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The boundaries and location of consciousness as identity theories deem fit

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Abstract In this paper I approach the problem of the boundaries and location of consciousness in a strictly physicalist way. I start with the debate on extended cognition, pointing to two unresolved issues: the ontological status of cognition and the fallacy of the center. I then propose using identity to single out the physical basis of consciousness. As a tentative solution, I consider Mind-Object Identity (MOI) and compare it with other identity theories of mind.
KEYWORDS: Extended Mind; Spread Mind; Enactivism; Cognition; Consciousness; Mind-Object Identity; Identity

Riassunto *I confini e la localizzazione della coscienza secondo le teorie dell'identità* – In questo lavoro tratterò il problema dei confini e della localizzazione della coscienza in termini strettamente fisicalisti. Prenderò le mosse dal dibattito sulla cognizione estesa, portando l'attenzione su due questioni irrisolte: lo status ontologico della cognizione e la fallacia del centro. Proporrò quindi di usare l'identità per individuare la base fisica della coscienza. Come possibile soluzione, prenderò in considerazione la *Mind-Object Identity* (MOI), confrontandola con oltre teorie dell'identità della mente.
PAROLE CHIAVE: Mente estesa; Mente diffusa; Enattivimo; Cognizione; Coscienza; Mind-Object Identity; Identità

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1 Locating the mind: Two unresolved issues

SINCE CLARK AND CHALMERS' SEMINAL essay on the extended mind, a heated debate has raged over the possibility that the processes underpinning the mind might extend beyond the confines of the brain and the nervous system.[1] Often, the notion of mind (or mental) refers to the cognitive mind, or to cognition. Moreover, aside from a few exceptions,[2] consciousness has been taken to be a special case of cognition taking place inside the cognitive mind and therefore inside the central nervous system. For instance, according to all versions of the popular Global Workspace Theory[3] consciousness is a case of cognition, in which memory offers a centralized hub for broadcasting information. As for the location of cognition, many authors have defended an internalist view, resisting the initiative to extend consciousness beyond the limits of the nervous system.[4]

In the current debate, it is common to distinguish between cognition and consciousness.[5] This distinction has become a de facto standard because it has allowed philosophers and cognitive scientists to tackle the problem of the mental without having to deal with the thorny ontology of consciousness. In practice, cognition and consciousness are used to refer to very different aspects of the mind. Cognition is related to the functional role of the body and the brain, while consciousness is *prima facie* not related to any practical objective.

Yet, there is no conclusive evidence that consciousness is a subset of cognition with special properties. Nor is consciousness an inner core of cognition. To the best of our knowledge, cognition neither requires nor entails phenomenal character. Although many cognitive scientists have attempted to derive consciousness from cognition,[6] there is as yet no consensus on whether consciousness plays an essential cognitive role. Of course, conscious subjects experience many (but not all) of their cognitive activities.[7] Yet, that does not imply that consciousness is an outcome or a subset of cognition. From the fact that I am conscious of, say, some of my linguistic skills, it does not follow that my consciousness is the outcome of my linguistic skills or that it somehow improves my cognitive performance. Consciousness and cognition may have very different explanations and roles. It is premature to draw any conclusion about the location of consciousness from the literature on the location of cognition, as many have nonetheless done.[8]

To disentangle the cognitive and the mental aspects of the mind, I will proceed as follows. First, I highlight two issues that bias the discussion on cognition: the ontological status of cognition and the fallacy of the center. I argue that they are not good starting points from which to address the localization of consciousness. I then propose to bypass such problems altogether by adopting an identity hypothesis – the *Mind-Object Identity* (MOI) – which, with the help of Leibniz's principle of the identity of indiscernibles, allows us to single out consciousness in the physical world. Eventually, I will compare MOI with other identity theories.

1.1 The ontological status of cognition

Before addressing the question of whether cognition is extended, a preliminary issue is the ontological status of cognition (or the cognitive mind): is it a natural kind? Is cognition something revealed by science that is real regardless of our distinctions, or is it a nominalist notion? If so, cognition would be a genuine addition to the physical world. Cognition would then exist, and it would satisfy a number of mandatory ontological requirements – causal efficacy, Ockham's razor, the Eleatic principle, and not be causally overdetermined. If not, cognition would be an invention that human beings introduced to arbitrarily group together certain processes. It would still be a useful concept, but it would not have a place in the world outside our theories. Here the question is relevant because in the latter case cognition could not be the basis for phenomenal character or consciousness, which I assume is a real aspect of reality. Although many authors have assumed that cognition is akin to other cognate notions such as computation, information, and mental representations,[9] the ontological status of these notions remains ambiguous. If cognition is not a constituent of the physical world, the debate about its extension and boundaries becomes a largely analytical endeavor.[10]

The notion of existence is notoriously slippery. Here, as a working premise and with no pretense of providing a satisfactory justification, I propose a causal criterion for existence – i.e., something exists if and only if it has irreducible causal efficacy and is located in space-time. Such a premise rules out *abstracta*. This is a causal criterion akin both to the Eleatic principle or to Alexander's dictum.[11] Based on such a criterion, both epiphenomenalism and causal overdetermination would rule out the existence of something. Therefore, in order to be real, cognition would need to have irreducible causal powers that are not drained by its physical underpinnings nor overdetermined by other physical facts.[12] As we will see, such a premise entails a strong physicalist view of the mental.

In fact, from both an epistemic and an empirical perspective, a causal view of existence, according to which the existence of anything is expressed (if not fixed) by its causal relevance, is mandatory. As Sidney Shoemaker recently claimed,

> To reject this view is to hold that for all we know what we take to be instantiations of single properties are really instantiations of clus-

> ters of causally equivalent properties, and this seems to cut off the possibility of reference to particular properties.[13]

It is very difficult to challenge this point. By the same token, twenty years ago, he wrote that

> [W]hat makes a property the property it is, what determines its identity, is its potential for contributing to the causal powers of the things that have it. This means, among other things, that if under all possible circumstances properties X and Y make the same contribution to the causal powers of the things that have them, X and Y are the same property.[14]

Jaegwon Kim has made more or more or less the same argument[15] – if something is causally overdetermined, it does not exist.

In a nutshell: Suppose we had a set of mechanical/electronic/neural processes. Would they do anything differently because they are considered "cognitive"? Probably not. And if they didn't, this cognitive aspect would be epiphenomenal. Therefore, one might be tempted to think of the category of the cognitive as a nominalist one. If cognition is not real, in the strongly physicalist sense advocated here, how could it be the basis for other phenomena, such as consciousness, that seem to be a fact? Of course, if consciousness is also regarded as a delusion, the argument is null and void.

To recap, I consider that there cannot be two sets of properties doing the same causal work. If they do the same work, one is causally overdetermined. Unless top-down causation is empirically demonstrated (and it never has been), the top level exists only as a good description; something akin to Dennett's intentional stance. Cognition seems to suffer from this ontological vacuity. If the causal work is carried out by the microphysical facts (as seems to be the case), cognition cannot resist causal overdetermination.[16] So cognition does not seem to have the ontological status required to host consciousness. Does this imply that consciousness is an illusion too? Luckily, as I argue below, there is an alternative possibility based on identity (if consciousness is real, it is identical to something physical).

