

On Connection, Necessity, And Overdetermination

1. Introduction

Take *strong emergence* to be the ontological beginning of a set of features arising from lower-level states of affairs where this new set of features is both dependent in some way on these states of affairs but itself possesses unique features, powers, properties, and states not shared with these underlying conditions. This is a very similar view to Jessica Wilson's conception of strong emergence (2011, 15). Contrary to Wilson, however, I think strong emergence is compatible with the idea that every physical effect has purely physical lower-level causes. I will attempt to argue so.

In explaining a view of Emergentism I have in mind, I suggest that it is possible to see M as strongly emergent and in a way that is both *materialistically respectable* and that doesn't lead to overdetermination.

Pace Hume, I argue that at least some distinct entities entail necessary connections. Pace *Kim's Argument (The Exclusion Argument)*, I argue that strong emergentism doesn't entail overdetermination. Background for these latter two concerns follows and in addressing them, I think the upshot is a kind of strong emergence that is compatible with the principle of causal closure.

2. Clarity

The interpretation of the term *distinct* is crucial to thinking that *distinct* entities do or do not share necessary connections. I take Emergentism to be a commitment to *mereologically essential distinctness* and *necessary connection* to be at least *nomological necessity* between the relationship of the physical to the mental. The heft of this paper explains each notion in more depth.

3. Definitions

Causal Powers = *df.* (roughly) the ability to generate effects.

Mereologically Essential Distinctness = *df.* F is *mereologically essentially distinct* from G just in case the parts essentially constitutive of F (Chisholm, 1973) are not in total the same parts essentially constitutive of G and vice versa.

Ontologically Basic Property = *df.* property E is ontologically basic if and only if the fact of the presence of E is not entailed by facts about the presence of things non-identical to E (Floth, 2008).

Nomological Necessity = *df.* necessary according to the laws of physics.

Realization = *df.* a dependence relation that is thought to exist between higher-level properties or states and lower-level properties or states (Baysan, 2020).

Supervenience = *df.* F-properties supervene on G-properties if and only if F and G cannot differ in regard to their F-properties without also differing in regard to their G-properties (Kallestrup 2020).

4. Roadmap

Ahead, I make four arguments. Each argument will be its own section. Each section will begin with the argument in standard form. Each section will then proceed with motivating the premises.

These arguments will be:

- A. The mental is strongly emergent from the physical.
- B. The mental is nothing over and above the physical.
- C. The mental is nomologically and metaphysically necessarily connected to P.
- D. The conjunction of mental realizers P and the mental M are jointly sufficient for downward causation P*.

I will then close with final thoughts.

5. The mental is strongly emergent from the physical

- 1) Mental *realizers* P are physical.
- 2) The mental M is not a proper subset of P.
 - a. M *supervenes* on P.
 - b. M has *causal powers* P has not.
 - c. M is *mereologically essentially distinct* from P.
- 3) If (1) and (2), M is strongly emergent with respect to P.
- 4) **So, M is strongly emergent with respect to P. (MP [1, 2], 3).**

It seems intuitively obvious that changes in our brain states effect our mental lives. There's an entire pharmaceutical industry dedicated to changing our mental lives for the better through chemistry. It also seems intuitively obvious that we can change our brain states when we make

decisions. When I want to raise my hand, the raising of it seems to be exactly in virtue of my mental desire to raise it. The trouble appears to be explaining phenomenal experience in terms of physical stuff and how mental and physical stuff can affect each other.

I take it to be the case that whatever the mental is supposed to be on any physicalist theory of mind, it is *realized* by the physical. For every instance of M, there is a token physical state P realizing it. On Physicalism, not only is the mental realized by the physical, but the mental also *supervenes* on the physical. There cannot be a change in M without a change in P. So, what is M if it has features P lacks, or maybe M isn't anything over and above P at all?

One problem with the vision of some forms of Emergentism is that the mental M is often considered a *proper subset* of P. That is, M as a proper part of P doesn't possess any features that P does not possess. Figure 1.1 below illustrates this relation. This sort of relation might explain how M and P supervene but it leaves open the question as to the sufficiency of M or P to cause some other state of affairs to obtain, say P*, without being overdetermining. It appears at least *prima facie* that if M is sufficient for P* then P is as well. This is Kim's concern in his exclusion argument. The problem is known as the problem of downward causation. It forces us to address whether M and P causing P* is an instance of overdetermination. Put in the more classic analogy, if the rebel was to be killed for his insurrection, then one bullet would do the job and an entire firing squad would be overkill. If we can do without positing M in that case, perhaps we ought to.

However, there doesn't seem to be any particularly good reason why we ought to have that sort of relationship in mind when talking about emergence. Indeed, I think much of the import in developing the concept of emergence is this sense that something is being birthed and out of P, M. Emergence is generalizable into the idea M is dependent on P yet M is distinct from P.

