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COGNITION

Chapter 5 REMEMBERING EVENTS

Fundamentals of Cognitive Psychology
(Kellogg)

Fall 2013

Atkinson & Shiffrin's Standard Model

Cowan's Model (STM as "activated" part of LTM)

Baddeley's Model of Working Memory

- (Executive + phonological loop, visuo-spatial sketchpad, episodic buffer)

Long-Term Memory Systems

- Declarative \sim Explicit \sim Direct
 - Episodic (memory of personal experience)
 - Semantic (general world knowledge)
- Nondeclarative \sim Implicit \sim Indirect \sim Procedural
 - Skills
 - Conditioned Responses

STM as an “activated memory” subset of LTM (wherein activation lasts for about 20 seconds without reinforcement or replacement)

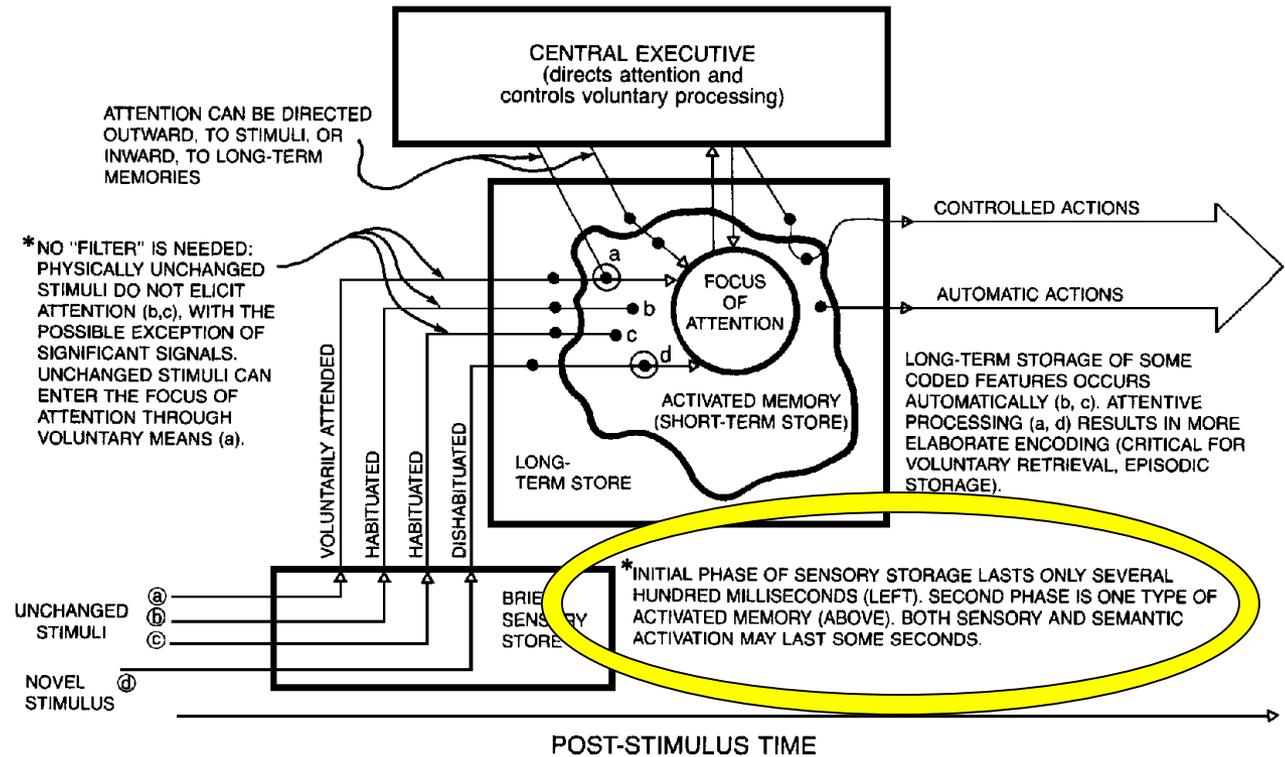


Figure 1. A revised model of the information-processing system. The time since stimulus reception is represented ordinally along the x axis. The components are arranged in real time, and stimulus information can be present in more than one component at the same time. Short-term storage is represented as an activated subset of long-term storage, and the focus of attention is represented as a subset of short-term storage. Habituated stimuli do not enter the focus of attention. The timing of involvement of the central executive in processing is flexible. The arrows represent the transfer of information from one form to another; these are discrete approximations to continuous processes that can occur in parallel or cascade. Pathways leading to awareness can come from three sources: changed stimuli for which there is dishabituation, items selected through effortful processing (whether of sensory origin or not), and the spontaneous activation of long-term memory information based on associations (not shown).

