

COMPLEX SYSTEMS APPROACH TO THE HARD PROBLEM OF CONSCIOUSNESS

“Our minds thus grow in spots; and like grease-spots, the spots spread. But we let them spread as little as possible: we keep unaltered as much of our old knowledge, as many of our old prejudices and beliefs, as we can. We patch and tinker more than we renew. The novelty soaks in; it stains the ancient mass; but it is also tinged by what absorbs it. Our past apperceives and co-operates; and in the new equilibrium in which each step forward in the process of learning terminates, it happens relatively seldom that the new fact is added RAW. More usually it is embedded cooked, as one might say, or stewed down in the sauce of the old.” ~William James

In a paper in *Darwin under Siege*, Bhakti Niskama Shanta talks about the inadequacies of current scientific approach in exploring subjectivity, the self-conscious perspective, proposing the need for “completely different rational approach...to understand further how conscious beings experience things and how they make their choices.” (Shanta 2013) Consciousness has been the bone of contention for philosophers throughout centuries. Indian philosophy largely adopted lived experience as the starting point for its explorations of consciousness. For this reason, from the very beginning, experience was an integral way of grasping consciousness, whose validity as a tool was considered self-evident. Thus, in Indian philosophy, the question was not to move from the brain to mind but to understand experience of an individual and how such an experience is determined through mental structures (and secondarily, the preoccupation with the brain and its relation to the mind)¹. In contrast, cognitive science (the study of mind and cognition through interdisciplinary methods, with emphasis on computational methods) found its debates soaked in discussion which primarily involved the brain and mind. Experience was not considered a primary source of information and its validity had to be established to consider it a source of information of mind. With the rise of physicalism and realization that mental states are correlative to brain states, the body was virtually neglected from involvement in understanding the mind and the attempts to reduce mind to the brain were rampant. The inability to explain subjective experience of an individual through neuroscientific findings alone has urged philosophers to explore other ways of understanding the ontology of mind. Over the last few years, embodied cognition and enactive approach have brought back the body as a central participant in this debate, providing fertile grounds to explain the relation of brain, body and mind.

This paper proposes that we understand the brain as a complex system from which the mind emerges. This emergence is marked by the development of novel property of self-consciousness in human beings. The mind is a process which is embedded throughout the body and thus, the body acts as an actualizing medium for the individual. Thus, the brain is a necessary condition for the mind to be while the mind is embedded throughout the body. The brain and mind are in reciprocal causal relationship with one another, as is the body and environment with one another. In this paper, embodied cognition is understood through principles of Merleau Ponty’s idea of embodiment, than through Andy Clark and Francis Varela’s alone. To the

¹ This is at no level to suggest that Indian Philosophy did not delve deeply into the relation between brain and mind (Chennakesavan 1980; Mohanty 1980). This only indicates that the starting points for Indian philosophy and cognitive science at large were different, thus leading to varying questions and ways of reaching answers.

question which is central to the conference, *Is science able to explain the scientist?*: beginning with the way in which science is defined (what is the criteria for scientificity?), the complex systems approach and emergence claims that the novel property, that of subjectivity, which belongs to the scientist and is embedded throughout her body cannot be reduced to study of any specific organ (including the brain) or explained/predicted through theories of lower-level components. More importantly, the complex systems approach and emergence allows us to understand Brahman as the ultimate Reality, as the emergent structure of our world. Each of us is perceived as embodying the form of Brahman, though the realization of this form only arises through self-knowledge and experience of the self.

This paper is divided into five parts: the first part introduces the easy and hard problem of consciousness: definition of consciousness and why the hard problem of consciousness is considered *hard*. This will include the introduction to qualia. The second part will be a short note on the complex systems approach (CSA) and the notion of emergence. This is followed by an explanation of consciousness from the CSA where the treatment of easy problems of consciousness is explicated. With the fourth section, we reach the central part of the paper: qualia. This will provide a detailed overview to the workings of mind, its structure (world-orientation) and the emergence of experience, thus forming a preliminary to dealing with the hard problem. In the fifth section, the concepts laid out in the previous sections are pieced together to respond to the hard problem with a concluding remark on where we can access qualia of the other.

PART 1: WHAT IS CONSCIOUSNESS?

1.1. HEURISTIC DEFINITION OF CONSCIOUSNESS

An exploration of easy and hard problem of consciousness can be discussed reasonably with acknowledgement of the amount of ambiguity and concerted efforts which have been directed towards defining consciousness over the years. This is the case in almost every discipline which is concerned with exploring the mind. Largely, consciousness can be seen as a property of the subject or of mental states.