Nevertheless, is the debate about the boundaries of cognition in the camps of enactivism and the extended mind anything more than a disagreement over different uses of the term "cognitive"?[17] Both supporters and deniers of extended cognition seem to agree that the debate has to be construed as substantive – i.e., that cognition is a real fact and not a mere terminological issue. Adams and Aizawa stated that «without a theory of the mark of the cognitive, or at least a plausible approach to determining what cognition is, the claim that cognition extends into the body and the environment lacks substance».[18] Yet, has this debate produced any substantive notion of cognition in which cognition qua cognition plays an irreducible causal role? Hardly. Even strong advocates of cognition such as Aizawa and Adams have appealed to the need for a substantive explanation of consciousness, and yet they can only point to «processes that are plausibly construed as answering to our common-sense and orthodox conception of the cognitive that occur only within core neurons in the brain».[19] Common-sense is not enough. If cognition is a real phenomenon, it should be possible to provide a positive and non-circular account. Most authors have mostly relied either on commonsensical ideas such as that the mind is in the head, or on circular definitions from cognitive science or neuroscience.

A valiant attempt to provide a more substantive definition of cognition put forward by Adams and Aizawa consisted in appealing to non-derivative representations. But this entailed little more than introducing a new name for mental representations – i.e., a synonym for cognition itself. It is an instance of the *obscurum per obscurius* fallacy. In fact, they too conceded that there is no available theory of underived representations:

> philosophers and psychologists have yet to develop a theory of naturalized semantics that enjoys much widespread acceptance. It remains unclear just exactly what naturalistic conditions give rise to non-derived content; hence it remains correspondingly unclear just exactly what objects bear non-derived content.[20]

So much for underived representations and intrinsic mental representations. Indeed, cognition might end up being just a useful epistemic construct that we use to refer to certain processes because of their role rather than because they refer to physical tokens of a natural kind. It wouldn't be the first time that a term turned out to be nothing more than an epistemic promissory note. In the past, other concepts such as intentionality have been exposed as epistemic short-circuits.[21] Does cognition really exist as a causally relevant entity? I doubt it.

A final argument against the existence of cognition as a substantive level of reality is given in passim by AI. Is an AI agent functionally equivalent to a human being, at least in specific cognitive tasks such as face recognition, a successful instance of cognition? Do we really need to add the category of the cognitive (or of the mental) to what an AI does? I do not see why. An AI is a system with a causal structure able to perform whatever complex task it is capable of. There is no additional level. Of course, one might enjoy adopting an intentional stance and attributing mental states to the AI as though it was an agent, but the engineer would need not to do so.

1.2 The fallacy of the center

The other key issue that we need to address at the very outset is what I shall here call the fallacy of the center – that is, the assumption that whatever the physical processes of the mind may be, they emanate from the center of the body, usually regarded as the brain. It is a fallacy based on the naive notion that our existence must originate within our body – a mind within a shell. Of course, this is a covert form of homuncularism. But even enactivists and proponents of either embodied cognition or extended mind fall into this fallacy. In simple terms: While proponents of the extended mind consider the possibility that the physical bases of the brain extend beyond the boundaries of the central nervous system or even the body, they never question the assumption that the center of its physical base must be in the head. The very name of Clark and Chalmers' hypothesis – namely, the extended mind – suggests this. Why should the mind extend? And extend out of what? The standard terminology suggests that the mind may extend, but that it must surely emanate from the brain. Likewise, on the same issue, Aizawa and Adams write that

> A theory that claims that cognitive processing extends into the body and the extracorporeal environment requires, at a minimum, an account of what cognitive processing is and how far beyond the boundaries of the brain it extends.[22]

Their wording reveals it is manifest that the debate is framed around the implicit notion that the mind originates from the "neural" center of the body. Yet why should it be so? Consider the famous question with which Chalmers and Clark's started their seminal paper "*where does the mind stop and the rest of the world begin?*".[23] Although they wonder where the mind stops, they have no doubt about where the mind starts: in the brain.

In short, the fallacy of the center is the assumption that the mind – be it cognition or consciousness – must emanate from a particular center. The fallacy consists in uncritically assuming the premise that the physical basis of a phenomenon must originate in a particular place.

Both the supporters and the deniers of extended cognition seem to assume something very like the fallacy of the center. Again, consider Aizawa and Adams:

> Either cognition is all in the brain or it extends into the body, or into the body and external environment. It is, however, possible to provide a rough arrangement of theories of the bounds of cognition along a spectrum of increasingly broad boundaries, from a core of neurons within the brain at one end of the spectrum to all sorts of extracorporeal tools with which we interact at the other end.[24]

The fallacy strikes the camps of both externalists and internalists. As for the latter, consider Jakob Hohwy's claim that we should give "explanatory priority" to the central nervous system since anything located in the environment external to the central nervous system can at best make a causal contribution to a cognitive process.[25] Of course, he assumes that cognition is in the center, and the external world can, at most, contribute to what is going on inside:

> The brain doing the inference is secluded at least in the sense that certain kinds of doubt about the occurrence of the evidence are unanswerable without further, independent evidence. Of course, once we average over the entire sensory input, there is no possibility of independent evidence, which would require us to crawl outside of our own brains.[26]

Significantly, he assumes that cognition must originate inside the brain and be secluded from the world. So, the question is, at most, whether we can "crawl outside of our own brains". This is precisely the fallacy of the center. Is there any definitive evidence that our minds (we) are inside our brains? No, there isn't. Of course, there is plenty of evidence that the brain contains a lot of useful machinery to perform various kinds of operations. There is also a lot of evidence that the brain is indeed necessary to our existence and that damage to the brain results in damage to one's mental states. Yet, is this enough to prove that our mind is located inside the brain? It is not. Does it show that our mind is centered in the brain? It does not.

If internalists are likely to assume that the mind is centered in the brain, what about externalists? Perhaps surprisingly, they are not different in this respect. While externalists question the boundaries of the mind, they almost invariably assume that the center of one's mental processes is the brain. For instance, Kirchhoff and Kiverstein argue against Hohwy's internalist view that the mind is secluded inside the brain and maintain that the boundary of the mind is relative and variable, yet they do not challenge the assumption the brain and the body are the center of the physical basis of the mind.[27]

It is clear from the presented literature, which is representative of the current state of the debate, that the dominant picture of extended mind is always such that the body is the alleged and unquestioned center of one's physical and mental existence. While this might indeed be the case, it is surely neither a metaphysical nor a nomological necessity. Assuming that the center of the body is included in the physical basis of the mind reveals a confusion between causation and constitution or

identity. It is the fallacy of the center.

To recap, although there is plenty of evidence that the body and the brain are among the necessary conditions for cognition and for consciousness, it is still an open question whether the body and brain are the physical basis of the mind. For instance, a dam is among the conditions necessary for the existence of an artificial lake without being identical to it. The dam is not among the material constituents of the lake. The lake is made of water. The lake is identical to a certain amount of water arranged lake-wise. Analogously, the body might cause the occurrence of consciousness without consciousness being physically located inside the body. Or maybe not. But it cannot be assumed a priori.

2 From extended cognition to extended consciousness

The preceding analysis of the issues is key to placing the possibility of extended consciousness in its proper context. Nevertheless, some further preliminary considerations are necessary. As noted earlier, cognition and consciousness do not necessarily overlap. Nor is one a subset of the other. We experience everyday circumstances that are the result of our cognitive abilities, but there is no evidence that cognition either needs or generates consciousness. Likewise, we experience circumstances that are the result of our body's movements, but there is no evidence that body movements in themselves generate our experience, or that they are in themselves our experience. There is certainly abundant evidence pointing to an enabling role for cognition and embodiment, but that is very far from showing that consciousness emerges from cognition, or that there is any constitutive or causal link between the body and brain on the one hand and consciousness on the other.

