

Wiggs, C. L, Weisberg, J. and Martin, A. (1999). Neural correlates of semantic and episodic memory retrieval. *Neuropsychologia*, 37, 103-118.

Study: Single word responses to achromatic drawings of cerebral blood flow with PET allows for study of functional neuroanatomy.

Abstract:

#### LANGUAGE CONNECTIONS

Responses: Name the objects; retrieve common color of object (yellow for banana); or a previously studied uncommon color or the object (episodic).

Findings: semantic information retrieval activated different regions from both naming and episodic retrieval. **Semantic**: left frontal; **Episodic**: bilateral medial parietal, right frontal thalamus and cerebellum. Therefore, **more complex retrieval is seen in episodic condition**.

Background:

Storing, and Tulving (1989) memory types: semantic / episodic

Evidence suggests activation of different but overlapping brain structures. Ex. Left temporal regions for semantic storage, but left frontal cortex in retrieval. Therefore, "accessing semantic knowledge depends on the orchestration of a distributed network of cortical areas."

Episodic memory function impaired on damage to medial temporal structure of the hippocampus, parahippocampal gyrus, etc. Therefore, regions of retrieval for episodic memory are not the site of episodic memory storage. Episodic memories are presumed to be stored in neocortex possibly "near or in the same regions involved in perceptual processing of the information."

#### LANGUAGE CONNECTIONS:

1. There are differences, often, "between semantic and episodic tasks besides the nature of the memories. These differences could affect retrieval strategies used by the subjects." Ex. Fletcher reports that subjects performed without error on semantic tasks, less so on episodic ones (100% vs 81%). Episodic tasks have only one answer (vs. multiple correct or potentially correct answers on semantic tests) and search strategies are more restricted (vs. open ended with semantic tests).
2. Processing and storing of vocabulary words is different, potentially, from internalizing a dialogue on processing material contained within a strong or cultural context. Also, indications are that episodic memory is not stored by processes using the same brain structures as those used to retrieve episodic memories, nor are those "storage" structures the site of episodic memory storage. "Where did I leave my keys?" reflects an episodic event of placing something that may not be processed with attention to the context of the event when a person recollects having come into the house but not the event of putting the keys in any place but the routine location. Then, one turn one's attention to another element of the episode of coming home. In trying to recall where the keys are, the person may be asking the brain for something that indeed was not processed as part of a separate episode. Instead, the familiarity and repetition of a common event may have caused traces in that familiar episode to be activated along with events prior to coming in and the immediate attention to a potentially new episode. So, language learners may become frustrated trying to retrieve information that was not processed in a manner similar to the conditions of retrieval.