

# MODAL ARGUMENTS AGAINST PHYSICALISM IN VIEW OF SCIENTIFIC FINDINGS CONCERNING PAIN

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## ABSTRACT

I analyse Kripke's modal argument against the mind-brain identity theories. Specifically, he argues against the identity between pain and C-fibres simulation by pointing out the difference between this identity claim and the theoretical identifications, such as 'Water is H<sub>2</sub>O' and 'Lightning is a motion of electric charges'. Kripke's argument relies on the assumption that the experience of pains is a simple and homogenous phenomenon, but scientific research shows that it is in fact a quite complex one. We can distinguish at least three components: sensory-discriminative, motivational-affective and cognitive. This discovery makes it possible to reject Kripke's argument, but it also uncovers a major flaw that is common to all modal arguments against physicalism. They proclaim to answer the fundamental question about the nature of our world by relying on our powers of imagination and without having the relevant factual knowledge.

## KEY WORDS

physicalism, modal argument, pain

## CLASSIFICATION

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## **INTRODUCTION**

Modal arguments are quite common in philosophy. We often reason what is necessary, possible, or impossible. For instance, one famous example from the history of philosophy is Anselm's argument for God's existence. Anselm relies on two claims, first, God is a being than which a greater cannot be conceived, and second, necessary existence is perfection. Often in modal arguments it is also talked about what is conceivable, and conceivability is understood as a guide to possibility. An especially common strategy is to employ such arguments to establish claims of identity and distinctness. In this way Descartes argues for a dualistic solution of the mind-body problem. He argues that since he can clearly and distinctly conceive the mind as being apart from the body, mind and body are possibly distinct. However, possible distinctness implies actual distinctness since nothing can exist without itself. Descartes thus concludes that mind (*res cogitans*) and body (*res extensa*) are two distinct entities and opts for substance dualism.

The mind-body problem is certainly still with us, but while in Descartes' times dualism was the prevalent view, today most philosophers defend the materialist or physicalist solution to the problem. However, it does not suffice to proclaim that the world is wholly physical – one must also explain how mental phenomena can be explained in physical terms, because at first sight humans clearly possess two distinct kinds of properties. Physical properties, such as weight, size or colour, are properties that natural sciences attribute to various objects, while mental properties, such as being conscious of, being sad, being in pain or having a belief, are typically attributed only to humans (and some to certain animals). While physical properties are public, i.e. in principle observable by anyone, mental properties are private to the subject that possesses them. For example, I can feel my pain, while everybody else can only infer from my behaviour that I am in pain, but cannot feel it themselves.

Physicalists insist that this difference is only apparent and that mental phenomena can be explained in physical terms, but there are many strategies of how to achieve this. One physicalist view – quite popular in the 1960s – is the mind-brain identity theory which maintains that mental states are identical to brain states, by which they mean a true identity, not merely a correlation [1-3]. For example, identity theorists claim that an experience of pain is merely a brain process. In 1970 S. Kripke presented a modal argument against the mind-brain identity theories, which was a direct consequence of his views on proper names and natural kind terms [4].

Mind-brain identity theorists as well as Kripke in his modal argument use pain as an example. In the decades since their debate took place, pain science has progressed considerably. Therefore, it is worth looking into whether this improved scientific understanding of the nature of pain has any bearing on Kripke's modal argument. I am building on my talk at the 19<sup>th</sup> International multiconference – IS 2016 [5], in which I outlined my findings. Here I provide a more detailed account and argue that this analysis also reveals a major flaw that is common to every modal argument against physicalism, for example, David Chalmers' zombie argument against physicalism.

## **KRIPKE'S MODAL ARGUMENT AGAINST THE MIND-BRAIN IDENTITY THEORY**

The identity theory holds that mental states and processes are identical to brain states and processes. Accordingly, there is only one state – the brain state, but it seems to us there are two distinct states, apart from the brain, there is also the mental state, because these identities are not necessary, but contingent. This means that we need to find out that a particular identity holds, or more specifically, it is the task of science to discover them, which is the reason why it appears that there are two distinct states and not only one.

At the time it was typical to understand necessity linguistically: a sentence is necessary if its truth is determined solely based on the meaning of the words it contains. For example, a sentence 'Bachelors are unmarried men' is necessarily true, because the meaning of the word 'bachelor' is 'an unmarried man'. Accordingly, in the case of necessary identities, their truth is known *a priori*, one only needs to know the meanings of the relevant words. However, in the case of contingent identities, their truth cannot be ascertained from linguistic meanings, but only discovered *a posteriori*. For example, the truth of the sentence 'Lightning is a motion of electric charges' cannot be determined based on meanings, since 'lightning' does not mean the same as 'motion of electric charges'. The fact that the perceived lightning is a motion of electric charges was discovered by scientists based on theory and experiments. Consequently, the way we talk suggests we are dealing with two distinct things, but science tells us it is one and the same thing we refer to with two distinct words. And the same applies to the case of mental states. 'Having a pain' does not mean the same as 'C-fibres firing', but scientific findings tell us otherwise. The apparent difference is therefore the consequence of words having different meaning, but nonetheless both refer, in fact, to the same thing.