We'd be much better off thinking of this relationship as M being an ontological overlap of P, having at least some features, properties, and powers of P. This sustains the notion of *necessary connection* and *supervenience*. However, in addition to those P-features, M has features unique than those of P. Figure 1.2 illustrates this view. This at least captures the spirit of what emergence is at heart.

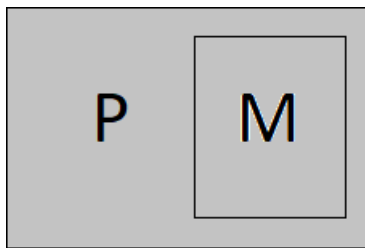


figure 1.1

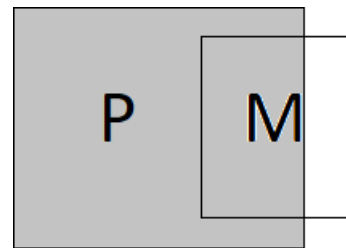


figure 1.2

In this way, we have the possibility of M-features being *over and above* P-features in that M has novel attributes relative to P. In this conception, M supervenes on P, M has features, causal powers, properties, attributes that P lacks, all while M is *mereologically essentially distinct* from P.

This view of M as a subset of P but not as a proper subset of P would satisfy all the expected commitments O'Conner (2010) and Churchill suggest strong emergentists have.

That is, strongly emergent properties are held to:

- i. be ontologically basic properties.
- ii. constitute new powers in the systems that have them, powers that non-redundantly contribute to the system's collective causal power.
- iii. appear in and only in organized complex systems of an empirically specifiable sort and persist if and only if the system maintains the requisite organized complexity.

- iv. be instantiations causally originated and sustained by the joint efficacy of the qualities and relations of some sort of the system's fundamental parts.

6. The mental is nothing over and above the physical

- 5) To exist is to be an entity that causally manifests.
- 6) The *causal constituent-relations* of proper parts of P are the proper parts of M.
- 7) M exists and is physical. (5, 6)
 - a. Physical causes have *only* physical effects.
 - b. M is an effect of P-causal powers.
 - c. Without P, M is impossible.
 - d. (but) M has *causal powers* P has not.
 - e. M is over and above P but is not over and above *being physical*.
- 8) If (7), then M is nothing over and above the physical.
- 9) **So, M is nothing over and above the physical. (MP 7, 8).**

Likely the most contentious premise of my thesis is that physical causes have *only* physical effects. That is a strong claim. My aim in this paper is to outline a possible way in which the mental could strongly emerge from the physical. I could begin simply by stipulating and asking that we grant that only physical effects result from physical causes. We could then rationally proceed and see how things might cache out. But I don't just want to stipulate such a thing. I want to suggest that this premise is at least as plausible if not even just slightly more so than taking it to be false. In that case, it would seem right to approach that premise with the idea that "nature would not double causes and laws unnecessarily" (Vincente, 2006, p 150). We should want a good reason to think either dubious, non-physical causes are requisite for M or that M itself is (at least in part) a dubious, non-physical effect. I take it that M and P abide by the causal closure principle. I also take it that we might argue against causal closure, however this principle is a guide that "tells contemporary physicists that they should look for physical causes first" (Ibid, p 152). This seems in harmony

with Ockham's razor. I don't think we've reached any good reasons to think M and P are not both physical and bound by causal closure.

So, even if it is merely on the side of cautious inquiry, there's good motivation to think M and P are necessarily connected in a way that satisfies causal closure.

If M and P are necessarily connected, can M be distinct from P?

It might be argued that M and P cannot be *mereologically essentially distinct* from one another. To what extent such an objection would be successful, I'm not entirely sure. Perhaps there's a case to be made that M actually is a proper subset of P. It could be complained that *essentiality* is a questionable concept and ultimately vague (after all, when is a bale of hay no longer a bail when picking it apart a straw at a time?). I think however, there's enough motivation to get the job done here. There are constituents of M without which M would no longer be M and these constituents are not one and the same constituents necessary to P. Those differences are what count as *essential distinctness* between M and P. Bread is not toast, for example, and objections about *essentiality* in the sense of determining essentiality are epistemic, not ontological. Toast is not (ontologically) essentially the same thing as bread, and vice versa.

What is M in that case?

If we take the mereological view that P is constituted by entities and only a particular set of their relations but not their (CCR) *causal constituent-relations* (i.e. what happens when constituent y and constituent z interact rather than, say, spacio-temporal relations between y and z), I think the relationship between M becomes clear and in a conceptually and explanatorily useful and *materialistically respectable* way. I take M to be over and above P precisely in that among the

features P has, CCR isn't among them. M (on my view) consists in the CCR of the constituents of P as well as their effects.

