

ESSAY

WHAT IS THE EXPLANATORY GAP AND WHAT PROBLEM DOES IT
POSE FOR COGNITIVE SCIENCE? CAN THIS PROBLEM BE SOLVED?

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Introduction:

In this essay I'll explore the answer to the question of what the explanatory gap is and what problem does it pose to cognitive science. I will additionally reflect on whether that problem can be solved.

Firstly, I will show that there are convincing reasons to believe that, although there currently is an explanatory gap, it is not ontological. Hence, I will go on to say that I believe the best position to take is that this problem can be solved and that there is very good reason to believe that solution will be completely physical.

For that, I will start by clarifying the essential concepts, then I will defend my thesis, primarily, by exposing why defending that there is an ontological gap in the world is imprudent and unfounded. Assuming, then, a physicalist perspective, I'll briefly explain why is it that this intuition about the gap is wrong, closely related to why we think that a zombie world could be possible, when it can't. Lastly, I'll expose why we have no satisfactory reasons to believe that we can't understand or solve this problem.

The explanatory gap:

The explanatory gap is a concept advanced by Joseph Levine (Levine, 1993) that pretends to highlight how the physical properties of the mental states leave out the qualitative character of our experiences. The problem can be better understood when considering the intuitive distinction between the physical processes of a brain and the inherent subjective experience that is linked to it. For instance, consider knowing the exact wavelengths that give rise to the colour red and actually seeing red, or knowing how a bat's brain functions and knowing what is like to be one¹. Examples like this one give rise to an intuition that seems to suggest that

¹ Example advanced by Thomas Nagel in his essay "What is it like to be a bat"

there is a significant difference between these two situations, this is, that we can't drive one from the other. Consequently, consciousness does not seem to be derivable from physical facts.

We can look at this gap as ontological, an indicative gap in the world that arises from the fact that there are some properties that can't be derived from physical facts (e.g. consciousness), or as merely conceptual, meaning these sort of questions arise because of our own way to conceptualise consciousness (I will take this position).

Problems it poses for cognitive science:

As, even with neuroscience's recent advances, we seem to lack a compelling theory that explains this difference in totality, the explanatory gap can pose a problem to cognitive science in a number of ways. Firstly, as suggested by Chalmers (Chalmers, 1995), cognitive science can explain how the brain processes information (he calls these the easy problems) but not why these processes are followed by subjective experiences (then called the hard problem of consciousness), this poses a problem to the possible theoretical reach of this science. Secondly, if there are facts that can only be accessed in a first-person experience way, then a methodological problem arises: if all science is based off a third-person perspective how, then, can science even study this kind of processes? Thirdly, if theories of philosophers such as McGinn's (McGinn, 1989) are correct, then the explanatory gap cannot be understood by humans. In that case, cognitive science's efforts towards understanding consciousness seem futile.

Argumentation – Part I:

To defend that there is an ontological gap in the world is, to me, imprudent for two main reasons. (1) The first one arises when evoking experience. Notice that, throughout the history of science, there have been innumerable gaps in research that were thought to be ontological, that were then successfully explained. For instance, Paul Churchland (Churchland, Paul M.,

2013, p. 60) illustrates exactly this when he highlights that once it was thought that light was something completely different from the material world, but scientific advances have proven that intuition wrong. Although, of course, this is no proof that the gap isn't ontological, it is, however, a strong argument against it. (2) Further support for this claim comes from Occam's razor². If we have, so far, explained so many phenomenon assuming a casual closeness of physics, then why should consciousness be an exception? What sort of extra principles, other than physical should guide it? How would those principles work? If the dualist believes these are relevant questions, then, it seems to me, she has the burden of proof and, so far, no satisfactory answers have been brought forward.

To summarise, it seems naïve to assume that the gap is ontological and, additionally, it appears to me that if one were to take that position then one would have to present very convincing proof, which has not happened, so there are not nearly enough reasons to take that position. It is, then, most prudent to adopt a physicalist position and try to understand the explanatory gap from this point of view. I will now do exactly that.

Argumentation – Part II:

For the second part of this paper I will present a possible account, consistent with the physicalist thesis, that explains why there seems to be an ontological gap in the world, when, in fact, there isn't. Since we have agreed that the best stance is to believe that there isn't an actual gap in the world, then the next logical step is to try to explain why is it that our way of thinking about consciousness seems to give rise to so many problems. For that, I will evoke phenomenal concepts.

