BRIEF SUMMARY

Buckner, R. L., Koutstaal, W., Schacter, D. L., Wagner, A. D., & Rosen, B. R. (1998). Functional-anatomic study of episodic retrieval using fMRI: I. Retrieval effort versus retrieval success. *NeuroImage, 7,* 151–162.

A number of recent functional imaging studies have identified brain areas activated during tasks involving episodic memory retrieval. The identification of such areas provides a foundation for targeted hypotheses regarding the more specific contributions that these areas make to episodic retrieval. As a beginning effort toward such an endeavor, whole-brain functional magnetic resonance imaging (fMRI) was used to examine 14 subjects during episodic word recognition in a block-designed fMRI experiment. Study conditions were manipulated by presenting either shallow or deep encoding tasks. This manipulation yielded two recognition conditions that differed with regard to retrieval effort and retrieval success: shallow encoding yielded low levels of recognition success with high levels of retrieval effort, and deep encoding yielded high levels of recognition success with low levels of effort. Many brain areas were activated in common by these two recognition conditions compared to a low level fixation condition, including left and right prefrontal regions often detected during PET episodic retrieval paradigms (e.g., R. L. Buckner et al., 1996, J. Neurosci. 16, 6219-6235) thereby generalizing these findings to fMRI. Characterization of the activated regions in relation to the separate recognition conditions showed (1) bilateral anterior insular regions and a left dorsal prefrontal region were more active after shallow encoding, when retrieval demanded greatest effort, and (2) right anterior prefrontal cortex, which has been implicated in episodic retrieval, was most active during successful retrieval after deep encoding. We discuss these findings in relation to component processes involved in episodic retrieval and in the context of a companion study using event-related fMRI.