

Supervenience, Brain, Mind, and Neurofeedback

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Introduction

- Critical search for clear meaning
- Unambiguous use of terms
- Reconcile science with common notions
- Understand dynamics of brain & mind
- Causation, prediction, mechanisms
- Consistent with rigorous philosophical thought and analysis

Historical Perspective

- Cartesian Dualism
- Newtonian Mechanism
- Connectionism, functionalism, reductionism
- Neurophysiology, Neuropaleontology
- ERP's; Libet; Churchland; Crick
- Seek to retain notion of causal mind embodied in physical brain

Supervenience

- Formal relationship between two domains
- E.g. physical and chemical
- Describes corresponding properties
- Concept of discernible vs. indiscernible
- Avoid issue of “causation”
- Avoid issue of “reduction”

Supervenience (weak)

- A weakly supervenes on B just in case:
- For any x and y
- If x and y share all properties in B
- Then x and y share all properties in A
- Indiscernibility in B entails indiscernibility in A

Supervenience (weak)

- A weakly supervenes on B means:
- For any object x and any property F in A,
- If x has F , then there exists a property G in B such that:
 - x has G , and
 - If any y has G , it has F

Supervenience (strong)

- A strongly supervenes on B just in case:
- Necessarily, for any object x and any property F in A ,
- If x has F , then there exists a property G ,
and
- Necessarily, if any y has G , it has F

Supervenience - Examples

- Morality (“goodness”) supervenes on thoughts and actions
- Temperature supervenes on molecular kinetics
- Center-of-gravity supervenes on masses
- Health supervenes on biological structure
- Beauty supervenes on physical makeup

Supervenience of Mind on Brain

- We say the mind supervenes on the brain
- Two identical brains would have identical minds
- Physical description is sufficient to determine mental states
- Based upon “conventional”
neurophysiology/psychology/psychophysics

