

# Financial Decision-Making:

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# Framework for Understanding Financial Decision-Making in SSI Beneficiaries

Understand particular strengths, weaknesses and vulnerabilities of the individual Beneficiary.

Understanding if the person once had these abilities and now they are lost, versus never able to acquire abilities.

Understand the decision-making context (complexity) of financial management, availability of supports.

Interaction of these factors.

# What is Decision-Making?

- Decision-Making:
  - Why a Honda Odyssey
  - Why a bagel?





# Dual Process Models

## System 1

- ▣ Spontaneous / Automatic
- ▣ Unconscious
- ▣ Emotion
- ▣ Heuristic (rule-based)
- ▣ Fast
- ▣ Holistic, perceptual
- ▣ Default Mode

## System 2

- ▣ Conscious
- ▣ Analytic
- ▣ Effortful
- ▣ Flexible
- ▣ Slow
- ▣ Low Capacity
- ▣ Deliberative



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# Research on Financial Decision-Making

- Neuroeconomics and Neuroimaging
  - Brain regions important for financial decision-making
    - Frontal Lobes
    - Parietal Lobes
- Mid Brain: Neurotransmitter DA is produced
- Subcortical Area:
  - Amygdala / Limbic System: Emotion
  - Basal Ganglia: Reward Center / goals
  - Insula
- Cognitive and Neuropsychological Studies.

# Frontal Lobes

## □ Pre-Frontal Cortex

### □ Dorsolateral Prefrontal cortex

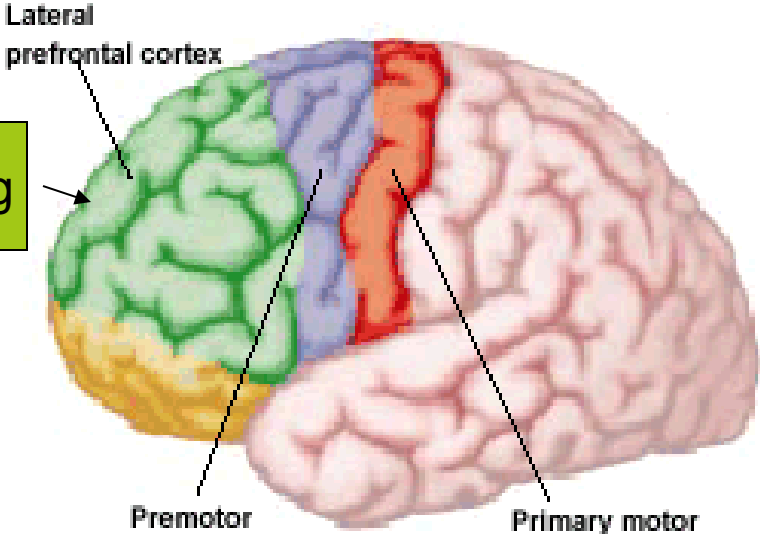
- Executive Functioning
- Initiation
- Working memory, ability to keep information on-line.
- System 2
- Extensive connections with other cortical regions.

### □ Ventromedial / Orbital-frontal

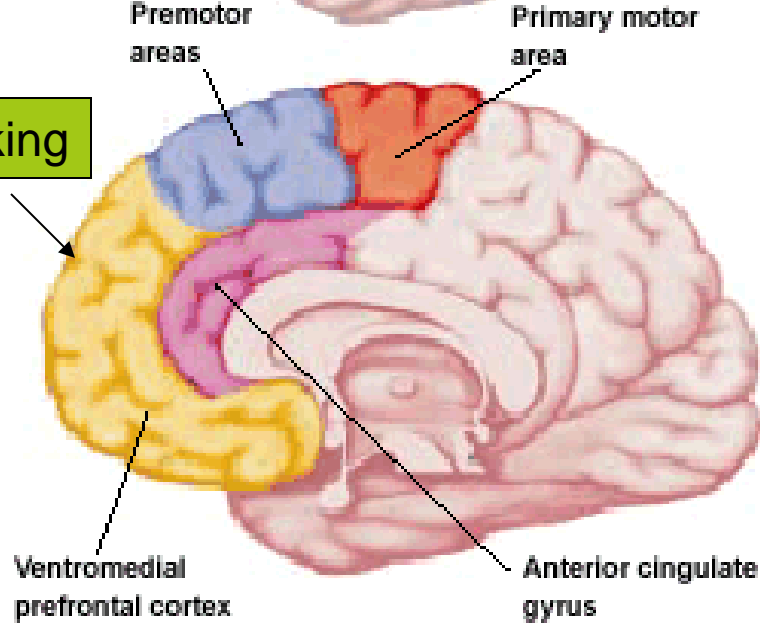
- Emotional Decision-Making (rewards)
- Area involved in Phineus Gage; Psychosurgery
- Extensive connections with autonomic nervous system and subcortical structures.