² Occam's Razor: "a scientific and philosophical rule that entities should not be multiplied unnecessarily which is interpreted as requiring that the simplest of competing theories be preferred to the more complex or that explanations of unknown phenomena be sought first in terms of known quantities", in Merriam-Webster Dictionary

This approach starts by distinguishing physical and phenomenal concepts, it goes on to explain how that makes the gap conceptual, without being incoherent with physicalism. Moreover, I will explain how this way of approaching the problem effectively dismantles both the Zombie Argument and Mary's Problem.³

To start, while physical concepts refer to the ones that can be learnt from a third-person perspective (C-fibre activity), phenomenal concepts are those that can only be known through first-person experience (how C-fibre activity feels to you). As Patricia Churchland pointed out (Churchland, Patricia S., 1996), this does not, in any way, suggest that there are other laws, other than physical, at play here. The phenomenal concepts are the ones we subjectively gain when we activate patterns of our neural structure. In this way, knowing facts about the brain is not the same as being in that state of brain activity.

In fact, this will help us understand what is going on in the Zombie Argument and in Mary's case.

Firstly, in the Zombie argument, we think we can imagine a Zombie because we're misusing the terms. It is not possible to imagine a world where there is c-fibre activation, but there is no phenomenal pain, it only feels possible because we're conceptually separating what is identical. To be clearer, when we think of "c-fibre activation" we're not actually putting ourselves in a brain state where there is c-fibre activity, hence the confusion. Similarly, in Mary's case, she doesn't learn new information about her brain, only learns a new way to access the information she already knew. She had all the physical facts about colour, but only when she saw colour could she be in the brain state that activated her neural patterns correspondent to seeing colour.

³ I assume here the reader knows these cases. Their formulations can be found in Chalmers, *The Conscious Mind* and Jackson, *Epiphenomenal Qualia*, respectively.

Argumentation – Part III:

Having determined that it is most prudent to approach the gap as conceptual and having given a positive account for why that is, we're left with the question of whether this special way we have of thinking about mental concepts implies that we will never be able to fully solve the body-mind problem. I hope to show that we have no reason to think so.

To start, the consequences of accepting the view that understanding the gap is beyond human comprehension seem pessimistic to an extreme. A lot of the research currently being conducted in the field of cognitive sciences would be completely futile. However, there have been many advances in the explanatory power that cognitive science conveys to many phenomenon (even consciousness) and just because a unifying theory hasn't been reached, it seems imprudent to think it won't. This, especially, considering that cognitive science is a relatively new science, and astonishing advances have already been made (Thagard, 2023).

To add on to that, to defend a thesis on the basis of human limitations seems, to me, unconsidered. When presenting his thesis McGinn (McGinn, 1989) compares our supposed limitation to understand consciousness as that of five-year-old to understand Relativity Theory. However, unlike five-year olds, human adults have been complementing their capabilities since the beginning of time: a human can't plant one acre in half an hour, a machine built by humans can; the great majority of humans can't possess the knowledge of 10.000 books, but we have built libraries and the internet; a human has a limitation of weight she can lift, but we have invented drugs that can upper that limit. To follow this, we have been further away from being able to enhance human brain's capabilities in itself, so if that's the only problem stopping humans from understanding this gap, then I say there is no reason to believe they won't.

Lastly, if we are, in fact, biologically limited to never understanding consciousness, then we have no way of proving that we can't do so (the same way a five-year-old can't prove why she can't understand Relativity Theory). So, even if the fact that the position seems to be

imprudent doesn't persuade, I see no point in holding that assumption as true, as it is something we will never be able to prove.

Where does this leave us?

If we have no good reasons to think that we can't ever solve this problem, what does the way we think about consciousness entail in the search for an encompassing theory? It entails that a satisfactory theory will explain how the physical processes in the brain correlate to consciousness and why phenomenal concepts feel special to us. Additionally, it will be able to predict, based on the physical states, what the conscious states are.

Conclusion:

We have seen why it is imprudent to hold that the gap is ontological, such a big assertion goes against all experience of scientific advance and makes very special claims about the nature of reality that have, in my view, not been properly backed up. We should, therefore, hold the belief that the gap reflects something in our way of thinking rather than in the world itself. Following that, we saw how that can be explained in a very satisfactory way by the clarification of what phenomenal concepts are and what role they play on our intuition. In fact, that elucidated our perspective on both the Zombie Argument and Mary's Problem. Lastly, it became clear that it is also imprudent to think that the gap is beyond our understanding. In the end, we have been able to conclude very briefly what to expect in a good theory of consciousness.

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