The contingent nature of identity statements also makes it possible to maintain that in some other circumstances a mental state could be identified with some other physical state. In this way, Lewis, who defines the concept of pain as the concept of a state that occupies a certain causal role, can claim that, in the case of human pain, this state is that of C-fibres firing, while in the case of Martian pain, it is some other state, which occupies the relevant causal role [6; p.124].

But Kripke forcefully rejects the idea of contingent identities. His famous example is about the identity statements involving proper names, which are according to him rigid designators. That means that a name in every possible world designates the same object. Take the example of Hesperus and Phosphorus. Ancients named the brightest star in the evening Hesperus and the brightest star in the morning Phosphorus, but they later discovered that they are actually one and the same celestial body, namely Venus. Accordingly, the identity statement 'Hesperus is Phosphorus' is true. But since this identity was discovered by Babylonian astronomers empirically, it is an *a posteriori* truth. However, it is not contingent, as identity theorists would have it. 'Hesperus' and 'Phosphorus' are names that refer in this world and consequently in every possible world to planet Venus. Therefore, identity statements between two names, when true at all, are necessarily true. And if they are false, they are necessarily false.

Kripke uses the same strategy in the discussion on names of natural kinds, by which he means terms for natural kinds of stuff, such as water and gold, terms for natural kinds of things, such as the tiger, and for terms for natural phenomena, such as heat or lightning. These terms are rigid designators, too. Accordingly, they designate the same kind in every possible world. Relevant for this discussion is his treatment of theoretical identifications, such as 'Lightning is a motion of electric charges' and 'Water is H<sub>2</sub>O'. Such identity statements are, as in the case of proper names, if true, necessarily true, and if false, necessarily false.

However, these identifications are not known *a priori* since, for example, it is not part of the meaning of 'water' that water is composed of H<sub>2</sub>O. Originally, we identified water, or fixed the term's reference, by its manifest properties, such as its characteristic feel, appearance, and so forth. As Kripke says, we identified it with the help of its contingent properties. But later scientists discovered water's chemical composition, thus discovering its essential property. Now, while in some other possible world water will lack all manifest properties we initially identified it by, there will be no possible world in which water is not composed of H<sub>2</sub>O. Scientists discovered water's essence and therefore 'Water is H<sub>2</sub>O' expresses an *a posteriori* necessary truth.

The same is true of the ‘Lightning is a motion of electric charges’. If it is in fact true that lightning is a motion of electric charges, then it is necessarily true. In general, theoretical identifications are necessary, if true at all, and science is discovering the true essences of natural phenomena, substances and species.

If Kripke’s analysis is correct, then identity theorists cannot claim that pain is contingently identical with C-fibres firing, and the only path open to them is to maintain that the identity is necessary. But Kripke further argues that the identity theorists in the case of mental-physical identities cannot explain away the apparent contingency as it is the case with other theoretical identifications. This is, according to him, proof that they are not really identities, and concludes that mind-brain identity theories are false. Let us look at his argument a bit more closely.

Identity theorists differentiate between at least two kinds of identifications, namely between two particular states and two types of states. In the first case we speak of token–token identity and in the second case of type–type identity. Suppose that I am having a pain in my right shoulder at this moment. A token–token identity theorist would maintain that this particular sensation of pain I am experiencing is identical to a particular physical state occurring inside me, while a type–type theorist would make a more general claim, proclaiming the identity between the two state-types, namely between a mental state of having pain and a physical state of C-fibres firing. Kripke considers both versions, but he mainly focuses on the type–type identity theses, since they best correspond with the theoretical identifications discussed previously in the text.

While these identifications are necessary, the fact that they are knowable only *a posteriori* gives them an appearance of contingency. One way to explain this illusion is by noting that we usually fix the reference of the term by some contingent marks of the object or phenomenon. In the case of water, we proclaim that water is transparent, an odourless liquid found in rivers and lakes around here which quenches thirst. Since nowhere in this definition its chemical composition is mentioned, it is easy to come to the wrong conclusion that water could have been composed, say, of XYZ. This explains why necessary *a posteriori* truths on the surface appear to us contingent. Only when we note that they express identities of objects (‘Hesperus’ and ‘Phosphorus’ are both names of planet Venus), the very nature of substances (water is composed of H<sub>2</sub>O) or phenomena (lightning is a motion of electric charges), do we realize that they are necessary and that it is not the case that Hesperus could not have been Phosphorus, water could not have been composed of H<sub>2</sub>O, and lightning could not have been a motion of electric charges.

