The Concept of Supervenience and the Mind-Body Problem

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Abstract: The concept of supervenience is a well discussed topic in the area of Philosophy of Mind. Some thinkers are trying to place the mind in the physical world. On the basis of the approach to the mind-body problem there are reductive and non-reductive thinkers with their arguments. This paper aims to provide some major viewpoints put forwarded by some prominent philosophers on the idea of supervenience. During the past two decades the concept of supervenience has been increasing service in the philosophy of mind. Its core idea is that the mental is supervenient on the physical. The three components of supervenience are property covariance, dependence and non-reducibility. There are local and global supervenience classified by some thinkers. Another significant distinction is between logical and natural supervenience. J. Kim explains mind-body supervenience as the thesis that any two things, or events, that, are exactly alike in all physical respects cannot differ in mental respects.

Key words: supervenience, global supervenience, mental causation, property covariance, reductionist model, epiphenomenalist model, supervenient causation model

Introduction

To find out a place for the mind in the physical world is a prominent approach in the area of Philosophy of Mind. In 50s and 60s Smart and Feigl proposed their views in the form of identity theory. (Smart, 1959) They argued that mental events are identical with brain states. Though short lived, this theory can set the basic parameters for the mind-body debates. The destruction of mind-brain identity theory is caused by the two major objections by Hilary Putnam (Feigl, 1967) and Donald Davidson (Guttenplan, S. 1994, p. 231-235) through their multiple realizability argument and anomalous monism respectively. The monistic component of the anomalous monism insisted that all individual events are physical events subject to laws of physics. His anamalous monism does not tell much more about mind-body relation. In his 'Mental Events', (Guttenplan, S. 1994, p.231-235) he argues that "Although the position I describe denies there are psychophysical laws, it is consistent with the view that the mental characteristics are in some sense dependent or supervenient on physical characteristics. Such supervenience might be taken to mean that there cannot be two events alike in all physical respects but differing in some mental respects, or that an object cannot alter in some mental respect without altering in some physical respect."

During the past two decades the concept of supervenience has been increasing service in the philosophy of mind. Its core idea is that the mental is supervenient on the physical. That is the mental character of a thing is wholly determined by its physical nature. Mind-body supervenience has also been invoked in arguments for or against certain specific claims about the mental and has been used to device a solution to some central problems about the mind. The idea of supervenience is usually thought to have originated in moral theory.

Supervenience has been a buzzword in the philosophy of mind since the early seventies. John Heil argues that supervenience argument is supported by naturalism. (Davidson, D., 1970) A commitment to naturalism is a commitment to supervenience, or something like it. He introduces a supervenience argument not as a solution to the mind body problem, but as affording a framework within which it may be possible to sharpen an appreciation of what that problem encompasses. His supervenience hypothesis holds that the internal characteristics of agents supervene on their non-intentional, physical characteristics. He also suggests that externalism and the supervenience hypothesis are perfectly, compatible, if we allow the supervenience 'base' of intentional characteristics to the 'broad'.

He advocates that supervenience relations are by no means confined to the mental domain. For example, liquidity might be brought to supervene on molecular structure. In other words, something is being liquid apparently 'depends on' and is determined by its possessing a certain sort of molecular structure. It follows that substances possessing intentional molecular structures will be identical with respect to liquidity. It also follows that, should a substance change its state, cease to be liquid, and become solid, and then its 'underlying' molecular structure must change as well. It means its change in state is due to some change at the molecular level.
The concept of supervenience is required if the world is considered as layered or sediment as consisting of hierarchies of characteristics in which the upper tiers of the hierarchy are fixed by those in the lower tiers. There are alternative to this layered picture of world. We might regard every characteristic as standing on its own. Something is being liquid might be a characteristic it possessed alongside the characteristic of possessing a certain molecular structure. And it's possessing that molecular structure would be a feature it possessed alongside the characteristics of possessing certain anomic features. Alternatively, we might imagine that liquidity is nothing but molecular structure, what appears to us to be distinct characteristics is in fact one and the same. Non-hierarchical conception encourages us to abandon efforts to explain or understand higher - level characteristics in terms of those at a lower level. In Heil's view, supervision hypothesis provides a powerful and natural way of fitting together elements of our overall picture of intelligent agency. An agent's state of mind depend on and are determined by the agent's biological condition, that states of mind are possessed in virtue of agent's possession of certain biological characteristics. He insists that experimental work on brains does not provide direct evidences for the supervision hypothesis. Whether state of mind supervenes on agent's physical characteristics is an empirical question, but the supervision relation itself is metaphysically saturated. In this respect supervision resembles causality. In the case of causality we advance casual laws that are both explanatory of and confirmed by their instances. According to Kim, who made much use of the concept in the physicalist theory of mind, supervision is a relation between two sets of properties, the supervenient properties and their base properties.