I will take this to be a *component view* in that P consists in parts irrespective of each of its parts causal interactions with other parts, though this might be a dubious move (Varzi, 2016).

Suppose sulfur is a constituent of P and a constituent of P'. (P) Pyrite is mereologically distinct from sulfuric acid given a difference in parts. Pyrite is iron sulfide. (P') Sulfuric acid is composed of sulfur, hydrogen, and oxygen. However, merely having sulfur, hydrogen, and oxygen in contact with each other is not sufficient for sulfuric acid. There is a specific way in which these constituents must come together for there to be sulfuric acid. Pyrite isn't necessarily emergent but we might want to think that sulfuric acid is. Sulfuric acid is more than just the sum of its parts, it's the CCR of other states of affairs which give rise to it.

At least part of my conception of the mental should be inferable at this point. That is, M is nothing above and beyond the physical. M is not P but P' which inherits some of the features of P and additionally has novel features relative to P. Note too that P might also be said to be emergent on this view just in case P has novel features relative to its antecedent dependence relations to other entities, if any.

But if no P is defined mereologically other than by its parts and relations that exclude the CCR of those parts, then if P is said to have causal powers, what part of P are they?

Causal powers would in fact be considered a *proper part* of the whole P. So it's not the case that P is merely defined in terms of its *component parts* but also include CCR (where CCR is of P's realizer) and their effects realized by whatever has brought about P.

Even though this is a sketch of how M might be *mereologically essentially distinct* from P, and though it rests on live topics of debate such as whether a whole is constituted by parts alone or parts in addition to some relations but sans CCR, it seems useful to think this way for our purposes here.

In other words, it's helpful to think that P is its parts and a subset of constituent relations since if P were its parts and all constituent relations, we might have a hard time telling the difference between bread and toast. Toast seems to entail the chemical interactions of the components of bread in a particular set of circumstances but bread is not toast. Toast is however bread. Toast is a type of bread but with different properties, causal powers, and so on. This is what I intend in talking about M, the mental, and P, the physical. M is more than just P but not more than *being physical*. Emergence doesn't entail materially unacceptable explanations.

The upshot of this view is that for any whole P, it may be emergent in a readily identifiable way, given its CCR from an antecedent realizer and the resultant features of P. These physical causal relations and their results allow us to cleanly distinguish between realizers and the realized where what is realized is something emergent. This appears to naturally dovetail with notions of role functionalism. P might just be some uninteresting physical state of affairs such as those contributing to the processing of digestion. Or P might be something more interesting which we take to be contributory to mental states; M would then be the physical realized state of affairs, the sort which carries out specific operations P alone cannot.

7. The mental is nomologically and metaphysically necessarily connected to P

- 10) Only P is sufficient for M and M is impossible without P.
 - a. P realizes M.
 - b. M *supervenes* on P.
 - c. M is nothing over and above the physical.
- 11) If (10), then M is (nomologically/metaphysically) necessarily connected to P.
- 12) **So, M is (nomologically/metaphysically) necessarily connected to P. (MP 10, 11)**

Stoljar (2008) argued that what we mean by *distinct* has everything to do with how *Hume's Dictum* plays itself out in any theory of mind. He concluded where I began. That is, there is no impassible or intractable problem with Emergentism if what the emergentist commits to is the idea that the mental is either mereologically or essentially distinct from the physical. I have taken up the notion of *mereological essential distinctness*. Rather than M not sharing any parts of P, I take it that they do and necessarily so. Rather than inheriting the questionable talk about entities having an essence, I take there to be an ontologically objective set of features by which a thing F is made an F and not something else.

Here, that would again look like figure 1.2. M and P share at least some constituent parts but what *makes* an M an M and not a P is what is ontologically essential to M. In other words, what is *mereologically essential* to M isn't a matter of our extensional or intentional classifications of M but what ontologically *makes* or *constitutes* M. Where M and P are in a (non-proper) subset relation as in figure 1.2, the constituents of M and P which essentially *make* M and P what they are, M and P are *mereologically essentially distinct*.

But if M and P are distinct in this way, is M necessarily connected to P? It certainly appears that way. The entire notion of *realization* and *supervenience* hinges on some necessary connection.

Here, I argue that M is at least nomologically necessarily connected to P in every *minimally physical duplicate world* of our own.

We have every reason to believe that these are appropriate ways of talking about the kinds of dependence relations that are nomologically necessary. Again, it suffices to point out that sulfur is nomologically necessary to sulfuric acid. However, the larger concern might be one where if we had a Jackson (1998) minimally physical duplicate world to our own, we might not have minds unless M and P had a metaphysically necessary dependence relationship. If a minimally physical duplicate world is one that is just like ours in every physical respect and nothing else that's needed to make that duplicate world be just like ours in every physical respect, then it is metaphysically necessary that the laws governing what happens when sulfur, hydrogen, and oxygen interact in a particular way don't come apart in any such world. Sulfuric acid would be the expected result.

