

# **Cognitive Architectures**



**Reflection:**  
What is an architecture?

What is an  
architecture?





Milliseconds

Seconds

A Hundred Seconds



**Timescales of Cognitive Behaviors**



Explaining behaviors at **different levels** that cognitive scientists think are the best:

Examples:

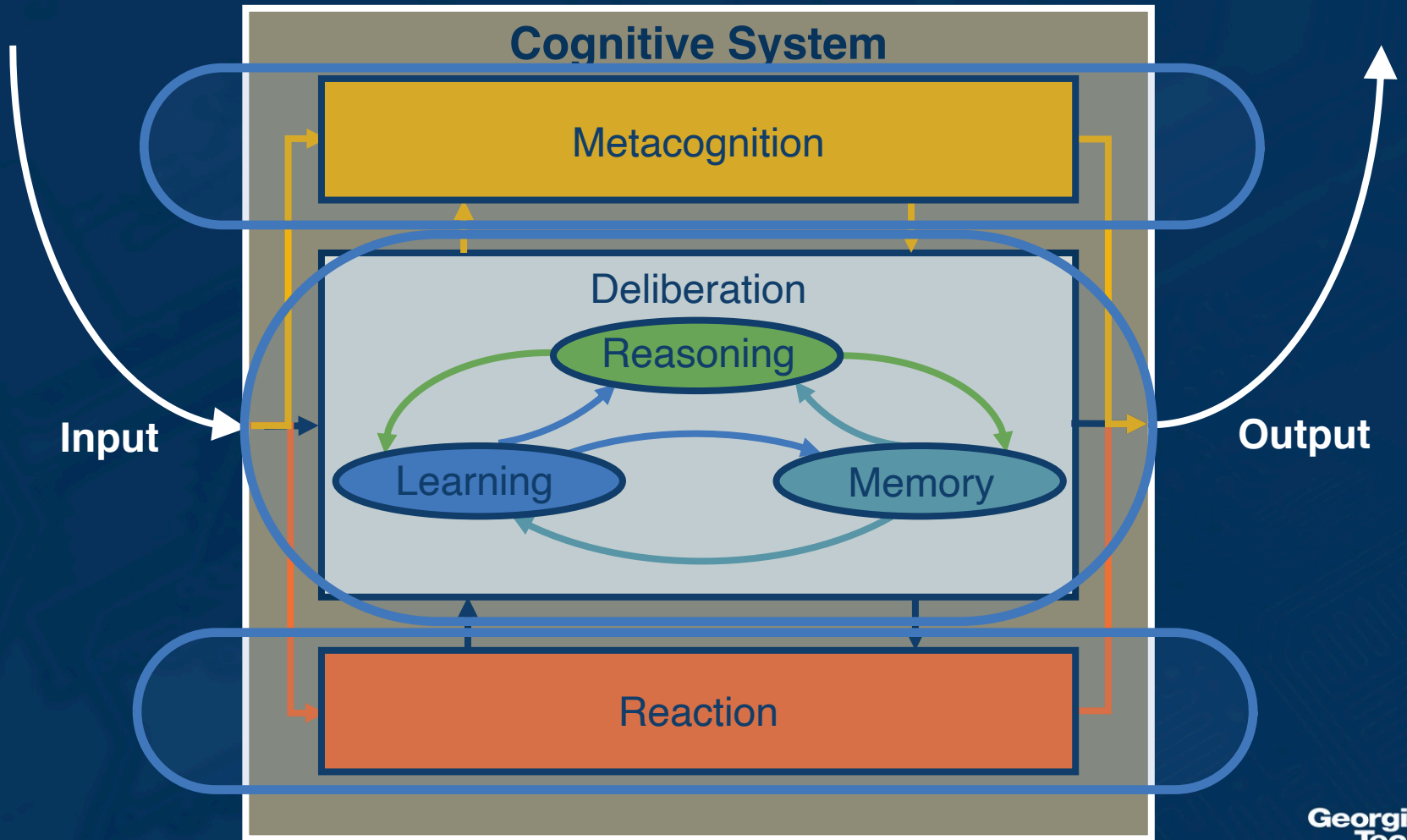


Working and  
Long-term memory



Neurons and  
their connections

What is Cognitive Architecture?





