The “I” as an epistemological world

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THE “I” AS AN EPISTEMOLOGICAL WORLD

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The first part of this article contains certain elements of the epistemologically different worlds perspective that focus the idea that the “I” or human subjectivity is an EW corresponding to the brain and body. The second part shows that Bechtel’s notion of “mechanism” is, in fact, a kind of more “technical” functionalism that tries to avoid the mind-brain problem. However, by avoiding the mind-brain problem, many cognitive science issues remain unsolved. Thus, we consider that Bechtel’s solution is only a surrogate-alternative in explaining the notions of cognition (or some of its functions) or mind/brain in interaction with the environment.

1. The Epistemologically Different Worlds (EDWs)

As Gabriel Vacariu wrote in various articles and one book (2008), EDWs perspective is an alternative to essential problems from philosophy (mind-body problem and all its related problems from philosophy of mind and cognitive science\(^1\)) and science (quantum mechanics problematic notions like entanglement, nonseparability, the relationship between micro and macro-“levels” etc.) All these problems can be rejected as pseudo-problems if we give up to the notion of the “world” or the “universe” (that it is called the “unicorn-world”). We introduce here the first five principles from Vacariu (2008), but we avoid the arguments from that book in support of them:

(P1) Under different conditions of observation, the human subject observes epistemologically different worlds.

(P2) The determining epistemologically different entities and their corresponding constitutive epistemologically different interactions represent the epistemologically different worlds. Each epistemologically different world has the same objective reality.

\(^1\) We emphasize here that all the particular problems from philosophy of mind and cognitive science cannot be completely solved if the main problem – the mind-body problem – remains unsolved! It is not the consciousness problem, as Chalmers underlines in various papers, the central problem of these fields but the Cartesian mind-brain relationship. We have to solve firstly the mind-brain problem, the human subjectivity and then the consciousness problem.
(P3) As human attention is a serial process, the human subject cannot simultaneously observe EDWs.

(P4) The set of judgments that describe the phenomena of each epistemological world must follow the rule of conceptual containment that is given by the conditions and limitations within the concepts of the judgments. These conditions and limitations are governed by the properties of (internal or external) tools of observation.

(P5) In physical terms, the part-counterpart relation corresponds to the “I” or human subjectivity or experience.

The only major problem that has to be somehow solved is the human subjectivity or the “I”. In Vacariu (2008), it is offered an alternative to the human subjectivity within the EDWs perspective. In this paper, we want to develop the main ideas about the “I” offered by the EDWs perspective.

2. The “I” as an EW

In our days the notion of human subjectivity is very problematic. The question “Does the ‘I’ exist?” still has no definitive answer. In order to explain human subjectivity in psychological terms from an EDWs perspective, we need to introduce some psychological dichotomies concerning the notion of representation developed by Mandler (1998). She synthesizes these dichotomies in pair-notions: declarative-procedural, accessible-inaccessible, conscious-unconscious, conceptual-sensorimotor, symbolic-subsymbolic, and explicit-implicit (Mandler, 1998, p. 265). These dichotomies are interconnected and partially overlap without being identical (Mandler, 1998, p. 265). The declarative-procedural distinction is based on whether or not the knowledge in question is accessible or inaccessible to consciousness. Procedural knowledge remains inaccessible to consciousness, since we have access only to the effects of procedures, not to procedures themselves. The fact that we use declarative knowledge for gaining procedural knowledge does not entail our having accessibility to procedural knowledge. We are never aware of the details of procedural knowledge by means of which our habituation can increase the performance of our body for some actions. Mandler maintains that we cannot conceptualize and think explicitly about sensoriomotor information. This, of course, does not mean that a person is not aware of sensations (qualia) involved in perceptual and motor learning. “You see that a tree is green, you experience greenness, but this is not the same as thinking.” (Mandler, 1998, p. 266) This shows the difference between the conceptual and sensoriomotor.

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2 The “I” in neural terms are given by P5. Large parts of this section are from Vacariu (2008).
From the EDWs perspective, how can we explain human subjectivity in psychological terms? If we define the existence of all other epistemologically different entities with the help of their interactions, we can say that the “I” does not interact with anything else. The “I” cannot “observe” itself as a complete entity (in Cartesian terms). Moreover, nobody can observe an “I” (in psychological form or the first-person ontology). Does this mean that the “I” does not exist? In order to define the existence of human subjectivity, we have to change the notion of the existence. Through the interaction of the brain and the body with the environment, certain patterns of neurons are activated. These brain-body-environment reciprocal causal interactions correspond to the “I” or to the mind-EW. However, the mind has no place in the “world”, the mind is just an internal EW or the “I”. Because brain, body and environment are in a continuous reciprocal interaction, the neural states and processes are undergoing continuous change. But the “I” and its mental states that correspond to the brain (neural patterns of (dis)activation) and the body (and their interaction with the environment) is an EW. For me, such mental states and processes represent implicit and explicit knowledge and all Mandler’s pairs of knowledge. Nevertheless, even this movement presupposes two elements that cannot be explained: the “I” and the knowledge. From an EDWs perspective, the mental states that represent knowledge are the “I”.

