



GST-03 Compatibility of Cognitive Physicalism and Critical Realism

Formal Description

Cognitive Physicalism and Critical Realism are compatible philosophical positions.

Cognitive Physicalism asserts that reality, including human cognition, is entirely physical and located in space-time, while Critical Realism asserts that this reality exists independently of human knowledge.

Together, they provide a coherent ontological and epistemological foundation for systems science.

Plain English Explanation

These two philosophies answer closely related questions.

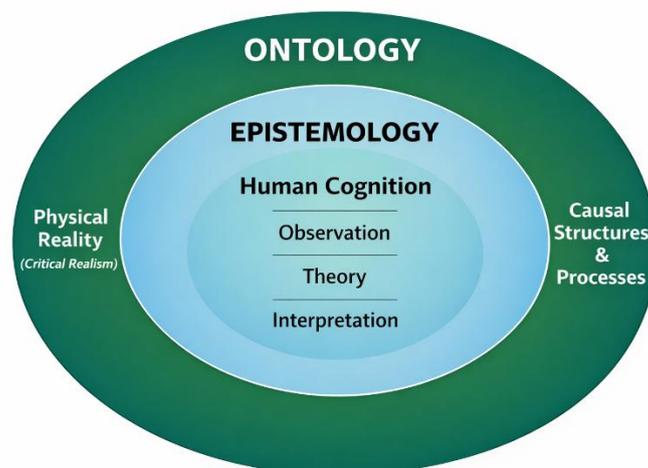
Cognitive Physicalism explains what reality is made of: physical systems, including human cognition itself.

Critical Realism explains how we come to know about reality: through observation, theory, and interpretation, all of which are shaped by our limited perspectives.

Together, they show that our knowledge of reality is produced by physical processes operating within the reality we are trying to understand.

This means that we do not stand outside the systems we study. When human agents are involved, their thinking, perception, and decision-making are part of the system itself and can influence how it behaves. For this reason, systems theory must be reflexive: it must recognise that observers and analysts are themselves components of the systems they study.

Systems theory therefore studies real physical systems, but always through models that are themselves physical, and necessarily partial and simplified.



Example 1 – Astronomy

Stars and galaxies exist independently of our knowledge of them.

In the past, stars were often thought to be small lights fixed in a firmament surrounding the Earth.

These early models reflected limited observations and cultural interpretations.



As scientific knowledge developed, more accurate astronomical models were created, describing stars as distant suns and galaxies as vast systems governed by physical laws. This illustrates that while reality remains the same, our understanding of it evolves through improved models that are themselves part of the physical world.

Example 2 – Economic Systems

Economic systems operate through complex interactions among institutions and individuals, whether or not those interactions are fully understood.

Different economic theories provide different models of how these systems work, emphasising factors such as markets, incentives, or social structures.

These models are developed and used by people within the system itself, and can influence decisions, policies, and outcomes.

This shows that our understanding of economic systems is both embedded within those systems and capable of shaping their behaviour.

Provenance and Links

This module integrates two complementary philosophical traditions:

- Roy Bhaskar – Critical Realism, including the distinction between the real, actual, and empirical domains
- Mario Bunge – scientific realism and the treatment of cognition as a physical process within systems

Related concepts:

- Cognitive Physicalism
- Critical Realism
- Scientific modelling
- Systems thinking

Practical Exercise

Scientific models are developed by people who are themselves part of the systems they study.

Explain in your own words why it is possible for scientific models to be both:

1. useful descriptions of reality
2. incomplete representations of reality

In your answer, consider:

- how models are created through human cognition
- why this means they are necessarily limited
- how they can still be effective in explaining and predicting system behaviour