The relation between cognition and consciousness might be just like the relation between muscles and heat, where the former is involved in the latter but there is no selective advantage in heat generation, it is just a nomological fact. Or it could be like the relation between metabolism and conscious experience – in a biological organism, active metabolic activity is necessary for consciousness, but there is no metaphysical necessity that connects them.

Since there seems to be no limiting dependence between consciousness and cognition, what if consciousness itself was extended and even located outside the boundary of the body? Could such a seemingly counterintuitive idea have any plausibility?

It might be helpful to consider how the relation between consciousness and cognition has been framed by the proponents of extended cognition. The original paper about the extended mind focused on cognition rather than on consciousness.[28] A few years later, Chalmers is still adamant that

> [I]t is unlikely that any everyday process [...] will yield extended consciousness [...] the extension of the mind is compatible with retaining an internal conscious core.[29]

Eventually, Chalmers has stressed that «there is no extended consciousness» because «it requires relatively direct access».[30] In his view, consciousness requires direct availability for global control, and this is not easy to achieve:

> Given that the sort of extension at issue is understood in terms of perception-action interaction, this explains why even if there is extended cognition, there is no extended consciousness.[31]

Unfortunately, Chalmers does not explain why consciousness should depend on a functional loop that ultimately remains a causal loop.[32] Note also that he suggests that extended consciousness is a subset of extended cognition, which is something to be demonstrated rather than assumed. Besides, the notion of direct access is an instance of the fallacy of the center – access to what? Why should this information require access to the center of the nervous system? It may be useful to have direct, one-step access, but this fact does not in itself explain why direct access would make consciousness possible, unless one supposes that there is something special in the center of the body. Chalmers does not explain why the lack of fast and broad direct access bandwidth would prevent conscious experience. At most, it might prevent fast conscious access, not consciousness per se. For one, my phone has super-fast direct access to its internal memory without being conscious. As Vold argued «Clark's and Chalmers' reason for denying that consciousness extends while still supporting unconscious state extension [...] is not well grounded and does not hold up against foreseeable advances in technology».[33] In general, supporters of extended cognition are not particularly optimistic about extended consciousness.[34] Clark's coauthor argued that

> Arguments for extended cognition do not generalize to arguments for an extended conscious mind [...] there are no good reasons (of a dynamical, enactive stripe) to endorse the vision of an extended conscious mind [...] nothing in the arguments for the extended mind should incline us to accept extended consciousness. [35]

Chalmers and Clark's opinions are a consequence of the fallacy of the center – the problematic notion that consciousness is a subset of cognition which is in turn centered in the nervous system.

In many versions of the extended cognition para-

digm – such as the embodied mind or enactivism[36] – the relationship between cognition and consciousness is similar. One exception, which I will discuss later, is the position taken by radical enactivists, who propose that consciousness may rest on a larger physical basis than neural activity alone, namely sensory-motor activity, variously defined.[37] Yet sensorimotor patterns are no better than neural activity in instantiating the properties we find in our experience. To a large extent, I agree with Clark's criticism of enactivism when he observes that

> The role of actual activity in these accounts is not, however, straightforward. For it is not activity itself, so much as the know-how that drives the activity, that ultimately plays the crucial role. Perceptual experience, so the story goes, gains its content and character courtesy of the exercise of sensorimotor know-how, that is, courtesy of the active deployment of implicit knowledge of the relations between (typically) movement and sensory stimulation.[38]

In a nutshell, Clark objects that there is no explanation for why any stored knowledge about sensorimotor contingencies should lead to phenomenal experience. Knowledge is stored as a set of functional patterns embedded in one's body, but why should it be the basis for consciousness? It is telling that the same sort of objections apply to the predictive mind model that Clark and others have defended.[39] Why should predictive knowledge – no matter how accurate and useful – transmogrify into phenomenal experience?

To recap, cognition does not seem to have the resources to explain consciousness. Nor is there any conclusive evidence indicating whether consciousness is (or is not) a subset of cognition. The location of neural machinery in the center of the body is a contingent fact that does not prove anything about the location and nature of the physical basis of consciousness. Surely cognition has an enabling role for many activities that contribute to experience, but it is far from obvious whether there is a dependence between the two Cs of our mental life – consciousness and cognition.

Cognition can be fully explained in functional and behavioral terms without having to commit to its privileged ontological status. Cognition is more like flying – i.e., a bundle of skills and abilities that can be achieved in many ways and do not require a commitment to a natural kind. There are many organisms and man-made objects that are capable of taking off and moving to some degree. Yet there is no need to commit to flight as something instantiated in a particular spatiotemporal region.

The fallacy of the center and the insufficient ontological status of cognition suggests considering a different strategy for consciousness that does not require us to think of consciousness as something instantiated inside bodies. Consciousness depends on bodies and is affected by cognition, but neither needs to be located in a body nor to be constituted by what goes on inside one.

In the next section I will consider an alternative possibility, namely that consciousness is identical to the subset of the physical world that takes place relative to our bodies. The basic idea is that consciousness is not located inside the body nor is it a special kind of cognition arising from cognitive or computational processes.

3 The mind-brain identity (MOI)

If consciousness is not a special kind of cognition, what is it then? What if consciousness was exactly the world as it presents itself to each of us – not in the sense of a mental version of the world, but as the world itself? This approach suggests an identity between consciousness and physical phenomena and it is, in form, akin to traditional identity theories. [40] The identity theory is based on two premises:

> Consciousness is physical (PHYSICAL)
>
> Consciousness is identical with whatever physical phenomenon that has the same properties (INDISCERNIBILITY)

Both premises do not pose any limitations on the location and boundaries of consciousness. This is key to overcoming the limitations of previous approaches and to avoiding the fallacy of the center.

The first premise (PHYSICAL) is mandatory for any physicalist. While providing an unambiguous definition of physical is very difficult, here it will suffice, as a working hypothesis, to define as physical anything that is located in space-time, observable, and causally relevant (there is some redundancy between these three conditions). However, in philosophy of mind, PHYSICAL is often interpreted as having a narrower meaning than it should – namely, that if consciousness is physical, it must be instantiated inside the body. For instance, an authoritative philosopher like Jaegwon Kim stated that «if you are a physicalist of any stripe, as most of us are, you would likely believe in the local supervenience of qualia».[41] Of course, such a consequence is wrong. From PHYSICAL it should follow that consciousness is identical to something physical not that consciousness is locally supervenient to the central nervous system. As Myin and Zahnoun have stated, «nothing in the idea of identity demands that the terms of identity be mind and brain, instead of mind and *something else*».[42] Embracing physicalism does not commit to any given location if the target of the proposed solution is of a physical nature. Yet, as we have seen, most consciousness science has fallen into

the fallacy of the center and thus assumed that the physical basis of the mind must include the brain: «Tracking the correlations between brain processes and states of phenomenal consciousness [...] is the basic method of scientific consciousness research».[43] Yet, again, why should it be so? Of course, the premise that the brain is included in one's physical basis is plausible and commonsensical. But, shouldn't scientific enquiry consider all possibilities beyond commonsense? PHYSICAL dictates that we consider all physical events and not only those that take place inside the body. PHYSICAL does not commit us to the fallacy of the center.