Executive Functioning



Emotional Decision-Making

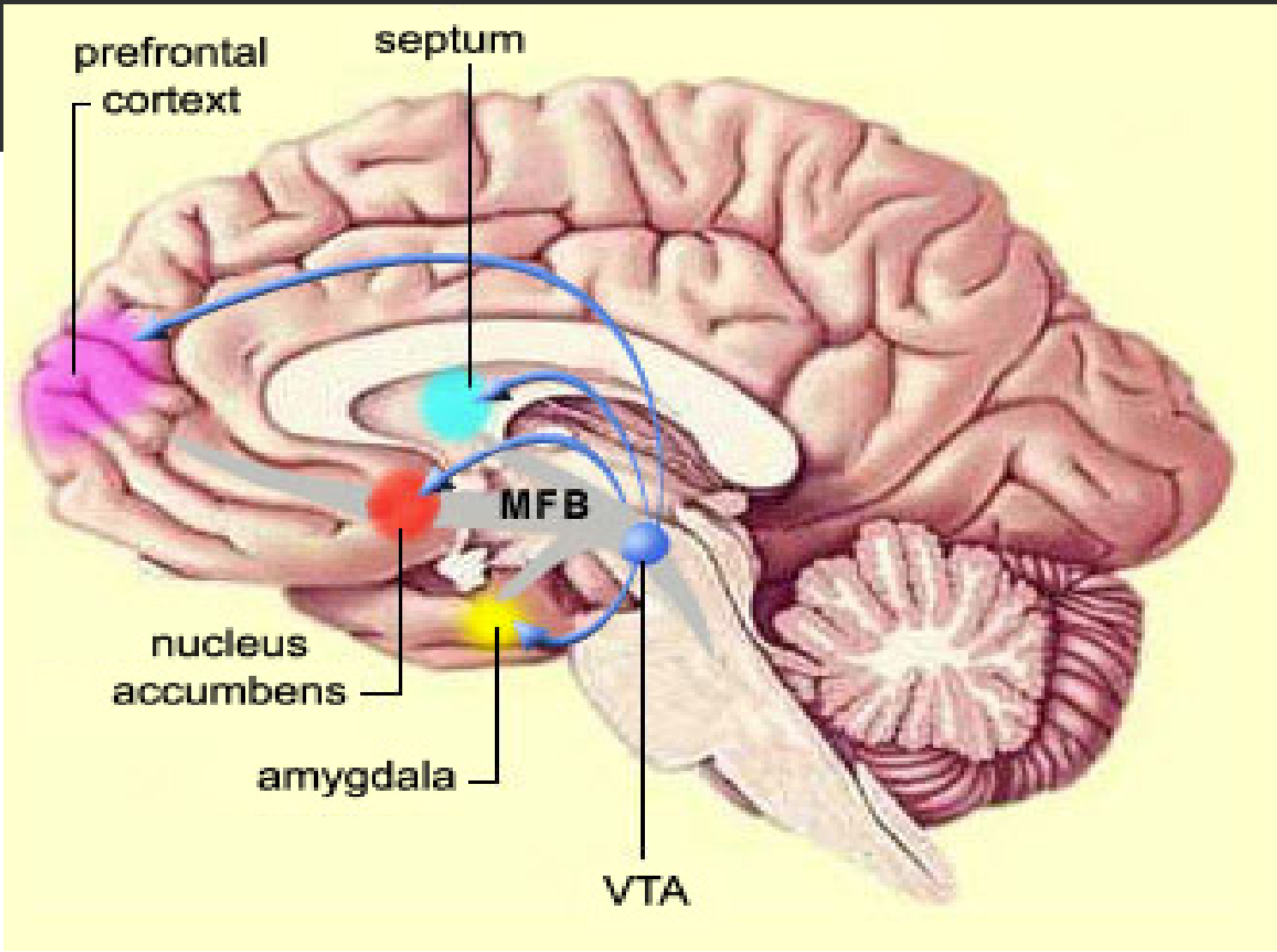






# Role of Parietal Cortex

- ❑ Parietal lobe has role in assessment of rewards.
- ❑ Monkeys demonstrated ability to assess probability and reward size (Platt and Glimcher, 2004).
- ❑ Mathematic ability, spatial reasoning also related to parietal lobe functioning.



# Big Picture: Neuroanatomy of Decision-making

- Prefrontal Cortex has two major subdivisions relevant to decision-making. Dorsal lateral prefrontal cortex (DLPFC) plays cognitive role with executive functioning. Ventromedial (VMF) related to emotion and motivation.
- Midbrain dopamine (substantia nigra) and Basal Ganglia (striatum) play role in anticipation of reward, learning linked to reward and actual rewards.
- Amygdala linked to both fear and reward, linked to memory, linked to general overall arousal.
- Parietal Lobe / DLPFC linked to assessment of value, calculations.