We mention that implicit knowledge is the results of the development and learning processes throughout the life of each individual. This knowledge corresponds to biological mechanisms that are the results of the evolution of our species and the development of each organism in the continuous reciprocal interactions between brain, body and environment. Such physical interactions correspond to certain mental states and processes. Due to the evolution of species and development of each individual, the “I” is feelings, desires, etc. we consider the feelings and desires to be knowledge as well. The mental representations and processes (that only correspond to parts of the brain and body) are the “I”. Now we can introduce the last principle. Human subjectivity or the self in psychological terms is given by the principle of knowledge:

(P6) The “I” is knowledge.

We emphasize that, in this case, the content of knowledge has at least four elements that overlap:

1) All knowledge (declarative and procedural, accessible and inaccessible, conscious and unconscious, conceptual and sensorimotor, symbolic and subsymbolic, and explicit and implicit knowledge).

2) All kinds of memory.

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3 The EDWs perspective has already changed the notion of existence regarding the external objects/entities (see ibidem).
3) Descartes’ functions. For him, the “I”, as a thinking thing, has different functions (or properties) such as doubting, understanding, denying, willing, sensing and imagining (Descartes, 1994, p. 82).

4) Self-knowledge and the capacity (possibility) of knowledge for manipulating itself. This capacity involves, among other features, Fodor’s characteristics of the mind: compositionality, systematicity and productivity (Fodor and Pylyshyn, 1988). This knowledge corresponds to the biological elements of a human subject.

For each self, the elements of knowledge superimpose during the process of development and the adult period to create and change the “I”. As a paradox, the “I” is both indivisible and formed by mental states and processes. This indivisibility is equal to the self unity and it represents the possibility of the “I” to access directly (in parallel and not in serial) any parts of it, i.e., any parts of the knowledge. The “I” is the knowledge, i.e., all its mental states and processes, having this ability to access itself. The “I” is the knowledge that can access itself.

We can make the analogy between the mind-brain relation and the wave-corpuscle relation. The mind (the “I”) as EW1 corresponds to the brain and body belonging to the macro-EW. The wave belongs to an EW different than the micro-EW. Although indivisible, the “I” can access parts of it, i.e., the mental representations and processes. These mental states and processes correspond to certain neural patterns of activation. The quantum wave (that is indivisible) corresponds to one or more particles but it is not formed by these particles. Otherwise, we would not be able to explain the most enigmatic notion from quantum mechanics, the “entanglement” (see Vacariu, 2008). Similarly, in the absence of the “I”’s compositionality and indivisibility, we would not be able to explain the cognition (with its functions) and the human subjectivity.

To support the EDWs perspective, we introduce the conclusion of a very interesting article written by Vul et al. (in press, on internet dated December 2008 – There have already been many discussions about this article on internet!) The authors investigate the “correlations between the behavioral and self-report measures of the personality or emotion and the measures of brain activation obtained using fMRI” (Abstract of the paper) showing that “these correlations often exceed what is statistically possible assuming the (evidently rather limited) reliability of both fMRI and personality/emotion measures.” Vul et al. inquire about the questions and methods used in social neuroscience from 54 articles! The main task of the authors of these papers was to find empirical data in order “to bridge the divide between mind and brain extremely high correlations between measures of individual differences relating to personality, emotionality and social behavior, and measures of brain activity obtained with functional magnetic resonance imaging (fMRI) (Vul et al., p. 2). Without analyzing this investigation in detail, we introduce the conclusion of this article: Vul et al. show that such correlations are “impossible high”. Even if Vul et al. urge the
authors of the articles under their investigations to correct the results of such correlations, we believe that these correlations would never be perfect! We cannot make perfect correlations between entities that belong to the mind-EW and the brain-EW. We strongly emphasize that, because of the part-counterpart and knowledge principles, it is possible for the cognitive neuroscientists to find only approximate correlations. A mental state/process can only be, in high approximation, correlated with a certain particular area of neural pattern(s) of activation. That mental state is (part of) the “I”; the “I” corresponds to the whole brain and body. Therefore, a mental state has to be in direct correlation with the most activated neural area of the brain but indirectly with the counterpart of the brain and the body. The meaning of that mental state corresponds to the rest of the brain and body.

3. Bechtel’s notion of “mechanism” and the EDWs perspective

Regarding the mind-body problem, Bechtel embraces the identity theory. Moreover, following the situated cognition approach (or dynamical system approach and maybe Brooks’ view of robots – Brooks 1990), the American philosopher emphasizes the interaction between mind and world (2009). For Bechtel, the main notion is that of “mechanism”. In reality, the notion of “mechanism” seems to us as a return to a sort of more technical functionalism from the philosophy of mind.

For mental phenomena it is appropriate to treat the mind/brain as the locus of the responsible mechanism and to emphasize the boundary between the mind/brain and the rest of the body and between the cognitive agent and its environment.

