

# Introduction to Cognition

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## Questions to consider

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- How is cognitive psychology relevant to game experience?
- How is it possible to study the inner workings of the mind?
- What is the difference between the brain and the mind?

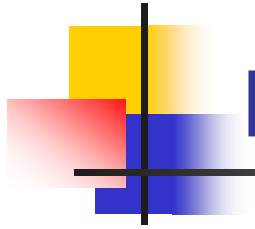


# Definitions

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- **Cognition**

- The mental processes involved in perception, attention, memory, reasoning, and problem solving

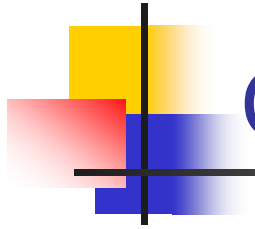


# Definitions

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- **Cognitive Psychology**

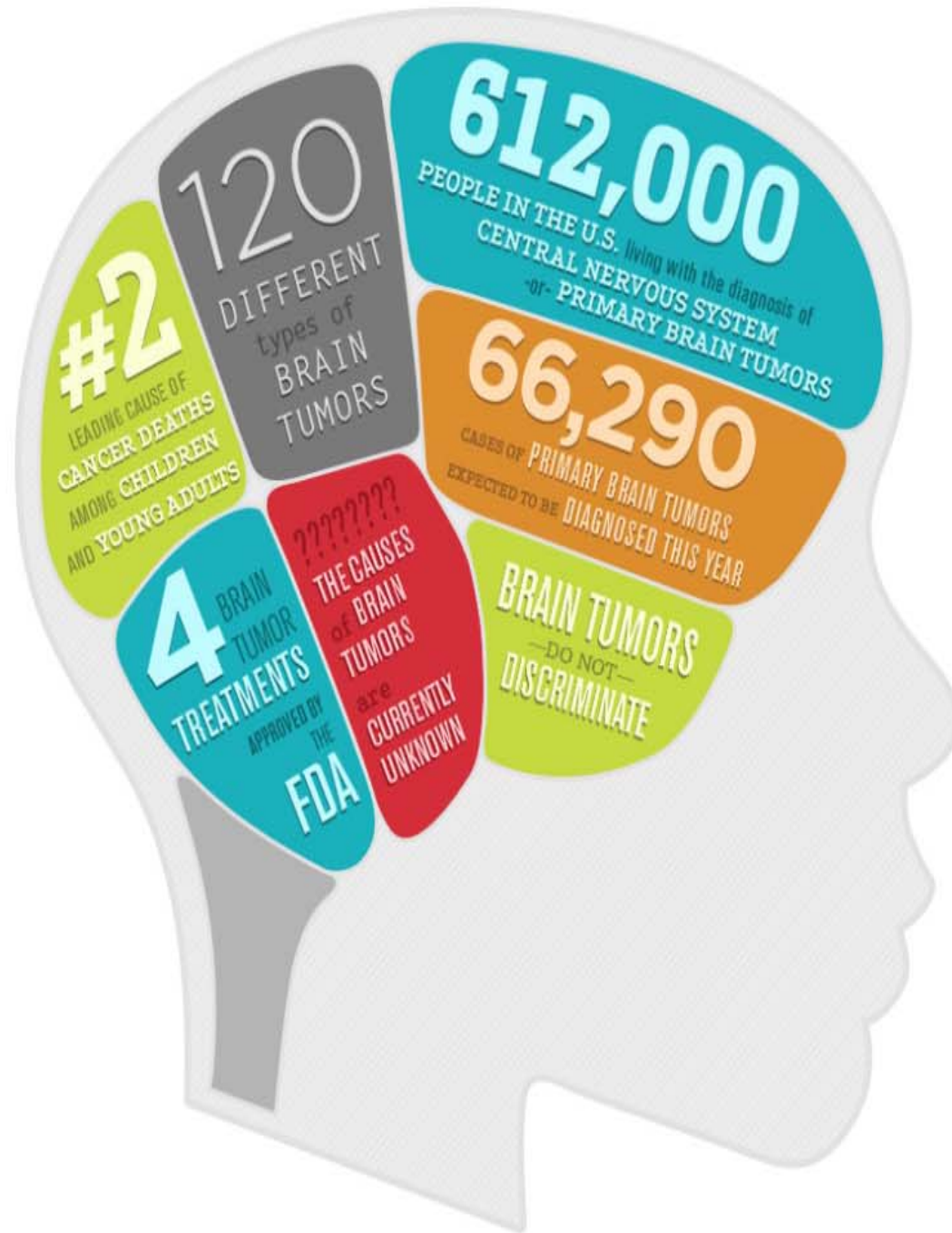
- The science of how the brain processes information (and generates thought and perception)
- Draws from many sub-disciplines: linguistics, computer science, philosophy, education, biology, neuroscience, etc.