If we take M and P to have a nomologically necessary dependence relationship, then it would follow that it is metaphysically necessary for M and P to be connected.

That relationship doesn't have to hold in every possible world in order to still be metaphysically necessary.

To put it more succinctly, M and P must hold an entailment relationship. We can consider M and P to have such a relationship just in case there are no counterexamples. Put differently, P entails M just in case there is no possible world in which P is true and M is false. There is no counterexample in minimally physical duplicate worlds where P doesn't metaphysically necessarily entail M given that the physics of such worlds (and nothing else) nomologically necessitate their relation.

8. There is no overdetermination with regard to M, P, and P*

- 13) P is sufficient for M but not independently sufficient for P*.
 - a. M is (nomologically/metaphysically) impossible without P.
 - b. M has *causal powers* P has not.
 - c. P without M is insufficient for P*.
 - d. P and M are jointly sufficient for P*.
- 14) If (13), then there is no overdetermination with regard to M, P, and P*.
- 15) So, there is no overdetermination with regard to M, P, and P*. (MP 13, 14)

As I've tried to conceive of the mental and the physical, P is necessary for M and since M has causal powers et. al. that P doesn't have, P can only be said to be a sufficient condition for M but not necessarily a sufficient condition in and of itself for some other physical state of affairs that we attribute to M. In other words, if M is sufficient for P* and P is insufficient for P* without M, then either P is jointly sufficient for P* or P is insufficient for P*. And, if P is necessary for M and M necessary for P*, then P and M are jointly sufficient for P*. Other than maybe to convey the same sort of reasoning a bit more clearly, maybe a better employment of English grammar, I'm not sure there's much to elaborate on. It seems that taking M as a (non-proper) subset of P where the causal powers relevant to realizing P* are the novel properties of M relative to P, there is no issue of overdetermination. There most certainly would be a problem if M were a proper subset of P as the concept of 'M' would be entirely a linguistic convention and practical convenience. M couldn't be anything over and above P.

In figure 1.3, we find Kim's causation square employing my interpretation of strong emergentism. In figure 1.4, I think we can abandon Kim's model to better illustrate what I intend in my arguments. Finally, figure 1.5 is a traditional graphic representing a computer neural network, a model of how artificial intelligence realizes what are arguably mental operations such as pattern

recognition, learning, adapting, planning (even “dreaming”¹). And though in this paper I’m not concerned with how consciousness itself emerges or how we get from physical simplicity to physical complexity of these sorts of activities both we and computers perform, I do think what I have described herein is a single set of node relations found in figure 1.5.

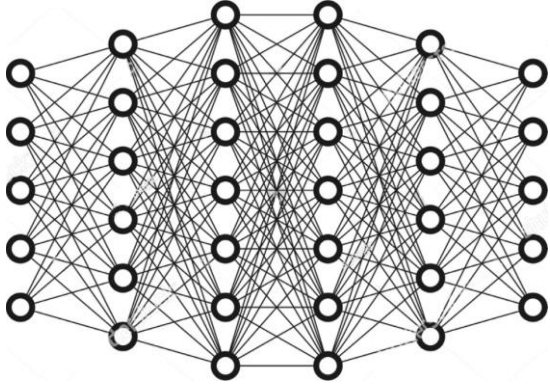
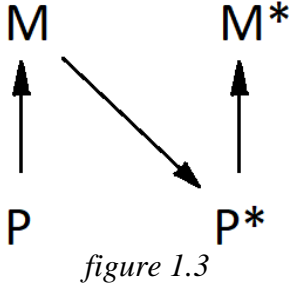


figure 1.5²

¹ See Google's self-representational [Deep Dream](#) project.

² Image courtesy of shutterstock.com.

9. Final thoughts

Stoljar left the subject of the coherence of Emergentism an open question, choosing instead to argue that for the emergentist, it's not clear that their commitments run afoul of Hume's Dictum or Kim's Argument. He and I both think they don't given a certain meaning for distinct. He left the coherence of Emergentism for others to speculate on but with our attentions able to focus on giving just that account. In my vision of what the mental is and how it might emerge from the physical, it doesn't undermine itself and is all at least logically valid. So, it's coherent in that sense. It seems reasonable, so, coherent in that sense as well. M being a physical consequence of P while both stand in a necessary dependence relation with each other, and M having novel features over and above P but not over and above M's being physical is plausible.

As for whether this thesis is accurately describing the relationships between the physical and mental, and whether one can derive some explanation of phenomenal experience through physical reduction, I'll leave those questions open in the same spirit.

Most importantly however, the relationships between M and P as I've outlined at least have the appearance of being explanatorily useful in a materialistically acceptable way and compatible with the principle of causal closure.

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