# BRAIN, MIND AND THE PERSPECTIVE OF THE OBSERVER

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Since Descartes the mind-brain relation has been conceived within two main approaches: identity perspective and non-identity perspective. In our days, higher and lower analysis/organization levels of cognitive system are considered. The main theoretical tools for adjoining different levels are the searching for an intermediary level and the emergence problem. In the followings, we try to offer an alternative way of grasping the mind-brain problem based on the role of the human subject as an observer. We claim that the mind and the brain are the same and thus, the finding of an intermediary between the mental levels to neural ones as well as the emergence from a lower level to a higher level of the cognitive system is just an outmost issue. They have sense only from the observer's perspective. In the first section, we provide a short review of the main perspective considered for the mind-brain problem. In the second and third sections, we discuss the splitting of the cognitive system into different levels and the main routes taken for connecting the considered levels. Finally, we try to offer a new perspective, *i.e.* the perspective of the observer.

## I. MIND-BRAIN DISTINCTION

In our days the old problem of the mind-brain distinction is configured out in three main ways:
1. the non-identity perspective: mind is the product of the brain but is not identical with the brain;
2. the identity theory: mind is nothing more than the brain or, less misleading, mental phenomena are nothing more than physical phenomena;
3. beyond mind-brain distinction.

1. In its very old form, the non-identity perspective was pointed out by Descartes – "a dualist for *a posteriori* reasons" (D. B. Mitchell and F. Jackson, p. 93, 1996) who thought that no mental state can be explained by referring to any physical state. In our days, because of the present state of science, the old dualism – with its assumption of the existence of an *elan vital* as an immaterial substance – is completely unacceptable.

However, a new kind of dualism, the moderate dualism, came in the form of the *qualia* debate. In the relatively recent debates on qualia, philosophers such as Nagel, Block, Jackson, Chalmers, have pleaded in different ways for the irreducibility

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of the mental qualitative phenomena – seeing a red object in the Mary's thought experiment or having pain – to physical or even to functional states. Describing the mental qualitative state in causal terms leaves out the special problem of qualia: what it means to be in such a state? (for instance, Nagel, 1975). The ontology of these phenomena "is essentially a first person ontology" (Searle, 92).

2. Within the identity theory, materialists, such as Place or Smart, considered that mental phenomena are nothing more than physical phenomena: mental phenomena are nothing but brain states; for instance, the pain state is identical with the firing of C-fibers. Of course, this is the old standard example for identifying mental states with neural states. Today, it is known that the corresponding brain states of pain are different areas of the brain and different types of axons, not only C fibers.

Having in mind the way in which scientists express many of their discoveries by means of identity, the identity theorists advanced an empirical hypothesis about the nature of the mind. As a response to the objection based on Leibniz's law (see Mittchell and Jackson 1996, p. 95) identity theorists made the distinction between mental properties and mental objects: the distinction between my belief that snow is white and the property of believing that snow is white. By means of this distinction a difference can be stressed between a strong identity theory and a weak one. The strong identity theorists are sustaining that both mental properties and mental objects are identical with neural states. The weak materialists deny the existence of mental objects but they have an ambiguous position regarding the mental properties.

Even if the position of eliminativism materialist is a little bit different, their perspective can be regarded as an offshoot of materialism. The early eliminativists, Feyerabend or Rorty sustained that such things as desires, beliefs, hopes, etc., do not exist; actually, this is what was labeled by the latter eliminativist as the rejecting of folk psychology. According to them, folk psychology is viewed as a set of dubious opinions failing to take into account the developments of (neuro) science. For instance, epilepsy can be explained by certain disturbances of the brain states and not by demonic possession. By means of strong arguments from neuroscience the later eliminativists, as Churchland's or Stich, offered a better image of this framework even if the full neural evidence of this approach is not available.

3. In the third perspective the explicit discussion of the mind-brain relation is avoided. Some of the philosophers of mind and of Cognitive Science from this framework – as Fodor, Dennett, and Searle among others – assume that the mind is the product of the brain. But in their explanation of cognitive behavior, they engage exclusively psychological notions as desires, beliefs or more generally mental states, without any reference to brain states.

