Memory Changes with Age: What to do about it?

Betty Glisky
Department of Psychology
University of Arizona
Cognitive Aspects of Aging and Memory

- What kinds of memory are affected by normal aging?
- What cognitive strategies can we engage to improve memory?
What Kinds of Memory Are Affected by Normal Aging?

- Memory for recent events or new information—*episodic memory*—but not memory for remote events or general knowledge—*semantic memory*
- Memory for *context* or details but not memory for content or *gist*
- *Recall* but not *recognition*
- Memory that depends on executive control—*working memory*
What is working memory?

- Working memory is a system where small amounts of information can be temporarily maintained and manipulated.
- It’s controlled by a central executive that allocates attention among various components and tasks.
- Executive control depends on prefrontal cortex, which declines with age.
Purposes of Working Memory

- To integrate information from different modalities and sources
- To think through problems, reflect on the past, and plan for the future
- To construct and implement encoding and retrieval strategies that will enhance episodic memory
Encoding & Retrieval

- **Encoding:** How do you get information into the system?
- **Retrieval:** How do you get information back out?
Encoding Processes

- Good encoding requires attention
- What is attended enters working memory
- In working memory, new information from various sources may be integrated and combined with pre-existing knowledge
Retrieval Processes

- Memories are most likely to be retrieved if encoding and retrieval processes overlap
- Re-create as closely as possible the original learning situation
- Everyday example
Encoding Strategies

Think about things meaningfully

- Levels of Processing
  - Information that is processed deeply or meaningfully will be well-remembered
  - Integrating new information with prior knowledge creates a rich encoding that provides many potential routes for retrieval
Levels of Processing

Based on Craik & Tulving, 1975
Encoding Strategies

1. Pay attention
2. Think about things meaningfully
3. Integrate an item with its context
Two Aspects of Episodic Memory

- **Item Memory**: Memory for the content of an event; what happened
- **Source or Context Memory**: Memory for the origin of information; “who” told you, “where” and “when you learned something

- Older people tend to have more problems with source or context memory than item memory
Memory for Item and Source

Glisky, Polster & Routhieaux, 1995
Memory for Item and Source

Glisky, Rubin, & Davidson, 2001
Memory for Item and Source

Glisky, Rubin, & Davidson, 2001
Everyday Example

- Where did I park my car?
Encoding Strategies

1. Pay attention
2. Think about things meaningfully
3. Integrate an item with its context
4. Think about information in relation to your self
Self-Reference Effect

- Think about how something is relevant to you personally.
- For example, does the word “honest” describe you?

Glisky & Marquine, 2009
Self-Imagination Effect

- Use visual imagery together with self-reference, what we call self-imagination.
- Imagine things that you want to remember from a personal perspective.

Grilli & Glisky, 2010
The Testing Effect (Roediger & Karpicke, 2006)
An example of Retrieval Practice

- Study Prose Passages
- Following by further study or by testing without feedback
- Test at 5 mins, 2 days, or 1 week
How to Improve Memory

- Pay careful **attention** to all aspects of an event or situation when it occurs
- Think about information in a **meaningful** way and **relate** it to other things you know or things of **personal** relevance; try **self-imagination**
- **Integrate** an event with its context
- **Re-create** the context at time of retrieval
- Use **retrieval practice**
Stay Active!
Mentally and Physically!
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