# Essay 1

# PSYCH10003: Mind, Brain & Behaviour 1

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# What is elaboration?

# Well, it is whatever improves memory recall.

# What improves memory recall?

# Elaboration?

*“Elaboration is such a broad term and can include so many different techniques that it is hard to claim that elaboration will always help learning.” (Weinstein et al., 2018, p. 10).*

Cognitive psychology can provide useful insights into the mechanisms of learning and memory. One technique argued to enhance learning is elaboration, broadly defined as the process of linking new content to prior knowledge. When new information is linked to prior knowledge, this new information is processed at deeper levels and will be remembered better. This paper discusses several learning methods that involve elaboration to improve memory retrieval. Although the concept of elaboration has been criticised for being circular and too broad, I argue that when elaboration is properly defined, it is a powerful method to promote learning and memory.

The concept of elaboration is based on Craik and Lockhart’s (1972) levels of processing (LOP) framework. Their central premise was that information is remembered better when processed at deeper levels. According to Craik and Lockhart deeper levels of encoding involve the learner in elaborating on the meaning and implications of the stimulus, which creates links between the to-be-remembered information and prior knowledge, producing a richer network of connections between concepts in memory and increasing pathways for retrieval. Craik and Tulving (1975) found experimental evidence that elaboration enhances memory retrieval. In their experiment, participants studied words in ways that ranged from shallow (deciding whether the word was printed in upper- or lower-case) to deep (deciding whether the word would fit in a sentence). On a subsequent memory test, words that had been studied at a deeper level were remembered more accurately than those studied at a shallower level, supporting the theory that elaboration enhances memory retrieval.

Despite the experimental evidence, elaboration attracted criticism for being circular as it seemed that any method of encoding resulting in better memory could be labelled as elaboration (Craik, 2020). Moreover, elaboration is a broad term, therefore it is difficult to distinguish the unique contribution of elaboration from apparently related methods such as generating mental imagery (Weinstein et al., 2018). These concerns can be addressed by limiting the definition of elaboration to Craik and Lockhart’s (1972) original claim that its central mechanism involves relating new content to existing knowledge by enriching the understanding of the meaning and implications of that content. Consequently, methods of elaboration can be defined as those that focus attention on enriching understanding in relation to prior knowledge and/or on the generation of explanations, including EI and self-explanation.

EI has been shown to enhance memory retrieval. Pressley et al. (1987) prompted participants to either read sentences alone or answer a question about its meaning (e.g., “Why did that man do that?”). Participants recalled the sentences more accurately when they had interrogated their meaning, supporting the effectiveness of EI for enhancing memory. Similar findings were reported for primary school children (Wood et al., 1990) and teenagers (Seifert, 1993), demonstrating the effectiveness of EI across a range of learners. However, the implementation of EI by Pressley et al. (1987) has some limitations if the goal of learning is to build deep knowledge of a domain, rather than to embellish statements to make them memorable. Their effect relied on generating any kind of elaboration, regardless of whether it was correct. It is also unclear how interrogations should be directed for more complex learning that relies less on memory for explicit information (e.g., how the digestive system works; Dunlosky et al., 2013), limiting the range of real-world learning tasks to which EI can be applied effectively.

Further evidence for the efficacy of elaboration comes from self-explanation research. Self-explanation was first shown to be effective for enhancing problem-solving skills in a study by Berry (1983). Participants first completed a logic problem-solving task, and either explained their process as they were completing the task (concurrent self-explanation), explained their solutions after completion (retrospective self-explanation), or worked silently (control group). In a subsequent problem-solving transfer test, the two self-explanation groups significantly outperformed the control group, with the concurrent group performing better than the retrospective group. Berry’s findings demonstrate that self-explanation leads to knowledge transfer, and that its efficacy increases with the number of explanations generated.

Notwithstanding the benefits of self-explanation, there is some evidence to suggest that its efficacy may be moderated by individual differences in level of prior knowledge or aptitude, although the evidence is mixed. For example, Chi et al. (1989) reported greater learning gains for students who had a better understanding of the physics problems they were studying than those who did not, whereas Chi et al. (1994) found no effect of student aptitude on the effects of self-explanation. Thus, it remains unclear how much foundational understanding of a domain is required before self-explanation can be utilised effectively, and the extent to which individual differences affect its applicability.

In conclusion, when elaboration is defined as methods that engage the learner in actively exploring the meaning and implications of new content, there is evidence that it can be an effective tool for enhancing both learning and transfer of knowledge. I have presented evidence that the interrogation and explanation prompts used in EI and self-explanation can be effective for improving learning outcomes for learners of all ages. However, there is still much to learn about how these methods are most effectively deployed and how they might interact with different learner characteristics. Ultimately, as Yeo and Fazio (2018) observe, the optimal learning strategy will depend on both the kind of knowledge being learned (e.g., declarative vs. procedural) and the intended learning outcomes (passing an exam vs. building domain-specific expertise). Defining how these factors interact to produce the best outcomes requires future investigation.

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