- A. As a property of the subject, consciousness is understood commonly as the state where a creature is awake and thus, senses and responds to the environment. It can also be said that a creature is conscious when it is aware of an other (it is conscious of something).
- B. As a property of mental states, a mental state is said to be conscious when it figures in the *stream of consciousness* of the subject. Here, the implications of considering consciousness a *stream* are debatable. It is used here largely to indicate the contrast between the former and latter sense of consciousness. In the former sense, consciousness is considered to be property of a creature as a whole where the sensing and responding is directed towards an object x : a subject A is conscious if it senses and responds to an object x . Here, the criteria for being conscious is to sense and respond to the object. In the later sense, consciousness is considered a property of mental state (hope or desire or anger) when the subject undergoing it becomes aware of it- there is a mental state m such that the subject possessing it is conscious of it if and only if..... Here the criteria can be self-consciousness or others.

In philosophy of mind, consciousness is generally received in the latter sense where it is considered a property of mental states. There can be conscious or unconscious or non-conscious mental states. Our purpose is to find under what conditions a certain mental state can be considered conscious, how such a consciousness of mental state can be understood using suitable tools and why a subject becomes conscious of x and not-of- y . Largely, the first two are housed as easy problems of consciousness while the third one inhabits the hard problem of consciousness.

While it is true that defining consciousness is an overwhelming task, it is important to begin with a definition of consciousness which will clearly direct course of the paper. For this reason, I will be starting with a heuristic definition: consciousness is the capacity to sense and respond, owing to the ability to distinguish oneself from the environment. Consciousness is interchangeably used with self-awareness. By understanding consciousness in this way, we will be able to do the following:

- A. Consider levels of consciousness in correspondence to the levels of complexity of a system (with brain featuring as a highly-complex one), thus making space for mentality of animals;
- B. Explore the possibility of artificial intelligence while keeping intact the crucial property of identity of an individual;
- C. Understand mental states as inherently actualised through the body (clearing, initially at least, the risk of ontological dualism): since every movement of sensing and responding is the expression of mental state of the system.

Thus, consciousness is the capacity to sense and respond, owing to the ability to distinguish oneself from the environment. Systems which surpass a certain level of complexity exhibit spatiotemporal integrity through boundary conditions and have mechanisms to sense and respond effectively to the environment. These systems are considered to be latently conscious at all times and actively conscious when they are sensing and responding to the environment.

1.2. EASY AND HARD PROBLEM OF CONSCIOUSNESS

In his paper “Facing Up to the Problem of Consciousness” (Chalmers 1995), David Chalmers introduced the distinction between easy and hard problem of consciousness². The easy problems of consciousness are those which are “are straightforwardly vulnerable to explanation in terms of computational or neural mechanisms.” (Chalmers 2010). These include but are not exhaustive of: capacity to discriminate, classify and respond to the environment, cognitively integrating information, reporting of mental states, the power to access one’s own states and others.

The hard problem of consciousness is the subjectivity involved in what-we-experience. The process of perceiving the world and thinking about it is accompanied by an inseparable subjective element. This is also labelled as qualia, the qualitative character of an experience. In Nagel’s terms (Nagel 1974), *what-it-is-likeness* of a conscious system. In the next section, we will explore why the hard problem of consciousness is considered *hard*.

² In his paper, Chalmers does not begin with a definition of consciousness, as his purpose was to delineate what has been considered the hard-problem about consciousness itself, within philosophy of mind, in line with the various ways in which it has been defined. For this reason, this paper picks up the distinction and tries to see if within the complex systems approach and emergence, the hard problem can be addressed adequately.

1.3. THE HEURISTIC DEFINITION AND EASY-HARD PROBLEM DISTINCTION

In this section, we will begin by recapping the definition of consciousness, moving on to reflect how the easy and hard problems can be understood in light of this definition.

D_f of Consciousness: Capacity to sense and respond to the environment, owing to the ability to distinguish oneself from it.

Carrying this definition, the easy problems can be understood as those which are involved in the sensing and responding to the environment. We sense a multitude of stimuli in the environment but respond coherently to a unitarily received landscape. A series of other features also populate our capacity to respond to the environment: complex systems can access their internal state and respond to the environment by providing a report on them, they can control their behaviour, they can focus their attention on a certain task.