Nevertheless, if the mind = the brain, this alternative cannot be available to explain the human mind in interaction with the environment. Bechtel wants to save two characteristics necessary to explain the mind/brain: the autonomy of such entities and the interaction between a mechanism and its environment. “A critical feature of an autonomous system is that it is an active system that operates to maintain itself” (p. 10).

How can we criticize Bechtel’s “mechanism” alternative from an EDWs perspective? In his article, Bechtel applies his analysis and decomposition to the biological mechanisms. Then, he moves – illicitly, from the EDWs perspective – to the mental level.

Mechanisms are bounded systems, but ones that are selectively open to their environment and that often interact with and depend upon their environment in giving rise to the phenomenon for which they are responsible. Moreover, biological mechanisms
operate in the context of active, self-maintaining organisms that are dependent on their environments and, yet, are in an important sense autonomous from them (Bechtel, 2009, p. 2).

Obviously, his view is correct when applied to the biological mechanisms that are bounded counter systems with specific autonomy and in interaction with their environment. However, from the EDWs perspective, there is no interaction between the mind and the world but only between the brain and the macro-EW. As we saw in Vacariu (2008), we cannot claim the same thing about the mind: the mind is an EW not a bounded system interacting with its environment. As we will see below in more details, perception and cognition belong both to the “I” or to the human subjectivity. (Regarding this idea, we followed Kant’s philosophy, see Vacariu, 2008.) Bechtel’s goal in using the notion of mechanism (that involves decomposition) is to find the “functional components that map onto the system’s structural components” (Bechtel, 2002, p. 229). Our question is: can we find the functional components of a cognitive mechanism that interact with its environment without making the distinction between the mind and the brain (or by accepting a pseudo-alternative – the identity theory – regarding the mind-body problem)? In reality, from an EDWs perspective, the alternative is to replace these functional components with the correspondences between elements of the brain and the mind. We emphasize again that by using the notion of “mechanism”, Bechtel wants in fact to avoid a direct confrontation with the eternal mind-brain problem. Without making the distinction between the mind and the brain, Bechtel’s strategy regarding his notion of mechanism is partially a pseudo-alternative just because he wants, as everyone, to explain the human cognition or the mind (with some functions) that “requires” a biological (ontological) mechanism. Maybe it is possible to explain a function by introducing the idea of “mechanism”, but ontologically (or hyperontologically, from an EDWs perspective), we have to deal with the mind-body problem.

In the paper dated 2002, Bechtel’s mission is to counter-attack Uttal’s skepticism about cognitive psychology and cognitive neuroscience. Using lesions and image techniques, Uttal considers that we cannot decompose a cognitive system (Bechtel, 2002, p. 230). “Many mental entities turn out on close inspection to be hypothetical constructs whose reality is impossible to validate because of the intrinsic inaccessibility of mental processes” (p. 15) (Uttal, p. 15, in Bechtel, 2002, p. 230). From an EDWs perspective, the “intrinsic inaccessibility of mental processes” means that the mental processes (i.e. the “I”) cannot be accessed from a third-viewpoint ontology, i.e., the mind is an EW that cannot be analyzed using fMRI, PET, etc. Moreover, according to the part-counterpart principle, the neural pattern of activation for an external stimulus (for example) is not enough to explain the corresponding mental state but we should add the counterpart of the brain and the whole body. According to the principle of knowledge, each mental process or mental representation/state is part of the “I”
and the “I” is the knowledge, the entire knowledge. Paradoxically, the “I” is composed (we have to recall the notion of “superposition” from connectionism) of various mental states and processes but, at the same time, it has its unity.

Let us analyze the meaning of Bechtel’s “mechanism”. Among different versions, he “prefers” the following one:

A mechanism is a structure performing a function in virtue of its components parts, component operations, and their organization. The orchestrated functioning of the mechanism is responsible for one or more phenomena (Bechtel & Abrahamsen, 2005; Bechtel, 2006) (Bechtel, 2009, p. 6)

In its essence, a mechanism consists of parts with various operations (p. 6). Bechtel highlights that even if the notion of “level” is considered to be “vexed” (Craver), the parts, with their functions and the mechanism, are situated at different levels of organization (p. 6). “Mechanistic explanation is in this sense reductionistic (Bechtel, 2009)” (idem). Bechtel inserts this view of mechanisms between a holistic vision and a modular view. The division of a mechanism into parts is relatively.

The operations of the component parts of a mechanism are determined not just by their internal constitution (their subparts, the operations of these subparts, and the way they are organized) but also by both the conditions arising within the mechanism as a result of the operation of other components and external factors impinging on the mechanism. The boundaries of the part partially isolate it from other parts, but do not completely encapsulate it in Fodor’s sense.

