

Creativity in Reading:
Understanding Novel Concepts
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Creativity in Reading

- Understanding Novel Concepts
- Understanding Known concepts in Novel Combinations

Definitions

- Understanding
- Novelty
- Useful
- Creative Understanding

Understanding

- Task of examining a concept
- Either predicting future states and events
- Abducing Prior states and events

Novelty

- Relative Term
- Different Types
 - A – Novel (Absolute Novelty)
 - I – Novel (Instantiation Novelty)
 - E – Novel (Evolutionary Novelty)
 - R – Novel (Revolutionary Novelty)

Useful

- Any achieved understanding that allows comprehension to continue.
- All such understanding should not be allowed with equal probability.

Creative Understanding

- Understanding of concepts that are
- Novel to the reasoning agent
- And the understanding is useful and allows understanding to continue.

Knowledge Representation

- Concepts are represented through entities known as frames.
- Everything in the representation is a node.
- Every concept is tagged with the current function.
- Categories are created temporarily.
 - Primary Attributes
 - Secondary Attributes

Ontological Grid

Domain Type	Physical	Mental	Emotional	Social	Temporal
Actions	Walking	Thinking	Loving	Selling	Getting closer to March
Objects	Rock	Idea	Hatred	Teacher-Student Relation	Second
Agents	Person	Consciousness	Arcs	Boss	Entropy
States	Young	Lack of knowledge	Being Angry	Public Dishonor	Early

Ontological Grid

- The level of effort required to understand a novel concept can be determined by how much transitioning is required of the current concepts in the memory system.
- Why this representation?
- Measuring the effort
- Similar concepts are placed close.

Manipulation of Concepts

- Same cell
- Same row or column
- Both axes

Transitions

- Physical to other domain
- Object – State and action transitions.
- Agents to objects
- Psychological domain
- Minimal changes

Algorithm

- Reading Decomposition
 - Control
Understanding and interest
 - Scenario Comprehension
Agent, Object
 - Story Structure Comprehension
Character, genre, plot, setting Identification,
 - Sentence Processing
Lexical retrieval, pronoun reference, syntactic parsing
 - Understanding
Abduction, explanation and prediction
 - Memory
 - Reminding and retrieval

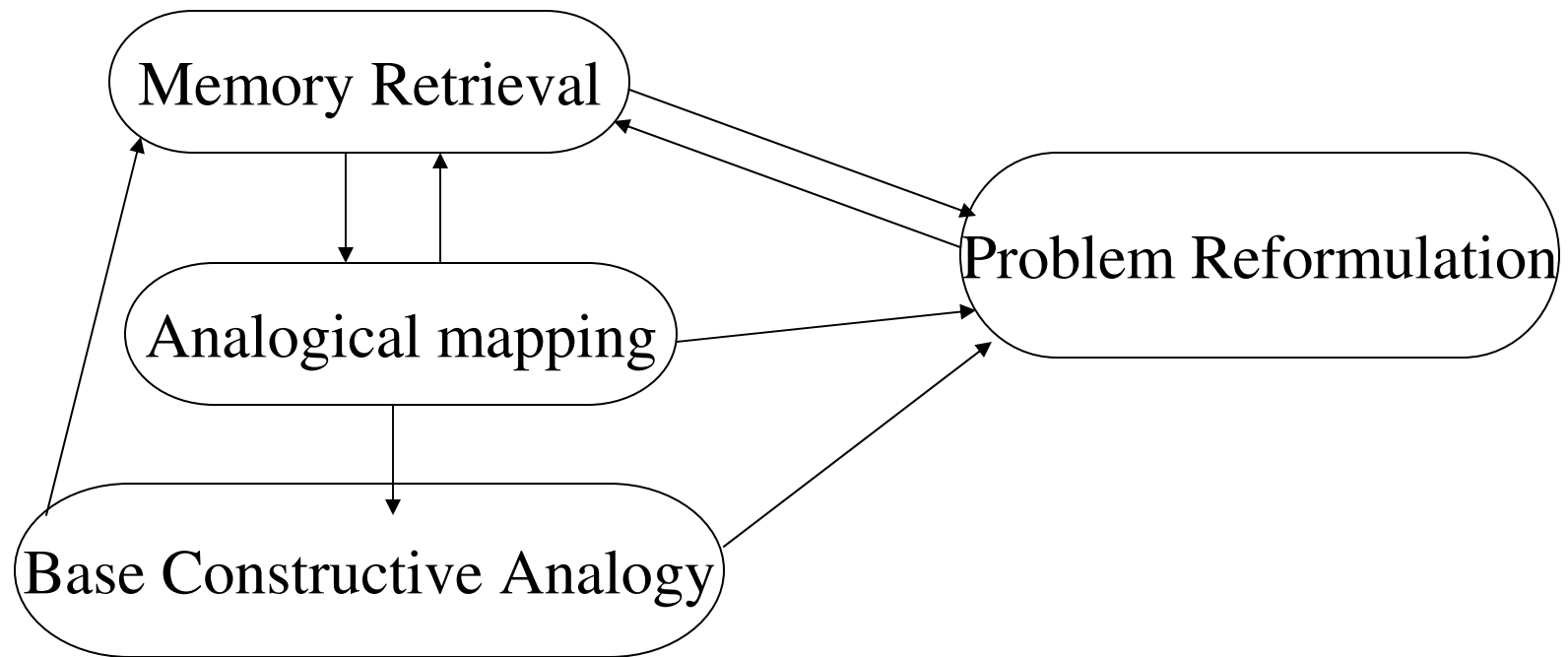
Tasks of Creative Understanding

- Memory Retrieval
 - » I- Novel
 - » Idea Incubation
- Analogical Mapping
 - » Atomic model from solar system
- Base Constructive Analogy
- Problem Reformulation
 - » Delay Reformulation
 - » Spontaneous Retrieval

New Concepts

- Function Driven Morphological Synthesis
- Strong FMS
- Weak FMS

Control of creative Understanding



Limit

- Satisfaction
- Interest
- Knowledge Ontology

ISAAC

- Integrated Story Analysis And Creativity
- Stories and few episodes of Star-Trek
- Evaluated Along with Human Subjects (Modifying Turing Test)
- Observation:
 - » ISAAC lacked the crucial concepts it needed to comprehend
 - » It performs on par with human participants
 - » Memory indicates it has modeled successfully

Conclusion

- Theory of creative understanding
- A model – ISAAC
- Extend to non reading algorithms
- Expand in the concept of Weak FMS

Thank You!!