# Cognitive Factors and Financial Capacity

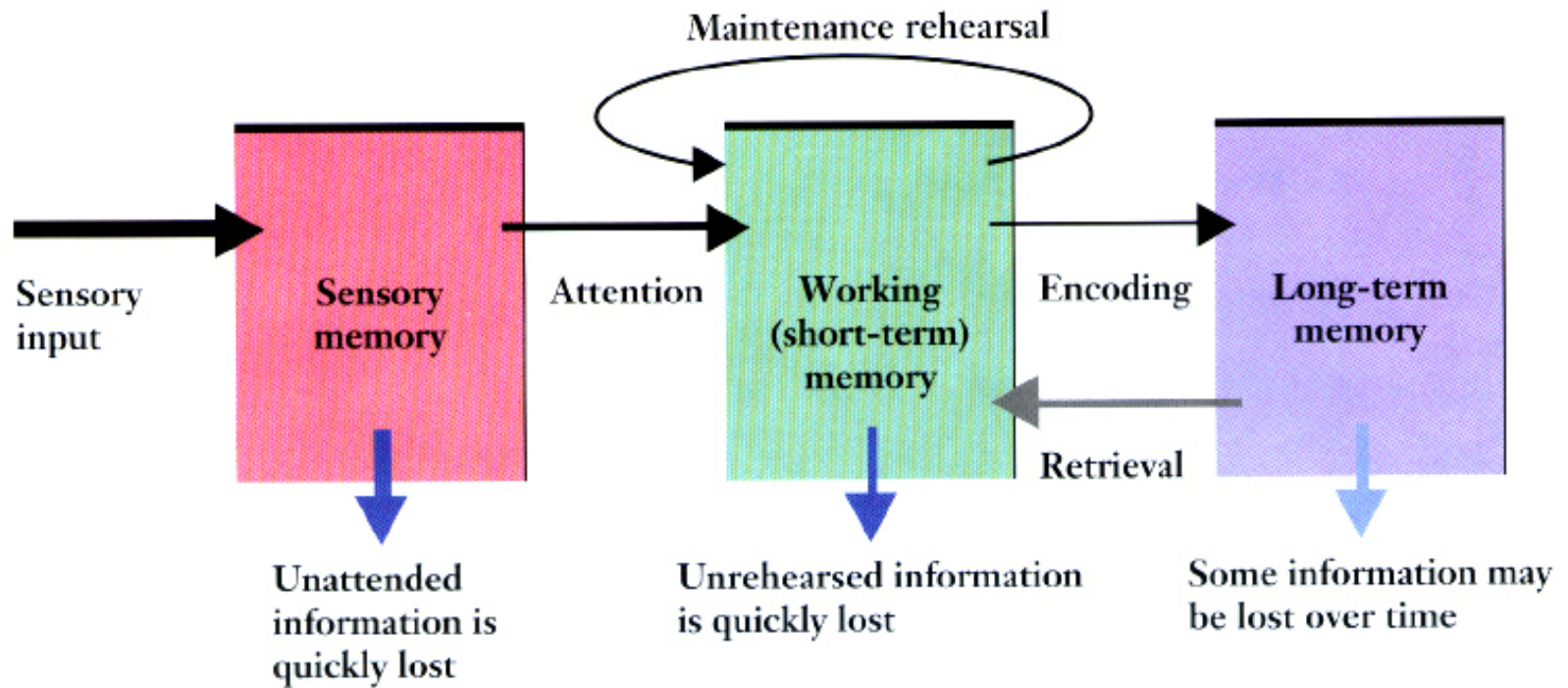
- Executive Functioning
- Episodic Memory
- Calculation abilities  
/ Financial literacy / Numeracy

