taking modality need to be considered dependent of situation.