



GST-01 Cognitive Physicalism

Formal Description

Cognitive Physicalism is the philosophical position that:

1. everything that exists is physical and located in space–time; and
2. human perception and cognition are limited, requiring simplified representations or models of reality.

Mental processes such as perception, reasoning, and modelling are themselves physical processes occurring within cognitive systems.

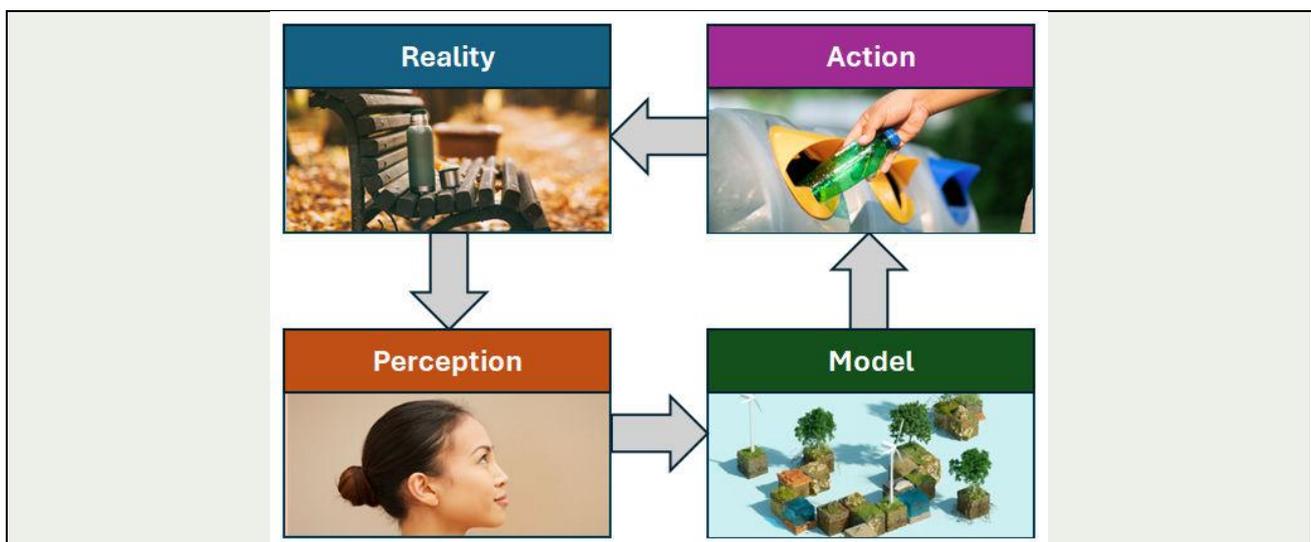
Plain English Explanation

Cognitive Physicalism means two things.

First, everything that exists is part of the physical universe. Matter, energy, information, thoughts, emotions, computers, and ecosystems are all physical entities or processes occurring somewhere in space and time.

Second, human beings cannot perceive the full complexity of reality. Our brains simplify the world in order to understand it. Scientific and other models therefore do not reproduce reality exactly. They simplify it so that we can understand patterns and relationships.

Some representations are more useful than others. Models that are sufficiently accurate help organisms and systems to identify opportunities and avoid threats. Over time, this creates a tendency for more useful (functionally adequate) representations to be retained and used, even though they are never complete.



Example 1 – Weather Models

Weather forecasts use simplified models of the atmosphere rather than simulating every air molecule. These models are implemented as physical processes in computers, where electrical signals represent atmospheric variables such as temperature, pressure, and wind speed.



Although simplified, these physical models allow meteorologists to predict storms and temperature patterns.

Example 2 – Subway Maps

Subway maps distort geographic distances in order to make routes easier to understand. The map itself is a physical object, whether printed on paper or displayed on a screen, and the mental representation of the map is also realised as a physical process in the brain.

These models are therefore both simplified and physical, designed for usability rather than complete realism.

Example 3 – Mental Imagery

When a person imagines a place or situation, they are using a mental model. Although this feels abstract, it corresponds to measurable patterns of activity in the brain.

The model is therefore both a simplification of reality and a physical process occurring within a cognitive system.

Provenance and Links

This concept builds on a long tradition in philosophy and cognitive science that treats cognition as a physical and model-based process, including:

- Mario Bunge – mind as a property of physical systems
- Daniel Dennett – cognition as functional, physical information processing
- Patricia Churchland – mental processes grounded in brain activity
- Kenneth Craik – the mind constructs internal models of reality
- Herbert A. Simon – cognition is limited and relies on simplified representations

Practical Exercise

Cognitive Physicalism proposes that thoughts, perceptions, and models are themselves physical processes occurring in the brain.

List examples or observations that suggest cognition is physical.

You might consider:

- the effects of brain injury or illness
- the role of the brain and nervous system
- the impact of drugs or chemicals on thought and perception
- scientific measurements of brain activity

List reasons why some people might think cognition is *not* purely physical.

For example:

- subjective experience (“what it feels like” to think or perceive)
- the apparent independence of ideas from physical objects
- philosophical or cultural beliefs about mind and consciousness

Based on your answers above:

- To what extent do you think cognition can be understood as a physical process?
- What implications might this have for how we understand knowledge, models, and decision-making?
- How might the physical nature of cognition influence the way models are formed, used, or limited?