

# Attention and Memory



- ❖ Is More Than What We Typically Might Think.

# **A Review Of The Body's Interaction In The World**

**Gravity Is The Driving  
Force Behind Cognitive  
Development**

# In The Beginning



We Live In A Three-  
Dimensional World  
Immersed In Gravity

# In The Beginning

Our Body Contends  
With Gravity At All  
Times

# In The Beginning

Our Primitive Reflexes

Give Us The First

Opportunity To Respond

to Gravity, and Engage

the Physical World

Along With Our Gravito-  
Inertial Receptor System  
(vestibular), Our Binocular,  
Accommodative And Saccadic  
Systems (visual) Provide An  
Opportunity To Acquire The  
Perception That Our World Is  
Three-Dimensional  
-And So Are We-

As We  
Engage The World

*Perception Begins To*  
*Develop For The*  
*Purpose Of*  
*Prediction*



*The Purpose Of Prediction*  
*Is To Most Effectively*  
*Contend with Current*  
*Situations, and to Predict*  
*The Likelihood Of Future*  
*Events*

**The Purpose Of**  
**Perception And Prediction Is**  
**To Be Aware Of,**  
**Move Toward**  
**Or Away From**  
**Living**  
**And Non-Living Things**

*We See Things Initially for  
Their Utility*

*Later We Will Name Them*

*We See Living Things And  
Predict Their Intentions*

*We Conclude We Know  
What They Are Thinking*

*Perception And*  
*Prediction Are*  
*Available Only*  
*Because Of Attention*  
*For The Current*  
*Situation And A*  
*Memory For Past*  
*Events*

The More Refined  
One's Sensory And  
Motor Capacity,  
The More Refined  
One's Attention,  
Perception  
And Predictions

# Meaning

Deriving Meaning

May Be

The Most Important Purpose  
Of Perception

When A Prediction  
Is Not Fulfilled  
Knowledge Is Acquired  
And Meaning Has  
*An Opportunity To Be Derived*



When A Prediction  
Is Fulfilled

Automaticity Is Developed  
And Cognitive Resources  
Become More Available,  
Knowledge Is Confirmed, and  
Meaning Is Derived

Fulfilled And Unfulfilled  
Predictions  
Nurture The Development  
Of Schemas

# What Is Visual Perception ?

A visual skill that derives  
information from light,  
and most importantly,

**derives**

***meaning from light***

# What Is Visual Perception ?

This Must First Involve  
Visual Discrimination

# What Is Visual Perception ?

**This involves**

**-Pattern Recognition-**

**Linear**

**Spatial**

**Temporal**

# How Does Visual Perception Develop?

**The starting point is the body's sensory-motor interaction in the concrete, dynamic three-dimensional world immersed in gravity**

# How Does Visual Perception Develop?

**When vision is a participant in the world**

**vision becomes dominant.**

**When reciprocal spoken and gestural language become active, visual perception is enhanced further**

# What Is Attention?



# What Is Attention?

- ❖ "... is the taking possession of the mind, in clear and vivid form, of one out of what may seem several simultaneously possible objects or trains of thought. It implies withdrawal from some things in order to deal effectively with others..."

- William James

Psychologist / Philosopher 1842- 1910

# What Is The Purpose Of Attention?

To Allocate An Appropriate  
Portion Of  
Our Limited Cognitive Resources  
When And Where  
We Need to  
Or Want To

# Attention

If You Are Bored,  
You Are Not  
Paying Enough Attention

# Attention

If You Can Spend Hours  
On-Line Or  
With A Video Game

You Are Not Developing Or  
Demonstrating Attention

Your Are Giving In To  
Seduction

# Types Of Attention

Sohlberg and Mateer Model - 2001

Selective

Sustained

Alternating

Simultaneous

# Types Of Attention

## Selective

“Freedom from distractibility.” The ability to sustain a certain cognitive task regardless of the competing sensory environment

# Types Of Attention

Sustained

The ability to maintain engagement in a repetitive and continuous task

# Types Of Attention

## Alternating

The mental dexterity to shift ones cognitive approach from one task to another



# Types Of Attention

## Simultaneous

Sometimes called “Divided Attention” is the ability to respond to more than one activity at a time

# Neurology Of Attention

- Alertness
  - Brain Stem
- Directed Attention
  - Prefrontal Cortex
  - Phonological loop or visual - spatial sketchpad