The second premise (INDISCERNIBILITY) is inspired by the identity of indiscernibles as in one of the two halves of Leibniz's principle of indiscernibles – two things are identical if they have the same properties. There are various versions of such a principle, and many have argued that it is not so straightforward as it seems. Here, I simply adopt this principle without defending it. As we shall see, this principle has a deep connection with the Eleatic principle mentioned above as is evident in Shoemaker's approach to identity assertion.[44] On the basis of such a principle, is there anything in the physical world that resembles conscious experience? I argue that such a physical candidate exists and that it has always been hidden in plain sight – it is the world external to the CNS.

In this paper, I restrict my arguments to cases of standard and veridical perception where we perceive something and, lo and behold, what we perceive is actually present, just in front of us. Although this may seem an overly favorable case, I have provided a more general account in other works.[45] Moreover, from a metaphysical angle, the problem of consciousness is already present in standard perception.

Consider a simple case of standard perception. You perceive a red, round, and shiny apple. Unsurprisingly, there is a red round and shiny apple in front of you. What is the physical basis of your conscious experience of the apple? Indeed, what *is* your consciousness of the apple at this very moment? Is there any physical phenomenon that is identical with your experience of the apple?

First, your consciousness of the apple might be identical to a brain process; this is traditional mind-brain identity. Second, the brain process might be the supervenience basis for your experience; this is closer to current approaches based on neural correlates. Unfortunately, both hypotheses remain unconfirmed to find confirmation because the properties of what is going on inside your brain do not match the properties of your experience: redness, roundness, and shininess. No brain process inside your brain has any such properties. Supervenience then also fails as an explanation. So simple mind-brain token identity fails. Third, consciousness might be correlated with what happens inside your brain. Yet, correlation also fails as an explanation because i) it entails a very weak dependence relation which begs further explanation, and ii) it entails the existence of two sets of correlated properties. Unfortunately, while neural processes are easy to trace, where are the conscious processes? There is a dilemma here. If consciousness is not observable, it cannot be physical (PHYSICAL is rejected). If consciousness is observable, correlation is no longer needed. We may appeal to identity. This point has been stated by Polák and Marvan

> However, materialist principles dictate that every conscious state must be implemented materially, i.e., by some brain state(s). [...] Thus we end up with two material processes involved in the production of the conscious mental state, not one. The first material brain process would be the cause of a conscious state. The second neural process then would be the implementation of the phenomenal conscious state P, though it would not be its cause. Without this second material process the conscious state would not have a place in a materialist universe. [Cognitive neuroscientists] are searching for the brain processes of the second kind.[46]

In the above passage, materialist principles are obviously equivalent to PHYSICAL. If consciousness is physical, why should it be invisible? There has to be something that is consciousness and it should be observable. For the above reasons, the appeal to correlation or supervenience is fraught with contradictions. If there are two physical phenomena, one of them must be identical with the explanandum – i.e., with consciousness. If this is not the case, consciousness will not be physical, hence:

> A non-causal account of the brain-mind correlations is to be preferred. We favor the theory of the identity of mind and brain, according to which states of phenomenal consciousness are identical with their neural correlates. [47]

I therefore agree with Polák and Marvan that identity is the only viable physical solution. However, I disagree that the physical must be limited to the neural. This is by no means mandatory. The physical realm is literally larger than the central nervous system (or the body).

In contrast to such authors, who identify the physical with the neural and thus endorse the fallacy of the center, I propose to consider a quite different, but still utterly physical, basis for consciousness, namely the external world as it occurs relative to the body. When one wants to find a physical explanation of a phenomenon, say temperature, a viable method is to find the physical process that is identical to the phenomenon to be explained. For instance, one may start to observe

that temperature relates to freezing, boiling, gas expansion, crystal formation, etc. If one can show that another phenomenon, say average molecular kinetic energy, exhibits the same properties, the identity between the two phenomena can be taken seriously. This is an empirical application of Leibniz's principle of the identity of the indiscernibles, of course. Can we do the same with consciousness?

Consider again the red, round, and shiny apple you see in front of your body when you have a conscious experience of it. At that very moment, the properties you find in your conscious experience are redness, roundness, and shininess. To the best of our knowledge, the brain does not instantiate any of these properties. Yet, at the time of your experience of the apple, is there anything that instantiates such properties in the physical world? Yes, there is. It is the apple itself. The apple is red, round, and shiny. Could the apple, as it takes place relative to our body, be identical to our experience of the apple? Is this so preposterous?

The key hypothesis is considering whether the experience of an object might be the object itself. After all, the object has the very proprieties of our experience, or so I will argue. We can call this hypothesis, the *mind-object identity* hypothesis (MOI). It is a hypothesis that I have presented and defended in previous works.[48] The explanatory structure of MOI is the same as that of traditional mind-brain identity theories[49] only it considers a different physical candidate for identity – i.e., the object rather than the neural processes.

Why should we take the external object (the apple) into serious consideration? For three reasons:

1. The apple exists at the time of one's experience;
2. The apple is located in spacetime - it is observable, and causally relevant;
3. The apple has the very same properties as our experience of the apple.

The first point addresses the empirical availability of the external object in the circumstances of one's experience. The second point boils down to PHYSICAL and avoids problems such as epiphenomenalism and/or causal overdetermination. The third point is the most debatable and will be discussed in the next section.

If we focus on the properties we perceive in standard everyday conditions, a straightforward way to determine in what way and where a physical process is identical to your experience is to look for anything that has the same properties as the experience itself (INDISCERNIBILITY) in the physical world (PHYSICAL). And there it is! The object! In the case of the experience of the apple, the best candidate is the apple itself. MOI states that the conscious experience of an object is not inside the body, but rather is *the object itself*.

In this very journal, I've already presented this view, labelling it OBJECTBOUND to contrast it with BRAINBOUND, stating that the relation between consciousness (E), the brain (B) and the external object (O) is the following:

> The alternative hypothesis, OBJECTBOUND, is that E is O itself – your experience of the object is the external object. In this way, E is O, B is B and O is O. If E were identical with O, it would no longer be a mystery that E had O's properties. In fact, if the identity between object and experience held, one's experience E and the object O would be one and the same. Given Ockham's razor and Leibniz's law of indiscernibles, the object and one's experience would be one and the same.[50]

So, OBJECTBOUND (i.e., MOI) is worth considering because it is the only physicalist hypothesis that does not require any additional hypothesis about the nature of the world, the emergence of additional special properties, the assumption of additional levels of reality with their own share of causal inconsistencies, or the adoption of an anthropocentric view (cf. *Figure 1*).

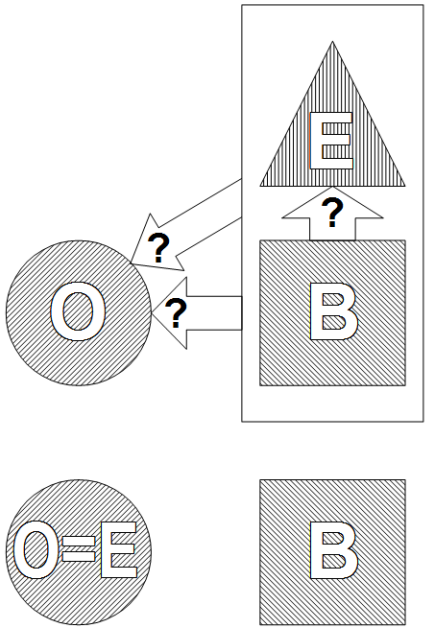

Figure 1. On the left, the traditional view trying to connect object (O), body/brain (B) and experience (E). On the right, MOI or BRAINBOUND that solves many problems by defending Mind-Body Identity, O=E, E≠B.