Declarative (~= Explicit ~= Direct)

- Episodic
 - memory of personal experience
- Semantic
 - general world knowledge: concepts, facts

Nondeclarative (~= Implicit ~= Indirect ~= Procedural)

- Skills
 - Perceptual [reading], sensimotor, cognitive
- Conditioned Reponses
 - classical, operant

Different components of memory systems can be illustrated using dissociations (and double dissociations)

In amnesics, episodic memory is impaired relative to normals, but procedural memory (motor learning, conditioned responses), and semantic memory (word fragment completion following a prime) remain unimpaired.

Dissociations between explicit and implicit tests of knowledge

- Alcohol, Scopolomine, & General Anesthesia
 - Each can produce amnesia for episodes that occurred during the altered state on consciousness but leave implicit tests of procedural (nondeclarative) memory unimpaired.

Anterograde Amnesia: Patient H.M.

- Profound Anterograde Amnesia
- H.M. shows a profound inability to store new episodic memories in LTM. General world knowledge, verbal skills, and intelligence (IQ = 112) remain intact.
- Sensorimotor (mirror tracing), perceptual skill learning, and conditioning, are all preserved despite the absence of episodic recall of learning the skills

Anterograde + Retrograde Amnesia: Patient K.C.

- Profound Anterograde Amnesia (damage to medial temporal lobes from motorcycle accident)
- Like H.M., K.C. shows a profound inability to store new episodic memories in LTM. General world knowledge, verbal skills, and intelligence remain intact.
- Aware of self-referential semantic information (date of birth, etc.) but no personal recollection (episodic memory)

Episodic vs. Semantic Memory (different memory systems?)

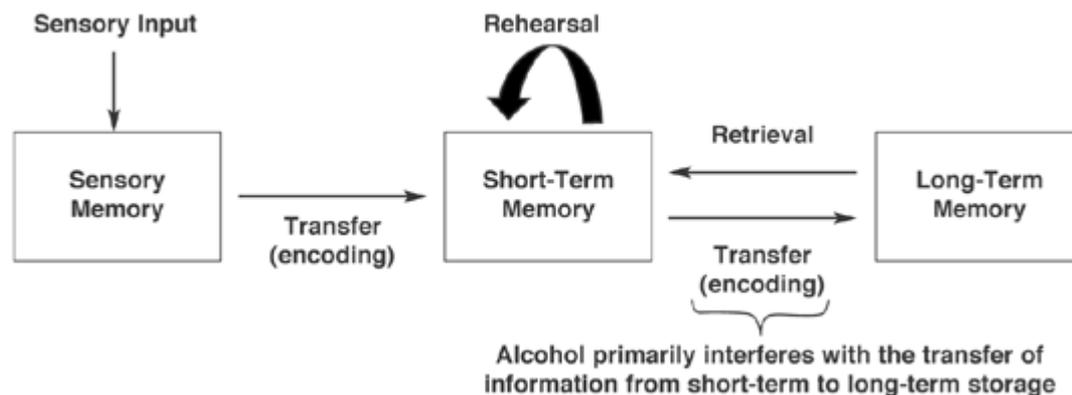
‘Remember’ vs. ‘Know’ judgments (Rajaram & Roediger, 1997)

‘Remembering’ an event from the past (personal reliving of the event) vs. ‘knowing’ that an event occurred (in the absence of personal memories)

Back to back repetition in study list: know +

Spaced out repetitions in study list: remember +

Alcohol/benzodiazepines: remember - (know =)



Is *Derek Besner* Famous?