# Neurology Of Attention

- Frontal Lobes
  - Left frontal lobe for verbal stimuli
  - Right frontal lobe for visual scenes



People only see what they are prepared  
to see-

Ralph Waldo Emerson-

Poet: 1803 - 1882

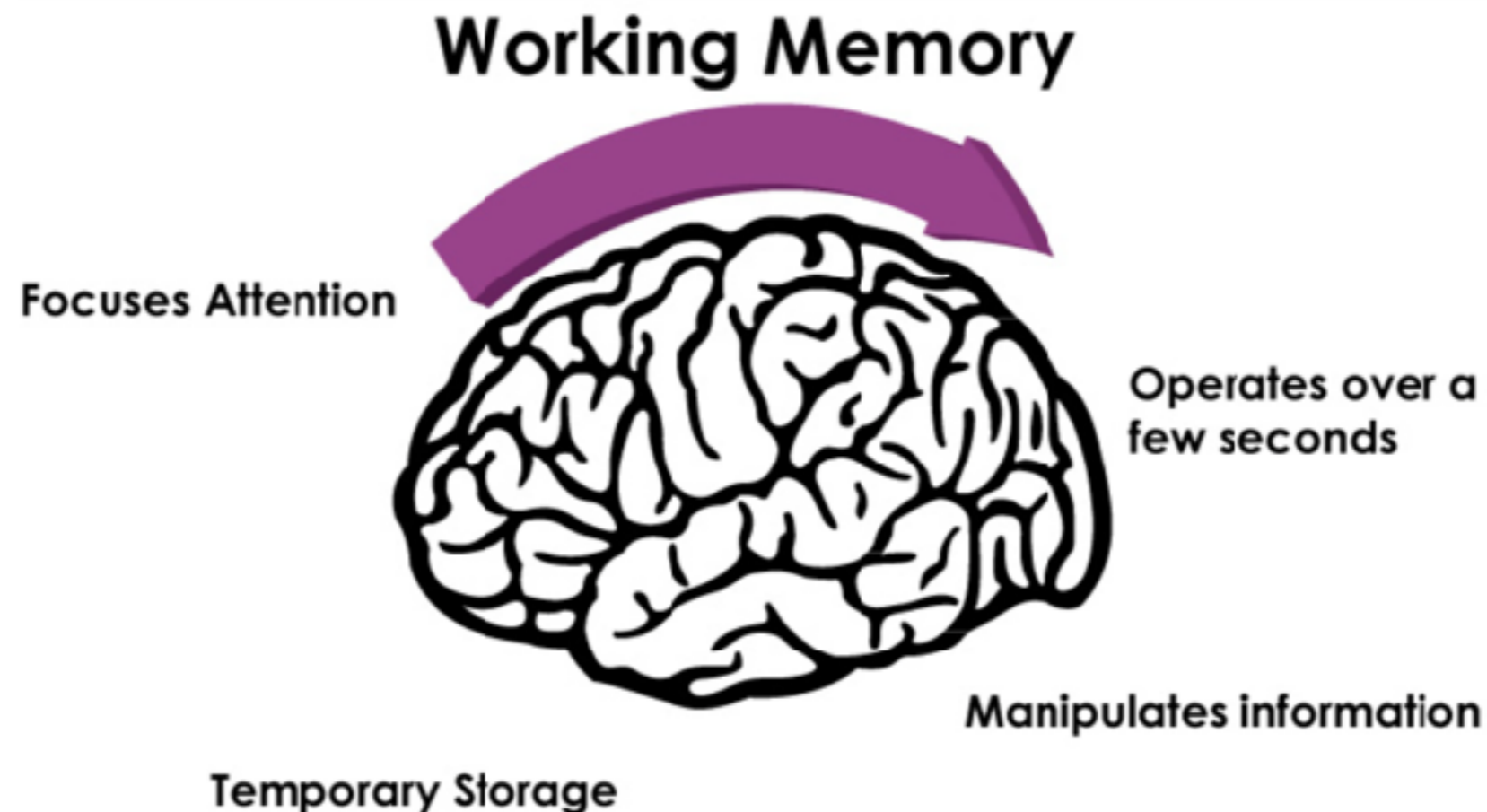
# The Role Of Attention In Sports

Sports - Overt and Covert Attention



# The Role Of Attention In Recovery From ABI And In Learning Disabilities

Frontal Lobes and Working Memory



# What Is Memory?

“Memory is the process of maintaining information over time.” - Matlin, 2005

“Memory is the means by which we draw on our past experiences in order to use this information in the present” - Sternberg, 1999

