


Distributed Cognition, Neuroprostheses and their Implications to Non-Physicalist Theories of Mind


Jean Gové

ABSTRACT This paper investigates the notion of “distributed cognition”—the idea that entities external to one’s organic brain participate in one’s overall cognitive functioning—and the challenges it poses to the notion of personhood. Related to this is also a consideration of the ever-increasing ways in which neuroprostheses replace and functionally replicate organic parts of the brain. However, the literature surrounding such issues has tended to take an almost exclusively physicalist approach. The common assumption is that, given that non-physicalist theories (chiefly, dualism, and hylomorphism) postulate some form of immaterial “soul,” then they are immune from the challenges that these advances in cognitive science pose. The first aim of this paper, therefore, is to argue that this is not the case.

The second aim of this paper is to attempt to elucidate a route available for non-physicalists that will allow them to accept the notion of distributed cognition. By appealing to an Aristotelian framework, I propose that non-physicalists can accept the notion of distributed cognition by appealing to the notion of “unitary life” which I introduce, as well as to Aristotle’s dichotomy between active and passive mind.

KEYWORDS distributed cognition; dualism; extended mind; neuroprostheses; personhood; physicalism; soul

✉ Jean Gové, University of St Andrews, Department of Philosophy, Edgecliffe, The Scores, St Andrews. KY16 9AL, United Kingdom jg261@st-andrews.ac.uk  0000-0001-7459-8410

©  FORUM PHILOSOPHICUM 26 (2021) no. 1, 123–42
ISSN 1426-1898 E-ISSN 2353-7043

SUBM. 13 October 2020 ACC. 2 February 2021
DOI:10.35765/forphil.2021.2601.08

1. INTRODUCTION

This paper investigates the notion of “distributed cognition”—the idea that entities external to one’s organic brain participate in one’s overall cognitive functioning—and the new questions it poses. Related to this is also a consideration of the ever-increasing ways in which neuroprostheses replace and functionally replicate organic parts of the brain. However, the literature surrounding such issues has tended to take an almost exclusively physicalist approach. My first argument in this paper is that distributed cognition and neuroprostheses present new questions even for dualist and hylomorphic theories of mind, which might be problematic if not addressed. Chiefly, it shall be seen that, in instances of distributed cognition, or in the use of (certain types of) neuroprostheses, inorganic parts (which are sometimes even spatially distant from the physical body) seem to form part of the subject’s mind and, consequently, we could also say part of the subject’s person. To admit as much would be to open a Pandora’s box of ethical dilemmas if a framework for delineating which entities form part of one’s person is not forthcoming. The common assumption is that, given that dualist and hylomorphic theories postulate some form of immaterial “soul,” they are immune from the novel issues that these advances in cognitive science present. The first aim of this paper, therefore, is to argue that this is not the case.

The dualist and hylomorphist may choose to dismiss the notion of distributed cognition as false (as some physicalists have done).¹ However, the second aim of this paper is to attempt to elucidate a second route available for the non-physicalist that will allow them to accept the notion of distributed cognition. To this end, I shall first show how, within dualist and hylomorphic theories—unless strictly specified and explicated—we frequently find a co-extension of the terms “soul” and “mind”: they are broadly understood to mean and refer to the same entity.² By appealing to an Aristotelian framework, I propose that, in separating these two notions, the non-physicalist has a way in which she can accept the notion of distributed cognition.

2. DISTRIBUTED COGNITION AND NEUROPROSTHESES

Broadly speaking, what distributed cognition and neuroprostheses have in common is the replacement, in some way or form, of an organic part by a functionally identical inorganic one. I shall briefly elaborate on some

1. A good example of this within physicalist literature is Adams and Aizawa (2008).

2. I shall use the term “soul-mind” when referring to this co-extended concept.

salient features that are relevant to our present discussion and the pressures they put on a variety of theories of mind, not only physicalist.

What does distributed cognition assert and why should it cause a problem? As a first pass, the breakthrough of distributed cognition is that the mind, or, at the very least, cognition, is not *only* located within the brain, but rather extends outwards.³ How this extension occurs and what other entities are involved in cognition apart from the brain is still hotly debated. The point that is crucial to our current debate is the fact that underpinning this philosophical thesis are various empirical observations in cognitive science that seem to indicate that inanimate, external objects share in the cognitive process and thus—proponents of distributed cognition would say—are constitutive of our cognitive apparatus.

The standard canon of literature on distributed cognition typically begins with Clark and Chalmers' (CC) "The Extended Mind" (1998). CC motivate their thesis by the now-famous thought experiment involving Otto and Inga. Both Otto and Inga want to get to the Museum of Modern Art (MOMA). Inga has a belief that MOMA is on 53rd Street. She walks there and, sure enough, she successfully arrives at the museum. In doing so, Inga has relied on her internal, biological memory. Otto, on the other hand, suffers from Alzheimer's and thus cannot store information internally as well as Inga can. To this end, he carries with him a notebook in which he records information he might need at a future time. Upon deciding to make his way to MOMA, he immediately consults his notebook, finds the address written there, and successfully arrives on 53rd Street. In this way, therefore, the information contained in Otto's notebook provides the content for his dispositional belief as to where MOMA is, while Inga stores that content internally. CC thus make the following argument: if both Otto and Inga successfully arrive at MOMA, then Otto's notebook is fulfilling the same functional role as Inga's biological memory and, hence, should be considered as participating in the cognitive process. Distributed cognition can thus be understood in the following way:

