# Capabilities of Cognitive Architectures

- Recognition and Categorization
  - represent patterns and situations in memory
  - learn these patterns

- Decision Making and Choice (one step plans?)
  - allowable alternatives
  - desirability of alternatives
    - goals, objectives, and utilities
  - learning allowability/desirability/effectiveness

- Perception and Situation Assessment
  - Compose large-scale environment models from percepts
  - relies recognition and categorization of patterns in the environment
  - relies on inferential mechanisms

- Prediction and Monitoring
  - model of the environment
  - effects of actions

- Problem Solving and Planning
  - goals, objective, and utilities
  - partially ordered actions
  - enabling conditions
  - predicted effects
  - learning to reduce effective breadth and depth of search

- Reasoning and Belief Maintenance
  - deductive reasoning
  - abductive reasoning
  - inductive reasoning
  - incremental or online learning

- Execution and Action
  - actuators in environment
  - primitive actions
  - composite actions

- Interaction and Communication
  - translating knowledge for other agents
  - question asking and answering

- Remembering, Reflection, and Learning
  - cognitive structures formed during external or cognitive activities
  - explanation/justification
  - metareasoning

Learning is pervasive and in human instantiations, perhaps
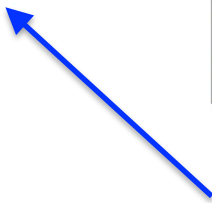
- emotional awareness and response

is too.

