The Explanatory Gap: 30 years after

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Abstract

Thirty years ago, in a now classic paper, Joseph Levine (1983) explicitly outlined the difficulties physicalism encounters when confronting the qualitative aspect of mental states. In the present article, I wish to present the main directions materialists took in responding to these difficulties, arguing that the most popular contemporary theories of consciousness avoid confronting directly the “hard problem” of phenomenal experiences (Chalmers, 1995). One possible solution, of course, is to take conscious experience as a fundamental brute fact of the universe we inhabit, but in doing so the boundaries of psychology become ill defined and unclear.

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1. Introduction

Why is there a universe rather than nothing? What was there before the universe began? What is the meaning of life? These questions have fascinated philosophers, scientists and lay people alike for hundreds of years and will continue most probably to excite our minds for hundreds of years to come. One particular and important question, however, is missing from the previous list, namely - the central, intractable problem of consciousness. The mind-body problem, as it came to be known in the philosophy of mind literature, is at its core a problem of identifying an empirically adequate meeting point between the physical extensions of our brains and bodies and the apparently non-physical mind. To use Willfrid Sellars famous distinction (Sellars, 1962), there seems to be an irreconcilable

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conflict between the Manifest Image of colours, sounds, smells, desires and beliefs and the world of atoms, molecules and fields described by modern physical science. Indeed, while we frequently think of the world in terms of intrinsic qualitative experiences, viz. the ineffable “what is like” (Nagel, 1974) quality of “phenomenal consciousness” (Block, 1995), science tells us that the fundamental ontological bricks of the universe are quarks, leptons and their antiparticles, along with force carriers, all trapped together in the “cement” of causality. Needless to say, in such a world, there is no room for mental properties, as everything ultimately depends on the microphysical structures and dynamics of purely material entities.

Empirical psychology, as it evolved in the 20th century, especially after J.B. Watson’s famous “Behaviourist Manifesto” (Watson, 1913), has largely ignored deep metaphysical questions about the mind, leaving such issues open to debate only to philosophers or neuroscientists. The “mechanical mind” thesis, as Tim Crane (2003) called it, crystalized within cognitive psychology in the late 1950s, continuing Thomas Hobbes perspective that “life is but a movement of limbs” (Hobbes, 1901, p.1) and all we have to do in order to understand the universe is find the correct law-like relations that hold between entities. Fueled by advancements made in the realm of electronics and computer technology, cognitive psychology then postulated that what the human brain does is essentially a process of systematic manipulation of symbols (i.e. functioning at the level of syntax) similar to the workings of a Turing Machine. While this perspective has come under attack in the last three decades (e.g. Block, 1978; Searle, 1980), the computational theory of the mind remains today the dominant paradigm, although it is quite clear that some aspects of the mind, such as qualitative experiences (i.e. qualia), resist functional definitions and mechanical understanding.

After this somehow lengthy introduction, I maintain that my purpose in this paper will be twofold: first, I wish to provide a short review of the philosophical positions that have been advanced by materialists in the last three decades in order to resolve (or dissolve) the phenomenal consciousness problem. Secondly, I wish to offer a brief sketch of an argument of why most research programs preoccupied with the central issue of consciousness do not actually confront the problem directly. If we take psychology to be a science concerned only with the implementation level of the mind, as most cognitive scientists certainly take it, this may not have profound consequences. However, if we consider phenomenal qualities and subjectivity as a mark of the mental, it follows that we have no good explanation of why we are conscious entities and not simple mechanical automata or, to use the jargon of analytical philosophy, why we are not “zombies” (Chalmers, 1996). Structurally, I will begin this inquiry by discussing what the “explanatory gap” (Levine, 1983) means and why the phenomenal character of experience (qualia) is the central point of the debate.

2. The Explanatory gap

Three decades ago, in a now classic paper, Joseph Levine (1983) introduced the so-called “explanatory gap” in order to name the difficulties materialist metaphysics like physicalism encounter when facing the qualitative aspect of mental states. The thing that made his paper the more important is that Levine himself was a materialist and after exposing why functionalist positions won’t solve the issue either, he concluded that most physicalists will probably retreat to a type-identity theory when confronting such issues. However, even if “some psycho-physical identity statements are true, we can’t determine exactly which ones are true” (Levine, 1983, p.359). Ultimately, Levine’s highly problematic epistemological argument leads to an unhappy consequence: the physicalist can either eliminate qualia (i.e. intrinsically qualitative ineffable mental states) altogether or face defeat (Levine, 1983).