Searle's position is ambiguous: he denies both dualism and monism. Consciousness (and generally, the mind) is the product of the brain, but he disagrees with the identity theory. His main thesis is that consciousness is a property of the brain, it is a physical property but it is not identical with the brain (Searle, 1992; p. 14, 90, 105, 112). On Nagel and Jackson's line, he introduces the role of the observer for external and internal objects. Starting with Nagel's idea, Searle sustains that we cannot picture the link between our subjectivity and the brain states because we are already in subjectivity (Searle, 1992; p. 102-3). The irreducibility of consciousness is due to the fact that the first person features are different from the third-person features.

Even if Dennett thought about himself as an eliminative materialist, his main idea is that the rational human being's behavior could be explained and predicted only through intentional stance and not through physical or design stances. A super-intelligent Martian or a Laplacean super-physicist capable of understanding everything, including human being through microphysics level could not see us as intentional systems. In this case, they are missing "the *patterns* in human behavior that are describable from intentional stance, and only from that stance (...)", *i.e.* the patterns that have an objective reality. Another source of strength for the intentional stance is the limits of the human being to predict fine-grained description of actions (Dennett 1981, pp.158-9). In Haugeland's words, Dennett considers that intentionality is in "the eyes of the beholder" (Haugeland 1998). and thus, in contrast with Searle, he talks about mental states in terms of third person.

Under the umbrella of the 'language of thought', Fodor puts the explanation of cognitive phenomena in pure psychological terms: desires, beliefs, shortly, mental representations with semantic and syntactic constituent structures. He considers that the mental phenomena cannot be reduced to the neural ones because of the representational character of the mental symbols (Fodor 1975). The counterparts of symbolic representations at the neural level are neuronal patterns of activation, but the correspondence between primitives of mental level and those of the neural one is not biunivoque. "...[T]he structures of 'higher levels' of a system are rarely isomorphic, or even similar, to the structures of 'lower levels' of a system." (Fodor and Pylyshyn, 1988, p. 63).

Turning back to the first perspective of the non-identity theory, and considering only the second case of dualism – the moderate dualism –, we can think of the existence of only one perspective, due to the following two very simple reasons:

a) the sustainers of the moderate dualism do not reject the idea that the very mental phenomena are (somehow!) the result of some very complex processes of the brain; what they explicitly reject is the possibility of explanation of this kind of phenomena in terms of any physical state;

b) the philosophers of third category explicitly recognize that the mental phenomena are the product of the brain; but, they also reject the possibility of explanation of mental phenomena in terms of neural states.

Thus, we are confronted with only two ways of considering the mind-brain relation: first, the identity perspective and second, let's call it, the non-identity perspective. Or, in Bechtel's words, the present state of affairs of the mind-brain relation is pictured by the debate between psychology as an autonomous discipline and eliminative materialism (Bechtel, 1995).

## II. DIFFERENT LEVELS OF ORGANIZATION

It is very common among all the philosophers of mind or of Cognitive Science to think the explanation of cognitive behavior in terms of micro/macro phenomena and then to stress a distinction between the micro and macro levels of organization of the cognitive system. Generally, they talk about mental phenomena in terms of macrophenomena or higher level properties and about neural ones in terms of microphenomena or microlevels processes.

In the framework of non-identity, the philosophers agree about the underlying neural base for the mental phenomena. But all of them tell us, in a way or another, that they are not interested in the underlying neural processes purely because the brain processes will not tell us anything about the nature of the very cognitive phenomena. Thus, they think about themselves as situating the explanation of these phenomena at a very high level of organization that is a result of some kind of emergent process from lower levels.

Searle, for instance, sustains that consciousness is a high level property, *i.e.* an emergent trèat of certain neural systems. From the micro-macro level perspective, he always makes an analogy between the consciousness (mind)–brain relation and liquidity/$H_2O$ molecules: consciousness is an emergent property of the brain in the same way that liquidity is an emergent property of $H_2O$ molecules (Searle, 1992).

On the other side, in a relative recent paper, P. S. Churchland (1996) recognizes that the research of the cognitive system has to be focused simultaneously on many levels of analysis such that the hypothesis emitted for different levels of analysis coevolute and reciprocally inform each other. "High levels capacities clearly exist, and high level descriptions are therefore necessary to specify them." (p. 285) The main point of such a strategy is that the characterization of the higher level properties does not have to engage any unscientific entity or "*per se* capacity". In Churchland's example, to recognize that something is in front of Arafat means purely and simply that this is the emergence of the neurons' answers and of the way in which these interact.