Evidently, Bechtel cannot accept Fodor’s notion of “encapsulation”. When interacting with its environment, a mechanism cannot be totally encapsulated. Thus, for instance, there is an alternative considering that the perception is not encapsulated from cognition (not encapsulated with Kossylyn, etc. vs. encapsulated with Pylyshyn etc.). From an EDWs perspective, both perception and cognition are the “I” just because the “I” is an EW. Therefore, we cannot talk about an encapsulation of any properties/functions of the mind in relation with the “I” or human subjectivity. Using fMRI or PET, we may be able to identify some neural parts of the brain that accomplish some functions, but it does not mean that the corresponding mental functions are encapsulated from the “I”. We repeat that the brain and the body interact with their environment (the brain, the body and the external environment, they all belong to the macro-EW), while the mind is an EDW that corresponds to the brain, body and these interactions. Bechtel is aware that it is compulsory for his approach to manage with both views at the same time. However, how can we do this in one unique world without producing vital contradictions in one consistent approach? From an EDWs perspective, the “holistic view” would represent the mind (the “I” with its superimposed entities and functions), while
the “modular view” would characterize specific neural mechanisms that correspond to some particular functions of the mind. Evidently, there are certain mental functions but all these functions belong to or, better, are the “I”. These functions are a priori in potential states and become real in a proper context.

Bechtel uses Simons’s distinction between decomposability and nearly decomposability. The independence of the sub-systems at any given level means that the system is decomposable. “If the sub-systems are completely independent, except for sending outputs from one sub-system to another, the system is fully decomposable” (p. 7).

What means “at any given level”? We may consider levels from genes to molecules and cells to neural patterns of activation and larger brain areas. But all these levels belong to the same macro-EW. Meanwhile, the mental “level” and neural “level” are not levels but EDWs! A subsystem is “completely” independent from another sub-system only when we use limited instruments of observation (fMRI and PET), but in reality we have to check for the unity of the brain entities and functions that correspond to the unity of the “I”. According to the last principle, the “I” is knowledge but this knowledge has an absolute unity! We are aware of this unity only within the mind-EW but not within the brain-EW. Nevertheless, we have to recall that the brain acts in parallel, the mind is serial (the conscious knowledge is serial) and parallel (the implicit, unconscious knowledge).

To Simon, if the interactions between the sub-systems are “not negligible”, then we have nearly decomposability. The difference made by Simon is interesting:

(1) In a nearly decomposable system the short-run behavior of each of the component subsystems is approximately independent of the short-run behavior of the other components;
(2) In the long run the behavior of any one of the components depends in only an aggregative way on the behavior of the other components (p. 198) (Bechtel, p. 7).

Nearly decomposable systems mainly exist in “the organic world where the chemical bounds are of different strengths” (p. 8). Simon considers that different mechanisms interfere. We can clearly see that both authors try to satisfy both conditions of decomposability and non-decomposability but they are not able to do this within the unicorn-world. Therefore, they need to introduce certain Ptolemaic epicycles. From my perspective, the first point refers to the components that belong to the brain, while the second point reflects the indivisibility of the “I”, the human subjectivity.

Bechtel argues two characteristics of a mechanism: the autonomy and the interaction with its environment. The components of a mechanism are “independent only to a first approximation” (p. 9). We believe that from my perspective the situation is even more complicated than the two EDWs, the mind-EW and the brain-EW (or the macro-EW). As we will see below, we have
to introduce the viewpoint of a gene, a molecule, a cell, and a sub-organism even if, for us, these entities are in the same EW, the macro-EW. From its viewpoint, each entity is the “it” that interacts with its environment and which has no idea about the entities that compose it.

Let us find the place of this idea in Bechtel’s framework. An organism has different mechanisms, and each of them operates within an “internal environment” (Bernard’s expression in Bechtel, 2009, p. 12). To us, this idea of “internal environment” can be useful within the EDWs. The “internal environment” of each mechanism is quite similar to the idea of the “it” or the “I”. Evidently, we can analyze each biological mechanism that belongs to the body in relationship with its functions but it is much more difficult to apply this framework to the relationships of some brain parts to the “mental level”. For Bechtel, the traits of a mechanism explain the mind/brain mechanism as a locus of control of cognitive activities. With these traits, we needn’t “extend the mind out into the world or deny the differentiation of the mind/brain from the rest of the organism and the external world” (Bechtel, 2009, p. 12). Working within the unicorn-world, and avoiding the notion of human subjectivity and the viewpoint of each “it”, it seems normal for Bechtel to believe that

\[(\text{Biological systems usually have multiple layers of control arranged such that higher-level control systems can bias the functioning of lower-level ones (\ldots), but do not directly determine the behavior of the lower level systems (p. 13).)}\]

In this context, it seems obvious that although being autonomous, the components are not modulated (in a Fodorian sense). Uttal is skeptical about both types of decomposition:

– Phenomenal decomposition (“differentiates the different phenomena a system exhibits and that need explanation” or “the attempt of faculty psychology to differentiate different faculties of mind is an exercise in phenomenal decomposition);

– Mechanistic decomposition (“Mechanistic decomposition of an activity involves identifying component processes which contribute to the overall performance and are recruited when the activity is performed.”) (Bechtel, 2002, p. 231-2 or 2001, section 2)⁴.

