

A Model of the Human Information Processing System

Ling/Psych 371N, SP '03

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NOTE: This material presented in-class only
(not in your text).

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Three Mental Structures

- These structures are independent of language.
- 1. Sensory Stores
- 2. Working Memory
- 3. Permanent Memory

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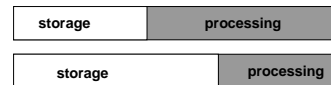
Sensory Stores

- Take in sensory input
- Store briefly in raw, unanalyzed form
- Duration of storage depends on the store:
 - Visual store: 1 second
 - Auditory store: 4 seconds
- Why should the auditory store be so long?
 - You usually don't hear things more than once.

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Working Memory

- Handles limited information for a limited time (seconds)
- Consists of storage and processing functions
- Is finite in size.



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Chunking

- Working memory can only hold 7 +/- 2 units of information. It does not matter how big those units are.
- To keep more info in working memory, we can chunk it: group several units into one chunk.
- How does chunking apply to language?

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How chunking in working memory applies to language:

- Chunk SOUNDS into WORDS
- CHUNK WORDS into NAMES & PHRASES
- Chunk PHRASES into SENTENCES

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Permanent Memory

- Semantic Memory + Episodic Memory
- **Semantic Memory:**
 - Things you know about the world
 - General knowledge (math, **grammar, lexicon**)
 - Motor skills (walking, running, cycling)
 - Spatial knowledge (layout of your apartment, the way to school)
 - Social skills

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Permanent Memory, contd.

- Semantic Memory + Episodic Memory
- **Episodic Memory**
 - Events that are specific to time and place
 - Varies from person to person
 - Constantly updated

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Pattern Recognition

- Matching information in a sensory store with information in permanent memory
 - Info in auditory sensory store is matched with info in lexicon.
 - Recall that the lexicon is part of semantic memory.
- **QUESTION:**
- How do you use these structures for processing language?

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Using the System to Process Language

- Hear a sentence
- Info stored initially in auditory sensory store
- Chunk information

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Using the System to Process Language (contd.)

- Use Permanent Memory:
- **Semantic Memory:**
 - Has information on sounds and words
 - Has information about the discourse
- **Episodic Memory:**
 - Builds a discourse* representation so you can keep track of what is happening.

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*What is a discourse representation?

- A discourse is a story or a conversation
- A discourse representation is your mental picture of the story or conversation

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