Reasoning

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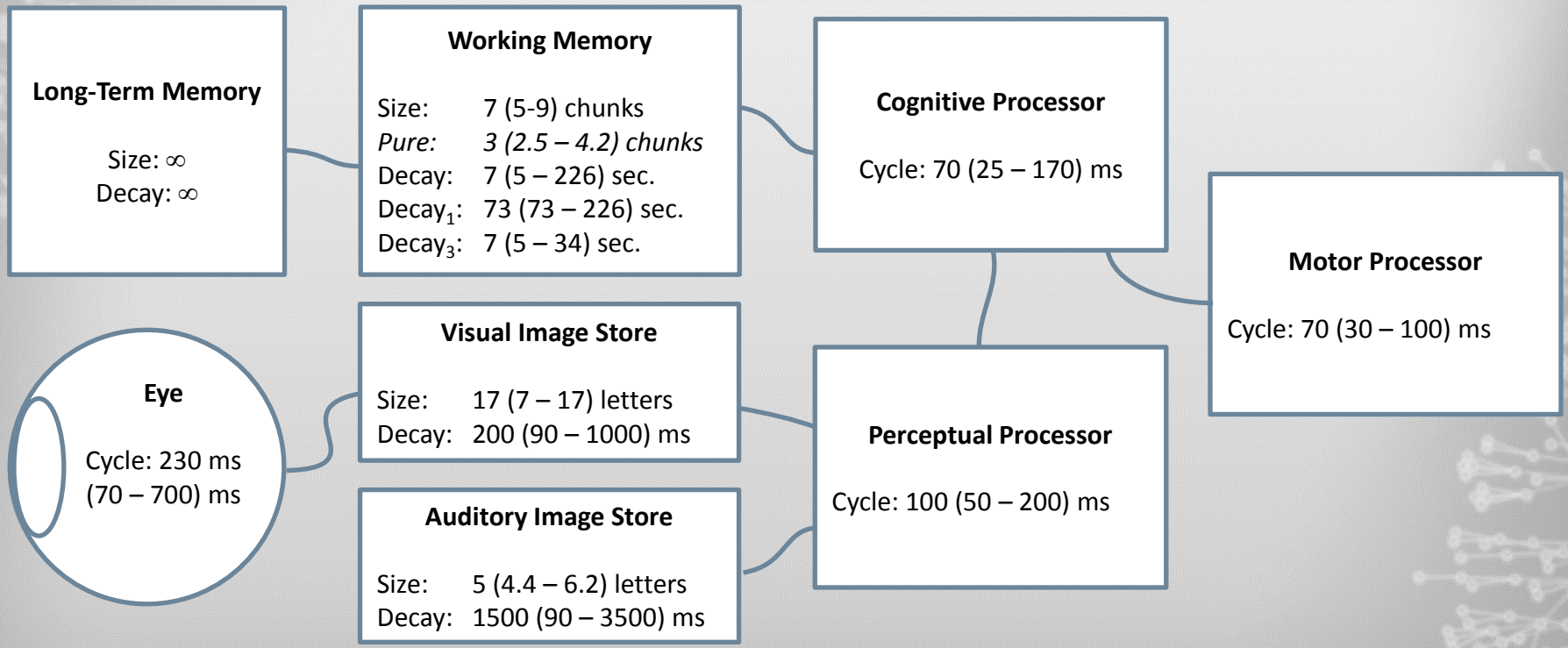
What Will We Learn

- How do we understand a visualization?
- How do we respond to a visualization?