## III. THE LINKS AMONG LEVELS

Very roughly, the two perspectives raise two types of problems: i) a horizontal problem: the interactions of the components at the same level and ii) the vertical problem: the relation between levels.

In considering the vertical problem, two main routes can be detected: the search for an intermediary level as a link between micro and macro levels and the problem of emergence.



### III.1. THE INTERMEDIARY PROBLEM

Even though Smolensky was not concerned with consciousness or intentionality problems, in his famous paper *On the proper treatment of connectionism* (Smolensky, 1988), he brought into discussion the problem of levels of analysis. He stressed the distinction between the symbolic level proper to Fodor's approach and the sub-symbolic level proper to the connectionist approach.

He suggests an interesting view on the relationship between the sub-symbolic and the symbolic levels: the relationship is similar to the relationship between micro- and macrophysics. If we wish to explain conceptual phenomena we need to maintain the discussion at a *conceptual (symbolic)* level, that is, to provide a *macro-description* of cognition. But if we wish to explain the sub-conceptual phenomena, we need to maintain the discussion in terms of the sub-conceptual (sub-symbolic) *level*, in other words, we need to provide a *micro-description* of cognition.

Actually, the sub-symbolic level represents an intermediary between the lower level (neural level) and the higher level (conceptual level) of the cognitive system. The relationship between the sub-conceptual and the neural levels may be approached from a semantic point of view, but also from a syntactic point of view. *Semantic*: which is the relationship between sub-symbolic representations and neural representations (patterns of neurons)? *Syntactic*: which is the relationship between the connectionist network architecture and the neural architecture? As our knowledge about neural representations regarding some complex cognitive tasks is not very precise, it seems plausible for us to assert that the semantics of the connectionist networks is closer to the conceptual level approach, that is, it is closer to the computationalist semantics compared with the semantics proper to any neural attempt. But if we take a look at the processing mechanism, the computation type involved in the neural networks seems to be closer to those in the brain.

However, the search for an intermediary level between the neural and the mental levels, and generally between micro and macro levels raises the *ad infinitum* regression problem. We shall not mention here the problems for the sub-conceptual level thought of as an intermediary between the neural and the mental levels. But definitely, it does not solve the problem of the connection between levels. In this sense, it might be that other intermediary levels among levels already considered are necessary; for instance, one between the conceptual and the sub-conceptual and one between the sub-conceptual and the neural levels, and so on. Besides, why should researchers consider the neural level as primitive? Why not go further in considering the quantic level of the cognitive system?

### III.2. THE EMERGENCE PROBLEM

*1. The case of emergence in the qualia debate*

According to the weak emergentism, the properties of a system are emergent if they belong to the system as a whole, but not to the parts of the system. For strong emergentism there are two cases: synchronic emergentism and diachronic emergentism. According to *synchronic emergentism* irreducibility and impredictability are both available. The properties and the dispositions that control the behavior of the system depend nomologically on the microstructure of the system, *i.e.* they depend on the properties of the system's parts and on their organization. But from the behavior of the system's parts S in isolation or in constellations simpler than S (that have a simpler structure than S) we can not deduce that S has P. Moreover, we can not describe the behavior of the system's components as a whole if we are only taking into account the components in isolation or in constellations simpler than S.

In arguing the irreducibility of qualia to neurophysiological states, the moderate dualists offer the argument of the explanatory gap between explanation of pain by firing of C fibers (the causal role of pain) and the filling of pain. They stress, in a way or another, that it is not possible even in principle to deduce by means of natural laws that "the microstructures of those systems that have phenomenal states have all features or characteristics of phenomenal states" (Stephan, 1998, p. 648). Thus, the notion of emergence necessary in the qualia debate is a strong one such as that of synchronic emergentism. It is about synchronic emergentism because of two reasons: i) the reduction of a systemic property is explanatory if and only if the realization base exhausts the causal role of P, and ii) phenomenal properties are not fully graspable by the features of their causal role (Stephan, 1998; p.649)

## *2. The case of emergence in connectionism*

Weak emergentism is compatible with weak reductionism because the emergent structures are explainable and completely definable by the cooperation of the parts already defined. The system as a whole is the sum of the parts plus the organization or the cooperation of these parts. According to Stephan, the organization adds nothing to the sum of the system's parts; it just explains what this sum is.

