On the hard problem of consciousness: Why is physics not enough?

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Abstract

I present 3 arguments that the laws of physics, by themselves, cannot explain the origin of phenomenal consciousness. First, physics investigates the objective, while consciousness is subjective. Second, the laws of physics are syntactical, while consciousness is semantic. Third, the concept of consciousness cannot even be defined in terms of physics.

1. Introduction

The (in)famous hard problem of consciousness (Chalmers, 1996) is the idea that the problem of explaining subjective phenomenal consciousness (also known as qualia) is a much more difficult problem than scientists usually think. According to this idea, even if cognitive sciences can explain how the brain works, it is very unlikely that it will explain why the brain has subjective experiences.

Not surprisingly, this idea is much more popular among philosophers than among scientists. While many philosophers of mind find this idea very attractive, or at least worthwhile of a serious consideration, most scientists seem to either ignore it or dismiss it with a contempt.

In my opinion, scientists ignore or dismiss it not because there is a good scientific evidence that the idea is wrong, but because the idea is not explained in a form which most scientists would find convincing. With a motivation to alleviate this deficiency, in this paper I defend the same basic ideas as those in (Chalmers, 1996), but I use different arguments, which, hopefully, might better resonate with typical reasoning of scientists. I present my arguments as three short scientific essays, each of which presents some arguments that subjective consciousness cannot be explained by an objective science such as physics.

2. What is hard about the problem of consciousness?

Before I start to deal with the problem of consciousness, let me first deal with another concept, which will later serve as an example. Let me deal with the concept of *complexity*.

What is complexity? Can complexity be scientifically defined? Can physics explain complexity? Can complexity be measured?

My answer is – yes and no.

I have two answers because complexity has two components: objective and subjective. The subjective component is when we look at something and have a feeling that it looks "complex". The objective component is, for instance, when we quantify complexity by entropy (e.g. algorithmic entropy), which is a measure of complexity that can be computed and measured (Mitchell, 2009).

The key assumption (which I cannot prove but I take it for granted as something that seems obvious to me) is that physics (or some similar science) can define, explain and measure only the objective component of complexity. The subjective component cannot be defined, explained or measured by objective science such as physics.

But complexity is just one of many examples. There are many other concepts (e.g. the concept of life, the concept of justice or the concept of beauty) which have both an objective component and a subjective component. Physics, in general, can define, explain and measure only the objective component. The subjective component is not a subject of physics and similar sciences.

Now let us turn our attention to the concept of consciousness. Just like many other concepts, consciousness also has two components: objective and subjective. By that criteria, there is nothing special about consciousness. I believe that physics, in principle, can define, explain and measure the objective component of consciousness. But the point is that it cannot do that with the subjective component.

But if this is so, then what makes the problem of consciousness harder than other problems in science?

The answer is that the problem of consciousness is not harder. Instead, it is more important!

Why more important? Here is why. In general, the problem of understanding the subjective component is about equally hard for all the concepts that have such a component. A man would like to understand the subjective components of all these concepts, but he cannot understand them by physics or similar sciences. This is what makes those problems *hard*. But then a man can try to think like this: If I cannot solve all these hard problems, can I at least reduce all them to only *one* hard problem? For it is easier to deal with only one hard problem than with many of them. So, is there one key hard problem, such that all other hard problems can be reduced to that one key fundamental hard problem?

The answer is that there is. This is the so-called *hard problem of consciousness*, that is, the problem of subjective component of consciousness. All the other problems of subjective components of various concepts can be reduced to the problem of subjective component of consciousness.

How do I know that subjective components of all those concepts can be reduced precisely to the subjective component of consciousness, and not to a subjective component of something else? The answer is obvious. This is because, in general, the subjective component of any concept is a result of our subjective consciousness about that concept. Without subjective consciousness there would be no subjective concept of justice, there would be no subjective concept of beauty, etc. (Someone might object that without subjective consciousness there would be no even objective concepts. But such objection, if correct, would only reinforce my argument that subjective consciousness is something very important and fundamental.) The subjective consciousness, therefore, is what makes subjective concepts subjective. All what is subjective, is subjective precisely due to our subjective consciousness. Therefore, if there is something to which all subjectivity can be reduced, then it is the subjective consciousness.

This is why the problem of subjective consciousness is so important and fundamental.

To conclude, all the above can be summarized into 3 basic theses:

1. Some concepts have both an objective and a subjective component.
2. The subjective component cannot be studied by physics and similar sciences.
3. The origin of all subjective components lies in the subjective component of consciousness.

From those 3 theses, the two main conclusions can be derived:

a) From 3. it follows that the problem of subjective consciousness is important and fundamental.
b) From 2. it follows that the problem of subjective consciousness is hard because it cannot be solved by physics and similar sciences.

3. A refined Chinese-room argument

In (Searle, 1997), Searle has presented a refined compact version of his famous "Chinese-room" argument. His refined compact version of the argument is this:

1. Programs are entirely syntactical.
2. Minds have a semantics.
3. Syntax is not the same as, nor by itself sufficient for, semantics.