Why are the easy problems easy? Chalmers mentions that the easy problems are easy precisely because they ask for functional explanations of abilities: that is, they seek mechanisms in which the function can be performed. How such explanations are provided within complex systems approach is outlined in the fourth part.

Following the above mentioned definition of consciousness, the hard problem of consciousness would be to explain *why* a system senses and responds to the environment in a certain way. The entire body receives the environment (a specific stimulant or a set of conditions) in a certain way, which cannot be duplicated or equalized to that which another body undergoes. This explicates what it is like to be a subject *x*- it manifests the perspective of the system.

Why is the hard problem of consciousness hard? While the easy problems need us to explain how a function is performed within a system, the hard problem asks for the structure which determines status of the system as a whole as it experiences the world, continuously. This asking is a seeking for the structure of experience itself, of *why* the system senses and responds to the world in a certain manner. This question arises because we observe that there are systems of different kinds of complexity and each receive the common world we inhabit in drastically diverse ways, evident through the varying responses. This act of receiving the world encompasses the qualitative character of an experience, named qualia.

PART 2: COMPLEX SYSTEMS APPROACH AND EMERGENCE

2.1. COMPLEX SYSTEMS

Complex system refers to a structured arrangement of components³ which are non-linearly interacting⁴ with one another and self-organizing themselves⁵ to respond effectively to the internal and external changes in the environment. Borrowing from Mario Bunge (Bunge 2000), we adopt the following axioms in complex systems approach (CSA):

- A. Everything, whether concrete or abstract, is a system or an actual or potential component of a system;
- B. Systems have systemic (emergent) features that their components lack, whence
- C. All problems should be approached in a systemic rather than in a sectoral fashion;
- D. All ideas should be put together into systems (theories); and
- E. The testing of anything, whether idea or artifact, assumes the validity of other items, which are taken as benchmarks, at least for the time being.

By following such an approach, it becomes possible to account for as many possible factors as involved in explaining and predicting behaviour of the system. This can be explained by comparing the approach with other attempts to explain interaction between brain and mind. Identity theory says that brain states are mental states, thus we can understand mental states through sources of information about the brain- primarily MRI. However, in such a move, we do not gather information about the subject in a holistic manner: from her behaviour, from the way in which she interacts with the world at large- which is where we find her mind extended- embedded in her body and extended in the world around her. Eliminative materialism also faces the same charge. While choosing the approach, the aim is to find a method which would allow us to collect as much information as possible and then, to organize it in such a manner that it would reflect the form of life that the system embodies. This is possible through the complex systems approach.

2.2. EMERGENCE

Along with understanding an existent as a complex system, the notion of emergence allows us to grasp the idea that the whole is other than the sum of its parts. Kurt Koffka, a prominent Gestalt psychologist pointed out that it is more apt to talk of the whole as an *other* than as *greater* than the sum of its parts (Dewey 2017). Coming to the definition of emergence: Emergence is the process of development of novel properties/wholes from the self-organization of components in a system. Novel properties refers to those which are not shared by any of the constituents. Such

³ Structured arrangement indicates that the components are interacting with one another, without there being a central or mother component. There can be sub-systems which have varying functions, which can be ordered on the basis of their contribution towards stability of the system.

⁴ Non-linearity refers the phenomenon where the effect is not proportional to the cause. There are largely two types of non-linear interaction: positive feedback mechanism and negative feedback mechanism. In the positive non-linear interaction, the effect is amplified in proportion to the cause, as in the case of an infection turning into an epidemic or an employee mistreatment turning into a labor strike. In case of negative feedback system, the effect is diminished in comparison to the cause. A constant series of positive and negative feedback mechanisms allow the system to restore its stability, in confrontation with disturbance.

⁵ Self-organization refers to the process where global structure develops spontaneously from local interactions between components.

properties allow the system, as a whole, to be marked as a member of higher order of being, with causal power to affect the lower-level components.

With emergence, it becomes possible to begin observing a system as a qualitatively distinct individual. This qualitatively distinct individual exhibits spatiotemporal integrity, verifiable through boundary conditions⁶ and has causal power that is oriented towards stable equilibrium of the whole.

2.3. THE INTEGRATION OF CSA AND EMERGENCE

This section discusses how following the complex systems approach, in company with notion of emergence allows us to handle the hard problem of consciousness. A detailed note on treatment of consciousness within this approach is provided in the next section.

An integration of the complex systems approach and emergence allows us to understand every existent through the following two stages:

1. Consider the existent as an integral whole in itself (as a complex system with a novel property);
2. Consider the existent as a component of a larger system (allowing to take into account series of factors which can contribute towards its behaviour).