The type-type identity theorist, on the other hand, cannot in such a way dispel the supposed illusion of contingency. In the case of the identity of pain with C-fibre stimulation, we would need to show that the reference of pain is fixed by some of its accidental properties, which makes it possible for us to miss the fact that it is essentially C-fibre stimulation. This would explain why we are at first prepared to agree that pain could have been something else than C-fibre stimulation, but then we think better of it after we are informed that the true nature of pain is C-fibre stimulation. However, Kripke continues, pain ‘is not picked out by one of its accidental properties; rather it is picked out by the property of being pain itself, by its immediate phenomenological quality [4; p. 152]. Pain is picked out by its essential property, by its phenomenal feel, which fixes the referent of ‘pain’ as well as pain itself. There is no intermediary as in the case of ‘Heat is molecular motion’, where the sensation of heat is an intermediary between the external phenomenon and the observer. From this it follows that the appearance of contingency cannot be dispelled because it is not a mere appearance. Therefore, if we can imagine a situation in which pain is being felt without a stimulation of C-fibres, or a situation in which a stimulation of C-fibres exists without being felt as pain, then we must conclude that pain and C-fibre stimulation are two distinct things and that the identity thesis should be rejected. Pain is not identical to C-fibre stimulation.

In this short presentation of Kripke's modal argument against the mind-brain identity theory I left out many details and I did not question any of his claims since my aim here is not to assess the strength of the argument as it is, but rather to determine whether a better scientific understanding of pain has any bearing on the argument.

## RELEVANT SCIENTIFIC FINDINGS ON PAIN

Traditionally it was thought that pain is an injury-produced response. In the so-called specificity theory of pain, first, injury or some other somatic pathology activates pain receptors, and then the message is conveyed via specialized fibres directly up the spinal cord to the pain centre in the brain.

As Aydede notes [7; p.31], it became clear by the 1960s that observed facts about pain could not be accounted for on the basis of such a simplistic theory. One problem was the high variability in the connection between nociceptive stimuli and the pain experience. For example, the same stimuli can elicit pain of widely different quality and intensity in different people as well as in the same person at different times. Another unexplainable data came from the dissociation effects, which were exhibited, for example, by patients who underwent prefrontal lobotomy, or cingulotomy. These patients reported that they were in pain; they could recognize its location, intensity and so on, but they were not bothered by it and did not behave like people normally do when in pain. In other words, the unpleasantness of pain was removed or reduced, while its sensory-discriminative aspect remained intact. Pain asymbolia presents an especially strong kind of dissociation, since patients do not react even to momentary pains like pinpricks, cuts or burns, and do not find any of it not in the least bit unpleasant. This suggests that phenomenological components of pain experience can come apart, which is difficult to explain when pain is connected with a simple, straightforward transmission from the place of injury to the brain.

The high variability problem was solved in 1965 when Melzack and Wall proposed the gate-control theory [8]. According to it, noxious stimuli from the peripheral nociceptors are carried to the spinal cord through two types of fibres, faster (A-delta fibres) and slower (C-fibres), while the amount of nerve-impulse transmission from the periphery to the spinal cord transmission cells is controlled by the modulatory gating mechanism, which results in modulated output being transmitted to higher brain structures. Further research revealed the complexity of modulatory mechanisms and the important role that the brain plays in this activity through the descending pain-control pathways. All this explains the high variability in the link between the stimulus and the pain experience. And in 1968 also data gathered from the disassociation effects was accommodated within the gate-control theory when Melzack and Casey postulated multiple parallel central processing systems, which are selectively associated with the sensory-discriminative and motivational-affective aspect of pain experience [9]. Later research confirmed their hypothesis that functionally distinct central systems correspond to phenomenologically distinct and apparently dissociable components of pain experience. At least one other such component is a cognitive-evaluative one.

In this new model, pain is allowed to be a subjective experience and is no longer explained in terms of behavioural responses to noxious stimuli. And the key role in this model is given to the brain which, as Melzack nicely puts it, creatively transforms 'patterns of nerve impulses into the perceptual qualities, emotions, and meanings that compose the stream of subjective experience' [10; p.3].

The new, more complex understanding of pain is also captured in the definition of *The International Association for the Study of Pain* according to which pain is '[a]n unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage' [11].

