

## I. STM vs. LTM

## II. Tripartite Model of WM

## III. Neuroimaging of WM

### Short-term vs. Long-term Memory

- *primary memory*: “the specious present”, refers to this moment in time

- *secondary memory*: memories storehouse

### Distinctions between STM and LTM

Active contents of consciousness	Not currently in consciousness
Active nodes in LTM	Inactive until cued
Heightened neural firing synaptic strength	Unit-to-unit changes in relative to baseline
Fast access to contents	Slower access
Limited capacity	Unlimited capacity

### Modal Two-Store Model of Memory

Atkinson & Shiffrin (1968)

### Serial Position Function in Free Recall

Primacy Component – LTM

*Dissociable effects of study duration*

Rehearsal and Free Recall

Recency Component – STM

*Dissociable effects of filled delay*

- Forward span (digits, words, symbols)

- 493759
- 6715247
- 05369417
- 265070193

- 8167049716
- 04862517290

- H.M.intact STM span, but impaired LTM

The Fall of the Modal Model

- Duration of maintenance/rote rehearsal doesn't always predict LTM performance: impacts recognition but not recall

- Rundus (1971) effects likely due to meaningful elaboration

The Fall of the Modal Model

*LTM = incidental byproduct of processing of an event*

- LTM ≠ rehearsal time in STM
- “deeper” processing = more effective and durable encoding
- processing can be terminated at a particular level

Levels of Processing Paradigm

Levels of Processing: Subsequent Memory

STM = Active Portion of LTM

Control mechanisms maintain or keep active different memory representations such that they can be worked with in a goal-directed manner: Working Memory

## I. STM vs. LTM

## II. Tripartite Model of WM

- Phonological WM
- Visuo-spatial WM
- Executive Control

Working Memory

Atkinson & Shiffrin (1971)

“...we tend to equate the short-term *store* with ‘consciousness,’ that is, the thoughts and information of which we are currently aware can be considered part of the contents of the short-term store...Because consciousness is equated with the short-term store and because *control processes* are centered in and act through it, the short-term store is considered a working memory: a system in which decisions are made, problems are solved and information flow is directed.”

Working Memory:

What Do We Want to Know?

Unitary vs. non-unitary WM?

Nature of control in WM?

Nature of representations in WM?

What are the limits of WM?

Biological implementation of WM?

Tripartite Model of WM

(Baddeley & Hitch, 1974)

Separate WM Systems?

Dual-task Double Dissociation

Dual-task Double Dissociation

Neuropsychological Double Dissociation

The Phonological Loop

What is the Nature of the PL?

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Neuropsychology & PL Sub-components

Brain Bases of Phonological WM

Component Processes and Brain Bases of Phonological WM

Component Processes and Brain Bases of Phonological WM

Separating Rehearsal from Storage

Separating Rehearsal from Storage

Component Processes and Brain Bases of Phonological WM

fMRI Study of Relation between WM and LTM

Relation between STM and LTM

Do Meaning and Phonology Depend on Different WM Systems?

Separable Semantic & Phonological WM?

Separable Semantic & Phonological WM?

Visuo-Spatial Working Memory

I. Distinguishing verbal from visuo-spatial WM

II. Nature of representation and rehearsal in VSSP

### III. Visual vs. Spatial WM

Dual-task Double Dissociation

(van Heyer & Barrett, 1971)

Distinguishing Verbal and Spatial WM

What is the nature of the representations that are maintained in visuo-spatial WM?

Representations in Visuo-Spatial WM

What is the nature of rehearsal in

visuo-spatial WM?

Visuo-Spatial Selective Attention

Rehearsal in Visuo-Spatial Working Memory

Rehearsal in Visuo-spatial Working Memory

Visual & Spatial WM: Unitary or Separable?

Updated Understanding of Forms of WM