Again, from the EDWs perspective, we can only talk about biological decomposition of the brain. Nevertheless, such decompositions would only correspond to rough approximations (imposed by the limits of our tools of observation, fMRI and PET regarding the thresholds of activation for neural

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⁴ “(\ldots) to understand complex systems by analyzing or decomposing their operation into component processes and attempting to identify these component processes with physical parts of the system (what I call mechanistic explanation – see BECHTEL and RICHARDSON, 1993)” (BECHTEL, 2001, p. 483).
areas) to some elements/functions of the mind just because the “I” is indivisible, despite the various entities and processes forming it. In its essence, this indivisibility or unity appears in the viewpoint of the “I” but not in the the viewpoint of a particular mental entity or process! A mental entity has its viewpoint of the interaction with other mental entities (we have here Fodor’s properties of the mind – compositionality, systematicity and productivity) and this idea guarantees the compositionality of the mind. But systematicity is provided only by the indivisibility of the mind⁵.

In his paper dated 2001, Bechtel dedicates the second part to the localization and decomposition of memory into systems based on different kinds of memory functions and properties. Using lesions or neuroimages, we can identify the brain areas for these systems. “But what I want to emphasize here is that the decomposition is in terms of the phenomena to be explained – different types of memory exhibit different properties and require different explanations” (2001, p. 490). Being aware of the difficulties involved by the memory localization and decomposition, Bechtel introduces the difference between the system and the process memory. Surprisingly, due to the numerous interactions of such functions, like memory, inside the brain, Bechtel embraces the memory process.⁶ Evidently, from the EDWs perspective, these interactions have to be extended from the part and the counterpart of the brain to the whole body. Thus, only the “I” has or, better, represents the memory but not the brain even if there are large parts of the brain that correspond, with rough approximation, to the memory of the mind. We believe that localization and decomposition are just rough “heuristic” approximations. Bechtel is aware of these difficulties:

All these researchers are strongly committed to decomposition and localization of function. But there are two procedures for decomposing memory – decomposing into different kinds or systems of memory and decomposing into different cognitive operations involved in memory. Both give rise to localization, but in the former case, which I have referred to as phenomenal decomposition, the localized systems are often overlapping and there is a serious danger of failing to identify the various interactions between the localized areas. The second strategy, process or mechanistic decomposition, opens the potential for discovering complex, interactive and integrated systems. Often the tools for localizing – relying on deficits from lesions or subtractions between neuroimages – can mislead one to think more is localized in a given location than actually is. But this danger is often temporary, and continued pursuit can lead to discovering multiple components with complex patterns of interaction. This is the stage research is entering, both in the case of the hippocampus and in the case of frontal regions (Bechtel, 2001, p. 498).

⁵ This unity or indivisibility is the property missing to any neural network! When we will create neural networks having a kind of unity then that network will have the property required by Fodor.

⁶ “Multiple systems operate independently of each other (they are similar to Fodorian modules) whereas multiple processes interact and combine to perform cognitive operations” (BECHTEL, 2001, p. 491). Again, here we can clearly observe that what is missing to Bechtel’s view is the EDWs.
There are various reasons for which we cannot make a phenomenal decomposition: different activities involve clearly defined regions of the brain (language or problem solving); it is very possible that such activities involve common areas of the brain; this decomposition provides no explanation (p. 231-2). Uttal is against the decomposition of the mind into components (or elementary operations) (that have non-linear modes of organization) that can be localized in the brain areas. The opposition to these ideas also reflects the opposition to the mechanistic view. Uttal considers that the research activity of the cognitive neuroscience is guided by the identity theory\(^7\). Against this identity theory, he introduces the main characteristic of the brain: the complex non-linearity. However, by this heuristic argument (it is useful to use the identity theory to extend our knowledge or to review the initially proposed decomposition) in section 3 of his paper, Bechtel considers that the cognitive neuroscience can be guided by the psychoneural identity as he proved. From an EDWs viewpoint, we emphasize again two points:

1. We have to accept that the psychoneural identity is a false presupposition required by the unicorn-world. On the contrary, the mind and the brain belong to the EDWs.
2. The non-linear complexity of the brain is reflected by our correspondence between the entities/processes belonging to the brain-EW and the mind-EW. With both kinds of entities/processes located in the unicorn-world, we believe that the non-linearity can solve certain issues. However, hyper-ontologically, we cannot move directly (presupposed by the identity theory) from one EW to the other; this is a false movement or a pseudo-movement. There are no direct correlations/causations/emergences between the entities/processes of the mind and the brain.