Jacoby, Woloshyn, & Kelley (1989) demonstrated that nonfamous names can be judged 'famous' when participants were shown the items before (stimulus repetition), especially when the participants were distracted via a divided attention manipulation (and thus failure to attribute feelings of familiarity to the appropriate cause)

This argues for "familiarity" based on ease of processing (via priming)

ENCODING: Craik & Lockhart's (1972) “*depth of processing*”

A (discredited) account of memory strength

- **Maintenance Rehearsal** (Type I Processing)

- Sensory characteristics, repetition

- **Elaborative Encoding** (Type II Processing)

- Semantic characteristics, semantic processing

- What is “deeper”?

- Circularity of definition

- Task Effects

- Transfer-appropriate processing (study-test match)

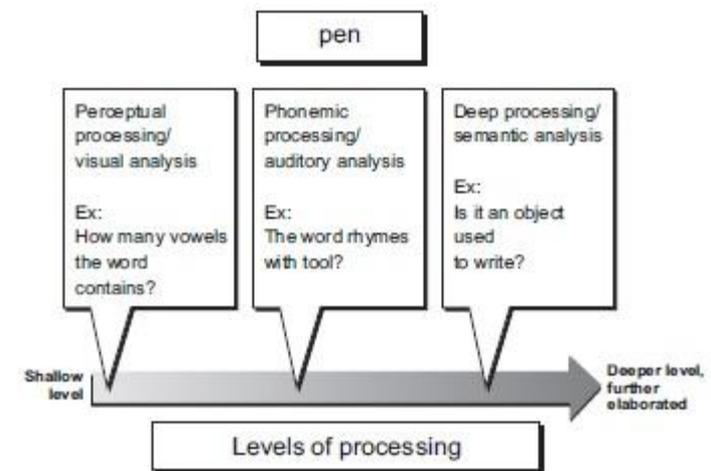
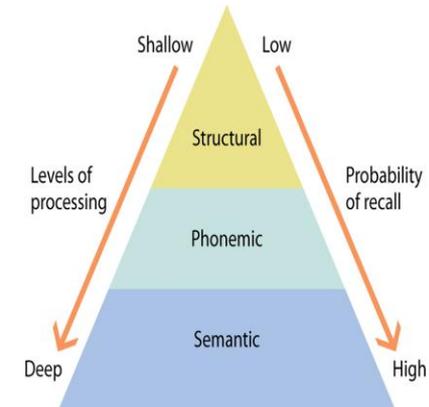
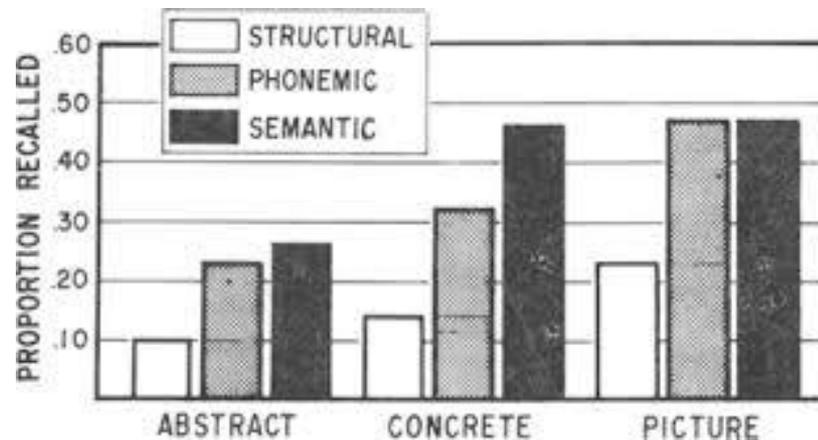


Figure 1. Diagram of levels of processing while encoding the written word “pen” (the subject can analyze it at various levels of processing).

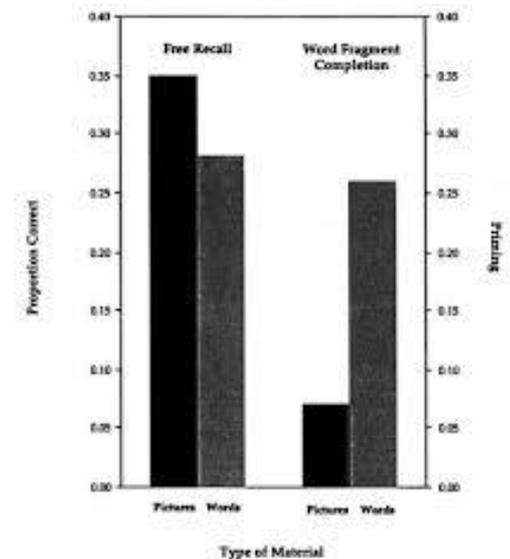
Encoding (depth of processing)