In addition, we think that in order to talk about the new structures and properties of the system we just have to switch our attention from the local behavior of the components to the resulted structure as a whole. But this final structure is the result of some series of processes among the simple components. Thus, we think it is not about any new level that really comes into existence. Very roughly, we can say that the macroscopic resulted level is just a new level taken for the analysis of the system. This level can be thought of as a new one, but only from the point of view of the observer. To simplify the outcome, we will only refer here to the human observer or, more clearly, the person who analyzes the system. Changing his observational conditions (from local to global), he has to consider a new level. But this is only for the purpose of a better analysis or explanation of the system's behavior. The level itself is completely definable and explainable by means of the components' interaction.

In this sense, the connectionist approach is an example of weak emergentism. If we analyze the relation between the properties of a connectionist network and the network's parts, we can observe that only trained connectionist networks show some macroscopic properties such as pattern recognition, rule following, generalization, etc. Untrained networks have just the disposition to instantiate the macroscopic properties, but not the properties themselves. These macroscopic properties supervene upon the hard structure of net, upon the number of the units, nodes and the connections among them. These properties are deducible from the organization of a certain network, *i.e.* from the properties of the net's units and connections. But these are not irreducible properties. On the contrary, they are deducible from the structure of the network and from the properties of its parts and connections. Thus, the connectionist approach can be thought of as a good example of weak emergentism (Stephan, 1998).

Baas's notion of deducible or computable emergence can be viewed as an offshoot of weak emergentism (Baas, 1994). For Baas, in order to observe that something new has come into existence, we need mechanisms to observe the new entities. The emergent properties have to be observable, but they have to be called emergent because of the interactions among the lower level entities, and not because of the observation. He does not specify what the mechanisms of observation are, but he emits some formal stipulations for the emergence notion. The emergence of higher level properties is a result of a series of abstract construction processes, similar to those from mathematics. Given S1 a set of first order structures, the properties of these structures can be observed or measured by means of an observational mechanism Obs1 (S1). Using the properties extracted from the observation, we can consider the set of interactions – determined by the components of S1 or by the outside factors – within S1, labeled *Int*. Thus, a new kind of structure S2 = R (S1, Obs1(S1), Int), where R is the result of the construction process. S2 is a second order structure; the properties of S2 can be observed or measured by means of another observational mechanism Obs2 (S2); obviously, Obs2 can be enough for the observation of S1's properties too. Thus, a property of S2 is *emergent* iff P belongs to Obs2 (S2), but P does not belong to Obs2 (S1). If there is a deductional or computational process D such that P can be determined by D plus Obs1 (S1), then we have a case of *deducible or computable emergence*. If such a D does not exist, we have a case of observational emergence. Of course, any deducible emergence can be thought of as an observational one, but not *vice versa*.

We consider that the connectionist approach makes a good case for deducible emergence: the macroproperties (pattern recognition, rule following, etc.) of the connectionist system can be deduced by means of different D (formula for changing the activation values and changing the weights, learning rules, etc.). A real example for observational emergence is constituted by Godel's theorems because they point out the existence of certain statements which are true but which can not be deduced as such.

## *3. The case of emergence in self-organization and Cellular Automata*

The main characteristics of *diachronic emergentism* are the novelty and unpredictability of S's structures. In the development or evolution of a system new structures and properties appear and in their turn they produce other new structures with new properties and new behaviors (Stephan, 1998).

The synergy and self-organization theories are examples of weak emergentism because their main point is the observation of the different system's regularities. The main aspect of the self-organization is that the novel structures are explainable by means of the cooperation of the system's parts. These structures are emergent, but not in a strong sense, *i.e.* they are not unpredictable and irreducible. The core notions of such a theory are the order parameter introduced by Haken. These quantities have a double task; first, the complex processes of self-organization can be described by means of them and second, they help to the causal explanation of the continuous processes of self-organization. Thus, instead of the specification of each system's part in isolation, the behavior of the whole system can be described by the adequate specification of some relevant order parameters (Stephan, 1998).