In these cases, the human organism is linked with an external entity in a two-way interaction, creating a coupled system that can be seen as a cognitive system in its own right. All the components in the system play an active causal role, and they jointly govern behaviour in the same sort of way that

3. In fact, the term "extended mind" is also frequently used instead of "distributed cognition" to mean roughly the same thing. In our present context, "distributed cognition" is preferred due to its wider applicability.

cognition usually does. If we remove the external component the system's behavioural competence will drop, just as it would if we removed part of its brain. Our thesis is that this sort of coupled process counts equally well as a cognitive process, whether or not it is wholly in the head. (Clark and Chalmers 1998, 8–9)

The motivation behind arguments within cognitive science which advance the notion of distributed cognition is empirical evidence to suggest that we use the environment around us—mobile phones, tablets, and even less technologically advanced artifacts such as notebooks or diaries—to enable us to “offload” parts of the cognitive process in order to help us carry out a specific task successfully. Another typical example would be the fact that I would use pen and paper to perform a complicated mathematical equation that I would otherwise be unable to perform mentally without such aids.⁴

Furthermore, since what one holds as regards to mind affects what one holds with regards to personhood, one of the implications of distributed cognition is what CC term as the “extended self” (Clark and Chalmers 1998, 18) (henceforth *EXTENDED*). If the person is to be located where the mind is, and if the mind is extended, then the person is also extended. One can immediately realise that this possibility gives rise to a host of practical, legal and ethical issues. It has already been stated that the philosophical thesis of distributed cognition forms part of the wider physicalist debate. However, I argue that the notion of distributed cognition causes problems not only for the physicalist but also for the dualist and the hylomorphist. One avenue for overcoming these problems is to reject the notion of distributed cognition altogether. However, I propose that this need not necessarily be the case, and the non-physicalist can reconcile the notion of *EXTENDED* by separating the notions of soul and mind. I shall approach this particular issue in the following sections.

We can now proceed to the second part of this section—the issue of inorganic entities within the brain itself. Neuroprostheses are not cases of distributed cognition *per se*, but rather of the same cognition that used to be carried out by an organic part of the brain that is replaced by an inorganic part—similar to replacing an organic heart with an artificial one. In these situations, therefore, the brain state or event that used to be realised

4. Wilson and Clark (2009) provide a fuller explanation of this, along with how it can be seen in an evolutionary perspective. See Wilson and Lenart (2015) for a wide variety of references that support this thesis.

by a specific set of neurones is now realised by an inorganic replacement that is functionally equivalent.

Some types of neuroprostheses are already widely used, such as cochlear implants, while we can imagine that medical advancements may give us the possibility of replacing more and more parts of the brain with inorganic alternatives. Buller (2013), in fact, argues in favour of a position wherein these neuroprostheses should be considered as part of the person. We can take this even further and imagine a situation in which every part of the brain is slowly replaced by an inorganic counterpart such that we arrive at the point where there are no organic parts left (we can even extend this argument for the rest of the body—the philosophical consequences are the same). Whereas distributed cognition gives rise to EXTENDED as we have seen above, we can call this present case illustrated here an instance of an “inorganic self” (henceforth INORGANIC). What EXTENDED and INORGANIC both show us is that our intuition that cognitive processes are limited only to neural organic matter is false. In this manner, it no longer makes sense to speak of the brain (*qua* bodily organ) but rather the “cognitive system” which incorporates with it all those material elements—organic or not—that constitute the cognitive process. In the following section I shall explore how the dualist, physicalist, and hylomorphist react to these notions of EXTENDED OR INORGANIC.

3. PHYSICALISM, DUALISM, AND HYLOMORPHISM

Broadly speaking, the three general positions one can hold with respect to soul-mind and body are physicalism (or materialism), dualism, or some intermediate hylomorphic position. In this section, I shall consider Lynne Rudder Baker’s “constitution view” as well as Olson’s “animalist” view as physicalist positions, Richard Swinburne’s reinterpretation of strict Cartesian dualism, and Józef Bremer’s application of Aristotle’s concept of soul and human persons as a hylomorphic view.

3.1. *Physicalism*

Baker views the person as being constituted by the body, having what she terms “a capacity for ... a first-person perspective” (2000, 4). In fact, her view is referred to as the “Constitution View.” She further articulates what is meant by constitution and the importance of the first-person perspective:

A person is not a separate thing from the constituting body, any more than a statue is a separate thing from the constituting block of marble. Nor is a person identical to the constituting body. The nonidentity of person and

body, on the Constitution View, is guaranteed by the fact that any body could exist without a first-person perspective, but no person could exist without a capacity for first-person perspective. (Baker 2000, 91)

This view thus seeks to understand mind and personhood as arising or emerging from the animal. This first-person perspective can be likened to the “self,” although she does not make explicit recourse to the term. Baker defines the first-person perspective as a mental property of a higher level (as opposed to those related to homeostasis and other non-intentional bodily functions and movements). This means that it arises out of the physical development of the animal itself. Baker thus dismisses the notion of an immaterial soul-mind and explains the first-person perspective in physicalist terms.

