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Research Interests

Cognition requires memory. Every intelligent being has some form of memory playing a critical role in its higher cognitive function. In humans, a special memory system, called working memory, has been implicated as a critical component of all higher cognitive functions, including reasoning and problem-solving. Recently, it has become possible to examine the brain correlates of working memory through the use of neuroimaging techniques with normal humans. Research in our laboratory has begun to reveal the brain architecture of the working memory system and to relate this architecture to the functions of working memory in thinking. This research has uncovered, for example, that working memory is not unitary in character, but is rather composed of a set of isolable working memories that are specialized for different kinds of information (e.g., spatial versus verbal versus visual).

Continuing research in this laboratory is investigating how the various working memory components are recruited in complex cognitive skills, and how working memory changes with normal aging in humans, both behaviorally and neurobiologically. We also have a very active program of research concerning executive processes, ones that are responsible for allocating attention to selected information in working memory in the service of various cognitive tasks.

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