- What is “deeper”?
 - Circularity of definition
- Task Effects
 - Transfer-appropriate processing
 - (study-test match)



Transfer-Appropriate Processing

- Morris, Bransford, & Franks (1977)
- Test performance hinges on engaging in an encoding process that is compatible with the demands of the test (cf., task effects)
- Rhyming encoding produced better performance at a rhyming test than semantic encoding did even though free recall was better in the semantic encoding condition.



Relational Processing

- Whereas ‘Distinctiveness’ capitalizes on differences to increase likelihood of remembering, it is also possible to capitalize on similarities.
- Free-recall of mixed category elements generally produced ‘grouped’ recall where category elements primed each other (Tulving & Pearlstone, 1966) – providing the category cues almost doubled recall.
- *Subjective organization* is the individuals idiosyncratic ordering of randomly presented items during repeated recall attempts

Distinctiveness

- Distinctiveness refers to how ‘distinct’ or different the items to-be-learned are from each other.
- More distinctive items are remembered better (Von Restorff effect)
 - Auditory and visual Sensory
 - Semantic
- The distinctiveness effect can be shown for both auditory (singing an item) and pictorial stimuli (unique item vs. many \$20 bills).
- “Flashbulb” memories for emotionally laden personally-relevant events are demonstrably ‘distinctive’

Flashbulb Memories: Distinctiveness?

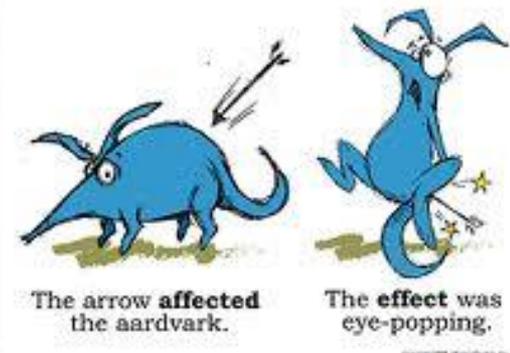
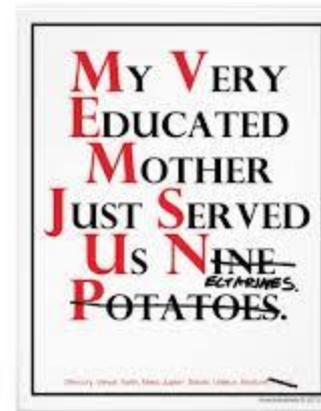
- Are ‘flashbulb’ memories (vivid recollection of an autobiographical event) actually any more accurate than ‘regular’ memories?
 - If there are strong connections to the event, the emotional arousal can cause the amygdala to hasten hippocampus-driven consolidation processes.
 - Flashbulb memories do not appear to rely on this mechanism (non-emotional features are remembered better than emotional features)
 - Post-challenger shuttle and post-9/11 memory experiments indicate no memory preservation for flashbulb memories

Systems of organizing information at encoding to improve later recall

- Chunking (grouping/organization), Building Meaning (tying to semantic structures), Effective Retrieval Cues
- visual and verbal code + association of retrieval cues with the to-be-remembered item (i.e., relies on “dual-coding”)
- *Self-reference effect* also improves memory (“do you use this product?”)

Often rely on visual imagery

- Method of Loci (Simonides)
- Peg-Word
- Key-Word
- Rhyming
- Acronym
- Acrostic
- ...



The arrow **affected** the aardvark.

The **effect** was eye-popping.

Retrieval Processes

- Memory Failures can result from the item not having been stored in memory or from an inability to retrieve the existing memory
- Appropriate retrieval cues may activate 'lost' memories and allow retrieval
- Encoding Specificity: that which is encoded with the target (e.g., from types of processing performed on the item) is retained in memory and provides a strong cue (even if a weak semantic associate – Tulving and Thompson, 1973)
- Dividing attention at retrieval has minimal impact on performance.