While some physicalists have no qualms about accepting the extended or inorganic self (Clark 2008), Baker holds that *EXTENDED* is an absurd notion to hold. However, despite being a physicalist, Baker articulates cognition and mind as being separable by introducing a separation between personal and sub-personal states. Briefly put, Baker articulates whatever happens on a personal level as those mental states of which I am consciously aware, and what ultimately always pertains to the mind. On the other hand, whatever happens on a sub-personal level, I am not consciously aware of—this is the level of cognition. On this latter level, it is possible for instances of cognition to be extended to include extended, non-organic entities as participants. Recall that, for Baker, a person is characterised as an organism gaining the (capacity for) first-person perspective. This awareness of “I” thoughts is, by definition, conscious in nature. Therefore, all conscious mental states must be carried out by a person—an agent or “cognizer.” That which occurs on the sub-personal level can be extended because it does not require an agent *per se* and we are to infer that, *mutatis mutandis*, the same principles of distributed cognition still hold on this sub-personal level (i.e. multiple-realizability and functionalism). Baker summarises her thesis in the following manner:

a person can have subpersonal parts that are not organic, and these can be material vehicles (or components of vehicles) of a person’s mental states. In this way, the person can have extended cognition, because the material vehicles of her contentful mental states may be inorganic. But the person is constituted by a body, perhaps partly bionic, and the person spatially coincides with the body that constitutes her and does not extend beyond it. (Baker 2009, 655)

Baker's aim, therefore, is to show that, while instances of cognition may occasionally extend out of one's physical body, this does not mean that the person (or her mind, for that matter) also extends outwards. Why is this so? Baker is here attempting to fit distributed cognition into her theory of personhood, a theory which—as we have already seen—asserts that a person always coincides with her body. This is because a person—inasmuch as it is a new ontological entity—arises out from the organism and is bounded by it. Baker is unwilling to accept the notion of EXTENDED as this would entail counting whatever external object is being coupled as part of the person (as CC state); however, as Baker aptly puts it, “shifting and transitory hybrids can hardly be persons” (Baker 2009, 656) since a person must always coincide with her body.

However, it seems like we are begging the question here. While Baker has sought to accommodate a modified version of distributed cognition in terms of “extended-cognition-but-not-extended-mind,” is such a view coherent? Specifically, is the separation between cognition and mind tenable? This separation shall be appealed to later on yet in a different manner. Baker herself admits that her main focus has been metaphysical rather than one related to cognitive science. However, Baker's attempt to “reconcile” distributed cognition with her constitution view seems like trying to hammer a square peg into a round hole. Baker has taken her view as primary and adapted a theory of mind to fit her view, with some unsavoury results. For example, some argue that the separation between personal and sub-personal states is itself unsupported by contemporary cognitive science (Rupert 2018). Therefore, while Baker's view has many positive features that we would want in reconciling distributed cognition with personhood—such as a preservation of the “bounded” person which does not extend outwards—it lacks the necessary supporting framework to make it credible.

However, it should be noted that, while Baker is unsympathetic to the notion of EXTENDED, she is less so towards the notion of INORGANIC. She asserts that:

It is an empirical fact that organs in a human body can be modified (and made to function properly) by artificial parts—cochlear implants, mind-brain interfaces, artificial hearts and other organs (soon an artificial eye), prosthetic limbs, neural implants and on and on. Even now, paralyzed people who have mind-brain interfaces are not simply constituted by a human organism, but by a human organism and a nonorganic prosthetic device. At some point, there could be enough nonorganic devices that support your mental and behavioral functioning that we should say that your body is no longer organic. (Baker 2011, 50)

Thus, we can observe that, on Baker's physicalist framework, mind arises out of an organic body but can also incorporate inorganic parts, as long as such parts form part of a single physical entity—a single body that is not extended outwards to include other, distinct and separate objects.

This view is to be contrasted with another physicalist position advanced by Olson. Olson claims that “we human people are animals” (Olson 2003, 365). This view is considered as the archetype position of animalism, which roughly falls within the category of physicalist theories, yet with some notable differences from Baker's view above. It would help to state what Olson is not saying. He is not equating personhood with one's body—in fact, he tries to do away with the term “body” as much as possible, seeing it as the source of “much philosophical confusion” (Olson 2003, 365). Therefore, whereas a body still exists even after death as a corpse, the same cannot be said of an animal—Olson argues that there is no such thing as a “dead animal.” In this respect, the notion of life can be inferred to be an important principle in the persistence conditions of personhood on this theory; a human person persists if the animal with which it is identified does not cease in carrying out certain functions such as metabolism and exhibit teleology, amongst other things (Olson 1997, chap. 6).