Barring this in mind it is natural to ask ourselves whether or not some progresses have been made in the last 30 years in respect to this highly problematic issue. The blunt and short answer, I think, is definitely “no”. The explanatory gap, slowly transformed in what David Chalmers called the “hard problem of consciousness” (Chalmers, 1995) and it is here to stay with us, as no current physical or biological theory can even attempt to solve it. With this being said, in the following sections I will try to examine why we haven’t abandoned our hopes yet and why I believe many materialist scientists and philosophers are still optimistic about finding an answer. As space is not sufficiently generous here for a comprehensive review of the literature, I will attempt only to offer a brief outline of the most popular directions and research programs that tackled the problem in the last three decades, underlying the fact that not even current endeavours aim directly at the heart of the issue.
3. Responses to the explanatory gap problem

Unlike some of other intractable philosophical questions, the problem of phenomenal consciousness seems, at least prima facie, addressable by science. To give a more articulate description, conscious mental events are implanted in the space-time continuum, making them possible objects of inquiry. By contrast, science can never investigate what was before the Big Bang, nor do we have the necessary resources to recreate those conditions.

If we look back in history we can observe that most of the findings that helped in exorcising Descartes’s “ghost in the machine” (Ryle, 1949) came mainly from empirical research investigating brain lesions, anaesthetics and various drug effects and not from a priori philosophical arguments. Results such as those gathered by Wilder Penfield (Penfield & Rasmussen, 1950), coupled with a still growing number of case studies on neurologically impaired persons, makes physicalism a highly attractive metaphysical thesis for our current age. Still, consciousness remains a very elusive and mysterious phenomenon as we have no idea why some particular neural activation pattern leads to a specific qualitative experience and not another one, nor why a qualitative experience has to exist at all.

In confronting such perplexing problems, some physicalists like Colin McGinn (1989) have advanced the cognitive closure thesis, believing that our intellects are simply unable to understand the psychophysical connections that lead to consciousness. This is to say that our perceptual and introspective capacities cannot penetrate the noumenon and no increase in frontal lobe volume or general intelligence can remediate the situation (McGinn, 1989). While McGinn remained undecided on the question if this closure is relative or absolute, he nonetheless expressed much pessimism about our future capabilities of solving the mind-body problem without having minds which operate independently of perceptive and introspective faculties (McGinn, 1989). Needless to say, these and similar conclusions advanced by like-minded philosophers (e.g. Nagel, 1974) have not been met warmly by some physicalists. In this respect, Daniel C. Dennett became probably the most vocal enemy of the “new mysterianism” movement, as Owen Flanagan (1991) called it.

An intellectual descendent of Gilbert Ryle, Dennett took the eliminative route regarding qualia (Dennett, 1991, 1993), seeing the concept as “the last ditch defence of the inwardness and elusiveness of our minds, a bulwark against creeping mechanism” that we employ in confronting the physicalist scientific picture (Dennett, 1993, p.386). Indeed, in defining qualia as ineffable, intrinsic, private and directly apprehensible conscious mental states (Dennett, 1993), Dennett is right in saying that there may be no qualia. However, this definition is extremely restrictive and the original concept sufficiently unclear to allow straw man arguments (Crane, 2000). To give just some examples, the term “qualia” (singular “quale”) was introduced by C.I. Lewis in 1929 to refer to the properties of sense-data (Crane, 2000). More recently, philosophers as diverse as Nagel (1974) and Block have used it to refer to the non-representational intrinsic properties of mental states. Sensu lato, it is safe to say that the concept refers to the phenomenal character of experiences, the “what is like” feel that we know so well. At this point, it is probably relevant to underline the fact that most philosophers today preoccupied with the mind-body problem are physicalists in one way or another. Not all, however, are reductive physicalists. To make the distinction clearer, for a reductive physicalist all mental states are physical-functional states of the brain and there is no ontological gap between mind and matter, although there might be an explanatory one. Within this broad class, a particular group, called Type-A materialists by David Chalmers (2003), deny even the existence of an epistemic gap. There is nothing more to consciousness, so they say, than explaining functions. All mental processes, conscious and unconscious, can thus be broken down to simpler and simpler processes until we reach the level of mindless cellular automata (Dennett, 1991). The other route taken by materialists in the last two decades was to advance the idea that what prima facie looks like a conflict between third-person scientific descriptions and first-person subjective experiences actually derives from the way we use phenomenal concepts. The locus classicus here is Brian Loar (1990) and his seminal treatment of conceptual dualism. Unfortunately, this approach does not close the epistemic gap but only explains why there’s a gap in the first place. Like qualia, the notion of consciousness is similarly used sometimes in a very lax manner (Block, 1995). According to one operationalization, for example, in order to be able to say that an organism or (more broadly) a system is conscious it must be able to process outside inputs and transform them in outputs in an appropriate fashion. This definition, of course, is very broad and “liberal” and cannot lead us very far.
in finding out if machines are conscious or not. Another definition, operationalized through the famous Gallup test, emphasizes self-awareness. Adopting this position, however, amounts to excluding almost all animals from our class of conscious beings. If the Gallup mirror test is really a measure of self-awareness remains an open issue (see for example Rochat & Zahavi, 2011), more so when we know that small children and people with prosopagnosia do not recognize themselves in the mirror. Still, our intuitions lead us to think that both small children and neurologically impaired individuals have what Ned Block called “phenomenal consciousness” (Block, 1995).