The Model Human Processor



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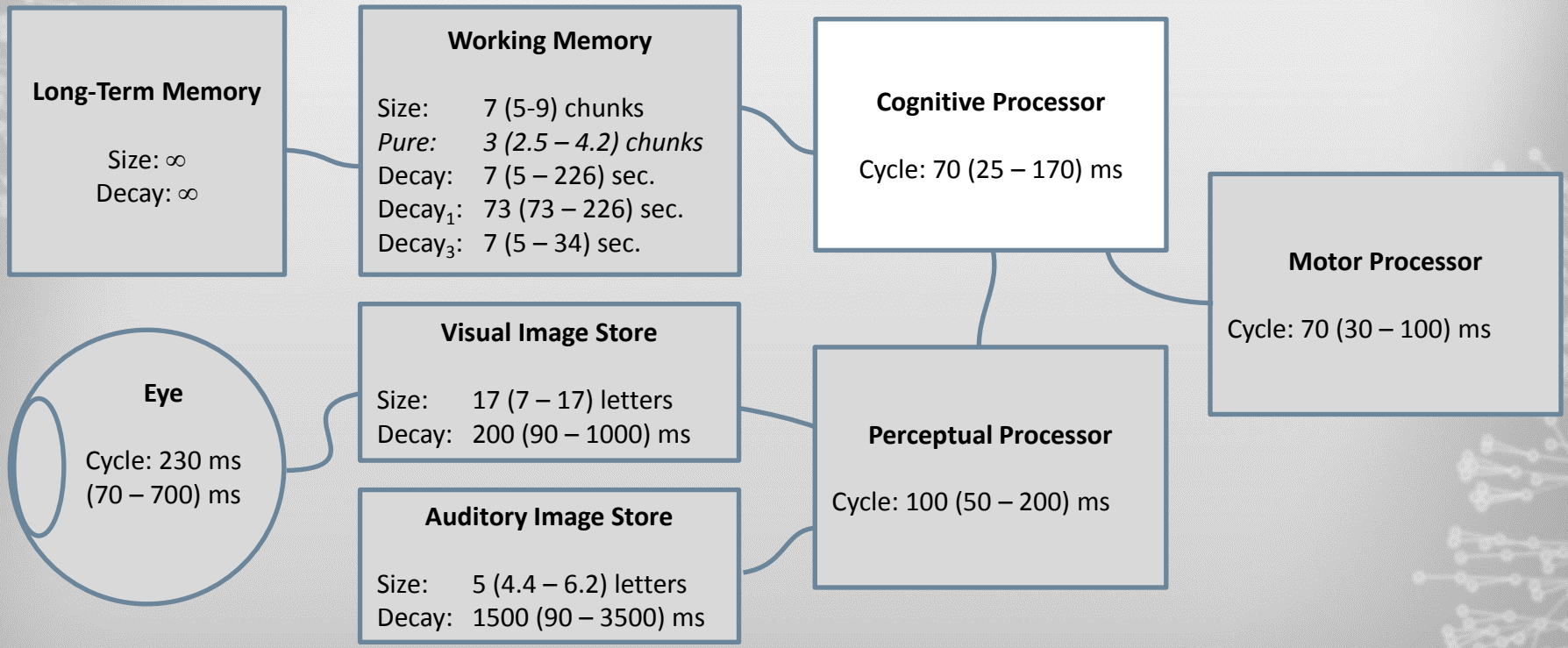
The Model Human Processor



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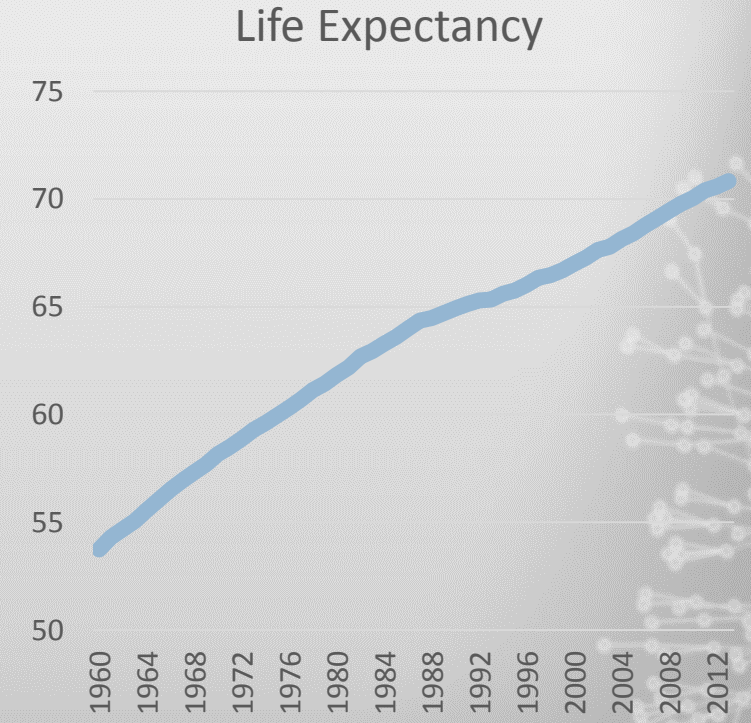
Reasoning