However, upon closer inspection, animalism tells us little more than what has been stated above. It does not state that every person must necessarily be an animal—since Olson leaves open the possibility of non-human (and, curiously, non-material) persons, such as gods and angels. The only claim animalism makes is that if there exists a human person, then that person must necessarily be a human animal. As a result, some have questioned the usefulness of such a theory. Olson admits as much:

This leads some to object that it isn't a view of personal identity at all ... There is some truth in this complaint. [Animalism] doesn't purport to give the persistence conditions of all and only people, or of people as such. It even implies that we are only temporarily and contingently people (on the usual definitions of that term). (2003, 365)

Yet, even given the limited assertions that animalism does make, Olson holds that it is still a superior view to maintain. The fact that we are animals should be irrefutable, and this fact alone is enough to render psychological views (like Baker's) incompatible as candidates for articulating personhood since they privilege one part of the organism (the brain) over the animal as a whole, single entity.

A major objection that Olson presents in favour of his argument is what he terms the “thinking-brain” problem—a variation of the “thinking-animal” problem. Olson articulates the problem as follows;

THINKING-BRAIN PROBLEM:

- (1) There is such a thing as my brain.
 - (2) My brain thinks my thoughts in the strictest sense.
 - (3) If my brain thinks my thoughts in the strictest sense, then anything else that thinks my thoughts does so only in the derivative sense of having a part that thinks in the strictest sense.
 - (4) If anything thinks my thoughts in the strictest sense, I do.
- [(C)] ... I am my brain. (Olson 2007, 79)

Olson considers this a problem precisely because, if I am my brain, then I cannot be my “organism.” This is to say, it would be impossible truthfully to say, “I have brown eyes,” or, “I am five feet tall,” because having brown eyes or being five feet tall are not properties that brains can possibly have. This problem is even further exacerbated when Olson challenges EXTENDED. EXTENDED alters premise (2) above to state that even Otto’s notebook is participating in Otto’s thoughts, and not only his brain. As a result, this gives us CC’s conclusion; Otto’s self is extended to include his notebook. Olson is understandably unhappy with this conclusion because “although the notebook comes to be a part of Otto (on the extended self), it never becomes part of any organism. It follows that Otto is not an organism” (Olson 2011, 486).

We can therefore see that Olson’s “brand” of physicalism is unique. While traditional physicalist theories of cognition (like Baker’s) undershoot Olson’s mark of identifying the person with the organism by locating personhood only in part of the organism (the brain), EXTENDED overshoots Olson’s theory by setting a boundary that exceeds the physical boundary of the organism. The result of both situations is that the person cannot be an organism. This leads us into another problem that Olson has with psychological theories of personhood generally: the too many thinkers problem. Briefly stated, Olson asserts that, while psychological beings are said to be thinking, we should also expect normally functioning human organisms to be capable of thought as well; therefore we are in the strange position of asserting two beings—a biological and a psychological one⁵—which are thinking the same thoughts with no way of determining which one of them is me. It should be noted that, in presenting this problem, Olson is making a number of assumptions and one can argue that in posing the question as

5. Since we have seen that a psychological entity necessarily cannot be an organism.

to whether one is a person or an organism (2011, 487), he is actually begging the question. However, let us put our misgivings about this problem to one side and—due to our inability presently to put a finger on what exactly is not right about too many thinkers—accept it as a given.

Olson further states that the reasoning that underpins the identification of mental states with the self is what he terms as thinking-subject minimalism. This states that, “a psychological being is located at a place if and only if at least one of its mental states is located or realized there” (Olson 2011, 492).

This minimalism is articulated in terms of “direct involvement” (Olson 2007, 88), meaning that for something to form part of the psychological person it must be directly involved in the process of thinking. At the same time, however, this principle causes problems. Despite including external objects (on *EXTENDED*), when considering the brain, one could make the argument that only parts of the brain are directly involved (such as parts of the neurones, or the synapses, but surely not the blood vessels inside the brain), thus shrinking the person to only those relevant parts. Olson sees this principle as unattractive and, furthermore, considers the distinction between direct and indirect involvement to be an arbitrary one. From what has already been stated about Olson, we can also come to the conclusion that animalism is incompatible with *INORGANIC* precisely because animalism maintains the importance of the organic organism for delineating personhood.

Thus, while conscious of the variety of physicalist theories not discussed in this paper, of the two physicalist positions I have considered, Baker’s tries to side-step the ethical challenges that *EXTENDED* would present to us by postulating a distinction between cognition and mind (albeit being more sympathetic to *INORGANIC*). Olson, on the other hand, manages to shut the door to *EXTENDED* and *INORGANIC* altogether by privileging the notion of life (which I shall turn to again further on). However, this comes at the cost of disregarding the special function that the brain has in cognition compared with the rest of the organism.

3.2. *Dualism*

Swinburne, on the other hand, presents a typical dualist position following in the Cartesian tradition. In “Are we Bodies or Souls?” Swinburne’s position categorically chooses the latter. We can also see here the conflation of soul-mind that I have alluded to at the opening of this paper in a specific and clear manner. In the introduction of his recent publication, he merely gives this passing comment:

Substance dualism is a view available both to religious believers and to atheists. If anyone feels that the very word “soul” already implies a religious outlook, substitute the word “self” for the word “soul” throughout this book. The word “mind” is sometimes used in the sense in which I am using the word “soul” as an individual thing, separate from the body; but “mind” is often used in other senses, sometimes very unclear ones. (Swinburne 2019, 2)

The soul-mind, therefore, is the immaterial entity that experiences mental states and undergoes mental events—which are differentiated from the brain which has brain states and brain events. The relationship between the two is aptly summed up by Swinburne, who states that “not merely does the brain cause events in the soul, but the soul causes events in both soul and brain” (2019, 115). Swinburne thus disregards the common objection against dualism—the issue of causal closure between the physical and the mental—and asserts that mental and brain events can be the cause of one another. The soul-mind, however, remains the essential part of a person (as opposed to the body which is non-essential) since we continue exist even when not linked to a body (Swinburne 2019, 108).