Cellular automata (CA) are formal systems constituted by networks of cells in which each cell is a finite state automaton (FSA), *i.e.* a simple formal machine with a finite number of discrete states that change according to a rule table or transition function. A rule table is a mapping from the set of neighborhood states to the set of cell states. The state of a neighborhood is "the cross product" of the other states of the FSA (Langhton, 1991). For instance, the evolution of a CA system can be illustrated by means of ten cells that change their states (*on* and *off*) according to a very simple rule table. The neighborhood of each cell includes the cell itself and one cell on each side. Moreover, the left and right cells count as neighborhood to each other. An example of a very simple rule table is the following: the *on* cells that are flanked by *off* cells at step t, in the next time step t+1 become *off*; and each *off* cell that is flanked by *on* neighborhood at time t, becomes *on* at the next time step t+1. In Figure 1, where the shaded boxes represent the cells that are *off* and the white ones represent the *on* cells, are displayed the first three time steps of the above discussed CA system. More complex results are obtained using the same rule table, but 200 cells at 200 time steps; these are exposed in Figure 2 and Figure 3.

It has to be mentioned that CA are viewed as a very physical matter, and in this way information dynamics in CA can "tell us something about information in the physical world" (Langhton, 1991; p.42).

Escaping a lot of technical details, we point out that there are four main classes of CA considered upon their shown behavior. The first two classes exhibe both local and global order and their behavior is easily classifiable as weak emergent in Stephan's terms, or deducible emergent in those of Baas. In the case of class CA I and CA II (Figure 1 and Figure 2 are example for these classes of CA) there is an alghoritmic deduction from the initial configuration to the final ordered one, and the final state of each FSA and thus the final structure of CA can be predicted (from the initial configuration plus the rule table) with a high degree of certainty.

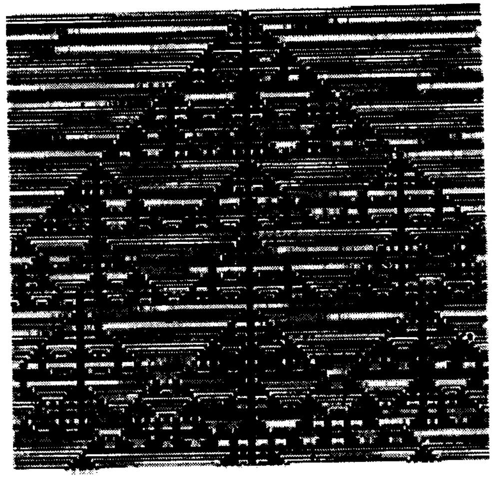

Figure 1

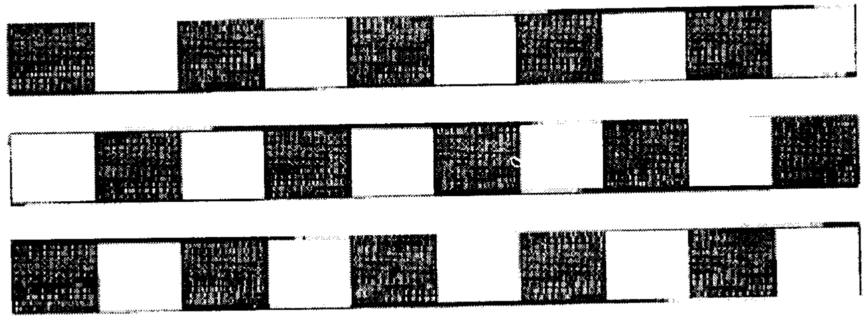

Figure 2

Class III CA manifests both local and global chaotic behavior (Figure 3 is an example for this CA). Even though the cells of CA III never show periodic behavior, their final dynamics can be predicted with a high degree of certainty; that is, from the initial configuration of cells, the behavior of the whole is easily predictable as a chaotic one. We think that in Baas's terms this kind of behavior can be viewed as an indefinite case between deducible and observational emergent.

Class IV CA is seen as exhibiting the most complex behavior and in this sense they can be understood as performing computation or self-organization. In this case, the predictability of the behavior and of the final dynamics seems an impossible task. From the initial configuration of the cells, nothing can be said about the final structure, *i.e.* if it is an ordered or a totally disordered one. It is very

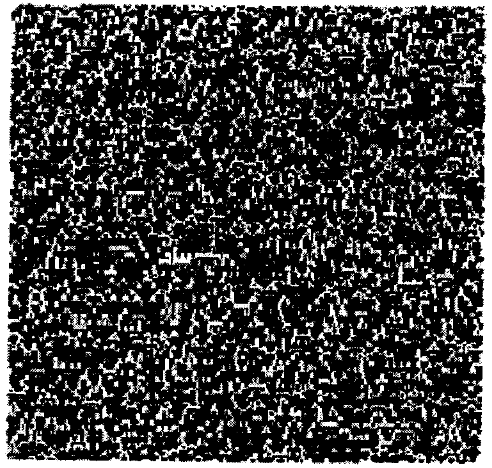

Figure 3

possible that the final state will be an ordered one, but this is something that can not be predicted from the initial configuration. That is, there is no alghoritm or D process in Baas's terms, which can do the job of a deducible transition. In contrast to chaos, some researchers label this state of affairs as complex. Figure 4 exposes an example of CA IV that finally exhibits an ordered structure.

