

Modelling Cognition

SE 367 : Cognitive Science

Group C

Nature of Linguistic Sign

- Linguistic sign
 - Not - Thing to Name
 - Concept to Sound-image
 - Signified and Signifier
 - The semantic breaking is arbitrary
 - Ex. The concept of eat and drink in Bengali being mapped to the same sound-image

The Sign

- Icon
 - In the mind
 - Existence of the 'object' – not necessary
 - Tends to be similar across people
- Index
 - Dynamic connection to the object by blind compulsion
 - If the object ceases to exist, the index loses its significance
- Symbol
 - Significant by how it is understood
 - Medium of communication
- Nothing is a sign unless interpreted as such

Symbol Grounding Problem and Symbolic Theft

- Chinese-Chinese dictionary recursion
- Symbolic representations (to be grounded)
- Non symbolic representations (sensory)
 - Iconic
 - Categorical

Symbol Grounding Problem and Symbolic Theft

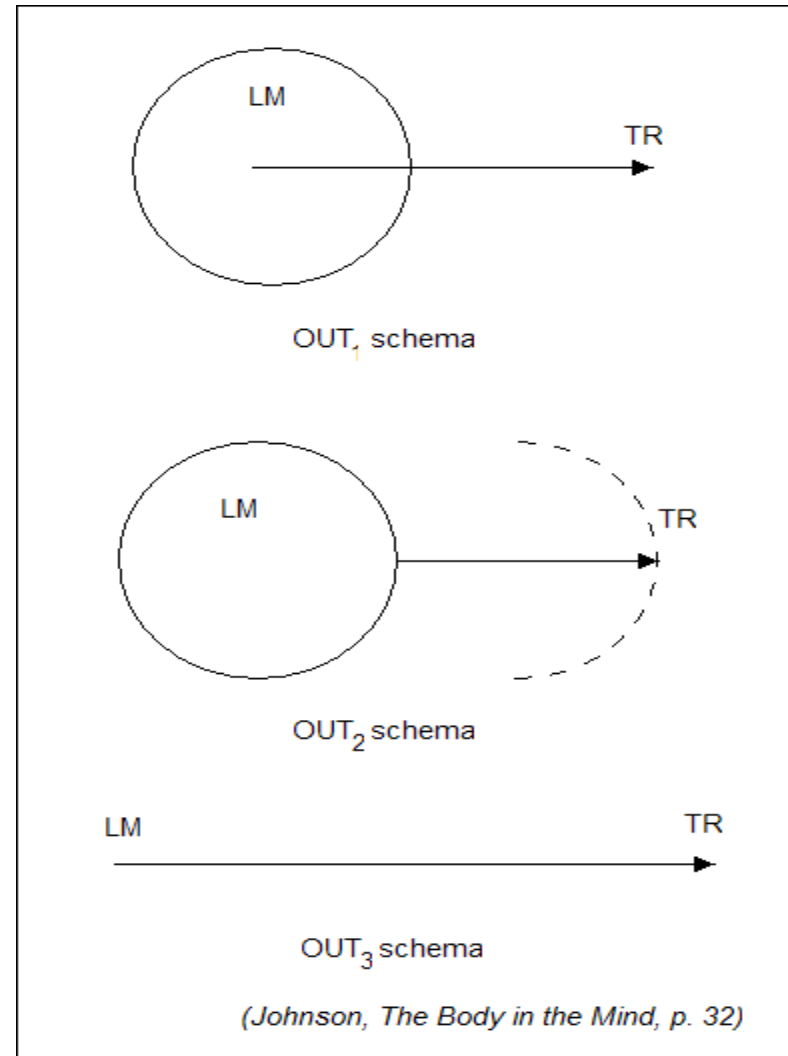
- Symbol Systems
 - Higher level cognition – semantics
- Connectionist systems
 - Capture invariant features
 - Identification and discrimination
- Sensorimeter toil
- Symbolic theft