On the one hand, pain is a sensory experience since it is a sensation in a part or parts of the body, namely we perceive a tissue damage or potentially damaging condition. But on the other hand it is also an emotional experience since it is always unpleasant. Pain scientists go on to point out that they do not want to tie pain to the stimulus. As they say, ‘activity induced in the nociceptor and nociceptive pathways by a noxious stimulus is not pain, which is always a psychological state, even though we may well appreciate that pain most often has a proximate physical cause’ [11].

The emphasis is therefore on the subjectivity of experience and not on its supposed physical causes. Moreover, the experience is recognized to be multidimensional. Scientists recognize sensory, motivational (affective) as well as cognitive components of pain experience.

## **IMPLICATIONS FOR KRIPKE’S MODAL ARGUMENT**

In general, philosophers talking about the mind-body problem and using pain as an example, tend to mention C-fibres as a physical mechanism that ‘accompanies’ the subjective experience of pain. As we know, C-fibres are not the only fibres that respond to noxious stimuli, and there are many other mechanisms that participate in the processing of noxious stimuli. However, the mind-brain identity theory was popular in the 1950s and 1960s when pain researchers only started to discover the complexity of ‘pain’ mechanisms, so it would be unreasonable to expect a more detailed explanation of relevant mechanisms. Still, it seems a bit funny that the mind-brain identity theorists proclaim mental states to be identical with brain states, but then identify pain with C-fibres which are not even part of the brain.

Many find this simplistic talk of philosophers of mind offensive to science. For example, Nikola Grahek in his book [12], which mainly focuses on pain asymbolia and what lessons we can learn from the complete dissociation of the sensory-discriminative dimension of pain from its other components, finds philosophers’ treatment of C-fibres appalling. He claims that they were first uncritically introduced, with complete disregard for their distinctive properties, and then uncritically rejected. Probably he has identity theorists in mind when he further complains that ‘[s]ome philosophers have “located” these quasi-mythical peripheral afferent fibers in the *brain* (!)’ [12, p.142].

In my opinion, Grahek and other critics are too harsh on philosophers of mind here. They are not being condescending to science, but rather trying to give it space to do its job. Accordingly, as Aydede nicely puts it, the role of C-fibres is to be ‘a sort of stand-in or proxy for whatever the ultimate physical structure is to be identified with pain experience (in case the Identity Theory is your game) or for whatever it is that turns out to be the occupant of the functional role of pains (if Functionalism is your preferred game)’ [13]. While I accept this well-intentioned interpretation of philosophers’ references to scientific findings, I do not find it harmless. If you have scant knowledge of the physical, you are not really in a position to claim that the mental is nothing above this physical, or the opposite – that the mental is an extra ingredient of our world that cannot be explained in physical terms. It would be prudent to stick to easier questions and not jump head first into the mind-body problem.

Better scientific understanding was surely at least in part responsible for the demise of the mind-brain identity theories and the advance of functionalism. But the focus of this paper are not the merits of the mind-brain identity theories, but the question how a better scientific understanding of pain bears on Kripke’s modal argument against these theories, and the possible implications for the modal arguments against physicalism in general.

Kripke bases his criticism on his analysis of theoretical identifications, such as ‘Water is H<sub>2</sub>O’, according to which such claims are necessary, if true. At first glance they seem contingent though, for instance, that water could have been something other than H<sub>2</sub>O. This

appearance of contingency is explained by the fact that the reference of 'water' is fixed by water's manifest properties, which are its accidental properties, and not by its essential property of being H<sub>2</sub>O. The true nature of water is discovered empirically and does not feature in our aprioristic conceptual schemes. And here Kripke locates a problem for the mind-brain identity theorists and their identity claims – they cannot explain away the apparent contingency in such a way. In the case of the identity between experience of pain and C-fibre stimulation, we cannot say that it just seems to us that these two things are not identical because we pick out pain by its contingent experience, but it turns out, or it is a scientific discovery, that its true nature is C-fibre stimulation. We cannot say this because, according to Kripke, pain is picked out by its essential property, by what makes it pain – namely, by its characteristic phenomenal quality. Consequently, pain and C-fibre stimulation are two distinct things and not one.

However, Kripke starts from the assumption that the sensation of pain is a simple experience, but we now know that it is, in fact, complex and has at least three components: sensory-discriminative, motivational-affective and cognitive. Now the brain-identity theorists can face Kripke's challenge and explain the apparent contingency of otherwise necessary identity between pain experience and C-fibre stimulation. Let me point out that what I describe here is not my view on pain. I do not claim it is a plausible one, my only aim here being to show one way in which Kripke's modal argument can be rejected.