# Challenges

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- Many cognitive “processes” hidden from view, occur very rapidly, and difficult to directly observe
- Cognition is very complex
  - We are constantly perceiving, using memory, paying attention(?), reasoning....
  - Cognitive biases, illusions, and processing errors





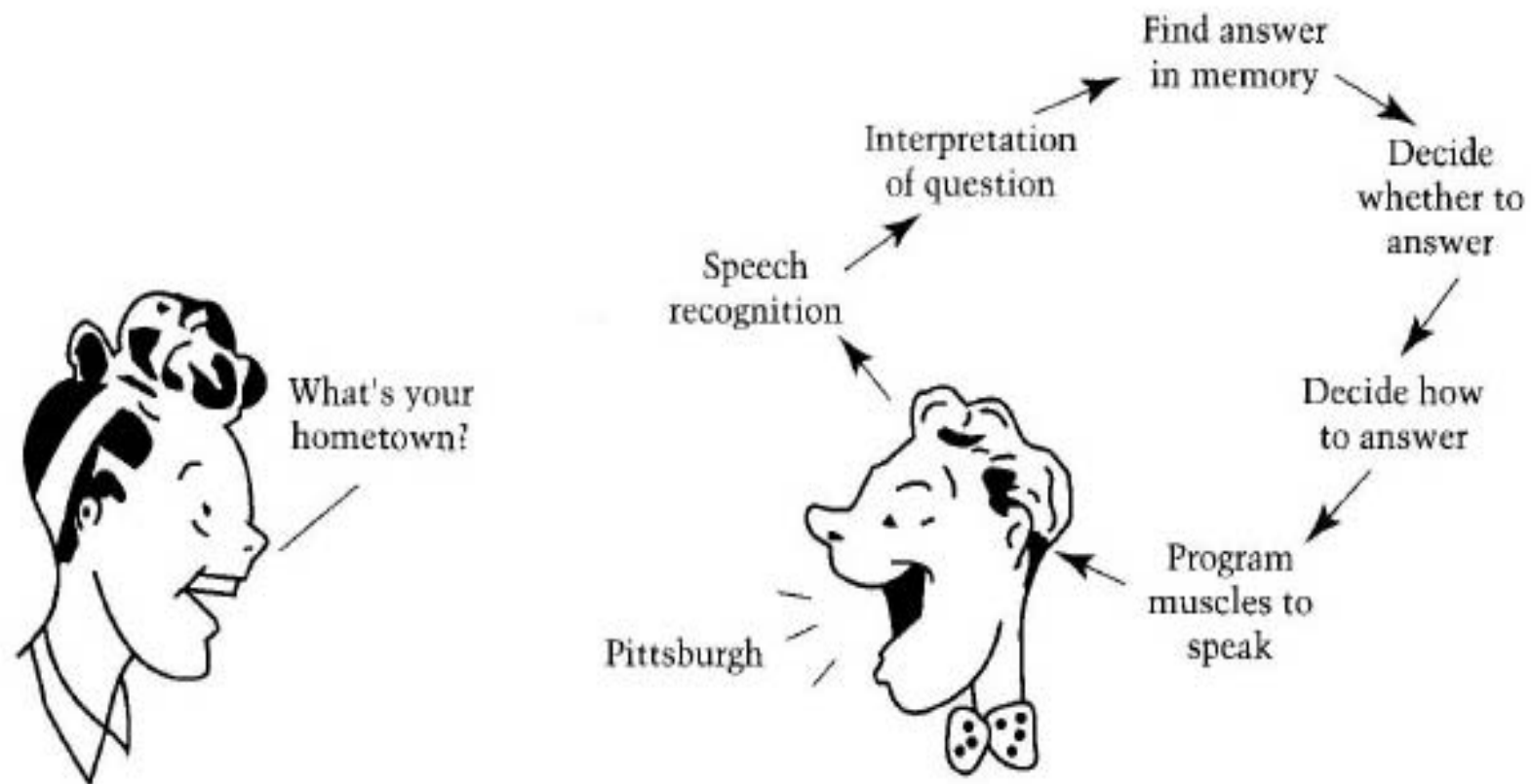
# Why study cognition?

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## ■ Theoretical reasons

- Discover processes and abilities that helps us mentally represent information
- Understand memory, cognitive distortions, language acquisition
- To predict how we learn, make decisions, and solve problems

## Information Processing Analysis Example



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*The processes that might be involved in answering the simple question, "What's your hometown?"*





# Why study cognition?

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## ■ Practical reasons

- Understand how to overcome biased thinking
- Study brain function and disorders that impair thinking
- Understand effects of imagery on cognitive ability, memory, emotion, and awareness
- Artificial intelligence!