- Deductive Reasoning
- Inductive Reasoning
- Abductive Reasoning

Deductive Reasoning

- Logic
  - If A then B
  - A, therefore B
  - Not B, therefore not A
- When you have eliminated the impossible, whatever remains, however improbably, must be the truth
- Correlation is not causation



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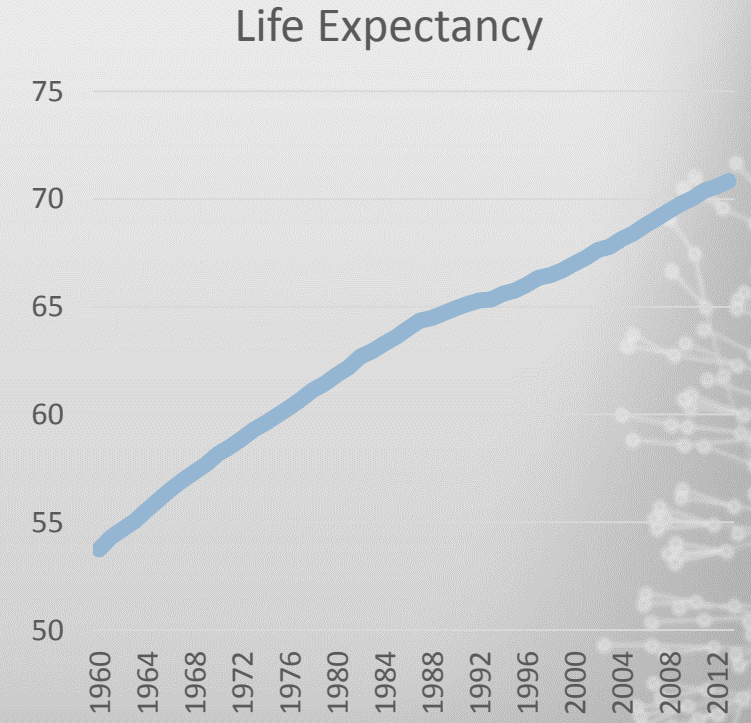
Inductive Reasoning

- If true for x, then true for x+1
- True for x, …

- Generalizations
- Extrapolation
- Interpolation
- Allows us to infer missing data



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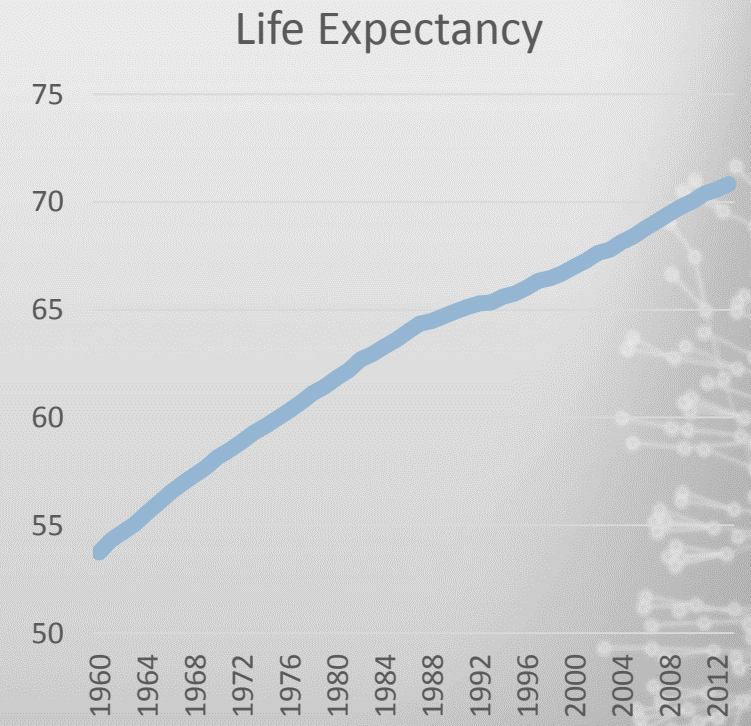
Abductive Reasoning

- Human need for meaning
- Asking why?
- Modeling
- Cognitive Dissonance
  - Entertaining simultaneous contradictory opinions
  - What happens when evidence disagrees with model?



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What Did We Learn?

- There are three kinds of reasoning:
  - Deductive: Concluding
  - Inductive: Generalizing
  - Abductive: Modeling

- Each kind of reasoning can be applied correctly or incorrectly