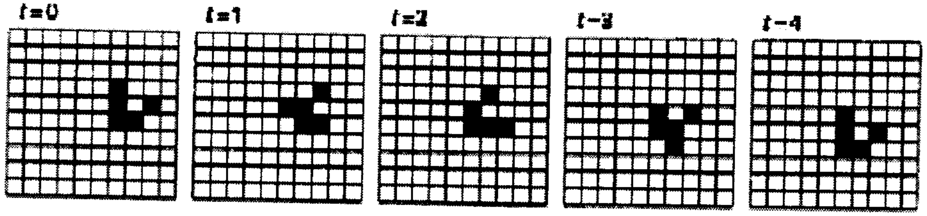


Figure 4

We think that this is a good example of diachronic emergentism in Stephan's terms and another example of the real case of observational emergence in Baas's terms. If it is about a final ordered structure, then in passing from chaos to order, a new level of observation is created. It can be about some final ordered structures, but they can not be deduced as such from the initial configuration.

## IV. THE PERSPECTIVE OF "THE OBSERVER". THE INTRODUCTION OF A NEW COORDINATE

Since Descartes till the present, the debates regarding the mind-brain (body) relation have been bewildering. We think that all the confusions are due to the mixing of the *ontological* perspective for grasping this problem with the



*epistemological* one. Very roughly, the epistemological perspective is given by the role of the human subject as an observer, while the ontological perspective is independent of the human observer. In the first part, we will stress the epistemological perspective and in the last part we will figure out the ontological one.

### 1. THE EPISTEMOLOGICAL PERSPECTIVE

We consider that within the conceptual framework of the approaches regarding the mind-brain relation – mentioned in the first part – an important coordinate is missed. We propose an alternative with a new dimension: *the role of the observer and the conditions of the observation.* Thus, we consider three very simple elements: the *subject as an observer*, the *observed object* and the *conditions of the observation.* For a subject, the identification of a certain object at one time is given by the conditions of the observation available at that particular moment. The change of the observational conditions involves an epistemological shift of the subject-object relation. In this sense in the following, we present two principles

1. The complementarity principle:

   *Because of the seriality of attention, a human subject can not observe/ can not form* ***simultaneously*** *different levels of/representations of a certain substance. The grasping of an object at a certain level of analysis depends on the observational conditions.*

Let us take the example of a human subject that observes a table. The table as a whole is static and discrete in relation with the surrounding environment. If the subject changes the observational conditions through an electronic microscope, he detects a small part of the network of micro-particles. He switches the attention from the whole object to local interaction among components. In the image-world created by the microscope the table doesn't exist as a whole. In the same way the network of particles doesn't exist from the perspective of a table as a whole; the perspective of the whole is given to the observer purely because of the human ecological niche. The examples of Necker's cube and Julezs' figure are more relevant for the role of the observer. In both examples it is about the existence of a bidimensional picture that is transformed into a tridimensional one only by the human subject.

Thus, we think that the "intermediary" between the neural level (brain) and psychological level (mind), and generally the " intermediary" between the micro and macro levels, is the subject as an observer. In fact, the intermediary, *i.e.* the human subject as an observer is an epistemological intermediary, not an ontological one. This is because, as we mentioned earlier, the search for an intermediary level as an ontological link between the micro and macro levels leads to the *ad infinitum* regression problem. On the other hand, as we have also pointed out, the problem of real emergence is directly connected with the observer's status. Thus, we think the observer's perspective confers the right way for the comprehension of the mind-brain relation.