Therefore programs are not minds. *Q.E.D.*

Concise, clear, and logically sharp! In other words - brilliant!

Now I would like to push forward this style of reasoning by myself, to show where that leads us. First, let me prove an auxiliary lemma:

1. Physical laws can be faithfully represented by a program.
2. Programs are entirely syntactical.
3. Anything which can be faithfully represented by something entirely syntactical is entirely syntactical itself.

Therefore physical laws are entirely syntactical.

Next, from this auxiliary lemma let me prove another lemma:

1. Physical laws are entirely syntactical.
2. Brains are entirely based on physical laws.
3. Anything entirely based on syntactical laws is entirely syntactical itself.

Therefore brains are entirely syntactical.

Finally, from the last lemma, my main theorem is straightforward:

1. Brains are entirely syntactical.
2. Minds have a semantics.
3. Syntax is not the same as, nor by itself sufficient for, semantics.

Therefore brains are not minds. *Q.E.D.*

What this argument shows is that, if one thinks of brain as a physical object entirely based on physical laws, then such a view of the brain cannot explain the mind. To explain the mind one needs something more, something beyond the laws of physics.

4. Definition of consciousness vs axiom of consciousness

By thinking about what exactly is missing in the existing theories of consciousness, I have noticed that it is the most important thing – the *definition* of consciousness. How can any theory explain the emergence of consciousness, if it did not first defined consciousness the emergence of which needs to be explained?

Someone will say that everybody knows what is consciousness, so that this concept does not need a special definition. But this is not really so. Even though everybody knows what is consciousness in the sense that he or she experienced it, for the purpose of scientific research of consciousness such a knowledge is not adequate. If one wants consciousness to be scientifically explained, first it needs to be scientifically defined. For instance, if you want to derive consciousness from the laws of physics, you must first define consciousness by using known terms from physics. Likewise, if you want to derive it from the principles of cybernetics, you must first define it in terms of cybernetics. A serious deficiency in the existing theories of consciousness (that I have seen) is that consciousness is not precisely defined at all. Neither in physical terms, nor in cybernetic terms, nor even in psychological terms. It is not precisely defined at all.

By further thinking about that problem I have concluded that the hard problem of consciousness is precisely the fact that consciousness is hard to define. Whatever definition I try, I either

- find that I must use an equally vague word (e.g. to define "consciousness" I use an equally vague word "aware"), or
- arrive at a definition that does not really correspond to the phenomenal subjective consciousness that I wanted to define.

Eventually I concluded that the concept of consciousness must be a *primitive* concept which cannot be defined. And what cannot be defined, cannot be explained. It must be accepted as such, as something so fundamental that it cannot be derived from something even more fundamental.

But consciousness is not the only such concept. Such primitive concepts which cannot be defined exist even in the most exact science – mathematics. For instance, the concept of "set" is one such concept, the meaning of which in mathematics is accepted intuitively, without giving a rigorous definition (Halmos, 1974). Besides being primitive, the concept of set is also fundamental, in the sense that all other branches of mathematics can be formulated as special cases of set theory.

Let me emphasize one particularly important consequence of the fact that set in mathematics is not defined. The important consequence is that no mathematician attempts to *explain* the origin of sets or to *prove* that sets generally exist. Likewise, if consciousness is also one such primitive concept, then it also should not be tried to be explained or proved. The best one can do is to *include* consciousness into a complete scientific theory of mind (or of nature).

In the set theory it looks like this. After an intuitive explanation of the concept of set (but without a rigorous definition of set) one gives a list of several basic axioms (Hrbacek and Jech, 1999), all of which sound plausible, but neither of which can be proved. Only after giving those axioms one can start to prove some claims about sets. (The claims that are proved are called theorems.)

The fundamental laws of physics, which cannot be derived from anything more fundamental, also have a form of axioms. So if physics has its axioms, I do not see why a theory of consciousness could not introduce its *own* additional new axioms which do not exist among the axioms of physics. In fact, the more I think about that, the more it looks plausible to me that introducing (at least) one such axiom is – necessary. I do not think that consciousness can be derived from the laws of physics, as I already said, simply because consciousness cannot even be defined by using only the concepts from physics.

When I think that way, it seems to me that the hard problem of consciousness is no longer so hard as it used to be. It is hard (actually, unsolvable) only if one stubbornly insists that consciousness must be derived from already existing axioms, such as those of physics. Once one realizes that one can (and must) step out from the framework of physics and add at least one axiom of consciousness that cannot be found in the known laws of physics, it seems that it should no longer be so prohibitively hard. If it is considered that the theory of consciousness should be formulated in a similar way as theories in physics and mathematics, I think that one such axiomatic approach should be the right way.

Of course, it does not mean that such an axiomatic approach would be easy. If you want to ask me what such an axiom of consciousness would *be*, I have to confess that I don't know (yet). If you have any good idea, please let me know!

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