"Mental properties supervene on physical properties in that necessarily for any mental property M, if anything has M at time t, there exists a physical base (or subvenient) property P such that it has p at t, and necessarily anything that has P at a time M at that time." (Heil, J. 1996)

E.g. If a person experiences pain, it must be the case that person instantiated some physical property, she must experience pain. Every mental problem has a physical base that guarantees its instantiations. Without a physical base, a mental property cannot be instantiated.

"Mental Properties supervene on physical properties, is that necessarily any two things (in the same of different possible worlds) indiscernible in all physical properties are indiscernible in mental respects." (Kim, J., 2000)

Under mind-body supervenience a physical base property, P, for mental property M guarantees, as a matter of necessity, the occurrence of M, that is necessarily if something instantiates P, it instantiates M. One mental property has multiple physical bases. An example of pain in human may be based on one neural property and another instance of pain that is in a reptile may be grounded in another. The idea of supervenience is a form of co variation between the two families of properties. Such co variances can occur in the absence of a metaphysical dependence or determination relation. The idea of supervenience introduced into discussion of mind-body problem by D. Davidson in 1970. (Kim, J., 2000) He argues that supervenience is consistent with the irreducibility of the supervenient to their subvenient properties.

There are three ideas, which are clearly related with supervenience. One is property co variation. If two things are indiscernible in base properties, they must be indiscernible in supervenient properties. The second one is dependence. Supervenient properties are dependent as, or determined by their subvenient bases. The last and third idea is non-reducibility. Emergentists firstly use the idea of supervenience in connection with mind-body problem. (Davidson, D. 1970) They used supervenient as a stylistic variant of emergent. There is similarity between emergence and supervenience. Emergentism holds that higher-level properties notably consciousness and other mental properties emerge when and only when an appropriate set of lower level basal conditions are present. The occurrence of the higher properties is determined by and dependent on the instantiation of appropriate lower-level properties and relation. In spite of this, emergent properties were held to be 'genuinely novel' characteristics irreducible to the lower-level processes from which they emerge. The concept of emergence also contains the three components of supervenience, property covariance, dependence and non-reducibility. And both emergence and supervenience can be regarded as the first systematic formulation of non-reductive physicalism.

The core idea of mind-body supervenience is that indiscernibly with respect to physical properties entails and sensibility with respect to mental properties. There are two sets of properties one is M, consisting mental properties and the other is P, physical properties. The supervenience of events and states can be explained in terms of property supervenience.

The thesis that properties of whole are fixed by the properties and relations that characterize their parts is known as mereological supervenience. This macro-no micro theory holds that world is the way it is because the micro world
is the way it is. It is the same in the case of mental properties. If M is a mental property had by something X, then any Y that is micro indiscernible from X will also have M. Thus, mental properties are macro properties supervening on micro properties.