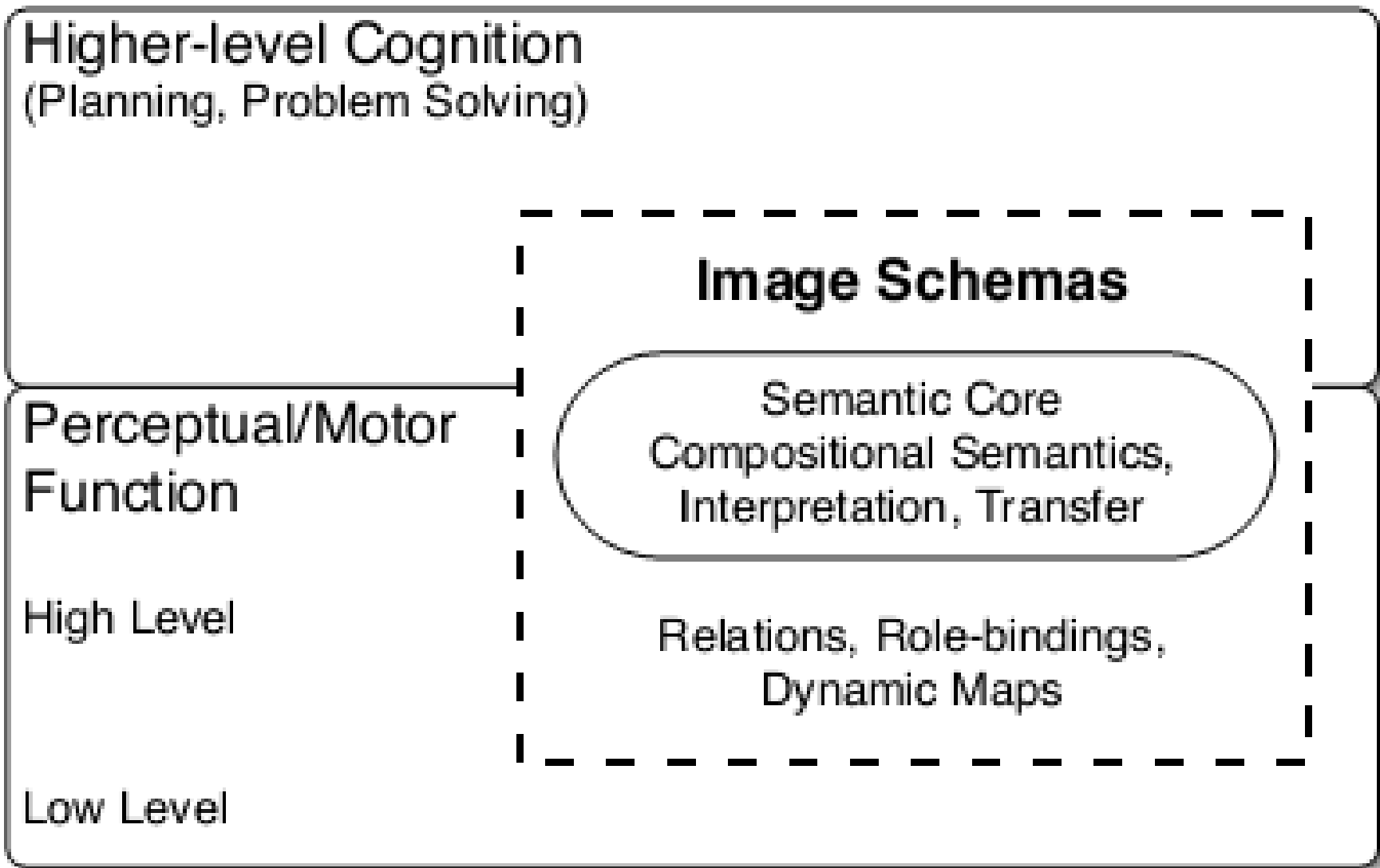
A Computer Program ?

- Computer Program –Searle
 - Strong /Weak AI
 - Chinese Room
 - Programs not constitutive nor sufficient of minds
 - Missing semantics
 - Compatibility of programs with any hardware –
contrary to the human mind
 - Mental content of thoughts
 - Casual interactions of human brain
 - Simulation vs. Duplication

Image Schema

- A condensed description of perceptual experience for the purpose of mapping spatial structure onto conceptual structure.