On a very known line of thought (Fodor, Searle, Dennett, etc.), we agree that it is completely wrong to try to find the bridge laws between the neuronal and conceptual levels. But for us the main argument against the bridge laws is based on the above principle. On the one side, within the conceptual perspective given by folk psychology, the observer grasps the mental states in terms of desires, believes, etc. Moreover, if the natural language is used as a tool for the analysis of cognitive behavior, then the finding of the Language of Thought as the paradigm of cognition arises as something as very natural. By means of psychological tools are seized just the *semantical* and *logical* relations among content sentences that are identified with mental states.

On the other side, if the observational conditions are changed by means of technology proper to neuroscience (fMRI, PET, plus dissection, etc.), then the discussion about mental states is replaced with one in terms of the corresponding neural states, *i.e.* the neural patterns of activation. The human subject deals with *causal* relations among the neuronal patterns of activation (that are identical with mental states). The human subjectivity (in terms of Searle) and semantical relations (in terms of Fodor) among mental states can not be captured out of these observational conditions.

Human subjectivity involves not only a certain area of the brain given by the *most neural activated pattern*, but also a considerable number of *less activated* neural patterns situated in other areas of the brain. In this sense, those less activated areas can be thought of as constituting the physical counterpart for the subjectivity problem, unavailable out of the observational conditions proved by PET and fMRI. Beside, because the sensory systems are the extended parts of the nervous systems, the body has to be added to the mentioned counterpart.

II. The part-counterpart principle:

*In neural terms, the part-counterpart relation gives the human subjectivity.*

Llinas and Parre claim that the perception at a given moment is "represented by a small percentage of coherently oscillating cellular elements over the whole thalamocortical system. The rest of the thalamocortical system, being silent to such coherence, may in fact represent the necessary counterpart to the temporal pattern of neuronal activity that we recognize individually as cognition". (Llinas and Parre, 1996)

In neural terms, the most activated pattern of neurons, at one moment, has considerable *implicit* links with the other patterns of neurons that are less activated. By this way, a *pyramid of neuronal patterns of activation* is formed. In this sense, Llinas and Perre sustain that: "The fact that all frequencies are not equally probable determines that certain resonant frequencies will be observed preferentially." Moreover, the kind of pyramid of activation patterns is involved in other cognitive processes like attention. "The selective property of attention is presumed to be expressed by a positive difference between the activity levels in columns that code for the target and the activity levels in neighboring columns that code for other (distracting) objects." (David LaBerge, 2002)

In psychological terms, we can find the same idea: the meaning of a concept depends on the meaning of other concepts (Keil, 1989). There are some implicit links (presented above in neural terms) between a concept and other concepts.

2. THE ONTOLOGICAL PERSPECTIVE OR THE EXTENDED OBSERVER PERSPECTIVE

In the following, we will figure how any entity "observes" other entities, *i.e.* it is interacting with other entities that have the same structure; the human subject is only a particular case. By the same structure we mean that the entities interact or follow the same laws. "...[T]he single cell with its membrane bound proteins constitute an *observer* of same aspects of its immediate environment (other molecules that can be recognized as signals or nutrition), and multicellular organism depend critically on inter-cell signaling." (Baas and Emmeche, 1997) (our emphasis)

In neural terms, the neural patterns of activation have a specific structure different from that of a single neuron and also from the neural network as a whole. To simplify the problem, we will stress the problem only in connectionist terms. The patterns of activity interact each other, *i.e.* they obey the laws of vectorial addition and product. It is not about a node that "interacts" with a pattern of activity. Of course, the activation value of a certain node contributes to the activation degree of the corresponding pattern which in its turn contributes to the state of the whole network at a particular moment and thus to the final stable state of that network. But this is just the type of causal relations above mentioned. In this sense, an activation pattern can be thought of as an "observer" only for other patterns.

In the same way, in psychological terms, a mental state is an "observer" only for other mental states. We think that if the discussion is replaced with what are considered to be the corresponding neural parts, the sense of the observation is lost. Generally speaking, an entity exists because of its relation with other entities that have the same structure. But that entity doesn't exist in relations with entities that have other structures and obey different laws. However, among the entities, only the human subject can shift from one set of observational condition to another one. Thus, only the human subject can be thought of as an observer for the mind-brain relation. Mind and brain are perceived as different things purely because of the difference among the observational conditions. Thus, from the observational condition given by psychology tools, Searle seems to be right in claiming that in the problem of subjectivity we can not make the distinction between seemingness and reality, purely because subjectivity is given by seemingness itself.

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