Furthermore, following his Cartesian stance, Swinburne asserts that

we are well justified in believing that souls cause brain events, as well as that brains cause events in souls ... each human soul interacts with a brain (2019, 139).

Again, the notions elucidated above come into play. Taking note of the phenomena of distributed cognition and neuroprostheses articulated in the previous section, a more precise way for Swinburne to state the above would be to say that each human soul-mind interacts with a cognitive system. This is so since, on Swinburne’s account, the relevant feature of the brain is that it is physical—the fact that it also happens to be organic is not given importance, leading one to believe that it could as well be partly or completely inorganic and distributed. There is a further step that needs to be said. Swinburne then goes on to articulate the location of the soul-mind. He states that:

[a soul] can be said to be located at the place if there is a place at which and only at which it exercises its causal influence, and by events at which it is itself causally influenced. In this sense a soul is located at that region of the brain with which it interacts and so is extended, although necessarily indivisible. If the soul ceases to be capable of interacting with its brain, and there is no

other physical substance with which it is capable of interacting, then—even if it continues to have a mental life—there seems to be no sense in which it would have a location. (Swinburne 2019, 39–140)

Therefore, we can easily imagine an inorganic part of the cognitive system with which the soul-mind is interacting—as the emphasized phrase seems to allow space for—as long as “causal influence” is being exerted on or by that particular part. Thus, we could theoretically be in a position to say that the soul of a particular individual is either located wholly in some inorganic substance or possibly even extended outward of the brain. It seems, then, that Swinburne’s dualist articulation can accept both EXTENDED and INORGANIC, and, *prima facie*, it seems there is no reason not to.

3.3. *Hylomorphism*

Finally, Józef Bremer (2017) argues in favour of an Aristotelian articulation of “soul” and seeks to integrate it within contemporary neuroscience. Bremer’s point is to show, by means of a Sellarsian approach, that “the Aristotelian conception of soul is preferable to that of Cartesian mind” (2017, 66; emphasis added).⁶ This Aristotelian approach is classified as a hylomorphist view. A midway position between physicalism and dualism, hylomorphism does not view the primary entity which makes up the human person as being only material as in physicalism, nor does it view the human person as being primarily an immaterial substance that can exist with or without a material body. On the contrary, this view requires the “marriage” of both elements of soul and body, based on the Aristotelian dichotomy of form and matter.⁷ Bremer aptly summarises this by stating that “the reality of souls is properly captured by the concepts of form and formal causation” (2017, 48).

A common (albeit rather crude) way of understanding the Aristotelian soul is to liken it with “life.” Aristotle in *On the Soul* (hereafter *De Anima*) held that “what has soul in it differs from what has not in that the former displays life” (*De Anima* II.2 413a22). In this sense, all living things have a soul, yet Aristotle then distinguishes between the three main capacities of the soul—nutrition, perception, and mind (or intellect). While all living things exhibit nutrition, only animals exhibit nutrition and perception, and

6. Again, however, “soul” and “mind” here should be taken to mean what I am calling for the time being “soul-mind.”

7. This is not without its problems. There is some controversy within the study of Aristotle as to the application of hylomorphism to the case of human beings. However, this is beyond our current scope. For more, see Appendix A of (Shields 2016).

only humans exhibit all three faculties. More can be said on this particularly complex notion of soul, yet this would go beyond our present needs. There is also still some debate among commentators of Aristotle as to what he really meant about numerous things. Furthermore, there is also some confusion as to whether the soul (or part of it) can exist separately from the body, and whether it is a special sort of substance unlike other forms. Some of these issues will be briefly touched upon further down.

So what stresses, if any, do EXTENDED and INORGANIC place on the Aristotelian conception of soul? We have already seen in the preceding section how, in the cases of EXTENDED or INORGANIC, the replacement or “adding on” of inorganic parts serves to sustain the mental functioning of the individual. Both are seen to function exactly like a fully organic individual. *A fortiori*, were the inorganic, or separate parts to be removed from the former two individuals, they would cease to function normally. Aristotle could have never conceived of the world we inhabit today, so naturally his philosophical framework does not cater to the current scientific and technological milestones we are undergoing. Yet, he does get close in his *Metaphysics*, when he states that:

even if all circles that had ever been seen were of bronze (for none the less the bronze would be no part of the form); but it is hard to effect this severance in thought. E.g. the form of man is always found in flesh and bones and parts of this kind; are these also then parts of the form and the formula? No, they are matter; but because man is not found also in other matters we are unable to effect this severance. (*Metaph. Z 1.1.1036b1-6*)

What, then, should restrict us from considering only organic matter in Aristotle’s dichotomy of matter and form? Nothing, I believe. To hold a contrary position would be to exert a form of foundationless organic-chauvinism. Some commentators in fact argue in favour of a form of “variable-realizability”:

Contemporary writers often claim that the “hardware” (neurons rather than silicon chips) is or ought to be irrelevant to contemporary psychology; it is claimed to be a fact that systems other than animal organisms can perform many of the functions that we can perform too. So the precise nature of the physical “hardware” is irrelevant to interesting generalizations about psychological competence: these latter transcend the precise nature of their actual “matter.” (Wilkes 1995, 124)

Yet, this is not to say that the hylomorphic framework could be distilled down and reduced to functionalism itself (Cohen 1995). While the notions

of EXTENDED and INORGANIC have arisen out of the functionalist framework, to assent to them does not necessarily imply an assent to functionalism as a whole. Nevertheless, it seems that, from the above, the hylomorphist is constrained to accept INORGANIC unless further arguments to the contrary are presented. This much is already admitted by another hylomorphist—David Hershenov (2008). Hershenov asserts that in the case of INORGANIC (including also inorganic part replacement of the rest of the body and not just the cerebrum), we can say that:

The soul has either come to configure just the remaining organic part of the brain or has actually come to configure the inorganic parts as well. What might make one say the latter is the case is if the person can control some of the inorganic parts. That is, the thoughts of the person cause the inorganic parts to move just as it did earlier with its arms and legs. But since the inorganic parts don't grow and decay, nor are reciprocally dependent upon each other as are the vital organ systems of an organism, readers might prefer the first interpretation of what is configured by the soul of the person. (Hershenov 2008, 497)

Things are not as clear when it comes to EXTENDED, however. This shall be tackled and clarified in the following section.

Before proceeding, however, a comment should also be said about personhood, due to its relevance further on. Whether one is a dualist, hylomorphist, or physicalist influences the manner in which one articulates personhood. Broadly speaking, dualists take the soul-mind to be that entity that determines personhood, materialists take the mind to be embodied and realised in one (or more) physical entity and therefore identify those entities that realise the mind as being the person, while hylomorphists take the combination of both soul-mind and body to constitute the full person.

It can be easily seen from the three subsections above that physicalism, dualism and hylomorphism must articulate some kind of relationship between the soul-mind and a physical entity (with the exception of animalism, in some sense), be it the body or the brain specifically. Due to this very fact, all three types of theories are placed under pressure by the realities of distributed cognition and neuroprostheses. In this manner, the first aim of this paper has been achieved.

Therefore, the serious implications that the physicalist faces are now shared by the non-physicalist as well. Since hylomorphists and dualists consider the soul-mind (or “soul-plus-body” in the case of hylomorphism) to be deserving of ethical value, they seem constrained to follow through with

the implications of their position and—given the arguments put forward above—accord legal and moral weight to those physical objects wherein one’s soul-mind—and, consequently, one’s person—resides and with which it interacts.⁸ For both theories, this would also lead to having to consider the inorganic parts, as well as possibly the extended parts that participate in the overall cognitive system of an individual, as deserving of the same ethical value accorded the rest of the body in virtue of being in relation to the soul-mind. The hylomorphist should do so because, on her view, these inorganic parts are—functionally speaking—part of the body. The dualist, on the other hand, should do so because the soul-mind seems also to reside in these inorganic parts given that, again, these parts are part of the brain (and, by extension, the body).

In this sense, therefore, the notions of EXTENDED and INORGANIC, while relating in a slightly different manner with physicalism, hylomorphism, and dualism, can be seen to arrive at the same consequences; there is no coherent manner in which, on the definition of “body” given by each, these inorganic parts can fail to be considered as part of the overall cognitive system (and, hence, the body).

4. A FOURTH WAY—ARISTOTLE REVISITED

We have seen in the preceding section that the notions of EXTENDED and INORGANIC lead to unsavoury consequences on each of the three frameworks being considered. Where does this leave us? Proponents of either theory may choose to bite the bullet and accept that the inorganic parts also form part of one’s person and should be accorded the same ethical value given that the soul-mind is present in these parts as well or, alternatively, dismiss the notion of EXTENDED and INORGANIC outrightly.

I propose yet another alternative, one that can still respect the empirical evidence in favour of inorganic and extended parts forming part of the overall cognitive system, while still restricting ethical value to the organic, living body only. This, I argue, can be done by separating the notions of “soul” and “mind.” How can this be done? The concept of “soul” has a much longer history, spanning back to Plato and Aristotle, whereas we cannot say the same for the concept of “mind” as an entity *per se*—which can trace

8. Carter and Palermos (2016) delve specifically into the legal argument (albeit from a purely physicalist perspective) and, despite making a case in favour of EXTENDED having legal implications, still fall short of advocating in favour of the extended person. We can analogously apply similar reasoning to our present discussion.

its roots back to Descartes.⁹ The crucial point to notice here is that, while “mind” has always had the function of “mentality,” pertaining to thinking and reasoning and acting, the notion of soul on the other hand—especially prior to Descartes—held within it not only the function of mentality but also identity, vitality, as well as a theological transcendental function (at least within the Christian philosophical tradition). In this regard, I agree with Bremer that:

the Cartesian conception of soul came to supplant the Aristotelian one in a manner that can be described as *pars pro toto*: the thinking soul was itself identified with the entirety of Aristotelian soul. As a consequence, the philosophy and psychology of consciousness, and the neurosciences, have all come in essence to amount to sciences deprived of soul in the Aristotelian sense. (2017, 67)

