

## Tutorial: Retrieval & Retrieval Problems

### WHAT IS RETRIEVAL?

There are three main aspects to memory or learning: **encoding** (i.e., putting the memory into one's head or knowledge base); **storage** (holding the memory there over time); and **retrieval** (pulling the memory out when needed). Thus retrieval is the act of remembering something that was previously learned or experienced. It can either be *deliberate* retrieval (i.e., trying to remember; using strategies to remember) or *involuntary/effortless* retrieval (i.e., memories or learned information or skills come to mind with no effort, possibly triggered by environmental events). Retrieval can include retrieval of words, information, skills, habits, or personal experiences.

### WHAT RETRIEVAL PROBLEMS ARE ASSOCIATED WITH TBI?

Retrieval problems of one sort or another are associated with many types and locations of brain injury. Retrieval problems, including word retrieval problems, are among the most common symptoms of brain injury. [See Tutorial on Word Retrieval]

1. Difficulty retrieving words can be caused by damage to several parts of the brain because word meaning information is stored in many parts of the brain and involves large numbers of neural connections. Word retrieval problems are particularly associated with the “language zones” of the left hemisphere (toward the back and bottom of the left frontal lobe and front of the left temporal lobe) and with other parts of the frontal lobes that are associated with retrieval generally.
2. General difficulty with effortful or strategic retrieval (trying to remember) is usually associated with damage to the frontal lobes, common in TBI. Encouraging these students to try harder to remember may just make their problem worse.
3. Retrieval problems are also associated with anxiety. “Performance anxiety” is a common experience and everybody reports that it is harder to retrieve information or words when experiencing significant anxiety. Some degree of anxiety is common after TBI, possibly for specific neurologic reasons and possibly because so much in life is more difficult and frustrating after a brain injury. [See Tutorials on Anxiety; on Instructional Routines; on Performance-Oriented versus Support-Oriented (Apprenticeship) Teaching]

### WHAT ARE THE MAIN THEMES IN INTERVENTION AND SUPPORT?

**1. Understanding the Problem:** As with all problems, step one is understanding the problem. Retrieval problems are easily misidentified as lack of knowledge. Psychological or speech-language testing helps to identify specific retrieval and word retrieval problems. One way to identify and document retrieval problems is to present tasks with different response requirements: free retrieval, cued retrieval, and recognition memory. If the student performs significantly better on cued retrieval and recognition memory tasks than on free retrieval tasks, then there is reason to believe that the student has a specific retrieval problem.

- **Free retrieval:** previously presented information or skills/procedures need to be retrieved from storage with no external support (e.g., “Tell me what you remember about the chapter you read.”).
- **Cued retrieval:** Some cues are provided to structure and support the retrieval process (e.g., “You know that chapter you read? Let’s think about **who** was involved .....? And where were they at the time? And how did it **start**?”).
- **Recognition memory:** In this case, the individual does not have to retrieve information; rather the task is simply to affirm or deny. For example, true/false and multiple choice questions are

recognition memory tasks (e.g., “So, John, we need to think about who was in the story; was it Jane or Sally?”).

**2. Accommodations:** Accommodations need to be made for students with retrieval problems in both testing and instruction. With all students who have specific retrieval problems, staff and parents need to use something other than free recall quizzing to find out what the student knows and to teach new information. These tasks are by definition difficult for students with retrieval problems, cause frustration, and do not allow the student to reveal what he knows. Therefore, adults should get into the habit of asking questions (if questions are needed) that embody some kinds of supports (cued retrieval or recognition memory).

**Testing Accommodations:** If a student has documented retrieval problems, then test procedures should use recognition memory tasks (e.g., multiple choice or true/false) rather than or in addition to free retrieval tasks. Retrieval tasks may simply reveal what you already know – that the student has retrieval problems. These tasks will NOT tell you what you want to find out with testing – namely what the student actually knows in his head.

**Instructional Accommodations:** Similarly, everyday instructional tasks should not be organized around teacher questions requiring students to retrieve information without support. This will simply frustrate the student and little teaching and learning will be accomplished. Apprenticeship teaching procedures can be used. These procedures do not rely on ongoing demands for unassisted performance from the student. [See Tutorial on [Apprenticeship Teaching](#)]

**Conversational Accommodations and Supports:** [See Tutorial on [Word Retrieval](#)]

### 3. Instructional Strategies to Assist Students with Retrieval Problems

**Errorless Learning Tasks:** With students who have significant and general memory problems, teachers should always try to use errorless learning procedures in their teaching. [See Tutorial on [Errorless Learning](#)]

**Semantic Maps:** With students who have relatively specific word retrieval problems, helping them to organize their word knowledge with “semantic mapping” is useful. [See Tutorials on [Word Retrieval](#); and [Semantic Mapping](#)]

**Elaborative Encoding: Multiple “Retrieval Routes”:** Providing a variety of associations – including multi-sensory associations – for new information may create useful “retrieval routes” to get at the information when it is needed. New information should be as well elaborated – in an organized way – as possible.

**Retrieval Strategies:** Teaching the student retrieval strategies can be effective, but only for students whose general cognitive functioning is at a high enough level that retrieval strategies can be remembered and used functionally. *Effortful retrieval* is retrieval guided by an organized retrieval procedure or strategy. In most cases, the goal is to activate related words or information or experiences so that the desired word or information or experience will be triggered.

For example, in searching for a word, it is wise to begin describing the concept in an orderly way, thereby activating retrieval routes that may trigger the desired word. [See Tutorial on [Word Retrieval](#)] Similarly, in searching for information, it is wise to begin reciting what one knows, thereby activating related information that may facilitate retrieval of the desired information. In attempting to remember the location of an object (e.g., one's keys), it is wise to retrace one's steps, again activating related experiences that may trigger the placement of the object. [See Tutorial on [Teaching Cognitive and Learning Strategies](#)]

**Apprenticeship Teaching:** In general, students with specific retrieval problems may benefit from teaching routines that are more toward the support-oriented (apprenticeship) end of the teaching spectrum than the performance-oriented end of the spectrum. [See Tutorials on [Performance-Oriented versus Support-Oriented \(Apprenticeship\) Teaching](#); and [Instructional Routines](#)]

**Practice Asking for Help:** Students may need help remaining calm when faced with a retrieval problem – and then asking for assistance in retrieving the information. Asking for help is better than suffering in silence.

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