At this point, a recurrent objection is surely on its way. For many readers, a view stating that consciousness is identical with external objects and thus is external to the body rather than internal to the brain might appear to be a scientific nonstarter. Honestly, though, I do not see any strength in this

objection which is just a restatement of the fallacy of the center. Objects are just as good as neural processes. Both objects and neural processes are physical entities. The main reason why people have focused mostly on neural processes is that the brain is located anthropocentrically in the supposed "center" of one's physical reality. Yet, this objection is just a declaration of faith in the fallacy of the center. To guard against such a fallacy, no privileged location for the basis of consciousness we must not make any a priori assumptions. Consciousness can be everywhere and the only criterion is finding something with the very properties we find in our experience (INDISCERNIBILITY). Such properties are the properties of the objects we perceive, not the properties of neural processes.

As I have argued in the previous sections, once the fallacy of the center is rejected, other spatio-temporal regions causally connected with activity in the brain can be taken into consideration. This is where consciousness and cognition depart. Cognition is a form of neural behavior carried on by neural networks and thus cognitive machinery is plausibly located inside the body, yet consciousness might be located elsewhere. Where is consciousness then? Wherever we find the properties we experience, thus in the external world.

Relocating experience in the world – and therefore "spreading" consciousness across space-time to such unheard-of latitudes – offers pay back in terms of simplicity. If experience is one and the same with the world, there is no chasm in the fabric of nature. Problematic notions that have never found their match in the natural world – such as representations, phenomenal characters, mental properties, and so forth – can be dismissed. Consciousness is no longer an unexpected addition to the physical world. It is one with the physical world as it takes place in relation to our body and brain. Appearance and reality are the same thing. Identity is the fundamental – and only – relation we need.

Why not eliminate the notion of consciousness then? If this identity holds, there is of course no motivation to retain two terms. Eliminating this notion would also protect us from the risk of falling into panpsychism. This is, of course, the ultimate goal of MOI: a unified description of nature in which it is possible to carve out a subset that is our mind. Of course, MOI is also not an illusionistic or eliminativist theory of consciousness like Dennett's.[51] On the contrary, MOI states what consciousness is in the physical world and because it claims that consciousness is identical with objects, there is no need to posit an additional entity.

The key hypothesis is that one's consciousness is identical with the very objects one experiences. With a linguistic twist, one might morph William James' "a world of pure experience" into "an experience of pure world". *Consciousness occurs where and when physical objects take place relative to one's body*. Consciousness is not a subset of cognition endowed with special properties. Experience is not inside the body, but is the world we experience. The mind is spread9F. Surprisingly then, consciousness might thus be broader than cognition.

4 True and fake properties

Why has MOI attracted relatively little interest from other scholars so far? The three main objections are the argument from illusion and the diversity of individual experience, both of which I have addressed elsewhere,[52] and the alleged difference between the properties of the physical world and those of experience. This section will focus on this last issue.

Ever since Galileo's *Assayer*, it has usually been assumed that physical and mental properties are different.[53] The standard account is that on the one hand the apple has physical properties such as mass, size, and shape and on the other hand the experience of the apple has mental properties such as color, taste, texture plus esoteric features such as intentionality, phenomenal character, and perspectivalness. My strategy is to split the latter group of alleged mental properties into two classes: a first-class that is not obviously "mental" insofar it is made up of properties that look like they are in the world (for instance, color, size, and length), and a second class which is composed of properties – such as intentionality or phenomenal character – which are more less connected to the world.

Consider the first-class of properties. Are properties such as color or shape truly mental? Who has ever seen a mental color next to a physical color and can say that they are different in nature? I have seen only colors. In fact, I have no direct experience of the fact that colors are not in the world. The colors I see are neither purely physical nor purely mental. They are just colors. Had it not been for my philosophical studies, I would have never contrasted mental with physical colors. I see the colors of the object. I do not project mental colors onto the world.[54] Colors are thus fixed by external objects.[55] Why should the color I see in the apple be in the head rather than in the apple? So, my point is very simple. The properties we find in our experience, as long as they are causally relevant, are properties of the world. The color of the apple is the cause of my behavior and thus it must be physical since it has physical effects (my behavior). Since it is located in spacetime and is causally relevant, it follows that it must be physical. When I grab the reddest apple from the basket, what is the cause of my grabbing? The redness of the reddest apple.

And what about properties such as intentionality and phenomenal character that seem genuinely irreducible to any physical features aspect? A general reply is available. Such properties are not real properties, they are properties that have been invented to

cope with the fallacy of the center. They are conceptual inventions introduced to fill the gap between a naïve notion of the physical world and an equally naïve notion of the subject. They are conceptual crutches to safeguard the fallacy of the center and the belief that mental properties are inside the head. Conceptually speaking, these proprieties play a role akin to that of epicycles in Ptolemaic cosmology. Additional fictionary orbits (the epicycles) were invented to explain the apparent backward movement of planets – a consequence of the fallacy of considering the earth to be at the center of the universe. Of course, epicycles were not real and astronomers who sought to identify them were kept busy for several centuries without any real success. Is it possible that intentionality and phenomenal character are just like these epicycles? I believe so.

In the case of consciousness and cognition, the debate has been further plagued by the fallacy of the center, which has biased not only internalist but externalist stances as well. In the case of cognition, the mistake was not so serious since, after all, cognition is not a natural kind and thus it can be placed anywhere we like, a bit like the borders of a nation in a desert. In the case of consciousness, however, the fallacy of the center has led to more serious consequences since consciousness is a fact and thus, by placing it forcefully in the wrong place (the head), all kinds of conceptual crutches had to be invented.

Let's first consider intentionality. Intentionality or *aboutness* is conceived as the capacity of mental states to be about something else. Franz Brentano famously stated that intentionality is the hallmark of the mental insofar as nothing in the physical world seems to share such a capacity.[56] But Brentano was a dualist and he assumed that the mind is separate from the physical world. Ever since his work, many authors have tried to achieve what is usually called the naturalization of intentionality – i.e., finding a way to realize intentionality in the physical world.[57] The problem has become more and more urgent because of the development of AI and the possibility that machines may have intentionality.[58] Although many of the smartest philosophers and scientists of the last 50 years have addressed the issue,[59] no result has been achieved. In the current debate, the existence of intentionality in the physical world is still a mystery and intentionality is still true to Brentano's original formulation – something that the physical world seems incapable of instantiating. However, and this is the crux of the matter, the whole issue of intentionality might be the outcome of assuming that the physical basis of the mind is centered in the body, and possibly in the head/brain. If the fallacy of the center is set aside and MOI is adopted, there is no longer any separation between the world and the physical basis of the mind since they are identical (*Fig. 1*).

Intentionality is not a feature we experience, but something whose existence we postulate in order to cope with the premises we started from. In fact, intentionality has been a relatively late addition to the world of mental properties as a by-product of a dualist framework. Until Brentano (and leaving medieval scholasticism aside), intentionality had never been a relevant feature of anybody's phenomenology. Neither Descartes nor Kant felt any need to bother with intentionality. Of course, here the point is not whether such notions have been addressed by classical philosophers. The point is that the fact that human beings have been oblivious to intentionality for the best part of their history suggests that intentionality is not a paramount aspect of our experience.[60] A likely explanation for its conspicuous absence is that intentionality has always been a handy invention, just like epicycles.