Locating schemas in a cognitive architecture

Image Schema Language

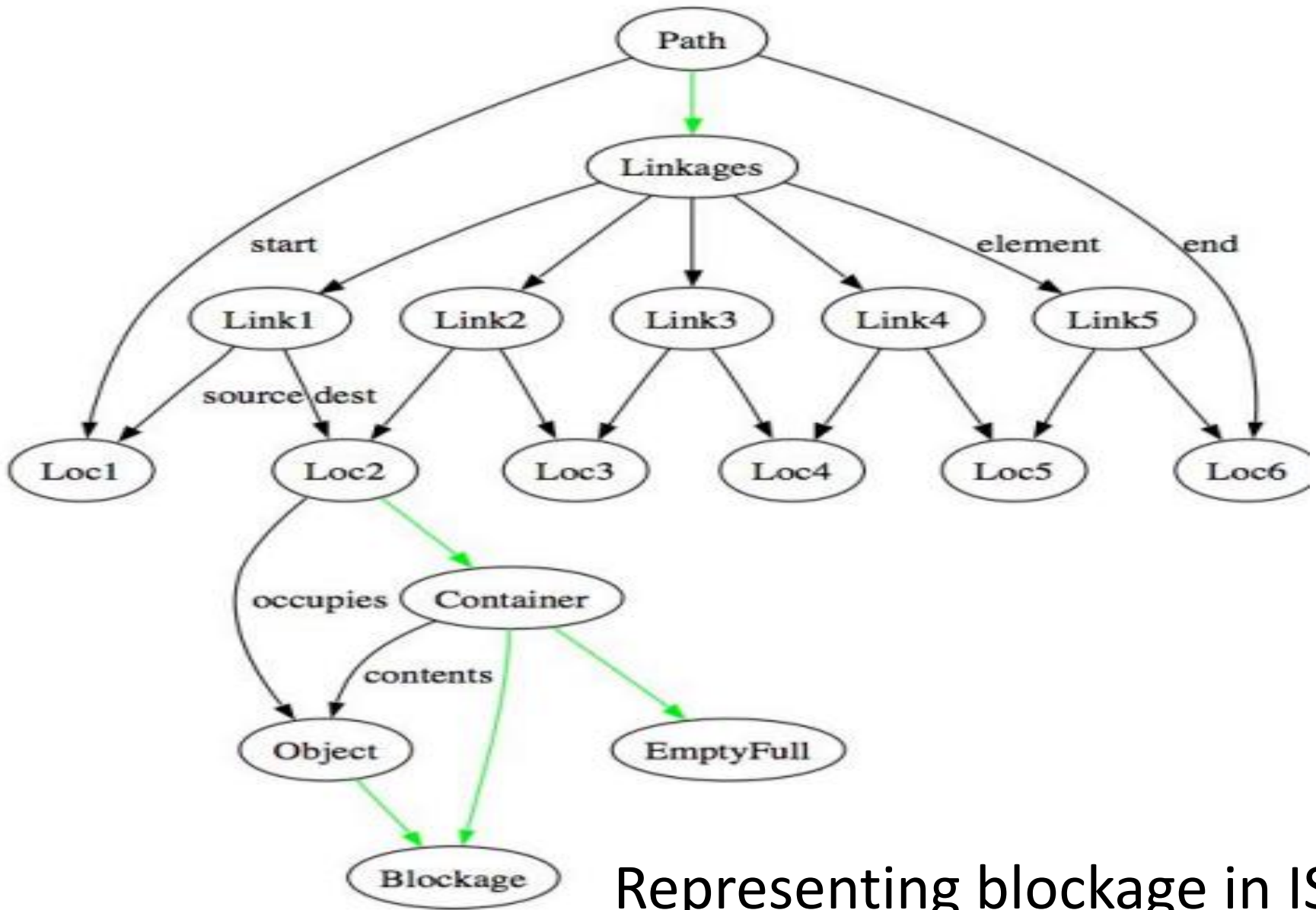
- Implementing image schemas gives us insight about how they can function as a semantic core for reasoning.
- ISL Image schemas
 - Static schemas
 - Dynamic schemas
 - Action schemas

Image Schema Language

- Schemas for verb-like concepts need
 - controllers,
 - “maps” of dynamic behaviour,
 - role bindings and associated axioms
- Many image schemas require quantitative and procedural components as well as a symbolic/declarative component.

Chess Pattern

- Path
 - A set of locations
- Queen can traverse the path
 - Path as a set of directional linkages
- No location can be occupied by more than one piece at a time
 - Location as a container with a capacity of 1
- Blockage



Representing blockage in ISL

Chess Pattern

- “Black queen has the White king in check”
- “When an opponent’s piece puts your king in check, you can counter by moving another piece into its path.”

Thank You