**Chapter 5: Remembering Events**

**Learning Objectives**

* Differentiate the declarative and nondeclarative forms of long-term memory.
* Explain the evidence supporting a distinction between semantic memory and the mental time travel of episodic memory.
* Understand the benefits of elaborative rehearsal in contrast to maintenance rehearsal for stor­age in long-term memory.
* Explain how levels of processing, distinctiveness, and relational processing influence long-term retention.
* Describe the encoding specificity principle and the kinds of evidence that supports it.

**Chapter 5: Remembering Events**

**Brief Summary**

Our memory for events is dependent on a long-term memory system that stores different types of information. According to the multiple-systems view, long-term memory consists of a number of subsystems that process particular forms of information. Two of these subsystems are declarative memory and nondeclarative memory. The declarative subsystem is further subdivided into semantic and episodic subsystems that, respectively, store our knowledge of the world and our autobiographical memories. Similarly, the nondeclarative subsystem is subdivided into memory for motor and perceptual skills. Case studies of individuals exhibiting Highly Superior Autobiographical Memory (HSAM) without similar retention of semantic information suggest a dissociation between the semantic and episodic subsystems of declarative memory. Furthermore, episodic memory may not be simply a system for storing autobiographical memories, but appears to involve the ability to envision future events through mental time travel as well as to prospectively use memory at a specific point in the future.

Storage of information in memory is also dependent on a range of encoding and retrieval processes. Memory retention can be enhanced by linking information in short-term memory with content in long-term memory through such processes as elaborative rehearsal and processing information on a deeper, semantic level of analysis. Retrieval can also benefit through increasing the distinctiveness of items being processes as well as increasing relational processing among items by categorical grouping and subjective organization. Emotional processes can also contribute to memory retention during both encoding and consolidation. The strong connection between encoding and retrieval processes is evident in the encoding specificity principle which asserts that optimal memory retention is dependent on the degree of similarity between the conditions present during encoding and those during retrieval. Findings supporting the encoding specificity principle are found in research on cued-retrieval, the tip of the tongue state, and the strong effects of environmental and psychological context on retrieval success. Many of the factors that enhance memory described in this chapter have been applied successfully to the development of studying strategies that have improved academic performance.

**NOTE- If any of the links contained within are not working, please contact the publisher and an alternate resource will be found for you. In addition, an updated Chapter to this instructor’s manual will be uploaded to the companion website.**

**Chapter 5: Remembering Events**

**Detailed Summary**

1. Long-term memory is not a unitary store, according to the multiple-systems hypothesis regarding the structure of long-term memory. There is a fundamental division in long-term memory between declarative (knowledge of what) and nondeclarative (knowledge of how) systems. Declarative memory is further divided into episodic memory (events that are encoded in terms of specific times and places of occurrence) and semantic memory (general knowledge of facts and concepts). Nondeclarative memory includes skill learning, priming, conditioning, and habituation.

2. Mental time travel refers to the use of episodic memory to recollect past events and envision future events using reconstructive retrieval processes. It stresses the subjective experience of traveling backward or forward in time when engaged in episodic recollection and imagination. The default network of the brain is activated by traveling backward in mental time or traveling forward into the imaginary future. An everyday form of future thinking occurs in tasks requiring prospective memory. This refers to remembering to take some specific action at some point in the future. One must first form an intention to perform an action in a specified window of time. Two kinds of retrieval processes are involved in successfully remembering to do something later. The first is to engage in the attention-demanding retrieval mode of monitoring the environment for cues to act as planned. The second is to rely on spontaneous, relatively effortless retrieval triggered automatically by environmental cues, as when the thought to act just pops into mind.

3. Encoding and storage of episodic information in long-term memory varies with the kind of rehearsal given to information stored in short-term memory. Repeating a list of words illustrates maintenance rehearsal. Elaborative rehearsal is superior to maintenance rehearsal because it establishes links between the information held in short-term memory and the information already stored in long-term memory, for example, by forming visual images of the objects referred to by the words in a list. Mnemonic techniques, such as the method of loci, are kinds of elaborative rehearsal. The level of processing also affects learning success, with deep semantic processing supporting better memory than shallow sensory processing. Deeply encoded information is distinctive and easily retrieved in the future. Finally, the organization of newly learned information is necessary for successful recognition and recall.