**Rules:** If... then...

**Example:** Boiling an egg

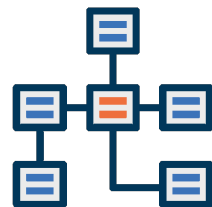




**Concepts:** Make inferences, structural dependency

**Example:**

**“John gave the  
book to Mary.”**



Structure



Conceptual  
Dependency





## Analogies and Case-based Reasoning: Draw from prior experiences

Example:

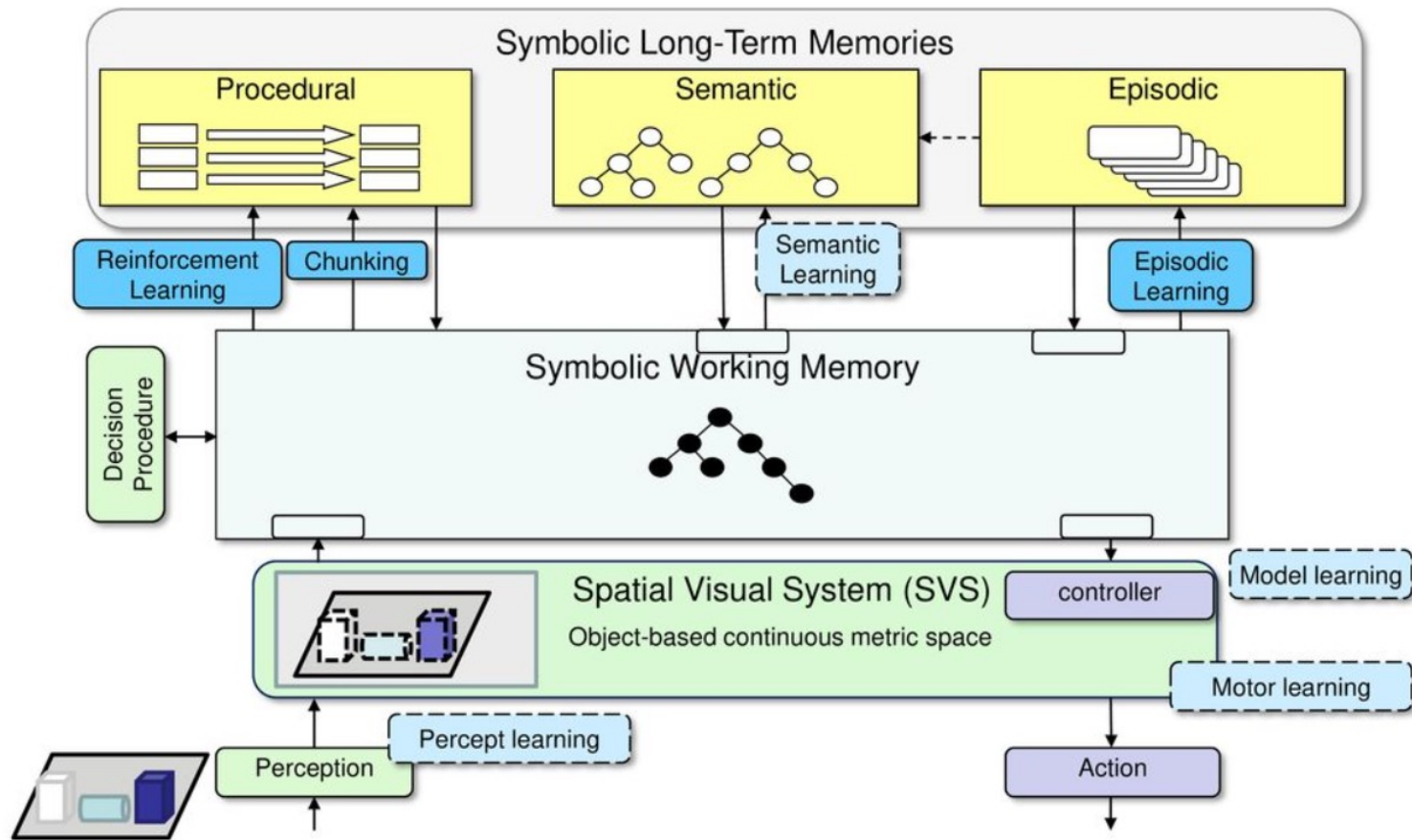