The challenge is the following. We should be able to imagine a situation in which pain is being felt without a stimulation of C-fibres and a situation in which a stimulation of C-fibres exists without being felt as pain. The general strategy would be to claim that not all components identified in pain experiences are essential to it. I will take here into consideration only the sensory-discriminative and the motivational-affective components.

One option would be to claim that we pick out pain by its affective character, namely its unpleasantness, which is actually only a contingent property of pain. Let's suppose scientists found out that its true nature is being C-fibre stimulation. Then, one could imagine a situation in which someone experiences unpleasantness without C-fibre stimulation and mistakenly thinks this is pain. But it is not, since pain is C-fibre stimulation essentially. The same way one could imagine a situation in which some of her C-fibres are stimulated, but she does not experience any unpleasantness, and, accordingly, no pain. Again, this would be wrong impression since C-fibre stimulation is essential to pain, while unpleasantness is only accidental property.

The last situation is actually not only imagined, but is pretty accurate description of a situation in which patients suffering from pain asymbolia are in. They proclaim to feel pain, they are able to localize it, to determine its intensity and qualitative character, yet they are simply not bothered by it and do not exhibit any typical pain behaviour. They do not find it unpleasant [12, 14]. Nonetheless, one difference from the imagined situation is that they do not say they are not in pain because they do not experience unpleasantness, which could suggest that maybe sensory-discriminative component is essential to pain. Or maybe it suffices for pain that at least one of the two is present? These are interesting questions that I will leave for another occasion.

Now, Kripke could propose the following improvement of his argument. The experience of pain is not a simple experience, but a complex one, and we are not entirely sure which component, if not perhaps all of them, are essential for something to count as pain. Nevertheless, it is still the case that its phenomenal character is essential to pain, whether it is its sensory-descriptive or its motivational-affective component, or both. Without the experience of pain there is no pain. Therefore, one can still imagine a situation in which they

do not experience (any component of) pain, but some of their C-fibres are stimulated. Contingency is not only apparent, but true, and pain is not identical to C-fibre stimulation (or whatever other physical structure).

Kripke is right that subjective experiences are special and that we cannot write them off as accidental properties of a certain physical phenomenon as it is the case with heat and lightning, where the sensation of heat or our perception of lightning is just a way in which we pick out the respective phenomenon, and not its essential part. However, part of his modal argument is the claim that we know very well what the nature of pain is, so we are trustworthy when we claim that we can imagine a situation in which we are not experiencing pain, but our C-fibres are stimulated. But it turned out that we do not know the nature of pain so well after all, so maybe we are not very good in imagining situations involving pain either. Maybe pain is identical to some physical structure after all, we just do not know it.

Let me illustrate my point with the example of water. Before scientists discovered that water is H<sub>2</sub>O, one could imagine its internal structure to be many different things. Its true nature was simply not known, so it was impossible to make certain claims about what is possible for water and what is not. But in the case of pain, we are still in such a position, so our possibility claims concerning pain are unwarranted. The fact that we can imagine a situation in which pain is present without C-fibre stimulation can be also attributed to our ignorance of the true nature of pain. Maybe what we are imagining is not a portrayal of a possible situation at all. Moreover, if the way pain feels like is essential to pain, this does not mean that C-fibre stimulation cannot be essential as well. Both could be essential to pain, one does not exclude the other.

To conclude, at this point in pain research we simply do not know yet whether it can be explained solely in physical terms or not. And if we accept Kripke's claim that science discovers essences of natural phenomena, then we should let it do its job and not assume we can decide this question beforehand solely relying on our powers of imagination. The modal argument cannot help us decide this matter one way or the other.

## **IMPLICATIONS FOR MODAL ARGUMENTS AGAINST PHYSICALISM**

Kripke's modal argument is not the only such argument in the philosophy of mind. Another famous example is Chalmers' zombie argument [15, 16]. Chalmers basically argues that since we can conceive a zombie – a complete physical duplicate of a normal human being who behaves and functions exactly like that human being, but lacks all conscious experience – such a creature is metaphysically possible, which in turn implies that physicalism is false. Consciousness is some extra ingredient in the world that cannot be explained in physical terms.

While this argument does not involve pain specifically, the lesson of a better understanding of pain also applies to it and to all other modal arguments against physicalism. In matters in which we still lack relevant scientific information, imaginability or conceivability cannot play a decisive role. Our claims of what is possible concerning the mental, the physical and their relationship are unwarranted until we acquire a better scientific understanding of our physical structure, functioning of various mechanisms, but also of the nature of subjective experience.

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