# Why study cognition?

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## ■ Game design

- Creativity and divergent problem solving tasks  
(*The Stanley Parable, Portal 2, Assassin's Creed*)
- Use of imagery to explore routine vs. randomized choice  
(*Riven, Puzzle Quest, The Binding of Isaac*)
- Use of character-based conflict and meta-cognition  
(MMOs, RPGs)
- Issues of rapid and multi-target localization  
(*Metal Gear Solid, The Division, Forza*)





# Why study cognition?

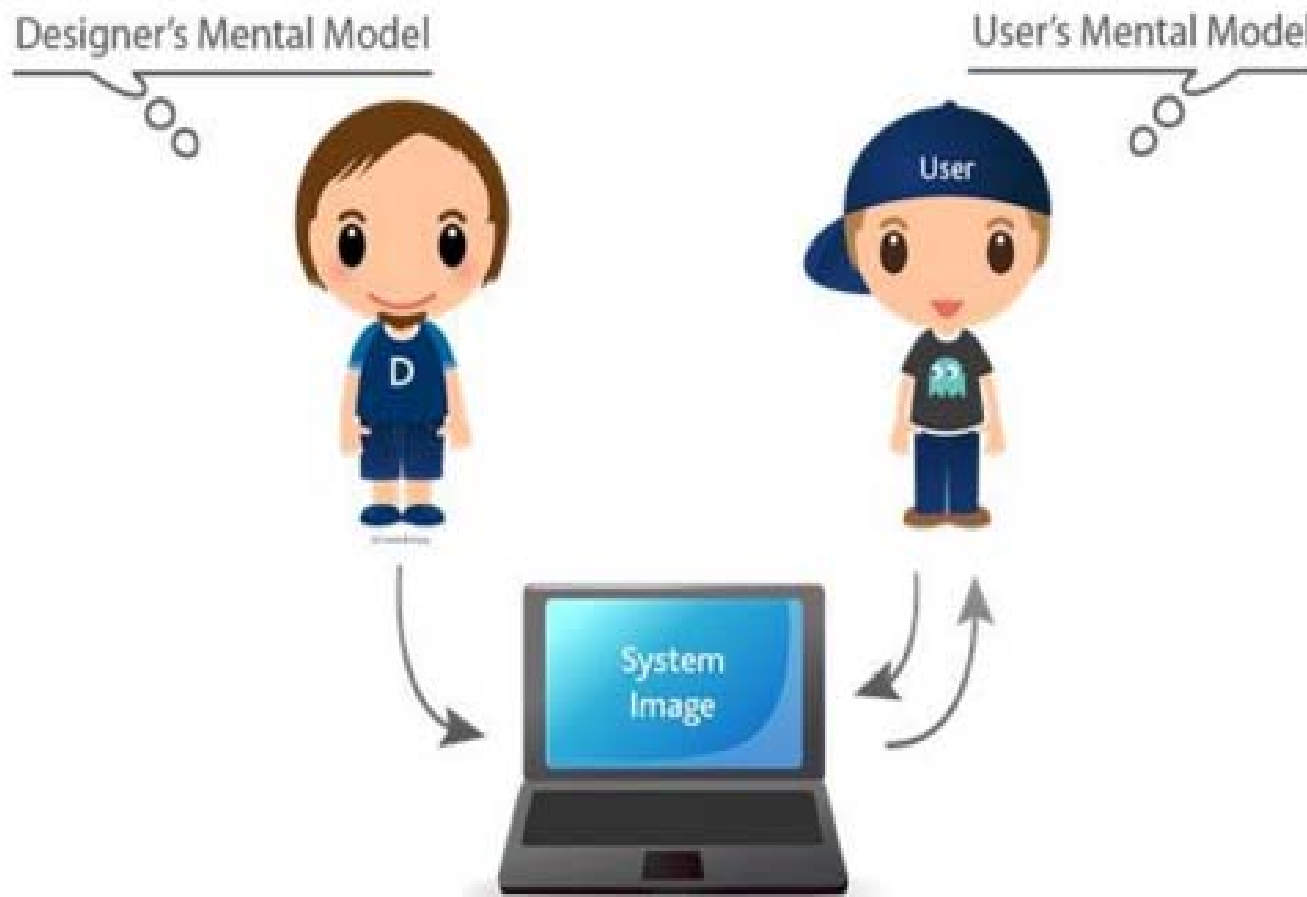
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## ■ Game design (con't)

- Visual processing and UX/UI  
(*Overwatch, Dark Souls, Legend of Zelda*)
- Predicting and shaping player behaviors through schemas and perceptual biases (*Journey, Destiny*)
- Attention and decision-making during choice  
(*The Last of Us, Mass Effect series*)

# A definition of User eXperience

What it is like for the targeted **user** to **interact** with the software, including how engaging the **experience** is, relative to the **design intentions**.



## Signs & Feedback: “Red overload”



Unreal Tournament 3