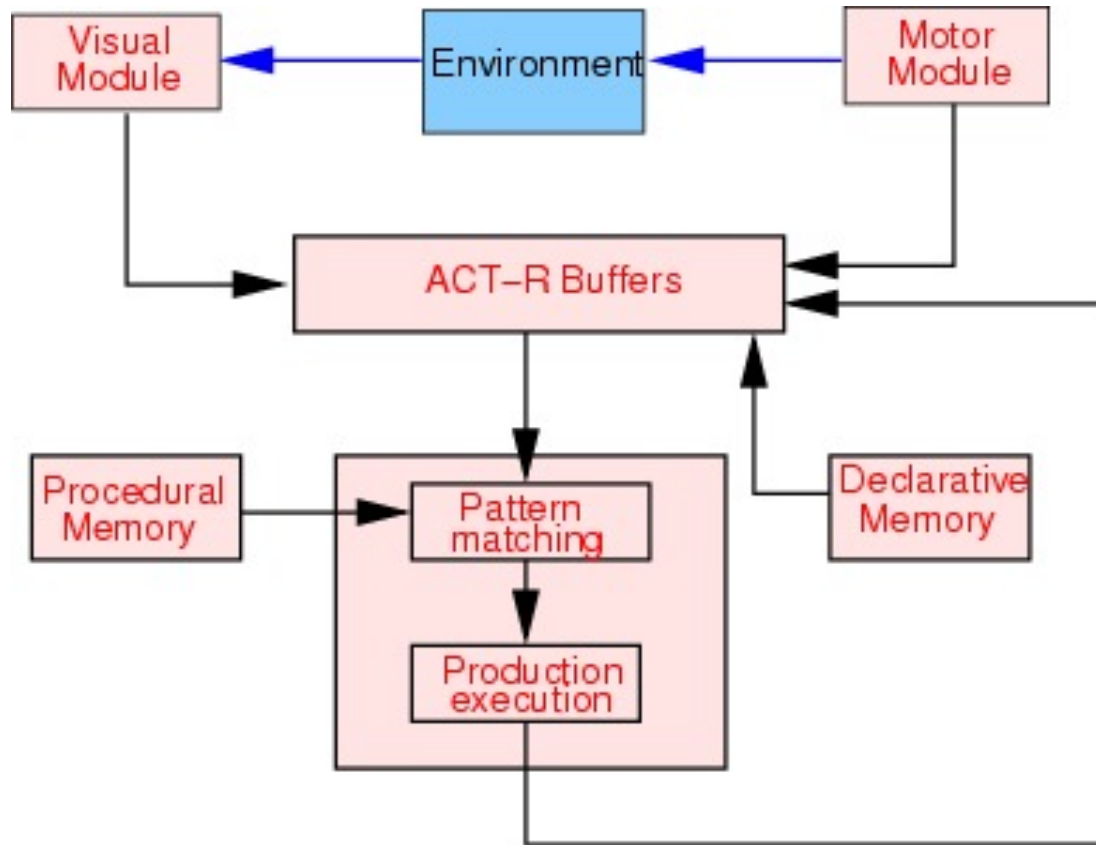
Episodic Knowledge



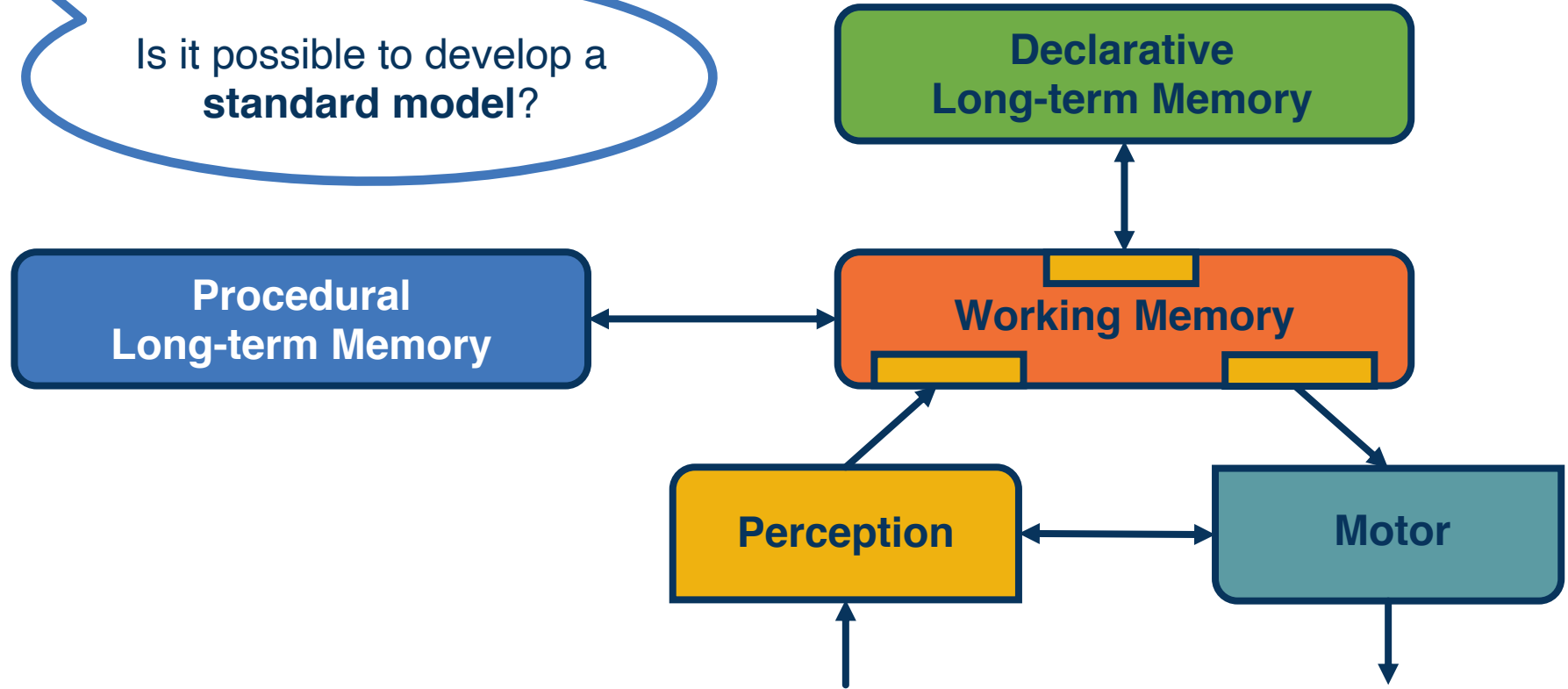
## **Reflection:**

Can you think of some other examples of procedural, semantic, and episodic knowledge?



