GST 28 – The Evolution of Representation

Formal Description

Representation has evolved from simple forms that enable recognition of environmental features to increasingly sophisticated symbolic systems capable of supporting communication, abstraction, cultural transmission, and scientific understanding. This progression includes iconic representation, symbolic representation, language, and formal systems of knowledge.

Plain English Explanation

The ability to represent reality did not appear all at once. It evolved gradually as organisms developed increasingly sophisticated ways of perceiving, interpreting, and responding to their environments.

The earliest forms of representation were likely iconic. Organisms recognised recurring patterns associated with threats, opportunities, resources, or dangers. A predator's shape, the appearance of food, or the location of shelter could all be recognised without the need for language or abstract thought.

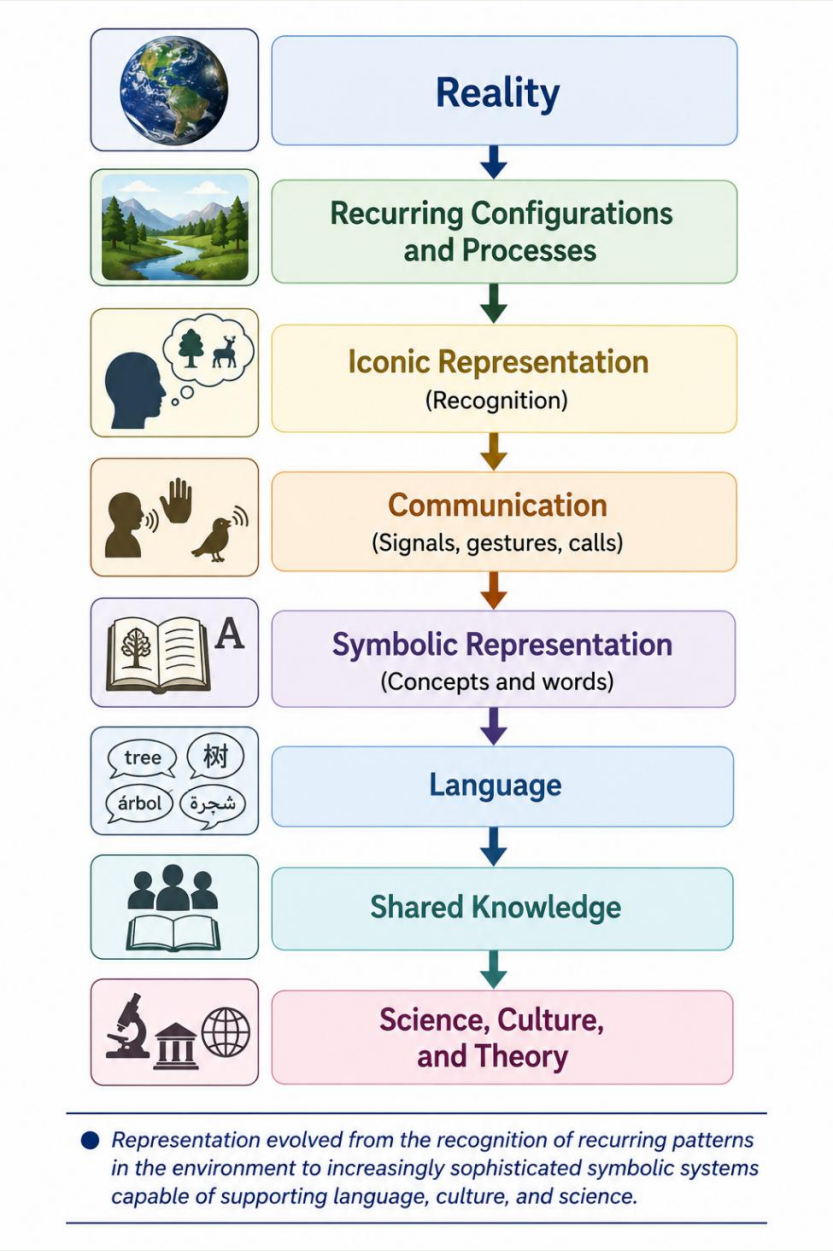
As cognition became more sophisticated, communication emerged. Signals, calls, gestures, and other forms of communication allowed information about the environment to be shared between individuals. This greatly increased the ability of groups to coordinate behaviour.

Over time, symbolic representation developed. Symbols allowed individuals to represent things that were not immediately present and to communicate increasingly complex ideas. Words, concepts, stories, and explanations became possible.

Language then enabled the accumulation and transmission of knowledge across generations. Rather than rediscovering everything through direct experience, humans could learn from one another and build upon existing understanding.

The development of writing, mathematics, science, and formal theories extended this process even further. Modern knowledge systems allow enormous amounts of information to be stored, communicated, and refined across large populations and long periods of time.

Representation therefore evolved from recognising immediate patterns in the environment to supporting the complex systems of knowledge upon which modern societies depend.



Example 1 – Animal Behaviour
A deer recognises the shape or movement of a predator and reacts immediately. The representation is primarily iconic and does not require language.
Example 2 – Human Communication
A parent points towards a danger and warns a child. Communication allows information to be shared without the child having to experience the danger directly.
Example 3 – Scientific Knowledge
An engineer can learn about bridges through textbooks, diagrams, equations, and theories developed over centuries. Symbolic representation allows knowledge to accumulate across generations.

Provenance and Links

The evolution of representation draws upon work from psychology, linguistics, anthropology, cognitive science, and systems theory.

Relevant contributors include:

- Jerome Bruner – iconic and symbolic modes of representation.
- Lev Vygotsky – language, cognition, and cultural learning.
- Noam Chomsky – language and symbolic structures.
- Michael Tomasello – cultural learning and communication.
- Terrence Deacon – symbolic thought and human evolution.

Related topics include cognition, communication, language, learning, culture, and knowledge systems.

Practical Exercise

Consider an important skill that you possess (for example, driving, cooking, gardening, playing a sport, or using a computer).

1. Identify examples of iconic representation involved in learning the skill.
2. Identify examples of symbolic representation such as words, diagrams, instructions, or rules.
3. Identify examples of communication used during learning.
4. Reflect on how each stage contributed to your understanding and competence.

Could the skill have been learned without one of these forms of representation?