By positioning an existent as an integral whole, we can account for the irreducibility of its behaviour to the causal power of its components and by situating it as a component within a larger system, we can explore the factors which affect it, as a whole.

2.3.1. WHY TALK OF IRREDUCIBILITY?

The hard problem of consciousness is fundamentally an issue of asking if the systemic property of brain, consciousness can be reduced to the activities of its components, the interaction between the neurons. By understanding the irreducible nature of consciousness, we can identify that the question, *Where is qualia in the brain?* is misplaced. The locus of qualia is our entire body consistently interacting with its environment, the lived experience of this body.

2.3.2. IRREDUCIBILITY

To say that a system x is ontologically irreducible to its components $C_1, C_2, C_3, \dots, C_n$ is to claim that the causal power of x (exhibited through its behaviour) is not derived from the causal power of its components alone. This happens because when we consider causal power of the components alone, we cease to look at the whole, the system. The epistemological counterpart to this is to say that a system x is epistemologically irreducible to its components $C_1, C_2, C_3, \dots, C_n$ is to claim that the explanation and prediction of behaviour of x cannot be carried out through theories which apply to the lower-level components. The relation between these two senses of irreducibility (ontological and epistemological) can be stated in the following ways:

- A system which can be ontologically reduced to its components can be epistemologically reduced;

⁶ "... a system that is generated through a closed organisation of production processes such that the same organisation of processes is regenerated through the interaction of its own products (components), and a boundary emerges as a result of the same constitutive processes." ([Boulding and Khalil 2002](#))

- When an epistemological reduction of ontologically reducible system is not possible, it is due to lack of information about the components (current knowledge); and
- When an attempt to epistemologically reduce a system which cannot be ontologically reduced to its components is made, then we encounter the ontic residue of novel quality belonging to the whole.

2.3.3. ONTIC RESIDUE OF NOVEL QUALITY

When we try to explain or predict behaviour of a system through its components, to which it cannot be ontologically reduced, we encounter ontic residue of novel quality. This occurs because, as mentioned earlier, in attempting to explain the whole through its components, we lose sight of that which marks the qualitative distinction of the whole as an individual, its novel property.

Let us take example of cells and atoms. As atoms self-organize, we witness the emergence of molecules. Uptil this point, we observe molecular properties: molecular size, molecular formula, melting and boiling point, solubility in water, electrical conductivity and others. After a certain point of complexity, we encounter the emergence of cells which possess the following novel properties among many others: capacity to reproduce, capacity to self-regulate, ability to acquire and utilize energy, capacity to sense and respond to stimuli. Ontologically, the cells have properties which are unpossessed by its components, atoms. Thus, they cannot be ontologically reduced. When we attempt to epistemologically reduce them, then we encounter that we cannot explain property of self-regulation (which applies only to a cell, which has membrane that defines its spatiotemporal integrity). A further exploration of irreducibility can be made in more detailed terms through the idea of order and level.

2.3.4. ORDER AND LEVEL

An order refers to the kind of causal power an existent exercises to negotiate its survival in the environment. To find the causal power of a system, we have to find out the complex system within which it is a component (say, a human being x can be considered a component within the complex system of society or community), and lay down the properties it has through its behaviour, accompanied by self-reports and corroborated through physiological monitoring in sync with its internal structure. There are broadly three orders:

- A. Material: Those systems which are oriented towards thermal equilibrium alone are considered members of material order. The novel quality of material order is being. To be, is to move towards thermal equilibrium.

The members of sentient and phenomenal order possess a sense of self. This sense of self is simply that recognition of oneself as distinct from the environment. This will include all living beings. In CSA, to be a mind is characteristic of sentient and phenomenal order. Thus, we witness mentality in the following two orders:

- B. Sentient: Those systems which have the capacity to sense and respond to its environment, owing to the ability to distinguish itself from the environment are considered members of sentient order. The novel quality of sentient order is consciousness or self-awareness, minimally defined as, the capacity to distinguish oneself from the environment and to orient oneself towards stable equilibrium.

- C. Phenomenal: Those systems which have the capacity to qualitatively distinguish itself from the environment, exhibited through the exercise of choice and responsibility. Here, the primal choice is that of choosing one's source of stable equilibrium, choice being the ability to exhibit preference for a certain form of living and the responsibility is to recognize and acknowledge one's contribution towards an occurrence. The novel quality of phenomenal order is self-consciousness. Thus, members of phenomenal order can choose the source of their stable equilibrium and also set up conditions to fulfill them.