Consider now phenomenal character, the alleged quality our experience is supposed to have – i.e., the "what-it-is-like-to-be" made famous by Nagel.[61] It is almost canon to suppose that our experience has a phenomenal character which the physical world does not have. It is assumed that the world is devoid of any quality. But how could we know this with certainty? Do we experience the world as free of qualities? No, of course we don't. In fact, every time we experience the world, it is completely defined by its qualities. But either dualism is true or the physical world harbors qualities as they show up in our experience. The reasoning that supports such a claim is straightforward. If physicalism is true, our experience must also be physical. So whatever our experience is, it takes place in the physical world. So it doesn't matter whether our experience takes place in the brain or in the world, either way it takes place in the physical world. If you are a physicalist, you have to accept that the properties that our experience exhibits are physical properties.

When we look around, the world overflows with qualities. Are they mental or physical? The standard view is that we project mental properties onto the world, but why should this be the case? Who has ever experienced firsthand the difference between the world as it appears in everyday life and the world without qualities that philosophers and scientists claim is true reality? Nobody. Is there any direct experiential gap between the way the world appears and the way the world is? There isn't because the scientific image of the world is not the direct object of our experience, it is a conceptual construct. The scientific description has been mistaken for the true nature of reality – a position that Galen Strawson rightly dubbed physicsalism[62] – mostly because, due to the fallacy of the center, many authors have separated our experience from the world. In fact, because of the fallacy of the center, one's experience cannot be the world

one experiences. The wrong conclusion is, give or take, the following:

- Experience is in the brain (fallacy of the center)
- The properties of the brain are different from the properties of experience
- The properties of experience are different from the properties of the physical world

Such a conclusion is false because it is based on a false premise (the fallacy of the center). In fact, if such a premise was changed, it would rather follow that

- Experience is wherever its properties are instantiated
- The properties of the brain are different from the properties of experience
- Experience is not in the brain

A false and only apparently successful workaround to the first wrong conclusion has been assuming that the properties of experience are somehow special and unique, i.e., phenomenal. The invention of phenomenal properties – i.e., properties of a phenomenal character – was the historical (and wrong) solution to such a case.

MOI offers a simpler solution – experience is physical but is not inside the brain. Rather it is identical with the objects in the world. MOI allows a radical simplification of the ontological scenario: there are no longer phenomenal *and* physical properties, there are just properties and such properties are the same both in our experience and in the world. Let alone that in this way, epiphenomenalism is no longer an issue, for the properties of the world are clearly the causes of what happens. By decoupling cognition and consciousness and by placing the latter in the external world, MOI gets rid of old problems such as intentionality and phenomenal character.

5 A comparison between identity theories

Finally, it is worth comparing how various identity theories address the issue of the boundaries and location of consciousness. As I have argued above, identity theories are well suited to challenge the fallacy of the center since they are based on the indiscernibility of properties. An identity theory should not make any a priori commitment to the location and boundaries of consciousness. It must be free to choose whatever physical basis exhibits the same properties as the experience. That is one of the reasons why it is important to make a distinction between consciousness from cognition. The latter is not a natural kind and thus mostly a matter of conceptual clarification. Extended cognition is an analytical endeavor, so to speak. Cognition cannot be found by means of a "cognition-scope".

Consciousness is a completely different matter. Consciousness is more than a useful concept; it exists outside our description of reality. Consciousness is the expression of some real structure in the fabric of nature. Thus there must be something of a physical nature that is identical to it. Luckily, consciousness can be located by means of the individuation of something that has its very properties. Identity theories are ideally suited to do this.

The first group mentioned above, includes the classic mind-brain identity theories. The key hypothesis is that conscious processes are identical with neural processes occurring in the CNS.[63] While these theorists put forward a respectable empirical hypothesis, they fell short of proving it because the properties of the neural processes and the properties of experience do not match. Imposing identity on the two sets of properties is too much of a stretch. Yet, this group failed on empirical grounds – not because of any conceptual flaw, but for lack of empirical evidence. Had the properties of neural processes being different, the mind-brain identity would have been right. Of course, different proponents of classic identity put forward approaches with considerable differences, most notably regarding whether the identity thesis is only an empirical hypothesis or a metaphysical claim. For Place the mind-brain identity theory is an empirical hypothesis to be defended by broadly empirical and inductive arguments. In contrast, Smart shifts the debate to metaphysical grounds and maintains that dualism and mind-brain identity theory do not make distinctive claims about

Table 1. A comparison between different Identity Theories

Identity theory	Identity candidate	Cons
Substance Dualism	Ideas	Ontologically expensive, empirically untenable
Integrated Information Theory	Integrated information as measured by phi	Empirically to be verified, metaphysically expensive
Token Mind-Brain Identity	Token of brain processes	Empirically untenable
Type Mind-Brain Identity	Types of neural processes	Empirically untenable
Modern Mind-Brain Identity	Type of neural processes	Empirically untenable
Embodied Identity	Activities of the organism	Weakly empirically sound
Mind-Object Identity	External relative physical objects	None

the data. Here, for the sake of the present discussion, I will stick to Place's original empirical interpretation of identity. It is my contention that one of the main causes of the disregard in which the identity theory has fallen is the metaphysical/analytical drift that betrayed Place's original straightforward proposal.

Another version of identity theory has recently been advanced by Polák and Marvan, who revived traditional mind-brain identity theory.[64] They argue that the traditional causal strategy is misguided since it entails an "undesirable dualism of matter and mind". They end up considering only the processes internal to the CNS. Like classic identity theorists, Polák and Marvan maintain that consciousness is identical with its neural correlates. While they try to sidestep the difference between neural processes and experience by appealing to types, they lack a convincing explanation as to why the type of neural processes should be identical to the type of one's experience.

Another case of revisited mind-brain identity is offered by Thomas Polger[65] who defends traditional mind-brain identity, which, in his opinion, has been a victim of unfortunate historical blame. He has defended mind-brain type identity, which may seem more general than token identity theories. Yet, from an empirical angle it is a weaker kind of thesis. In particular, Polger has asserted that types of mental things (states, events, processes, or properties) are identical to types of brain things (states, events, processes, or properties). Mind-brain type theories are empirically weaker since they dodge the problem of one-to-one property confrontation usually demanded in the case of token-identity – they border on epiphenomenalism. Type theories move the issue of identity to a higher conceptual level (for instance using verbal reports as a truth criterion) that does not require any straightforward physical similarity. The problem is that this higher conceptual level does not have a direct physical translation and is more a matter of conceptual clarity than causal relevance.