We emphasize again that by applying the heuristic method, Bechtel is aware of the difficulties of the cognitive neuroscience. From my viewpoint, contrary to the identity theory, we can only check the very approximate correspondences between the entities/processes belonging to those two EDWs. Moreover, we have to be aware that, according to the principle of part-counterpart and the principle of knowledge, we have to include the “I” corresponding to the part-counterpart of the brain and body for each psychological entity/process that corresponds with

\(^7\) “A major component of McCauley’s and my motivation in emphasizing the heuristic character of identity claims was to counter objections to identity claims that one could never prove more than a correlation between the entities characterized in the two vocabularies (KIM, 1964). No evidence could ever demonstrate that they were not just correlated but were identical” (BECHTEL, 2002, p. 236). From an EDWs perspective, we have to replace these two vocabularies with the mind-EW and the brain-EW. The EDWs requires only correlations (correspondences) but not identity!
approximation to a brain area. Only within the unicorn-world, we are forced to resort to heuristic instead of (hyper)ontological or epistemological methods!

It seems that Uttal admits the validity of decomposition and localization for the visual processing system, the “exemplar of cognitive neuroscience” (Bechtel, 2002, p. 238-239). Nevertheless, Bechtel emphasizes essential problems of decomposition and localization for the same processes! Although it is known the role of V4 in shape and color processing and the role of MT in motion processing, it is clear that V4 is not the color processing area and MT is not the motion processing area. “They only contribute to color and motion processing as a result of their interactions with a host of other areas” (p. 240). Thus, it seems quite impossible to the cognitive neuroscience researchers to achieve the main task, i.e., to determine which is the exact area that contributes (corresponds) to a particular mental activity.

From an EDW’s perspective, we can clearly understand these doubts. Obviously, vision does not only involve V4. Moreover, it has no sense to check Damasion’s convergence zone of vision, in this case, the famous binding problem. There are many other areas directly involved in vision (many feed-forward, feedback and lateral projections). Using fMRI, PET, etc., we can discover quite many neural areas of the brain directly activated for certain vision processes but, according to the part-counterpart principle and that of knowledge, we have to include the whole subject in order to explain the mental states that are vision. The vision is a mental process not a neural one! This is one of the most important ideas to be taken into account in cognitive science.

Using only tools like fMRI and PET, we are probably not able to observe other neural parts involved in the vision processes just because of the limits imposed by these tools regarding the thresholds of neural activation. With large approximation, we can stop somewhere, but this halt would only be an

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8 Bechtel discusses about Brodmann’s famous map in a few papers. (2001, 2002) Brodmann tries to distinguish different areas that were performing various functions. Bechtel introduces quite recent research on the same topic made by van Essen, Felleman, and Gallant. “Forward, backwards, and lateral connections are typically distinguishable in terms of the layers from which they originate and layers in which they terminate. Overall, the visual system seems to be a complex system, but one in which there are distinct areas carrying out different operations on visual input which interact with each other in a structured manner.” (BECHTEL, 2001, p. 487) From an EDWs, we can identify with “rough approximation” the correspondences between certain cognitive functions and brain areas/processes. We cannot accept a drastic encapsulation of perception in relation to cognition as Fodor and Pylyshyn stipulate because both elements are the “I”.

9 Bechtel discusses about another objection against decomposition and localization: the plasticity of the brain.

10 Within the EDWs perspective, both perception and cognition are the “I”. It is totally useless to try to find what neural patterns or areas of the brain correspond to perception. The same thing is available for a sub-process of perception, the binding problem.

11 For supporting this essential idea, we followed the Kantian transcendental framework of understanding (see again VACARIU, 2008).
“heuristic” method. Our future research activities will include more and more areas and parts of the brain and body until we reach, only in theory, the whole brain and body. To conclude his paper (2009), Bechtel writes

In fact, living systems are typically highly integrated despite the differentiation of operations between different organs and cell types. The mind/brain seems to be no different on this score – it consists of component processing areas that perform different computations which are nonetheless highly integrated with each other. Such a mechanism does not typically include encapsulated modules, and one is not likely to find them in the mind/brain (Bechtel, 2009).