Context-Dependent Learning

- Environmental Context
 - Wet/dry (Godden & Baddeley, 1975)
 - Changing rooms (Smith, Glenberg, & Bjork, 1978)
- Psychological Context
 - Mood Congruence Effect (Bower, 1981)
 - State-Dependent Learning
 - Alcohol impairs learning, but produces better recall than sober when study and test match

Tip of the Tongue State

- A feeling of knowing or familiarity in which some name, word, date, or other information cannot be retrieved despite a certainty of belief that it is available in memory.
 - State Capitals: Maine, New Hampshire, Georgia, South Dakota, Arizona, Tennessee, Rhode Island, Iowa, Virginia, Oregon
 - Country Capitals: Finland, Belgium, Denmark, Italy, Iceland, Germany, United Kingdom, Australia
- Information may be available in memory but inaccessible (~60% correct on number of syllables, first letter, etc.)



Geiselman's Cognitive Interview

Reinstate Context

- Cues memory (personal and environmental context)
- Pulls for additional cues (re: encoding specificity)
- The interviewer tries to **mentally reinstate the environmental and personal context of the crime** for the witnesses, perhaps by asking them about their general activities and feelings on the day. This could include sights, sounds, feelings and emotions, the weather etc..

Report all

- Seeks out additional memory cues (partial memories ok, TOT, etc.)
- Witnesses are asked to **report every detail**, even if they think that detail is trivial. In this way, apparently unimportant detail might act as a trigger for key information about the event.

Report in several sequences

- Avoids single schema being used to guide reconstruction
- Recounting the incident in a **different narrative order**. Geiselman & Fisher proposed that people tend to recall more recent events more clearly than others. Witnesses should be encouraged to work backwards from the end to the beginning.

Report from several perspectives

- Witnesses are asked to report the incident from **different perspective**, describing what they think other witnesses (or even the criminals themselves) might have seen.

Enhanced Cognitive Interview: adds social aspects (interviewer-interviewee interaction) and minimizing distraction, adding extra time between questions, etc. These manipulations are thought to increase context reinstatement.

Geiselman's Cognitive Interview: Geiselman et al. (1985)

Aim: Geiselman (1985) set out to investigate the effectiveness of the cognitive interview.

Method: Participants viewed a film of a violent crime and, after 48 hours, were interviewed by a policeman using one of three methods: the cognitive interview; a standard interview used by the Los Angeles Police; or an interview using hypnosis. The number of facts accurately recalled and the number of errors made were recorded.

Results: The average number of correctly recalled facts for the cognitive interview was 41.2, for hypnosis it was 38.0 and for the standard interview it was 29.4. There was no significant difference in the number of errors in each condition. (note: often hypnosis leads to more false positives)

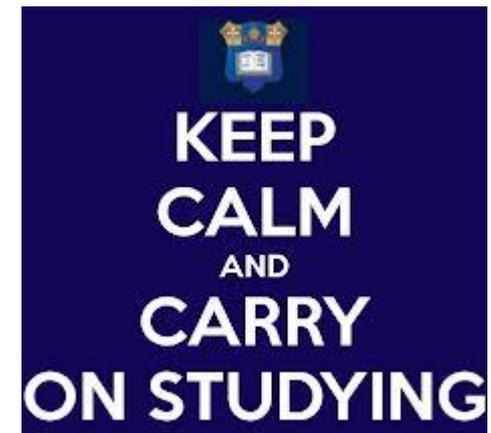
Conclusion: The cognitive interview leads to better memory for events and will yield more relevant information compared with a traditional interview method (but is both harder to perform and relies on having a cooperative interviewee)

How To Study

- Go to class and pay attention
- Read the book before class
- Study deep, not shallow
 - (i.e., make meaningful connections)
- Form a study group
- Devise meaningful mnemonics



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Remembering Events

- Episodic Memory
- Declarative memory
- Semantic memory
- Nondeclarative memory
- Maintenance rehearsal
- Elaborative encoding
- Depth of Processing
- Self-reference effect
- Transfer-appropriate processing
- Von Restorff effect
- Distinctiveness
- Flashbulb memory
- Relational processing
- Subjective organization
- Retrieval mode
- Encoding specificity
- Tip-of-Tongue (TOT) state
- Mood congruence effect
- State-dependent learning
- Dissociations
- H.M.



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