4. Encoding processes are important, but they cannot be considered apart from retrieval processes. The encoding specificity principle asserts that events are recognized or recalled only when retrieval cues at the time of test match the encoding cues at the time of learning. The retrieval cues allow one to activate the to-be-remembered episode and its context. From this perspective, forgetting represents a failure to access an episode because the retrieval cues are inadequate.

5. Students are advised to (a) self-test often to practice retrieval; (b) space one’s study time rather than massing it; and (c) supplement note taking with the 3R strategy of reading, reciting, and reviewing. In addition to these study strategies, all of the principles of encoding and retrieval discussed in this chapter can be applied to learning course-related material. For example, the method of loci can be adopted to learn a list of facts in a history course or a biology course, just as it can be used to remember a grocery list.

**Chapter 5: Remembering Events**

**Topical Outline**

Types of Long-Term Memory

Long-term memory does not appear to be unitary and may have evolved different subsystems to adapt to different environmental demands.

Declarative Versus Procedural Memory

* Declarative memory consists of our knowledge of events, facts, and concepts. Declarative memory consists of two components: Semantic memory and episodic memory.
* Procedural or nondeclarative memory refers to skills and conditioned responses that reflect knowing how to respond to the world. Procedural memory is also known as implicit memory. Procedural memory consists of two components: Motor skills and perceptual skills.

Types of Tests

* + Direct tests require conscious recollection.
  + Indirect tests require the use of information stored in long-term memory, but not its conscious recollection, to improve performance.

Interpreting Test Dissociations

* + Dissociations on implicit and explicit tests support the view of multiple memory systems which operate independently.

Episodic Versus Semantic Memory

* + Highly Superior Autobiographical Memory (HSAM) refers to a form of episodic memory in which individuals can recall very specific details of their past personal experiences such as the days and dates for when an event occurred.
  + Episodic and semantic forms of declarative memory are distinguished by two kinds of judgment made on a recall test. Remembering judgments indicate recollections of personal experiences from the past through mental time travel. Knowing involves being aware of facts and concepts in the absence of personally reliving past experiences.

Criticisms of Multiple Systems

* Evidence that different processes operate on a single declarative memory system suggests an alternative explanation for the multiple systems view of memory.

Mental Time Travel

* The use of episodic memory to recollect past events and envision future events through reconstructive retrieval processes.

The Default Network

* Mental time travel involves the operation of the occipital lobe together with the brain’s default network to construct our autobiographical past and future.

Prospective Memory

* The use of memory to develop a plan or intention to do something at a relatively distant point in the future as opposed to immediately.
* Top-down intentional control enables the ability to hold an intention in mind and monitor for the right moment to carry out a planned action. These cognitive operations activate the anterior prefrontal cortex.
* Bottom-up processes underlie attentional capture, target detection, and episodic retrieval. These cognitive operations activate the parietal and ventral regions of the cortex.

Encoding and Storing Events

* + Two types of rehearsal enable the encoding and storage of events in long-term memory.
  + Maintenance rehearsal uses covert verbalization to recycle information in short-term or working memory.
  + Elaborative rehearsal refers to the process of linking information in short-term memory with previously stored information in long-term memory.

Levels of Processing

* Memory superiority for events attentively processed at a semantic level as compared with a sensory level.

Transfer-Appropriate Processing

* Test performance hinges on engaging in an encoding process that is compatible with the demands of the test.

Distinctiveness

* Greater distinctiveness in the features of items leads to easier discrimination at the time of retrieval.

Picture Memory

* Memory for brief exposure to complex pictorial information is highly accurate.

Flashbulb Memories

* A flashbulb memory is a vivid recollection of some autobiographical event that carries with it strong emotional reactions.

Synesthesia

* Synesthesia is enhanced encoding of information due to cross-talk among the various sensory modalities.

Relational Processing

* Remembering information using the relations among items-to-be-remembered and to other items stored in memory.