One’s soul—conceived in Aristotelian terms—must remain the basis for ascribing ethical value to the organic individual (and bounding it in the process). Aristotle speaks of the human body as having such a soul because it carries out and exhibits the three capabilities of the soul as already mentioned. In this sense, therefore, at least in the case of EXTENDED, we already have a manner in which we can exclude such entities from the hylomorphic unity because, even if we were to agree with the assertion that such entities participate in the cognitive process, they do not exhibit the other two functions of the soul. A crude litmus test would therefore be to say that, in cases of distributed cognition, the Aristotelian soul resides in the organic body which is animated by unitary life.¹⁰

A crucial clarificatory note should be inserted here. Some philosophers use the terms “mental” and “cognitive” interchangeably. However, CC do not consider all instances of cognition to be instances of mind (in the physicalist, functionalist sense). This can be seen from their line of argumentation, in that they first argue in favour of cognitive processing extending into the environment, and then ask:

9. Here I refer to “mind” as an entity in itself as opposed to the manner in which Aristotle intends it as one of the faculties of soul.

10. Since the entity (body) that is animated by life is thus capable of performing nutritive and perceptive capacities as well. I specify unitary life in order to overcome those instances on EXTENDED when participants in my cognitive process might be animated by life which is not my own (as in the case of cognitive interdependency cases). These cases, generally found within physicalist literature, argue that one’s mind extends in such a manner that the minds of others also form part of it. For more, see Wilson and Lenart (2015).

but what of mind? Everything we have said so far is compatible with the view that truly mental states—experiences, beliefs, desires, emotions, and so on—are all determined by states of the brain. Perhaps what is truly mental is internal, after all? We propose to take things a step further. (Clark and Chalmers 1998, 12)

This “step further,” as CC put it, this distinction between what is “mental” and what is “cognitive,” is of utmost importance and, I hold, the key to attempting to articulate this fourth way within an Aristotelian framework.¹¹ As has already been mentioned above, a traditional reading of Aristotle views the soul (in the case of humans) as having three main capabilities: nutrition, perception, and mind (or “thinking”). It seems, at first, that the philosopher cannot both hold that cognition extends outwards of the organic body, as in the cases of *INORGANIC* and *EXTENDED*, and assert that these inorganic, external entities do not relate with the soul (and, consequently, need not be given the corresponding ethical value). Yet, this separation of “mental” and “cognitive” would allow the hylomorphist to have her cake and eat it!

Here, we may again appeal to the physicalist literature for clarity. Clark might be of help in this regard. When discussing the notion of the *EXTENDED*, despite arguing in favour of cognitive impartiality, he formulates the below definition:

HYPOTHESIS OF ORGANISM-CENTERED COGNITION (HOC):

Human cognitive processing (sometimes) literally extends into the environment surrounding the organism. But the organism (and within the organism, the brain/CNS) remains the core and currently the most active element. Cognition is organism centered even when it is not organism bound. (Clark 2008, 139)

Therefore, despite asserting cognitive impartiality amongst all the entities involved—organic or not—all cognition centres around the organism. This is also a plausible way in which Clark can further assert that, lacking Otto’s organism, Otto’s notebook is not participating in (Otto’s) cognitive process.

11. CC’s separation of cognition and mind should not be confused with Baker’s attempt which has been dismissed above. Baker’s separation, as I have argued, is *ad hoc* and crafted in a manner to “fit” her constitution view without a proper foundation. CC, on the other hand, elucidate the same separation as a way of illustrating that the mind does not simply mean “the sum of all cognition” but rather involves something more—a whole which exceeds the sum of its parts.

Transposing this concept onto our present debate, we can say that, wherever human cognition is present, the soul (and, consequently, also ethical value) extends up to and only to the space that is animated by the same unitary life that animates the organic part of the mind. Taking Otto as our example again, we can still call the cognitive processes that take place in the other, inorganic entities as properly Otto's precisely because of HOC—it is Otto's cognition because it is centred around Otto's organic body—which is, in turn, animated by his soul.

Yet, we have not fully bridged the gap between the living, organic body and the external, inorganic entities that participate in the cognitive process. How can we speak of these different entities as truly being cognitive, while the soul remaining the locus of what is mental? The external entities are truly cognitive only insofar as the organism around which this cognition is centred is animated by a soul having the capacity for mind.¹² This division between “cognitive” and “mental” could be another complimentary interpretation of the controversial divide Aristotle makes between the “passive” and “active” mind in *De Anima* III.5. While many interpretations exist on this particular issue within Aristotelian commentary, the fact remains that Aristotle articulates the soul's capacity of mind in two ways, only one of which seems to be able to exist outside of the body. Some Christian philosophers have taken this to imply an immortal soul (Wilkes 1995, 126), yet this is beyond our present concern. The soul's capacity of having a part of the mind that must remain embodied, and another that need not be so, might be conceived of as the Aristotelian equivalent of HOC articulated above. Thus, Aristotle's active mind affords us the possibility to maintain at the same time the hylomorphic unity and importance of the soul-body, while also reconciling the notion of distributed cognition as articulated in EXTENDED.