No appeal to a non-physical⁷ is made when we present such a hierarchy. The hierarchy is to exhibit that the higher the complexity, the greater the capacity of system to adapt to its environment by setting up conditions for fulfilment of its stable equilibrium (after a certain point, we encounter self-consciousness where the member can *choose* its source of stable equilibrium and also set up conditions to fulfill it).

PART 3: CONSCIOUSNESS IN COMPLEX SYSTEMS APPROACH

There are varying definitions of consciousness in philosophy of mind. To avoid vagueness in discourse, it is best to mention the definition followed in this paper. Consciousness refers to the capacity to sense and respond to the environment, owing to the ability of a system to distinguish itself from the environment. This is the first sign of a sense of self- that the system can identify its spatiotemporal integrity (through boundary conditions).

There are two senses in which we can approach consciousness: the *how* and the *why*. The CSA answers the *how* and the notion of emergence answers the *why* within the framework of embodied mind.

Coming to the *how*: In the brain, the neurons consistently interact with one another leading to the emergence of dynamic brain signatures. These dynamic brain signatures are our mental states which are embedded throughout the body. As the body receives the world, it is represented in the brain continually. A subject becomes conscious of *x* when the rate of formation of cell assemblies passes a certain threshold during the representation of *x*. This *x* can be an external object or an object within the representational model of the subject. By understanding the interaction between neurons forming networks, it is possible to understand how different cognitive functions are carried out, thus covering the easy problems of consciousness.

As the complexity of a system increases, its degree of consciousness also increases. Thus, according to the complex systems approach, from the member of sentient order with the lowest level of complexity, we witness consciousness (mentality/intentionality). It is after the passing of a threshold of complexity that a different kind of consciousness- self consciousness- arises in human beings, amongst other kind of beings.

My interest in this paper is to focus heavily on the *why* dimension, so I take leave of the *how* with reference to works of Klaus Mainzer⁸, N.M. Krieger⁹ and Andrei P. Kirilyuk¹⁰.

⁷ Physical refers to that which exists in the spatiotemporal realm.

⁸ (Mainzer 2008, 2004)

⁹ (Krieger 2013)

¹⁰(Kirilyuk 30 Sep, 2003)

PART 4: QUALIA: AN INTEGRATIVE ENCOUNTER OF THE EXISTENT IN THE WORLD

Qualia is the qualitative character of experience- it encompasses everything that the body undergoes at the moment of experience (more aptly, moment-to-moment). According to complex systems approach, every subject has representation of the world. There are research studies on how the body is represented in various regions of the brain. In the same way, the environment is also represented continually, moment-to-moment, in the network of dynamic brain signatures. However, these representations in themselves are placed within the world-orientation of the subject. World-orientation is the way in which an individual looks at the world, to make sense and navigate it for its survival. Thus, it is the subject's model of reality. However, this model of reality is not *located* (as a physical object would be) in the brain or in specific region of the body. The model of reality that every subject possesses is evident through intersubjectivity, by witnessing the interaction that the subject with its world. Consider a model of action that a football team creates: where is this model of action? Though they could make a written blueprint of it, that is not *what* the model is. The model is observed in the game, in how the players are interacting with one another. In the same way, we can witness the world-orientation/perspective of a subject through the interaction she undertakes with the world. How is this world-orientation built? This model is built as the subject develops within the environment and becomes familiar with it.

The following three stages mention the process of how we receive and respond to the world. They are intertwined. The linearity explicated here is only for the sake of convenience. Though each step occurs, it is already involved with the series of steps that have already taken place and are going to take place- like listening to a piece of music, the meaning of any sound in a song emerges through its relation to the sounds that have previously inhabited the song and those which succeed it.

Stage 1: We are continually in interaction with our environment, since the moment of our entrance into the world¹¹. Our sense organs receive input of multitude of sensory information. This receiving is not accessible to cognition at the first stage. In this sense, it is unevaluated, bare receiving of information. This is akin to the concept of indeterminate perception/nirvikalpa pratyaksa in Indian philosophy. This is also often posited as the impenetrability of cognition in philosophy of mind.

Stage 2: The received information is re-presentation from moment-to-moment (in form of dynamic brain signatures) within our world-orientation. As mentioned earlier, the world-orientation is perspective of the existent towards its world, observable in the intersubjectivity. Thus, any received information is never an alien object to us. It is swallowed within the framework we set up to make sense of the world. At this moment, the perception has become determinate- savikalpa pratyaksa. In terms of philosophy of mind, it is penetrated by the cognition.