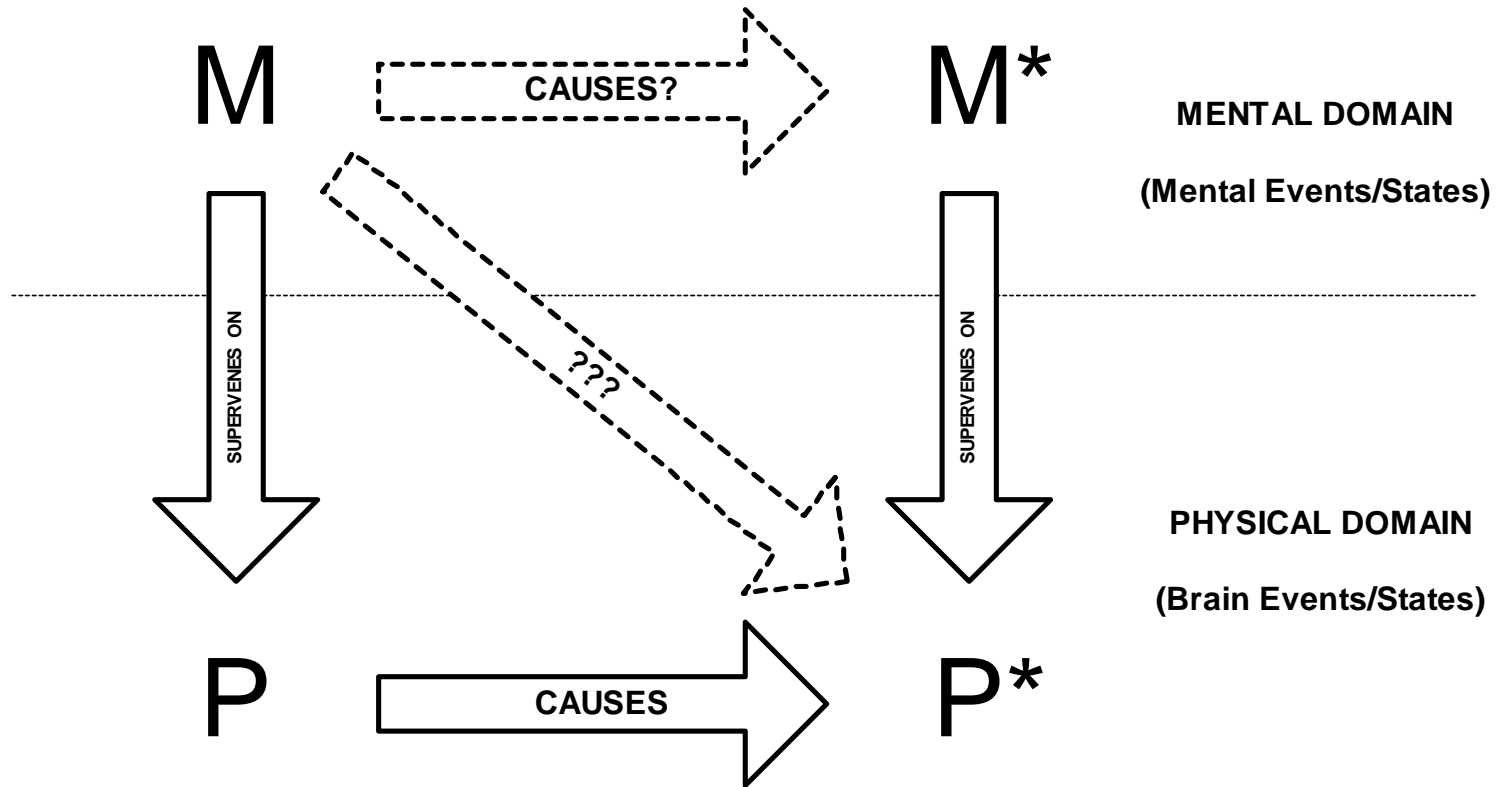
Problems with M/B Supervenience

- Supervenience not generally accompanied by downward causation
- E.g. shift in center of gravity does not “cause” mass to move
- Not the same as e.g. temperature emerging from molecular kinetics
- Mind is either “special” or becomes an epiphenomenon

Emergent Causal Agency

- Emergent property could enable “causal” changes at lower level
- In presence of an additional set of agents
- E.g. beauty could “cause” wealth, hence health. Or “cause” painting to be preserved.
- Radio can receive outside broadcasts
- Complex brain might enable new causal levels (“high-information physics?”)

Brain/Mind Supervenience and Causation



Typical NF Scenario

- Begins with “intention not to move”
- Subsequent production of SMR wave
- Production/delivery of feedback signal(s)
- Sensation/perception of feedback
- Brain registers internal & external events
- Production of PRS
- Backward referencing / learning

“Folk Psychology”

- Subscribes to naïve reductionism
- “Collection of truisms and platitudes”
- Motives, desires, beliefs, hopes, actions, etc.
- “Explains” behavior of ourselves and others
- Bound to our conception of ourselves as persons and as agents

Reductionism

- Folk Psychology reduces to cognitive science
- Individual differences, mental illnesses
- Imagination, creativity, production
- Sleep, altered states, meditation, zen
- Abilities – sports, intellect, language, art
- Learning process, memory, recall

Problem with Reductionism

- No reductionism can “explain” subjective states vis a vis physical correlates
- How does subjectivity emerge from collections of neuronal activities?
- How can mind have autonomous causative powers?
- Excludes independence of mind and brain

Brain in a Vat

- Brain is in a vat, under a “microscope”
- Connected to a vast computer
- Overseer monitors all physical state transitions
- Are there any unexplained transitions?
- Like monitoring a radio circuit?
- Additional or external causality?

Star-Trek Transporter

- Creates identical replica somewhere
- Sends atoms or information?
- What happens to original traveler?
- What if two are created (preserve original)?
- “Where” is the conscious observer?
- Same as murder / replication?
- Any different from a person walking?

More Science Won't Fix the Problem!

- Neurochemistry, Neuroimaging
- High-information physics (hyper-connectionism)
- Quantum microtubules
- DC potentials / Glial Cells (sorry, Jay)
- It is all “More of the same thing”
- Physical realm remains self-contained

Outstanding Problems

- Is Mind an epiphenomenon?
- Is duality a tenable option?
- Is reduction a tenable option?
- How can Mind cause anything?
- Is “Folk Psychology” doomed?

Jaegwon Kim on Mind in a Physical World

- To think that one can be a serious physicalist and at the same time enjoy the company of things and phenomena that are nonphysical, I believe, is an idle dream...
- It would be premature, however, to conclude that an all-out dualism offers a more realistic chance of saving the mental.

Possible “solutions”

- Epiphenomenalism
- Eliminativism
- Property dualism
- Anomalous monism
- Nonreductive physicalism
- Throw the whole thing out (the brain/mind can never comprehend itself)