Despite the problems surrounding the self-awareness as consciousness perspective, this approach has been another popular path taken in the past three decades. Briefly sketched, higher order approaches were born in the late 90s emphasizing the intuition that for a mental state to be conscious it has to be the object of some higher-order “meta-psychological” mental state. Higher Order theories (HO) come in many shapes and varieties, viz. higher order of thought (e.g. Rosenthal, 2005), of perception (Lycan, 1996) or of experience. What all these theories have in common is the idea that phenomenal consciousness can be explained in terms of intentionality – namely, the intentionality of a higher-order mental state. More explicitly, a mental state becomes conscious when two unconscious mental states are related in such a way that the higher order one represents the lower order one. Reformulating the explanatory gap in terms of intentionality then comes down to solving the problem of representation, an issue addressable, at least in theory, by naturalistic evolutionary theories of mental representations (e.g. Dretske, 1995), although not all philosophers consider this to be the case (e.g. Lycan, 2009, n.8). Higher Order theories of consciousness have been the target of many critical arguments in the last decade. Without having the opportunity to go into details here, I consider Block’s remark that the main issue of HO approaches is thinking that putting together thought, intentionality and representations, namely “ingredients that are not in themselves conscious” (Block, 2009, p. 1114), would somehow lead to consciousness, is right to the point. I will refrain from saying more on this issue now, but I will come back to it at the end of this paper.

As we have seen, most responses coming from the materialist camp to the explanatory gap problem have revolved either around rejecting the concept of qualia altogether or around avoiding a direct collision with the concept. Unfortunately, the tactic cognitive science took has largely been the same with no real progress done in this field on the issue of consciousness. As such, only the neurobiological approach seems to acknowledge that there is indeed an explanatory gap that needs to be addressed in an empirical manner (Block, 2009). In the last section of this paper I will try to offer a brief sketch of an argument of why this perspective might ultimately be futile.

4. Conclusions: consciousness and function

Reducive naturalism is an extremely intuitive and powerful thesis. Marching along with science, we might be tempted to think that consciousness or, at least, a form of proto-consciousness is not a fundamental property of the universe. Indeed, it is hard to think of quarks and leptons as having minds or even experiences. And still, naturalism asks us to consider that our minds are natural processes which appeared in the course of evolution. The question here is how far down the phylogenetic tree we have to go in order to find qualia and, possibly more important, how we could know if an organism has phenomenal experiences. An important distinction introduced by the great biologists Ernst Mayr (1963) is that between proximate and ultimate explanations. Strictly speaking, phenomenal consciousness is not a type of behaviour, nor is it a trait that can be investigated directly. Some neuroscientists, like Rudolfo Llinás, however, consider qualia to be “primordial in the global organization of nervous system function” (Llinás, 2002, p. 203), arising from properties of single cells and exhibiting characters similar to fixed action patterns (Llinás, 2002). If this idea leads anywhere is not up for philosophical debate but for empirical science to settle. More important for our current inquiry is the manner in which philosophers and scientists alike try to put phenomenal consciousness in evolutionary perspective.

Using our intuitions it is not difficult to imagine different plausible “just-so” stories about the functions of consciousness. As such, we can give many ultimate explanations of why organisms that had internal representations of their environment were favoured by natural selection. On the other hand, we have no plausible explanation of why these representations have a “raw feel” to them (if they do have at some simple level). Following Elliott Sober’s evolutionary treatment of the problem of other minds (Sober, 2000), it is perhaps not a bad heuristic to attribute similar mental states to entities that exhibit homologous behavioural patterns. But the further we go down the phylogenetic tree, the less similar organisms become. What biology lacks, and this fact has been repeated ad
nauseam by dualists and pan experientialists alike, is a proximate explanation of phenomenal consciousness. Looking at molecules, cytoskeletons, microtubules and other fine-grained structures of the cell does not tell us anything about how that cell “experiences” the world. In fact, our inability to know for sure if primitive organisms have some kind of proto-qualia draws explicitly the limits of reductive physicalism. The natural solution, of course, would be to consider conscious experience as a brute fact of our universe. If we adopt such a position, however, psychology might not turn out to be a higher-order science after all.

References