We return again to the viewpoint of each entity. When speaking about biological mechanisms, we have to take into account the EDWs and the “I” (of the organism and of each internal entity). To the human mind analyzing an external (for the brain!) biological organism, all the biological mechanisms (cells, molecules, organs, etc.) are in the same EW, the macro-EW. Nevertheless, from the “it” viewpoint, each internal entity has its own identity within its environment. We have here Claude Bernard’s “internal milieu” of each organ in the organism (Bechtel, 2001, p. 486) that represents, from an EDWs perspective, the implicit knowledge (see Vacariu, 2008). This internal milieu is in fact the internal biological “world” of an organism. Each organ is an internal milieu for the sub-organs that “compose” it. In the relationship with its environment, each organ is an “it” (or an “I”) that cannot “observe” its parts. The organ accomplishes its functions, as a whole, through its parts. Nevertheless, each sub-organ has some specific sub-functions. From an EDWs perspective viewpoint, the organism as a whole does not exist for any sub-organ! In this context, we can understand Bechtel’s ideas completely different. “Even though the areas never functioned independently, the existence of differentiated cortical areas is a powerful argument for homuncularism” (Bechtel, 2001, p. 486). Only when we analyze the brain-EW as a whole (or a sub-organ) in relationship with its parts, we can state that some “areas never functioned independently”. However, by introducing the “I” (that corresponds to the union between the brain and the body) (or the “it” for each sub-organ), “the existence of differentiated cortical areas is a powerful argument for homuncularism” (in my words, each of them is a homunculus!). So, here we have indeed a kind o “homunculus” that corresponds to the biological organ as a whole (or to each sub-organ) but only from “it” or the “I” viewpoint. From the viewpoint of any living entity, we can consider the existence of some new biological “forces” (the “force” of a cell or a molecule acting in its environment) that cannot be explained through the decomposition of such entities. As external observers, some of us situate a cell or a molecule and all their internal entities/processes into the same macro-EW. But from the viewpoint of the cell/molecule its internal entities/processes do not exist. Thus,
the cell/molecule exists only at the surface! In relation to their surface, it seems to us (as external observers), that a cell/molecule has an unexplained “force”! This is the main reason for which we have to include the viewpoint of each cell, molecule, sub-organ, etc. in the analysis of biological mechanisms! Otherwise, we mix EDWs and we will not be able to explain the correspondences between the mind as a whole (or its entities/functions) and the brain and body as an organism (or their entities/functions).

Within the EDWs framework, let us translate the last paragraph quoted above from Bechtel’s article: “Living systems are typically highly integrated despite the differentiation of operations between different organs and cell types.” The integration of a living system in its environment as a whole entity can be considered only in relationship to it/the “I”. On the one hand, a particular it, for instance it1 that corresponds to all entities/processes that “compose” it (again, this composition is available only to us) is not integrated in the “world” because it1, its entities and its environment are all elements of the same macro-EW only to us, the observers. The viewpoint of it1 exists only for itself that corresponds to its “internal” entities and processes. Consequently, the environment of it1 is integrated within it1! Similarly, following Kant, the mental representations of the world (that is the macro-EW) is the self! (See again Waxman’s interpretation of Kant’s understanding, 1995, and this application to the EDWs perspective in Vacariu 2008) In this case, such integration means that the “I” represents the mental representations and processes of the entities and processes in the external macro-EW.

On the other hand, we can talk about “the differentiation of operations between different organs and cell types” only from the viewpoint of an external observer of biological mechanisms. Of course, each mechanism has its own viewpoint given by its “it” (the implicit knowledge) but this viewpoint can only be decomposed by the external decompositions.

We should introduce a “thought experiment”: imagine you are a biological mechanism like a cell. (See Vacariu, 2008 – Gabriel Vacariu applied this thought experiment to living entities – a cell or a molecule – but also to an electron or a planet.) Let us consider a cell with one external function given by its “implicit knowledge” that corresponds to the interactions of all internal sub-mechanisms. That function is accomplished in the environment of the cell, but the cell exists (with its functions) only at the surface and the surface corresponds to the internal entities and processes. The internal biological parts of a cell have other environments. For us, all biological entities are in the same macro-EW. However, to observe the quantum-EW that corresponds to the macro-EW, we – as external observers – need to change our tools of observation and to pass an epistemological-ontological threshold. In this way we move from one EW to another but the viewpoint of that cell and its internal entities is lost. The
physical microparticles corresponding to that cell have no idea about the respective cell or other cells and their environment.

At this point, we can ask how many EDWs are. The answer is: not too many. Nevertheless, many entities have their viewpoints of their environment – that is their “it” or “I” – but from our viewpoint, many such entities belong to the macro-EW. For Bechtel

The fact that the visual system and other brain systems are homuncular and can be understood in mechanistic terms, however, does not mean they are not also fruitfully characterized in dynamical terms. As just noted, the brain areas involved in vision are highly interconnected (Bechtel, 2001, p. 487).

The problem is that the “homunculus” cannot be explained in mechanistic terms (that is in the brain-EW) but only in psychological terms for each mind-EW or in it-ness terms for each it! The organism and each of its organs and sub-organs (in this case the brain-EW and its cells, molecules, various neural patterns etc.) have an “it” that corresponds to the biological or physical components. In Bechtel’s paragraph above, we can clearly see the mixture of two EDWs that continues in the next paragraph:

Accordingly, van Essen and Gallant (1994) link a variety of subtasks of visual processing with different areas. I take their account to be an exemplar of homuncular mechanistic analysis of how the brain performs a cognitive function (Bechtel, 2001) (Bechtel, 2001, p. 487).

Obviously, we can see here (as everywhere) that by embracing the identity theory, Bechtel makes the same mistake of working within the unicorn-world framework, i.e., one unique ontological world without having any idea about the viewpoint of each it (see Vacariu, 2005, 2008). From my viewpoint, it is impossible to talk about a “homuncular mechanistic” analysis or to inquire about “how the brain performs a cognitive function” within the same world. Using Kantian expression, these sentences involve only “uncontained” or “empty” concepts (see again Vacariu, 2008).