Category Cues

* + Recall of randomly presented words from specific categories is aided by grouping the words by category during recall.

Subjective Organization

* + The way individuals impose an idiosyncratic organizational scheme on unrelated items to be remembered.

Emotion and Memory Storage

* The amygdala contributes to the emotional processing of memories during encoding and consolidation.

Retrieval Processes

* The cue-dependent nature of remembering and forgetting stresses the role that the context and knowledge of the material in memory plays in successful retrieval.

Retrieval Mode

* Retrieval mode refers to the effort to retrieve an event from long-term memory as opposed to its actual retrieval.
* Activation in the right prefrontal cortex supports retrieval mode, whereas numerous regions are involved in successful retrieval.

Encoding Specificity

* High levels of recall and recognition are dependent on the degree of match between encoding and retrieval conditions.

Recall of Unrecognizable Events

* + Memory performance is superior on a cued-recall test compared with a free recall test in which there is an absence of retrieval cues.

Tip of the Tongue States

* + Inability to retrieve information despite a feeling of certainty that it is available in memory.

Environmental Context

* + The environmental context in which information is encoded can serve as a retrieval cue.

Psychological Context

* + A person’s state of mind when learning information can serve as a retrieval cue.
  + The mood congruence effect is when the material being learned fits with the induced mood.
  + State-dependent learning is demonstrated when recall performance is more accurate under conditions where an individual’s state of mind during encoding matches their state of mind during retrieval.

Emotion and Retrieval

* Retrieval of past autobiographical memories may rely on emotional cues for accurate retrieval.

Study Strategies

Memory principles such as elaborative rehearsal, mnemonic techniques, organizational strategies, and encoding specificity can be used to improve academic performance for students.

* Spacing study sessions results in more optimal retention of information than massed practice sessions.

**Chapter 5: Remembering Events**

**Key Terms**

declarative memory

semantic memory

episodic memory

nondeclarative memory

Highly Superior Autobiographical

Memory (HSAM)

mental time travel

prospective memory

maintenance rehearsal

elaborative rehearsal

levels or depths of processing

self-reference effect

transfer-appropriate processing

distinctiveness

flashbulb memory

relational processing

subjective organization

retrieval mode

encoding specificity

tip of the tongue (TOT) state

mood congruence effect

state-dependent learning

**Chapter 5: Remembering Events**

**Discussion Questions**

Discussion Question #1

Identify and describe the two main subsystems of long-term memory. Indicate under what conditions the information in these subsystems might be shared or integrated in a specific memory.

Discussion Question #2

Identify an example of when you used prospective memory to remember something important. Describe the process by which you monitored the right moment to carry out your intention. Did you rely on any specific cues to remember when to act or was retrieval spontaneous?

Discussion Question #3

Identify and describe a mnemonic technique that you have found to be successful in remembering information. Based on the information in this chapter, which memory principle(s) do you think is responsible for the success of your mnemonic technique?

Discussion Question #4

Based on your knowledge of the encoding specificity principle, list 5 techniques you could use to improve test performance in a course by increasing the similarity between the encoding and retrieval conditions.

Discussion Question #5

Describe how the technique used in the Cognitive Interview can be applied to retrieve information during an exam.

**Chapter 5: Remembering Events**

**Questions for Thought**

What kind of long-term memory did you use in coming to class for cognitive

psychology? Provide specific examples of both declarative and nondeclarative

memory use.

Describe a flashbulb memory that you have had personally. In what specific ways

does this memory illustrate the distinctiveness principle?

**Chapter 5: Remembering Events**

**Web Resources**

[**The Levels-of-Processing Approach**](http://www2.fairmontstate.edu/users/ffidura/cogpsy/cpmemods.html#THE LEVELS-OF-PROCESSING APPROACH)

An interactive demonstration of the levels-of-processing effect.

[**Recent Demonstrations**](http://courses.missouristate.edu/TimothyBender/mem/mydemos.html#recent)

An interactive demonstration of the self-reference effect.

[**Tip of the Tongue Phenomenon**](http://faculty.mercer.edu/spears_a/studentpages/tipofthetongue/TipoftheTongue.html)

A web page providing information about the tip of the tongue state including an interactive demonstration which induces the tip of the tongue state.