In this light, more work still needs to be done. My proposal is only that recent advances within neuroscience can be integrated within non-physicalist theories by making use of an Aristotelian framework. This is not to say that they should be. Even if the cases of INORGANIC and EXTENDED as articulated here were within the realm of science-fiction a few decades

12. Another way in which we can conceptualise this difference in a simpler fashion is to investigate whether the inorganic or external entity is functioning as a tool or as a part of the overall cognitive system. While many objects can be said to serve as tools in facilitating the cognitive system, this does not entail that they are also parts of that system. In order for us to classify a certain entity (inorganic, external, or otherwise), that entity must not merely facilitate cognitive functioning, but participate in the overarching teleological functioning of the system. I would like to thank an anonymous reviewer for articulating this difference.

ago, the future still holds possibilities that we have yet to imagine and conceive of. The realities of neuroprostheses and distributed cognition will seem insignificant when compared to greater transhumanist issues that are slowly coming to the fore, issues which will again need great examination and reflection. The role of the philosopher, as always, remains the same. From Aristotle down to today, we must continually strive not necessarily to change our ontological definitions, but to clarify them in order better to explain the phenomena we experience.

BIBLIOGRAPHY

- Adams, Frederick, and Kenneth Aizawa. 2008. *The Bounds of Cognition*. Malden, MA: Wiley-Blackwell.
- Aristotle. 1984. *The Complete Works of Aristotle: The Revised Oxford Translation*. edited by Jonathan Barnes. Princeton: Princeton University Press.
- Baker, Lynne Rudder. 2000. *Persons and Bodies: A Constitution View*. Cambridge: Cambridge University Press.
- . 2009. "Persons and the Extended-Mind Thesis." *Zygon* 44 (3): 642–58.
- . 2011. "Christian Materialism in a Scientific Age." *International Journal for Philosophy of Religion* 70 (1): 47–59. <https://doi.org/10.1007/s11153-010-9283-0>.
- Bremer, Józef. 2017. "Soul or Mind? Some Remarks on Explanation in Cognitive Science." *Scientia et Fides* 5 (2): 39–70. <https://doi.org/10.12775/SetF.2017.023>.
- Buller, Tom. 2013. "Neurotechnology, Invasiveness and the Extended Mind." *Neuroethics* 6 (3): 593–605. <https://doi.org/10.1007/s12152-011-9133-5>.
- Carter, J. Adam, and S. Orestis Palermos. 2016. "Is Having Your Computer Compromised a Personal Assault? The Ethics of Extended Cognition." *Journal of the American Philosophical Association* 2 (4): 542–60. <https://doi.org/10.1017/apa.2016.28>.
- Clark, Andy. 2008. *Supersizing the Mind*. Oxford: Oxford University Press.
- Clark, Andy, and David Chalmers. 1998. "The Extended Mind." *Analysis* 58 (1): 7–19. <https://doi.org/10.1093/analys/58.1.7>.
- Cohen, S. Marc. 1995. "Hylomorphism and Functionalism." In *Essays on Aristotle's De Anima*, edited by Martha Nussbaum and Amélie Oksenberg Rorty, 61–76. Oxford: Oxford University Press.
- Hershenov, David B. 2008. "A Hylomorphic Account of Thought Experiments Concerning Personal Identity." *American Catholic Philosophical Quarterly* 82 (3): 481–502. <https://doi.org/10.5840/acpq200882332>.
- Olson, Eric T. 1997. *The Human Animal: Personal Identity Without Psychology*. Oxford: Oxford University Press.
- . 2003. "Personal Identity." In *The Blackwell Guide to Philosophy of Mind*, edited by Stephen P. Stich and Ted A. Warfield, 352–68. Oxford: Blackwell Publishing.
- . 2007. *What Are We? A Study in Personal Ontology*. Oxford: Oxford University Press.
- . 2011. "The Extended Self." *Minds and Machines* 21: 481–95. <https://doi.org/10.1007/s11023-011-9258-7>.
- Rupert, Robert D. 2018. "The Self in the Age of Cognitive Science: Decoupling the Self from the Personal Level." *Philosophic Exchange* 47 (1): 1–36.
- Shields, Christopher. 2016. "Aristotle's Psychology." The Stanford Encyclopedia of Philosophy. <https://plato.stanford.edu/archives/win2016/entries/aristotle-psychology/>.

- Swinburne, Richard. 2019. *Are We Bodies or Souls?* Oxford: Oxford University Press.
- Wilkes, K. V. 1995. "Psuchē versus the Mind." In *Essays on Aristotle's De Anima*, edited by Martha Nussbaum and Amélie Oksenberg Rorty, 110–28. Oxford: Oxford University Press.
- Wilson, Robert A., and Andy Clark. 2009. "How to Situate Cognition: Letting Nature Take Its Course." In *The Cambridge Handbook of Situated Cognition*, edited by Murat Aydede and P. Robbins, 55–77. Cambridge: Cambridge University Press.
- Wilson, Robert A., and Bartłomiej A. Lenart. 2015. "Extended Mind and Identity." In *Handbook of Neuroethics*, edited by Jens Clausen and Neil Levy, 423–39. Dordrecht: Springer.