In their paper of 2007, Craver and Bechtel emphasize that the interlevel causation is meaningless. In the EDWs perspective, we offer the foundations for this idea: there are no relationships (causation or others) between any EDWs! The authors introduce the “mechanisms” to avoid the top-down (the mental causation) or even bottom-up relationships. Evidently, interlevel causation is between levels. Among many interpretations of the “level” notion, they introduce “levels of mechanisms” that refer to a whole composed by its parts or the part-whole relation (Craver and Beethel, 2007, p. 550). Under this umbrella, they establish the main concept, the “mechanistically mediated effects”, trying to avoid many unclear notions from cognitive science and biology.
Mechanistically mediated effects are hybrids of constitutive and causal relations in a mechanism, where the constitutive relations are interlevel, and the causal relations are exclusively intralevel (Craver and Bechtel, 2007, p. 547).

We have to understand “constitutive relations” (interlevel) within an identity theory of constitution (see van Gulick 2002). The parts compose the whole or there are constitutive relations between whole and its parts (p. 550). In this way, the authors reject the “top-down” causation. Interlevel or top-down causation does not exist; we can only talk about intralevel causation (the causation between entities at the same level)\textsuperscript{12}. Higher levels of mechanisms are “by definition, mechanistically explicable” (p. 550). We have to be aware that this “definition” applies to the unicorn-world! There are some experimental techniques (correlation, lesion, stimulation experiments, and neuroimaging) used to find the behavioral relationship between whole-parts (p. 553-554). We can clearly emphasize that, within the unicorn-world, Bechtel’s notion of “mechanism” really seems to be a good alternative to many issues cognitive science/philosophy of mind. In our opinion, this is in fact a subtle Ptolemaic epicycle!

At the end of this paper, let us analyze in detail this important paragraph (to us but also to the authors).

In bottom-up cases, we show that ordinary causal interactions between components of a mechanism produce a condition in the mechanism that constitutes a state of the mechanism identified at the higher level. There are no causal interactions beyond those at a level. In each top-down case, we show that the lower level components are simply being ‘carried along for the ride’ (p. 561).

In their view, both the bottom-up and the top-down causations are meaningless\textsuperscript{13}. From an EDWs perspective, there are obviously no causal relationships between any EDWs, and thus there are no bottom-up or top-down causations! The acceptance of the identity theory involves some contradictions (what does really exist: the mental states or the neural states?); the eliminative materialism would be a better solution (For more details, see again Vacariu, 2008). The missing element from the authors’ picture is the philosophical foundation that is, we believe, the EDWs perspective. Using the framework of “mechanism” and the \textit{constituent}\textsuperscript{14} notion, the authors consider that the

\textsuperscript{12} They criticize Patricia Churchland’s example, “Betty Croker Cookbook”: Betty uses the microwave to cook something. The temperature does not “generate” the heat through friction (the increase of mean kinetic energy) but the heat is “\textit{constituted} by the molecules’ mean kinetic energy” (p. 555).

\textsuperscript{13} About mental causation, see the endless duel between DAVIDSON, KIM (1998, 2005) and BLOCK (2003) \textit{vs.} the EDWs perspective in VACARIU (2008).

\textsuperscript{14} The Kantian notion of \textit{constitutive} is essential in the EDWs perspective (see VACARIU, 2008) but this relation has to be analysed in relation to another Kantian notions, \textit{determinate}. Within the EDWs perspective, both have the same importance. The dispute between Newton and
operation of a whole also involves its parts, we also operate its constituents. In their words, the parts are “carried along for the ride” (p. 558). In systems with more complex relationships between parts and whole (especially biological systems), they consider that the parts (the sub-mechanisms) are “enlisted in the ride” (p. 559). Again, the whole can be regarded from two viewpoints: the “I” (the “it”) or the whole biological organism/mechanism (the human being, the kidney, cell or the molecule). When the “I” acts on parts of itself (for instance, rising its virtual arm that belongs to the “I” that corresponds to the physical arm that belongs to the physical body), we can say that there is a corresponding picture, i.e., parts of the brain send signals to move the physical arm. The expression “carried along for the ride” can merely be re-interpreted as the correspondences between two entities/processes that belong to EDWs. Moreover, the “I” (that corresponds to a physical individual, i.e., the interaction between the brain and the body) or the “it” (a molecule, cell, or kidney) has a “force” that cannot be physically or biologically explained. This force is the behavior of an “it” or an “I” that can be observed and it represents in fact the life of a molecule, a cell or an organism. We cannot identify empirically what life is but, from an EDWs perspective, it corresponds to the behavior of such entities (“mechanisms”) that belong to the macro-EW.

REFERENCES


Leibniz referring to what elements are more important than the others, the entities or their relationships, is solved through equalizing the importance of these notions: the relations (the interactions) among entities are constitutive, while the entities determine the interactions. It is meaningless to emphasize one or the other element because we cannot talk about entities without involving their relationships or vice-versa.


*** 2008, Epistemologically Different Worlds, (in English) University of Bucharest Press.