# What Is The Purpose Of Memory?

To effectively be  
aware of, avoid or  
approach anything



The Storage Of Some  
Memories Require  
Conscious Attention-  
Some Do Not

Memories That Don't  
Require Conscious  
Attention,  
Do Require Some  
Sensory And Motor  
Capacity

# Types Of *Memory*

By Ability/Choice

Working

Procedural

Semantic

By Neurology/Default

Incidental

Episodic

# Types Of Recall

Declarative

Non-Declarative

Working

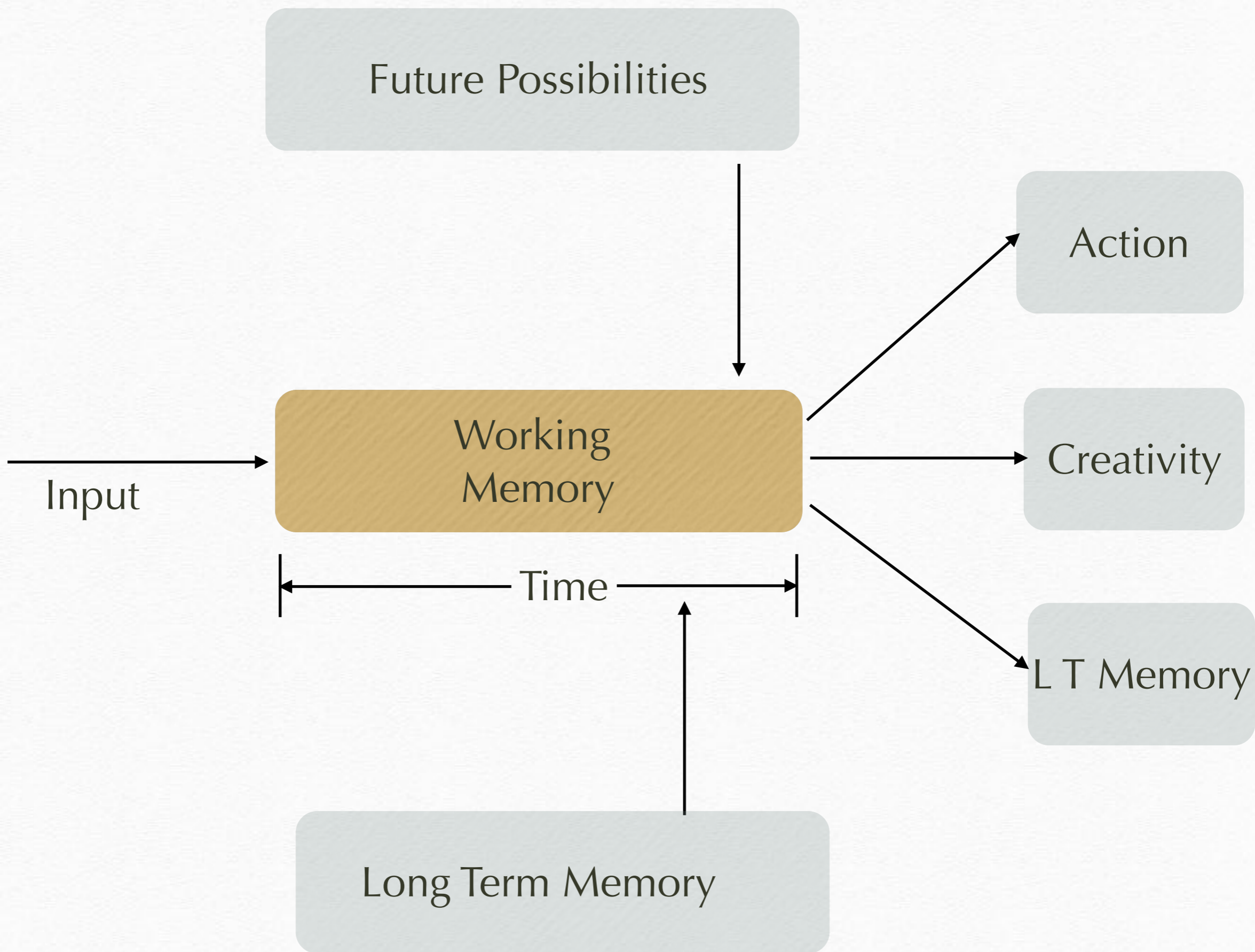
Incidental

Episodic

Procedural

Semantic

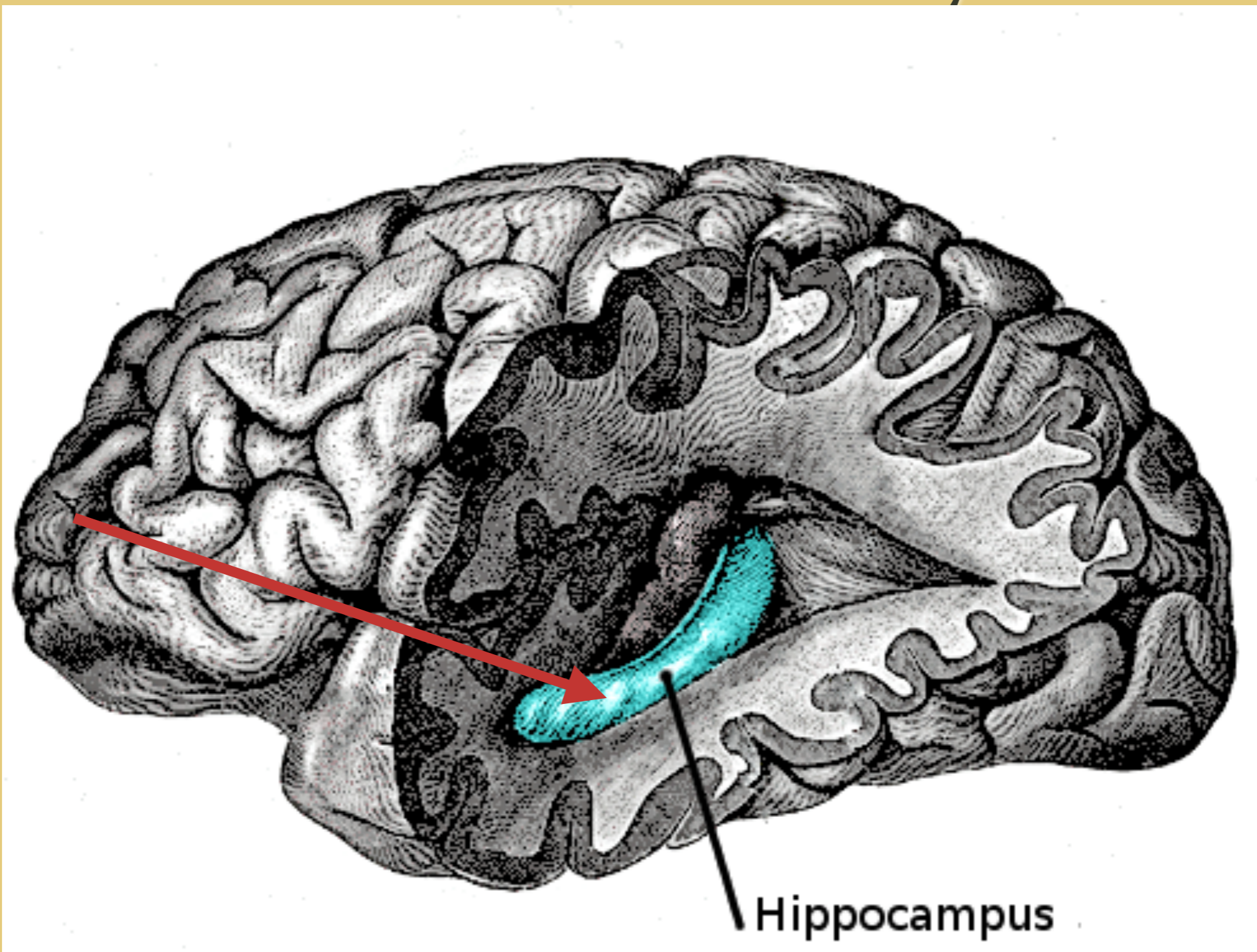




# The Neurology Of Memory

- Prefrontal Cortex
- Hippocampus

# The Neurology Of Memory



# Forgetting

- Hermann Ebbinghaus (1850-1909)
- Logarithmic
- Episodic
- Semantic

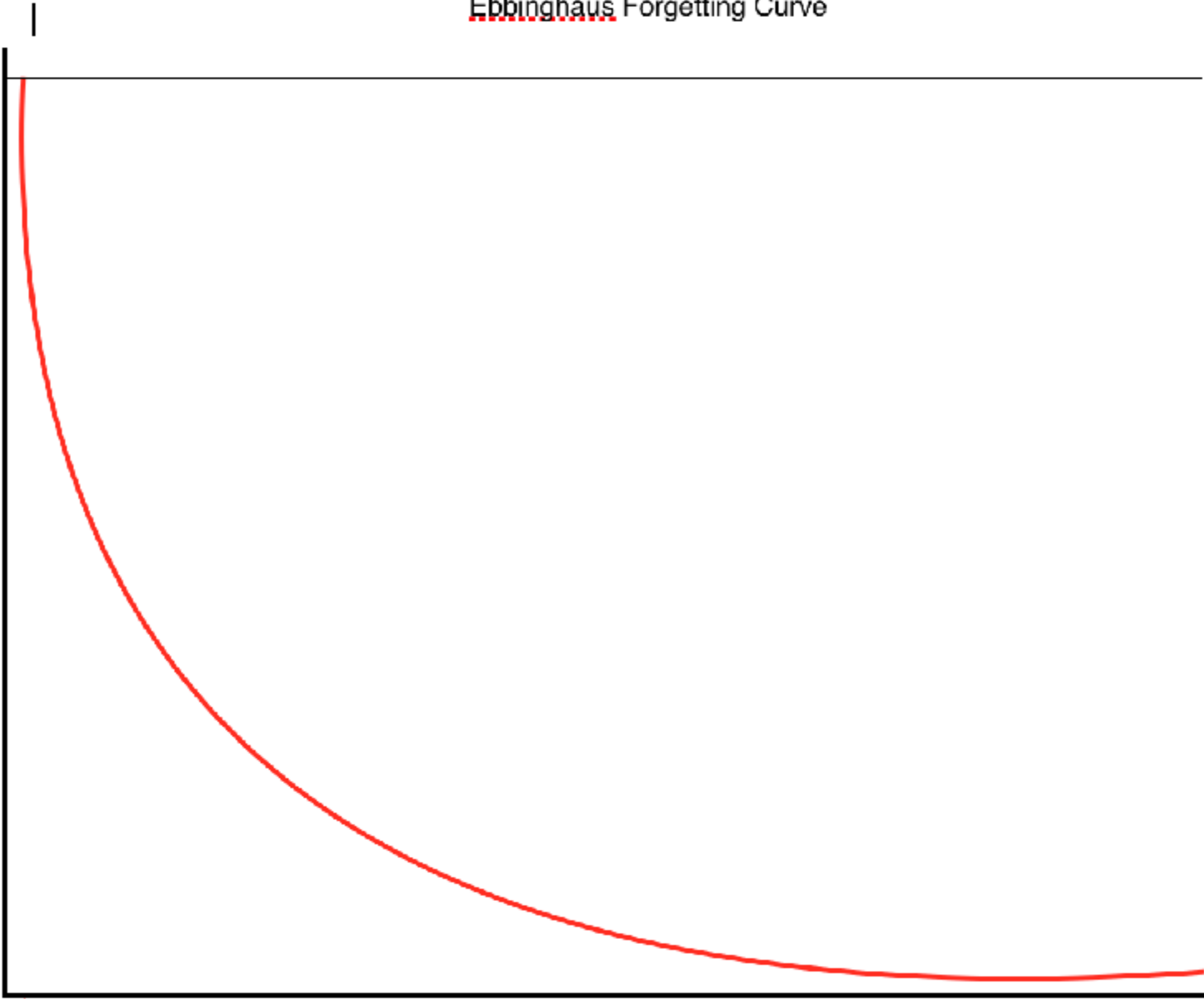


Ebbinghaus Forgetting Curve