Yet, identity theories are not always limited to neural process. Remarkably, Myin and Zahnoun have recently pointed out that identity theories are not mind/brain identity theories: «the identities concern not experiences and brain phenomena, but experiences and organism-environment interactions».[66] They explicitly state that

> [N]othing in the idea of identity demands that the terms of identity be mind and brain, instead of mind and something else. As a consequence, it is possible to develop an identity theory in line with an embodied or enactive view of the mind. [...] Experience and cognition are to be (re-) conceived in terms of organism-environment interactions. [...] The brain is seen as one of the players in the game, not as the locus of mindedness – that status is conferred to the spatially and temporally situated organism.[67]

While the approach presented here, MOI, is different in many respects from Myin and Zahoun's embodied approach, it is nonetheless significant that we both contend that both physicalism and identity theories do not have to commit to mind-brain identity. We both consider a tentative physical candidate (relative external objects in MOI and "organism-environment interactions" in their case). They argue that the properties of consciousness are the same as those of such particular organism activities. Their strategy is similar to my appeal to Leibniz's principle:

> The fact that a particular experience has the general characteristics that it has, such as being perspectival, subjective and affect-laden, exerts overall constraints on what it can be identified with. Activities of organisms fit the bill nicely, for they always have the required perspectivalness. They have a "value" uniquely related to a particular organism's needs.[68]

I completely agree with the above, but, as in the case of mind-brain identity, I disagree on their choice on what conscious processes should be identical to, namely what they call the "activities of the organism" which are basically Gibson's affordances.[69] I mention four possible objections to their proposal:

- Activities are not diverse and numerous enough to encompass the variety of our experiences (consider color hues);
- Activities are defined circularly with respect to the existence of an organism/agent;
- Activities do not have the properties of the world we experience (they are functional patterns);
- Activities are biased by the fallacy of the center and by the confusion between cognition and consciousness.

However, on the bright side, we both claim that identity and physicalism do not entail committing to the brain as the local physical basis. One may consider a broader physical basis or "going wide". They do not go wide enough, though, because like most enactivists and supporters of the extended mind, they are committed to the fallacy of the center, so they continue to consider that the body is the center of the physical basis of the mind. In contrast, MOI does not need to be body-centric and thus it chooses the best physical basis that fits with the properties of consciousness, i.e., the external objects.

Finally, I believe it is worth mentioning that most

forms of idealism are also theories of identity, insofar as they claim an identity between consciousness and some extra-physical state of affairs (for instance, Cartesian ideas). Descartes' substance dualism proposed an identity between immaterial ideas and one's consciousness and, once again, failed on empirical rather conceptual grounds.

Significantly, certain positions in contemporary neurosciences are not far from idealism or even panpsychism. For one, Tononi's theory of Integrated Information (IIT), which is also an identity theory,[70] is a form of idealism. In his case, the identity holds between consciousness and integrated information. Tononi's IIT suggests that certain physical systems instantiate a special kind of causal integration that is measured by a quantity dubbed integrated information or phi. According to IIT, consciousness would be tantamount to a value of phi greater than a certain critical threshold. Actually, according to IIT, even a bit of integrated information (the minimum possible) ideally generated by a photodiode is form of consciousness.[71] Consciousness would then be identical to the integrated information instantiated inside a system. The problem with such an approach is that the integrated information of a system is not visible per se – i.e., that phi is computable but not measurable since it is causally overdetermined by the network elementary units.[72] So, it is questionable whether we could ever provide empirical confirmation by appealing to an identity between consciousness and something that is, by definition, invisible.

Akin to such theories, MOI is an identity theory too. Its main claim is that consciousness is physical, and it is identical with external objects as they take place in relation to our body and our neural structures. A straightforward example is offered by velocity which is intrinsically relative to another object (or frame of reference) and yet is a property of the object itself. Or by weight, which is, of course relative to another mass, and yet it is a property of the object. Elsewhere, I've pointed to many examples of relative objects – e.g., a rainbow, a pattern, a sequence of flashes, a constellation.[73]

The key and most original element of MOI is that it suggests that the physical basis of consciousness is not inside the body (or inside the head or the brain), but that consciousness is one and the same as the objects in the surrounding physical world. This hypothesis, albeit unusual, is coherent with physicalism and squarely rejects the fallacy of the center. It is also a theory that suggests a difference between the physical basis of cognition and that of consciousness. In this view, cognition is then a convenient umbrella concept that covers several activities performed by the body. Consciousness, on the other hand, is a physical subset of the world that can be located in the world by its identity with physical properties in the world.

Notes

[1] Cf. M.D. KIRCHHOFF, J. KIVERSTEIN, *How to determine the boundaries of the mind*; J. HOHWY, *The predictive mind*; R.A. WILSON, *Boundaries of the mind*; D.M. KAPLAN, *How to demarcate the boundaries of cognition*; A. CLARK, D.J. CHALMERS, *The extended mind*; R. MENARY (ed.), *The extended mind*; M. ROWLANDS, *The new science of mind*; A. CLARK, *Supersizing the mind*; K. AIZAWA, F. ADAMS, *The bounds of cognition*.

[2] Cf. T. ROCKWELL, *Neither ghost nor brain*; E. MYIN, F. ZAHNOUN, *Reincarnating the identity theory*; R. MANZOTTI, *Mind-object identity*; R. MANZOTTI, *The spread mind*; R. MANZOTTI, *Consciousness and object*.

[3] Cf. B.J. BAARS, D. AVE, *In the theatre of consciousness*; M.P. SHANAHAN, *A cognitive architecture that combines internal simulation with a global workspace*; S. DEHAENE, *Consciouness and the brain*; S. DEHAENE, C. SERGENT, J.-P. P CHANGEUX, *A neural network model linking subjective reports and objective physiological data during conscious perception*.

[4] Cf. F. ADAMS, K. AIZAWA. *Why the mind is still in the head*; K. AIZAWA, F. ADAMS, *The bounds of cognition*.

[5] Cf. D.J. CHALMERS, *The conscious mind*.

[6] Cf. B.J. BAARS, N.M GAGE, *Cognition, brain and consciousness*; A.K. SETH, B.J BAARS, *Neural Darwinism and consciousness*; B.J. BAARS, *A cognitive theory of consciousness*; J. KIVERSTEIN, *The interdependence of embodied cognition and consciousness*.

[7] Cf. M. JORBA, D. MORAN, *Conscious thinking and cognitive phenomenology*.

[8] Cf. D.D. HUTTO, E. MYIN. *Radicalizing enactivism. Basic minds without content*; M.P. SHANAHAN, *Embodiment and the inner life*; B.J. BAARS, *A cognitive theory of consciousness*.

[9] Cf. K. AIZAWA, F. ADAMS, *The bounds of cognition*; A. NEWEN, L DE BRUIN, J.S GALLAGHER (ed.). *The Oxford handbook of 4E cognition*; G. PICCININI, *The computational theory of cognition*.

[10] Cf. T. SUSI, J. LINDBLOM, T. ZIEMKE, *Beyond the bounds of cognition*. It is debatable whether a hypothesis can play a productive role because it «continues to spark debate and to generate both new insights and new objections» (cf. S. GALLAGHER, *The extended mind*, p. 419).

[11] Cf. R. MANZOTTI, *No time, no wholes*; H. HUDSON, *Alexander' s dicta and Merricks' dictum*; S. ALEXANDER, *Space, Time and Deity*.

[12] Cf. S. SHOEMAKER, *Causality and properties*; S. SHOEMAKER, *Physical realization*; J. KIM, *Mind in a physical world*; J. KIM, *Physicalism, or something near enough*; R. MANZOTTI, *No time, no wholes*.

[13] S. SHOEMAKER, *Physical realization*, pp. 5-6.

[14] S. SHOEMAKER, *Causality and properties*, p. 234.

[15] Cf. J. KIM, *Mind in a physical world*.

[16] Cf. T. MERRICKS, *Objects and persons*.