Physical realizationism entails the supervenience thesis that mental properties must be physically realized. They cannot have non-physical realization. Suppose that P realizes M in systems of kinds S. From the viewpoint of realization, P is nomologically sufficient for M. Therefore, if <Pi … Pi> is a realizer of Mi, it follows that the Ms are supervenient on the Ps. According to physical realizationism, the mental supervenes on the physical because mental properties are second-order functional properties with physical realizers. And there is an explanation of mental physical correlations.

Local and Global Supervenience

1. David Chalmers’ notion of supervenience holds that one set of facts can fully determined by another set of facts. (Guttenplan, S. 1994., p.575-583)

The physical facts about the world seem to determine the biological facts. Supervenience is a relation between two sets of properties. B-properties are intuitively, the high-level properties and A-properties, which are the more basic low-level properties. B-Properties supervene on A-properties if no two possible situations are identical with respect to their A-properties while differing in their B-properties.

If A-properties of an individual determine the B-properties of that individual, B-properties supervene locally on A-properties, e.g. Shape supervene locally on physical properties. That is any two objects in the same physical properties will necessarily have the same shape. Global supervenience claims that B-properties supervene globally on A-properties, if the A-facts about the entire world determine the B-facts. Local supervenience implies global supervenience, but not vice versa. For instance, it is possible that biological properties supervene globally on physical properties in that any world physically identical to ours would also be biologically identical. But they do not supervene locally.

Logical and Natural Supervenience

Another significant distinction is between logical and natural supervenience. Logical supervenience is conceptual supervenience and natural supervenience empirical supervenience. B-properties supervene logically on A-properties if no two logically possible situations are identical with respect to their A-properties but distinct with respect to their possible worlds. This logical possible world is independent of formal considerations.

Naturally possible situations are one that is occurring in nature, without violating any natural laws. Natural supervenience holds that B-properties supervene naturally on A-properties if any two naturally possible situations with the same A-properties have the same B-properties. Some logically possible situation cannot be naturally possible. But any situation that is naturally possible can be logically possible.

Logical supervenience implies natural supervenience. If any two logically possible situations with the same A-properties have the same B-properties, then any two naturally possible situations also are the same. It is difficult to find cases of natural supervenience on the set of physical properties without logical supervenience. But consciousness is a useful example. Consciousness is naturally supervening on physical properties in the natural world. Any two physically identical creatures will have qualitatively identical experiences. It is not clear that consciousness is logically supervening on physical properties. It is logically possible that a creature physically identical to a conscious creature might have no conscious experiences. If this is so, then consciousness supervenes naturally but not logically on the physical. Only the laws of nature assure the necessary link between physical structure and experience. Any logical or conceptual force cannot do it. The distinction between natural supervenience and logical supervenience is:

If B-properties supervene logically on A-properties, then once God (hypothetically) creates a world with certain A-acts, the B-facts come along for free as an automatic consequence. If B-properties merely supervene naturally on A-properties, however, then after making sure of the A-facts, God has to do more work in order to make sure of the B-facts. He has to make sure there is a law relating the A-facts and the B-facts (Kripke 1972).

Kim on Supervenience

Mind-body supervenience posits mental phenomena within physical domain. The physical determines the mental. Then, the mental does not constitute an ontologically independent domain. Mind-body supervenience, in Kim's view is entailed by minimal physicalism and physical realisation. In his view, mental causation is unintelligible. Mind-body supervenience puts each mental phenomenon in the physical domain by providing for it a set of physical conditions that are nomologically sufficient for it and on which its occurrence depends. This theme holds that unless an appropriate physical base condition is present, mental property cannot be instantiated. If such a
basis were absent it would not occur. Mind-body supervenience assumes that mental-to-mental causation implies mental-to-physical causation.

J. Kim explains mind-body supervenience as the thesis that any two things, or events, that are exactly alike in all physical respects cannot differ in mental respects. (Kripke, S. 1974) There can be no mental difference unless there is physical difference. The idea that each mental-event or state kind has a neural correlate is a form of mind-body supervenience. It assumes that if two organisms are in identical neural states, they cannot be in different mental states.

