Conscious and Nonconscious Processes in Long-Term Memory

EXP 4404 - Psychology of Learning

Chapter 11

NonConscious Memory in Amnesics

- Amnesia is characterized by deficits on *explicit memory tasks*
- Performance on *implicit memory tasks* tends to be preserved
  - *Graf & Schacter found that priming was preserved even when novel associations were primed (but found no explicit memory for the new associations)*

NonConscious Memory

- Explicit (Conscious) Memory
- Implicit (NonConscious) Memory

NonConscious Memory in Normals

- People with intact memory systems will use both explicit and implicit memory when performing various tasks
  - *e.g., they might explicitly recall solutions that they studied solutions to word stems when doing this task*
- Studies of nonconsious memory processes in normals must find procedures that disrupt conscious memory to get a "pure" measure of nonconsious memory performance

Types of Memory Tests

- Explicit Tests
  - *Free recall*
  - *Cued recall*
  - *Recognition Tests*
- Implicit Tests
  - *Word-Fragment Completion*
  - *Word-Stem Completion*
  - *Lexical Decision Tasks*
  - *Perceptual Identification*
  - *Object Recognition*

How to Limit Contribution of Conscious Memory?

- Use tasks that are performed too quickly to benefit from conscious recollection
  - *perceptual identification of briefly presented words*
  - *task is perceived as a perception/reading task*
- Show that explicit tasks are improved by a memory-encoding process whereas implicit tasks are not improved
  - *depth of processing improves explicit memory only*
  - *generation effect improves explicit memory only*

How do we experience implicit memory in everyday life?

- Jacoby notes that students think he lectures more slowly as the term progresses
  - *implicit priming by his voice quality and knowledge learned during the course enable students to process his speech more quickly*
  - *perception of a slower rate of speech is an artifact of priming*
- False Fame experiment
  - *priming of names that were studied but can't be recalled causes participants to rate these names as famous*

Memory Processes (Jacoby)

- Memory performance is driven by two types of processing
  - *recollection*
  - *familiarity*
- Memory tasks tap these two types of processes to varying degrees
- Process-dissociation procedure
  - *separates contribution of recollection and familiarity to any memory task*

Memory Systems Assumptions

- Each system serves a different function and uses different memory processes
- Each system operates according to different rules
- Each system is associated with a different neural system
- Each system might use a different format for representing memories
- Each system has evolved independently

Metamemory

- Ability to monitor memory performance
  - *knowledge about our individual memory skill*
  - *assessment of how well we know or understand new knowledge*
  - *predictions about future memory performance*
- Ability to control memory processes to maximize memory performance
  - *selection of processing tasks*
  - *decisions to stop or to continue study of new material*
  - *decisions to continue to search memory for an item that has not yet been activated*

Memory Systems (Schacter & Tulving)

- Major Division: STM & LTM
- Systems of Long-Term Memory
  - *Procedural Memory*
    - *skill memory*
    - *primarily implicit memory*
  - *Semantic Memory*
    - *general knowledge*
  - *Episodic Memory*
    - *event memory*
    - *personal events: Autobiographical Memory*
  - *Perceptual Representational Systems*

Feeling-of Knowing Judgments

- Tip - of - the - Tongue experiences
  - *what information is used to make these judgments?*
    - *Direct Access Mechanisms*
      - Depends on partial activation of stored information
    - *Inferential Mechanisms*
      - Depends on knowledge about the likely contents of memory or strength of related memories that are retrieved
  - *false TOT experiences (Schwartz)*

Judgments of Learning

- Monitoring the quality of encoding before taking a memory test
  - *explicit predictions about performance on a future memory test*
- How accurate are these judgments?
  - *JOLs are fairly accurate estimates of performance on a memory test*
  - *timing of JOL is important*
    - *delayed JOLs are more accurate than immediate JOLs*
    - *delayed JOLs are based on accessibility from LTM whereas immediate JOLs include accessibility from STM*

Forms of Amnesia

- Anterograde amnesia
  - *inability to encode new information*
  - *poor memory for events* after *the accident or injury*
- Retrograde amnesia
  - *inability to retrieve old information*
  - *poor memory for events* before *the accident or injury*
- Usually characterized by loss of memory only
  - *intelligence & personality are preserved*

Control Processes and Metamemory

- Use metamemory knowledge to modify memory processing to improve memory performance
  - *people study items less when they make high JOL estimates & study items more if they have low JOL scores*
  - *people tend to underestimate the amount of study needed for low JOL items*
- Use metamemory knowledge to decide whether or not to produce a response during recall
  - *make judgments about the likelihood that the answer is correct*
  - *forced recall will produce more correct answers than free recall (but will include some false recalls as well)*

Amnesic Syndrome (Baddeley, 1998)

- Normal Short-Term (Working) Memory Function
- Normal Semantic Memory
- No effect on general intelligence
- Intact Implicit Memory
- Minimal Retrograde Amnesia
- Mild to Severe Anterograde Amnesia

Amnesia

- Four major causes for amnesia
  - *Older Individuals*
    - *Alzheimer's Disease*
    - *Stroke*
    - *Korsakoff's syndrome (chronic alcoholism)*
  - *Younger Individuals*
    - *accidents producing head injuries*

Korsakoff's Disease

- Brain damage produced as a result of chronic thiamine deficiency associated with long-term alcoholism
- Damage may be wide-spread
  - *medial temporal lobes*
  - *subcortical structures (thalamus & mamillary bodies)*
  - *frontal lobe damage*
- Greater damage associated with greater and more diverse cognitive impairments
  - *poor awareness of nature of memory impairment*
  - *confabulation is a common characteristic*