[17] Cf. T. SUSI, J. LINDBLOM, T. ZIEMKE, *Beyond the bounds of cognition*; K. AIZAWA, F. ADAMS, *The bounds of cognition*.

[18] K. AIZAWA, F. ADAMS, *The bounds of cognition*, p. 28.

[19] *Ibid*. p. 85.

[20] *Ibid.*, p. 55.

[21] Cf. D.C. DENNETT, *The intentional stance*.

[22] K. AIZAWA, F. ADAMS, *The bounds of cognition*, p. 76.

[23] Cf. A. Clark, D.J. Chalmers, *The extended mind*.
[24] K. Aizawa, F. Adams, *The bounds of cognition*, p. 17.
[25] Cf. C. Klein, J. Hohwy, T. Bayne, *Explanation in the science of consciousness*; J. Hohwy, *The neural correlates of consciousness*; J. Hohwy, *The self-evidencing brain*.
[26] J. Hohwy, *The self-evidencing brain*, p. 7.
[27] Cf. M.D. Kirchhoff, J. Kiverstein, *How to determine the boundaries of the mind*.
[28] Cf. A. Clark, D.J. Chalmers, *The extended mind*; A. Clark, *Supersizing the Mind*.
[29] D.J. Chalmers, *Foreword*, in: A. Clark, *Supersizing the Mind*, p. 6.
[30] D.J. Chalmers, *Extended cognition and extended consciousness*, p. 10.
[31] *Ibid*., p. 12.
[32] Cf. K. Vold, *The parity argument for extended consciousness*.
[33] *Ibid*., p. 16.
[34] Cf. K. Loorits, *The location and boundaries of consciousness*.
[35] A. Clark, *Spreading the joy?*, p. 963, 964, and 968.
[36] Cf. E. Thompson, D. Cosmelli, *Brainbound versus enactive views of experience*; E. Thompson, *Mind in life*; D.D. Hutto, E. Myin, *Evolving enactivism*; D.D. Hutto, E. Myin, *Radicalizing enactivism*.
[37] Cf. A. Noë, *Experience without the head*; A. Noë, *Out of our heads*; K.J. O'Regan, A. Noë, *A sensorimotor account of vision and visual consciousness*; E. Myin, F. Zahnoun, *Reincarnating the identity theory*; R. Manzotti, *A process oriented view of conscious perception*.
[38] A. Clark, *Spreading the joy?*, p. 969.
[39] Cf. A. Clark, *Surfing uncertainty*; J. Hohwy, *The predictive mind*; K.J. Friston, *The free-energy principle*.
[40] Cf. D.M. Armstrong, *A materialist theory of mind*; J.J.C. Smart, *Sensations and brain processes*; U.T. Place, *Is consciousness a brain process?*.
[41] J. Kim, *Dretske's qualia externalism*, p. 159.
[42] E. Myin, F. Zahnoun, *Reincarnating the identity theory* - italics mine.
[43] M. Polák, T. Marvan, *Neural correlates of consciousness meet the theory of identity*.
[44] Cf. S. Shoemaker, *Causality and properties*.
[45] Cf. R. Manzotti, *Experiences are objects*; R. Manzotti, *Objectbound*; R. Manzotti, *The spread mind*; R. Manzotti, *Consciousness and object*; R. Manzotti, *Mind-object identity*.
[46] M. Polák, T. Marvan, *Neural correlates of consciousness meet the theory of identity*.
[47] *Ibid*., p. 1
[48] Cf. R. Manzotti, *Mind-object identity*; R. Manzotti, *Objectbound*; R. Manzotti, *Experiences are objects*; R. Manzotti, *Consciousness and object*; R. Manzotti, *The spread mind*; R. Manzotti, A.C. Hashagen, *Ich denke, aber wer ist Ich?*.
[49] Cf. J.J.C. Smart, *Sensations and brain processes*; D.M. Armstrong, *A materialist theory of mind*; U.T. Place, *Is consciousness a brain process?*.
[50] R. Manzotti, *Experiences are objects*, p. 19.
[51] Cf. K. Frankish, *Illusionism as a theory of consciousness*; D.C. Dennett, *Consciousness explained*; D.C. Dennett, *Illusionism as the obvious default theory of consciousness*.
[52] Cf. R. Manzotti, *The spread mind*; R. Manzotti, *Consciousness and object*.
[53] Cf. G. Galilei, *The Assayer.*
[54] Cf. R. Manzotti, *Color afterimages as filtered perception of external physical colors*.
[55] Cf. M. Tye, *Phenomenal externalism*; A. Byrne, D.R Hilbert, *Color realism and color science*.
[56] Cf. F. Brentano, *Psychologie vom empirischen Standpunkt*.
[57] Cf. J.R. Searle, *Dualism revisited*; L. Albertazzi, *Naturalizing phenomenology: A must have?*; P. Pecere, *Naturalizing intentionality between philosophy and brain science*; U. Kriegel, *Naturalizing subjectivity*; M. Colombo, *How "authentic intentionality" can be enabled*.
[58] Cf. S. Harnad, *The symbol grounding problem*; R. Manzotti, A. Chella, *Conscious machines*.
[59] Cf. D.C. Dennett, *The myth of original intentionality*; D.C. Dennett, *The intentional stance*; S. Harnad, *The symbol grounding problem*; P. Pecere, *Naturalizing intentionality between philosophy and brain science*; F.I. Dretske, *Naturalizing the mind*; J. Petitot, F.J. Varela, B. Pachoud, J.M. Roy (eds.), *Naturalizing phenomenology*.
[60] One may object that the same argument can be applied to quarks and yet quarks are a fundamental building block of matter. Yet, the case is different. Here we are discussing what our experience is made of.
[61] Cf. T. Nagel, *What is it like to be a bat?*.
[62] Cf. G. Strawson, *What does "physical" mean? A prolegomenon to panpsychism*.
[63] Cfr. U.T. Place, *Is consciousness a brain process?*; H. Feigl, *The mental and the physical*; J.J.C. Smart, *Sensations and brain processes*; D.M. Armstrong, *A materialist theory of mind*.
[64] Cf. M. Polák, T. Marvan, *Neural correlates of consciousness meet the theory of identity*.
[65] Cf. T. Polger, *Natural minds*; T. Polger, *Identity theories*; T. Polger, *Are sensations still brain processes?*.
[66] E. Myin, F. Zahnoun, *Reincarnating the identity theory*, p. 1.
[67] *Ibid*., p. 2.
[68] *Ibid*., p. 3.
[69] Cf, J.J. Gibson, *The senses considered as perceptual systems*; K.S. Jones, *What is an affordance?*.
[70] Cf. S. Laureys, G. Tononi, *The neurology of consciousness*; G. Tononi, *An information integration theory of consciousness*; G. Tononi, C. Koch, *The neural correlates of consciousness: An update*.
[71] Cf. M. Oizumi, L. Albantakis, G. Tononi, *From the phenomenology to the mechanisms of consciousness: Integrated information theory 3.0*.
[72] Of course, the issue of the causal efficacy of IIT cannot be solved here. It will be sufficient to mention that proponents of IIT are compelled to defend some for of top-down emergent causation (cf. E.P. Hoel, L. Albantakis, W. Marshall, G. Tononi, *Can the macro beat the micro?*). Yet, the actual existence of top-down causation is debatable and not yet accepted.
[73] Cf. R. Manzotti, *The spread mind*; R. Manzotti, *Mind-object identity*; R. Manzotti, *Consciousness and object*.

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