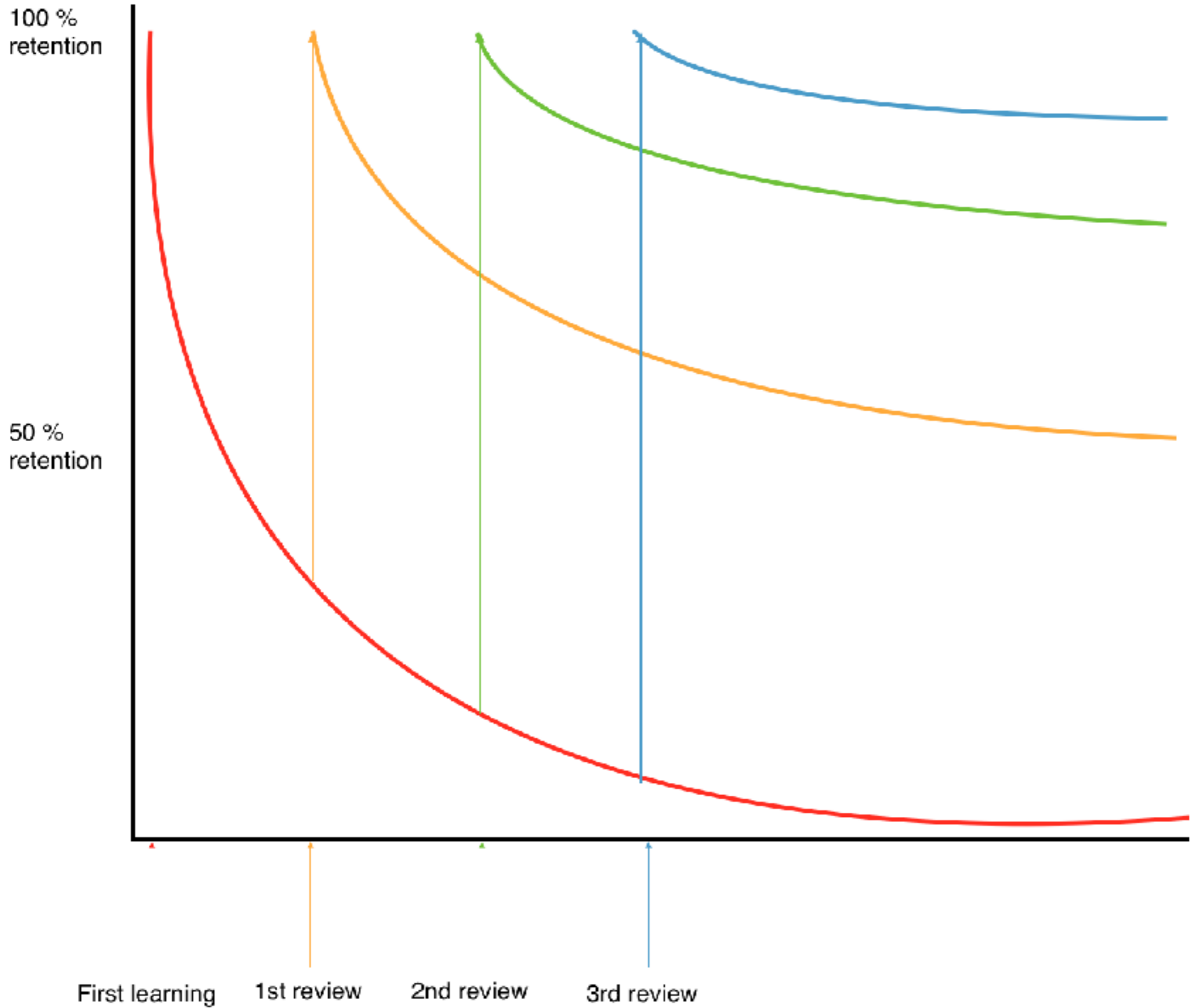
100 %  
retention

50 %  
retention

First learning



# Distributed Learning



# Therapeutic Methods For Developing Memory

- Cogmed?

“...after a grueling three years” of rigorous study, (Holmes, Gathercole, and Dunning 2009) Gathercole et al. found little evidence that skills transferred to the real-world.

“Generalization can occur, but it needs the therapist or trainer to build a bridge between the clinic and the world outside.” (Alan Baddeley 2015)

# Therapeutic Methods of Developing Visual Memory

Levels Of Processing

Mnemonics

Method Of Loci

The Major System

The Peg System

Orienteering

State Dependent Learning

# Therapeutic Methods of Developing Visual Memory

Feel Box

SET

Build In Another Place

Tachistoscopes

Flip And Rotations

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