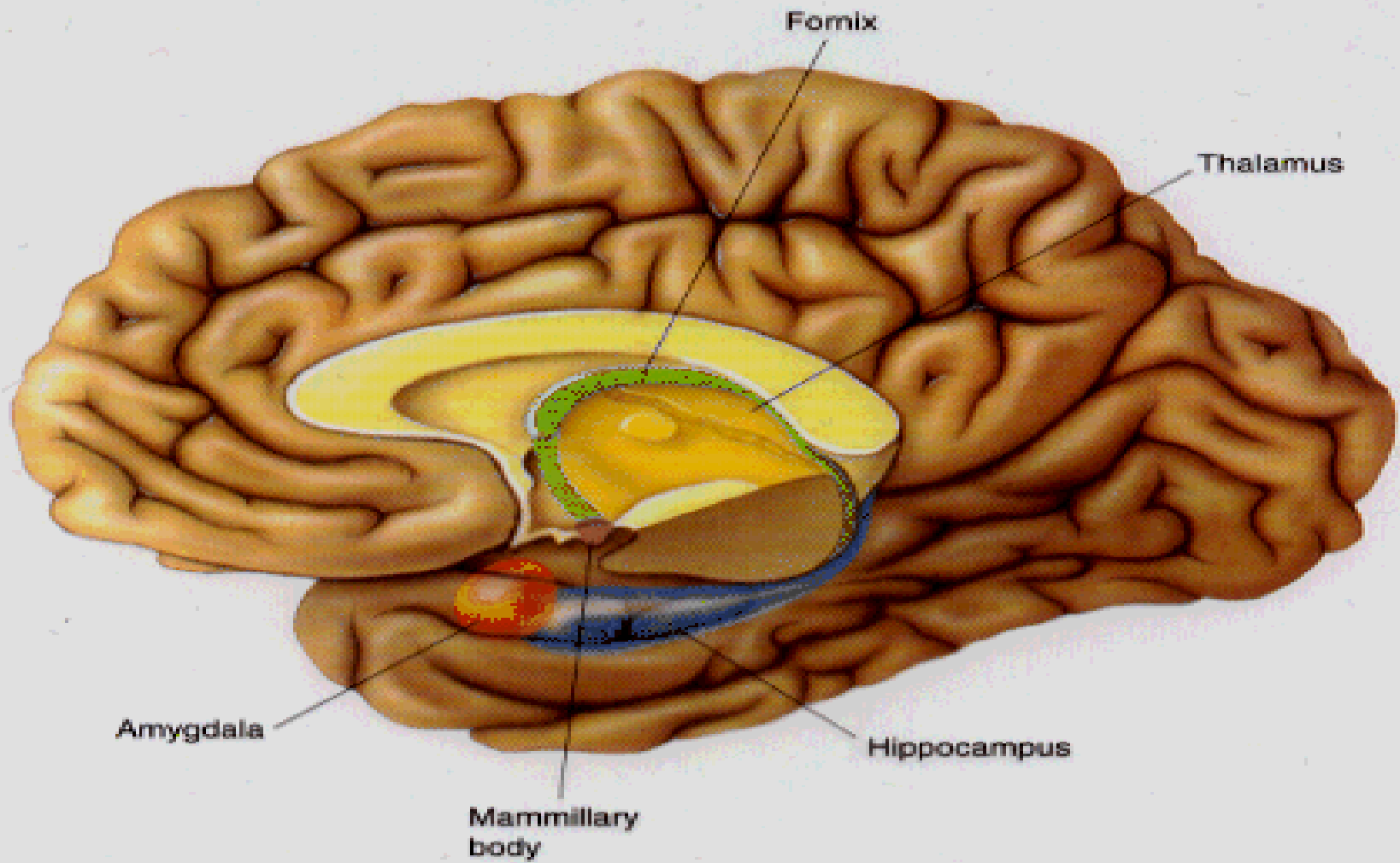
Lusardi (2010, 2012); Griffin and Marson, xxx; Wood et al.  
Agarwal & Mazumder (2010)

# Executive Functioning.

- ❑ What is Executive Functioning?
  - ❑ Allows us to regulate behavior. Example, freeway closure.
  - ❑ Specifically:
    - ❑ Ability to think flexibly.
    - ❑ Ability to Plan.
    - ❑ Ability to Problem solving.
    - ❑ Ability to control Impulsive behavior.
    - ❑ Ability to stay on “task”.
    - ❑ Simulate consequences, “what if”.
    - ❑ Associated with Dorsolateral Prefrontal Cortex (DLPFC)

# Role of Memory in D.Dm





**Figure 19.11**  
**Components of the diencephalon involved in memory.** The thalamus and mammillary bodies receive afferents from structures in the medial temporal lobe.




# Numeracy

- Comfort with numbers
- Found to be a distinct faculty from education, intelligence, literacy (Reyna)
- Related to certain biases in decision making (Peters et al, 2006)
- Related to risk perception, heuristic use, framing, choice, education, age.
- Older adults are less numerate than younger adults.

Peters et al, 2006; Lipkus 2003; Wood, et al, Psych and Aging, 2010.; Rolison, Wood et al, 2013





# How comfortable are you with numbers?

- Imagine we roll a fair dice. Out of 1,000 rolls, how many times would the die come up even?
  
- Which of the following numbers represents the biggest risk of getting a disease?
  - 1 in a 100
  - 1 in 1,000
  - 1 in 10

# Clinical Applications: Case Examples

- Intellectual Disability
  - May lack conceptual knowledge and skills
  - May lack risk awareness
  
- Mental Illness
  - May have preserved conceptual knowledge and skills
  - May have impaired executive functioning
  - Impaired judgment, impulsive
  
- TBI: May have declines in memory and executive functioning, declines in skills, limited insight.

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