Stage 3: The existent responds to any stimulus as an embodied mind, more aptly, the mindful body. The body and mind cannot be separated ontologically- that is, they are embedded onto each other. The mind grows on your body, as a grass which covers

¹¹ When this entrance begins is a matter of contention. Is it when the embryo is formed/at a particular gestation stage or when the child enters the environment external to mother's body? According to many research studies, the embryo is also in constant interaction with its environment- primarily, the mother's body and secondarily, the world that surrounds the mother.

the fertile soil of a ranch. The body is thus full of mind. That which we receive is never alien- it is always received as a guest to a house is, we have already setup an environment within which it can be accommodated: this is the concept of intentionality¹² within philosophy of mind. The brain is continuously representing the body and its situatedness in the world within its world-orientation in form of dynamic brain signatures. These signatures are embedded throughout the body through regulatory powers of the brain. The mind is this process of an organism embodying an intentional stance towards an other¹³. This other can be it's own self or an other in the environment.

This process can be stated in the following three ways:

1. The body and mind share relationship of embodiment. The mind is a process embedded throughout the body. They are not ontologically separate.
2. The mindful body continually receives the world as a multitude of sensory information which is represented in the brain in form of dynamic brain signature. This representation is positioning of the stimulus within the subject's world-orientation. Thus, the mindful body is medium of receiving the world for the brain. The brain is component of this body which has regulatory task of representing the stimulus within the subject's world-orientation¹⁴.
3. Response of the existent to the stimulus is manifested through the mindful body. The entire body manifests my intentional stance towards the other. Intentionality refers to the capacity of an existent to direct its behaviour towards an other.

Qualia, the qualitative character of an experience, is the integrative encounter of the above three stages. This belongs to the mindful body as a whole and cannot be reduced to the workings within any of the components of the body (like the brain or others).

PART 5: PIECING IT TOGETHER

The hard problem of consciousness- how can we understand the subjective aspect of an experience in an existent?- is misplaced, when it attempts to look for explanations in the brain. Because qualia, the subjective aspect is an emergent/systemic property of the mindful body, as a whole. It is an integrative encounter of the everything that one undergoes at the moment of experience and thus, cannot be studied through account of one of the components of the body, the brain alone.

It is, in principle, not possible to embody the qualia of a subject x in another subject y because the meaning¹⁵ of an experience is situated within the world-orientation of the subject x, which consists in the intersubjectivity that her mindful body has undergone

¹² "Every mental phenomenon is characterized by what the Scholastics of the Middle Ages called the intentional (or mental) inexistence of an object, and what we might call, though not wholly unambiguously, reference to a content, direction toward an object (which is not to be understood here as meaning a thing), or immanent objectivity. Every mental phenomenon includes something as object within itself..." (Brentano 1973)

¹³ "Mental" is a label we use for characterising intentional stance. Like we use the term "bodily" (state) to talk about that which characterises the stance of our bodies in the world.

¹⁴ It is important not to posit this regulatory role as "governing" or "mother" role. The brain is a component of the mindful body and has the task of representation, within the complex systems approach. It does not have the role of a controlling unit or a mother component within the system. Yes, the functions it carries out along with other components of the body are more important than the role of many other organs but the role does not eclipse the independent autonomy of the mindful body as a whole. The system as a whole has a global structure which is *other* (not *greater*) than the sum of functions of all its components.

¹⁵ Meaning being the value of a certain experience of a subject, within its world-orientation

in the past and the manner in which her mindful body manifests the future expectations in her responses to the world. Thus, to pick out a certain neural map which is considered the representational map of a certain event and place it in another person's brain would be to eliminate the value of that event. Because the value of an event for an existent is derived, not from that which a particular component undergoes, but in the experience of the event situated between the past and future of the existent and most importantly, in the world-orientation which is a systemic property of the whole ontologically extended in the intersubjectivity of an existent.

We can access qualia of the other, where access implies the ability to approach, is through sources of information that discuss the mindful body as a whole. These sources of information include those writings which talk about the experience of a mindful body as a whole- writings of existentialism, phenomenology, literature amongst others. Thus, science, defined as systematically decomposing the subject to its components to explain the properties of system, cannot give us access to the scientist. However, science understood as the inclination of choosing a method in sync with the nature of object of concern, can create a space where every existent can be understood as a complex system with independent autonomy and also as a component within a larger system and approach through the right sources of information.

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