(1) If N is a neural state on which mental property M supervenes, then N is a sufficient condition for the occurrence of M; (2) M can have multiple supervenience bases N1...N2... each of which is sufficient to give rise to M; (3) M is distinct from each of its many bases, N1,N2...

(Kim, J. 2000)

The sudden pain that felt in one’s elbow caused the person to wince. Mind-body supervenience says that the pain has a supervenience base, a certain neural state N. We can schematize this as follows:

![Figure 1: Mind-body supervenience](image)

If neural state N is a supervenience base for pain, it is lawfully sufficient for pain. If pain is a sufficient cause of wincing N is casually sufficient for wincing, as schematised below:

![Figure 2: Causal Supervenience](image)

This picture shows that there are two distinct causes for wincing, the pain and the neural state N. It means that wincing is causally over determined. It follows that all cases of mental causation are cases of over determination. The diagram presents an unstable picture that is, the causal relation it depicts is not coherent. To get a coherent picture we have to redraw this picture.

This first model is the epiphenomenalist model. This treats pain as an epiphenomenon of neural state N, denying it a causal role in the production of the wincing. N taken by itself is a full cause of it as shown below:

![Figure 3: Epiphenomenalist Model of Supervenience](image)
The concept of supervenience and the mind-body problem

The second one is supervenient causation model. This approach views that pain's cause of the wincing as consisting in its supervenience on neural state \( N \), which causes a certain physiological event on which the wincing supervenes. It takes causal processes at the micro level as fundamental and considers causal processes at the macro level. The following diagram represents this approach:

![Diagram of Supervenient Causation Model](image)

The pain supervenes on \( N \) and the wincing supervenes on the contraction of a certain group of muscles; the pain's causation of wincing consists of its supervenience base of the wincing. Generally, an instantiation of a property is a supervenience cause of an event in virtue of the fact that its supervenience base causes the event.

The third one is the reductionist model. The most elegant and simplest solution is reductionism. This approach identifies pain is the neural state \( N \). Since pain=\( N \), there is here only one cause of wincing, and all the puzzles with our original triangular diagram vanish.

![Diagram of Micro Macro Supervenience](image)

But most of philosophers of mind reject reductionism. So this is not a sufficient argument. It was Kim who reviewed reductionism through its many operative stages for the last four decades. His own brand of reductionism has a clear objective to locate mind in the physical world. The reigning idea here is mental causation. Kim argued that: (Kim, J. 2000)

1. If physics is causally closed, then all causal properties are causal properties (causal closure).
2. If mind is not causally closed, then mind is causally excluded (causal exclusion).
3. Mental properties supervene on physical properties (supervenience).
4. Mental properties are multiply realized (multiple realisability).

If (1) - (4) is true then either

5. There are prior mental properties that are causally efficacious. (Causal chain)
   (Against ex nihilo ex fit)
6. Mental and physical causes are discoverable for every event.
   (Over determination)

The fifth violates causal closure and it is to be rejected. Given the causal closure of physics, mental properties can only the casual properties via physical properties that realize them. So over determination (6) must be rejected. So,
7. Physical casual explanation of behaviour 'screen off' or 'exclude' mental casual explanation.

Kim is under attack for excluding mental causalities, but if mental causation is neurobiological (what happens at the cellular and molecular level), then the above argument cannot be valid. This is what is recommended by the new wave reductionism. That is, all over psychological explanations become **otiose**, if neurobiological explanations become available, as real explanations. So, **contra** Kim, we need not exclude but at the same time they become **otiose** when improved upon by neurobiological (cellular and molecular) explanation. That is to say, neurobiological explanation can be shown to explain what is left unexplained by psychological explanation. No eliminativism is intended because such explanations are only in the **formative stage**. But psychological explanations also play **heuristic role**. Thus Kim needs improvement. So the prevailing climate, the notion of supervenience not much to contribute towards anything like the neurobiological basis.

**REFERENCES**