A schematic of the Icarus Architecture.
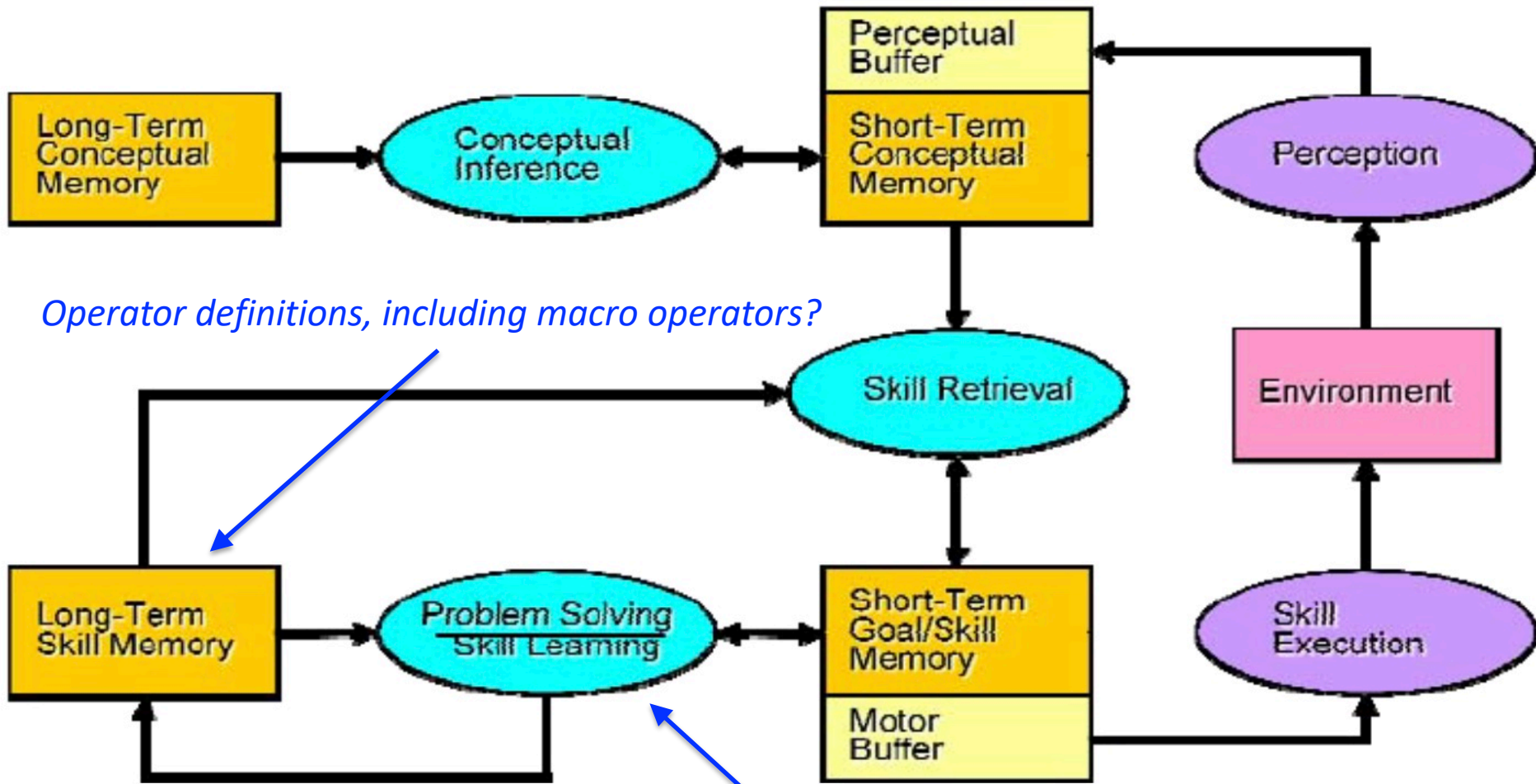
Operator definitions, including macro operators?
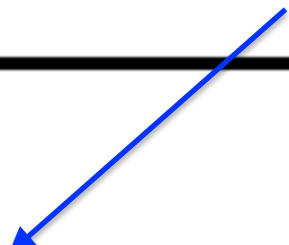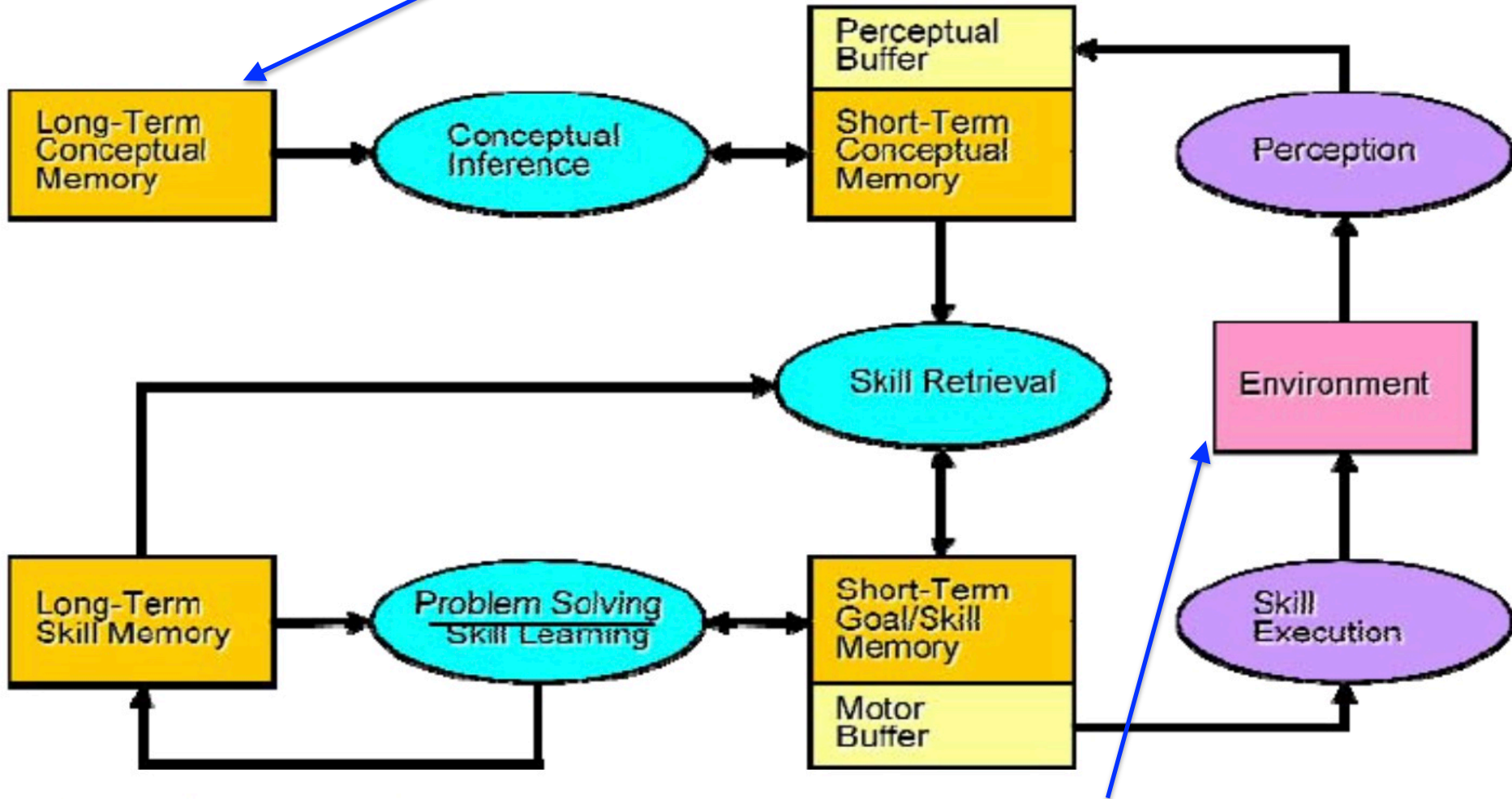
Anytime, forward, utility-driven search (i.e., planning, envisionment)

Clustered descriptions of materially wealthy and not so wealthy countries, allies and enemies, …

Perceptual Buffer
Short-Term Conceptual Memory

Perception

Long-Term Conceptual Memory

Conceptual Inference

Skill Retrieval

Environment

Long-Term Skill Memory

Problem Solving
Skill Learning

Short-Term Goal/Skill Memory
Motor Buffer

Skill Execution

A schematic of the Icarus Architecture.

Later on, the game manager

The SOAR Cognitive Architecture