[**Do You Have FLASH Memories?**](http://quizstop.com/askflsh.htm)

An interactive quiz designed to uncover your flashbulb memories.

[**Encoding Specificity**](http://cat.xula.edu/thinker/memory/longterm/context/encoding)

An interactive demonstration of the encoding specificity principle.

[**Recent Demonstrations**](http://courses.missouristate.edu/timothybender/mem/mydemos.html#recent)

An interactive demonstration of the spacing effect.

[**The Synesthesia Battery**](http://www.synesthete.org/)

A test battery to determine if you have synesthesia.

**Chapter 5: Remembering Events**

**SAGE Journal Articles**

Wang, Q. & Brockmeier, J. (2002). [*Autobiographical remembering as cultural practice: Understanding the interplay between memory, self, and culture*](http://cap.sagepub.com/cgi/reprint/8/1/45?ijkey=msTtiyPqRIMfU&keytype=ref&siteid=spcap)*.* Culture Psychology, 8, 45-64.

1. In their paper, the authors examine several genres of autobiographical remembering. One of these, the idea that we cast ourselves as the central character in our remembrances, is linked to western culture. The other view, in which the social context of the narrator is given importance, is linked to Asian culture. Based on these views of remembering one’s past, do you think it’s possible to purely experience semantic forms of memory or is all memory episodic?
2. Would you expect individuals who have lived in western and non-western cultures to possess an integrated autobiographical memory of their experiences that blends the two genres of narrative or separate autobiographical memories contextualized to each genre?
3. The authors make the suggestion that western culture leads to the development of an independently oriented self, whereas non-western culture promotes the development of an interdependently oriented self. According to the authors, what is the character of memory associated with each of these orientations?

Malhotra, N.K. (1991). [*Mnemonics in marketing: A pedagogical tool*](http://jam.sagepub.com/cgi/reprint/19/2/141?ijkey=356XZlbe6w9mU&keytype=ref&siteid=spjam)*.* Journal of the Academy of Marketing Science, 19, 141-149.

1. The author distinguishes between two broad categories of mnemonic techniques: Organizational and encoding. What are the differences between these categories? With what type of material would it be most useful to employ organizational mnemonics? With what type of material would it be most useful to employ encoding mnemonics?
2. Which mnemonic techniques, organizational or encoding, would provide a greater depth of processing?
3. In the discussion section, the author points out some of the criticisms of mnemonic techniques. What are some of these criticisms? Do you agree or disagree with these criticisms?

Harvey, J.H., Flanary, R., & Morgan, M. (1986). [*Vivid memories of vivid loves gone by*](http://spr.sagepub.com/cgi/reprint/3/3/359?ijkey=hJL4Y7a.L8k2Q&keytype=ref&siteid=spspr)*.* Journal of Social and Personal Relationships, 3, 359-373.

1. That aspects of the break-up of a close romantic relationship would you expect to have the qualities of a flashbulb memory?
2. The authors report that flashbulb memories were the most vivid for individuals who scored higher on a scale of depression. Why do you think heightened feelings of depression can increase the vividness of personal memories?
3. How do flashbulb memories of events experienced in one’s personal life, such as break-ups, differ from those of important historical events such as the Challenger disaster?

**Chapter 5: Remembering Events**

**Recommended Readings**

Eichenbaum, H. (1997). Declarative memory: Insights from cognitive neurobiology. *Annual Review of Psychology*, 48, 547-572.

Luria, A. R. (1968). *The mind of a mnemonist*. New York: Basic Books.

McDaniel, M. A., & Einstein, G. O. (2007). *Prospective memory: An overview and synthesis of an emerging field.* Thousand Oaks, CA: Sage.

Paivio, A. (1971). *Imagery and verbal processes*. New York: Holt, Rinehart & Winston.

Rohrer, D., & Pashler, H. (2007). Increasing retention without increasing study time. *Current Directions in Psychological Science, 16,* 183–186.

Tulving, E. (2002). Episodic memory: From brain to mind. *Annual Review of Psychology*, 53, 1-25.