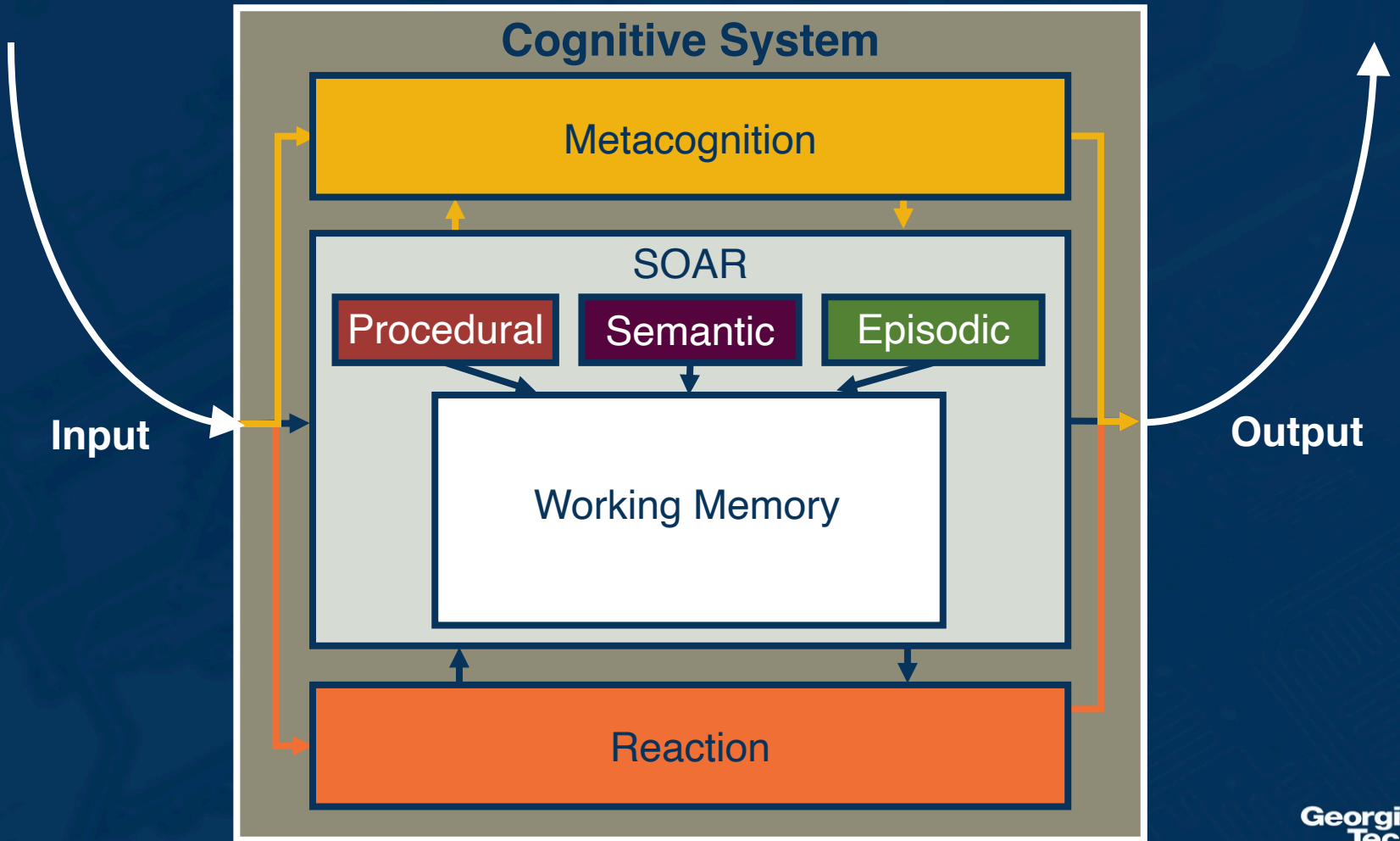


Is it possible to develop a  
**standard model?**



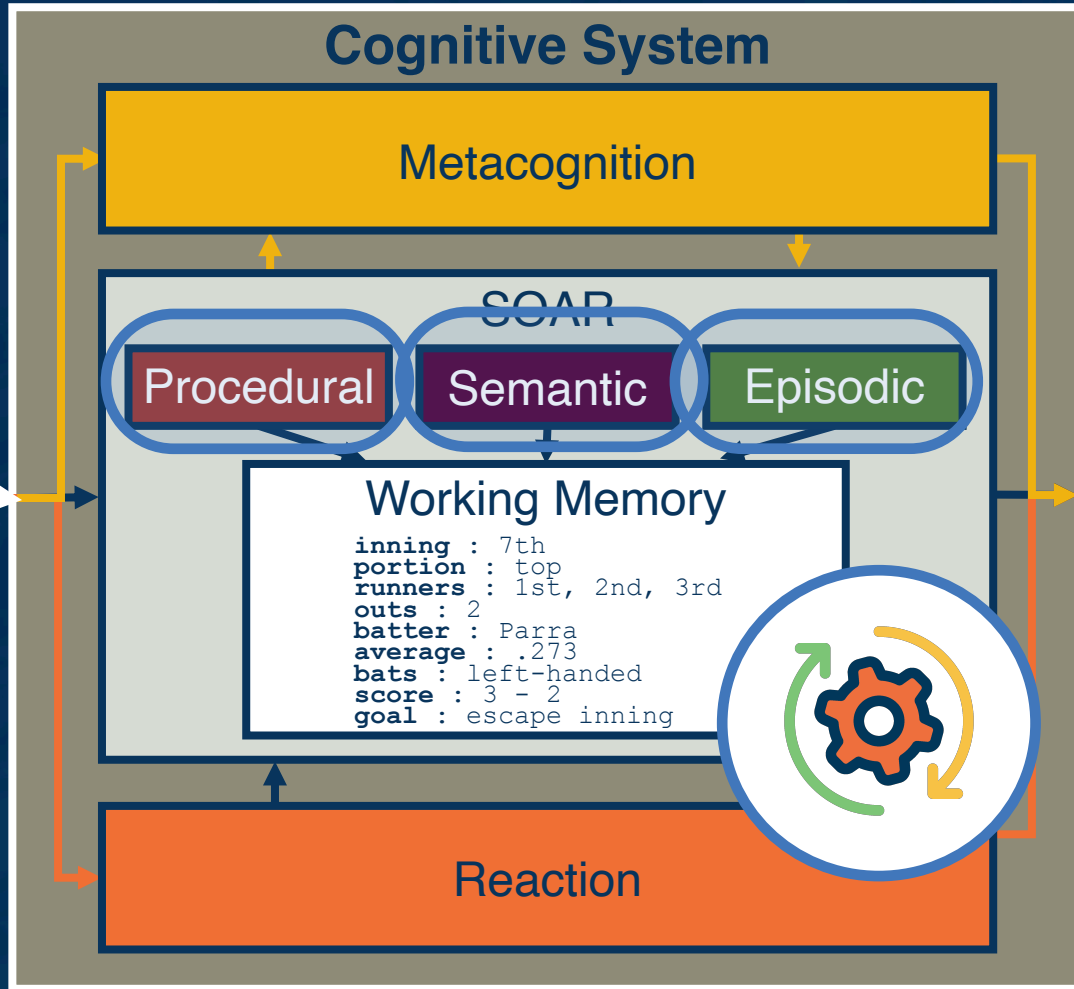
## The Standard Model

*Diagram adapted from Laird (2017)*

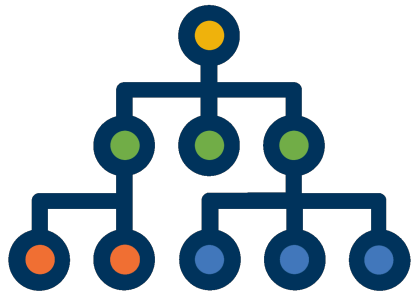




Input



Output



Architecture



Knowledge



Behavior





## Advantages of Cognitive Architecture



**Generality:**  
intend to explain all  
intelligent behaviors



**Reproducibility:**  
easily reproduce  
intelligent behaviors



## Criticism of Cognitive Architecture



**No agreement** on the  
level of abstraction



Everything is  
**knowledge-driven**



**Binds** thinking towards  
**certain perspective**