

**Brain, mind and language:
The mystery of the unity of the self**

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Ever since humans have understood that cognitive capacities depend on brain activities, the question of how the human mind relates to the structure and functions of the brain has represented a major intellectual challenge. Indeed, while this topic has a central specific relevance for neuroscience, it is also of great interest for science and philosophy in general, as it directly affects our concept of knowledge and the understanding of our own nature as human beings.

The study of the connection between mind and brain brings with itself the unique challenge of exploring the unity of two apparently unrelated elements, perhaps irreducible to each other: the material structure of our brain and the immaterial reality of our thoughts, mind, self-consciousness. Thus, the brain-mind investigation deals with the ineffable contact between levels of knowledge that are hard to match: the first-person experiential knowledge and the experimental-deductive scientific knowledge.

We all have a direct, evidence-based knowledge of our mind that includes some natural understanding of how it works. Such first-person experience has distinct existential characters that are at the basis of the very concept of individuality in all human cultures: freedom, consciousness, unity, knowledge, language. At the same time, the progress in neuroscience is constantly shedding new light on the functioning of the brain, and it progressively unveils the mechanisms involved in our perceptions and information processes. As this knowledge involves the basic characters of our self, we are often brought to face paradoxical questions, in which the distinct natures of our inner experience and of our scientific knowledge are forced to merge. Is our first-person experience of our mind just an illusion, while the “real” nature of our self is given by the neural circuitry? Or perhaps, vice versa, our scientific knowledge is there precisely because of freedom, consciousness and unity of our inner self? Or should we consider the biophysical structure of our brain as instrumental to our self, with its experience of freedom, unity, and consciousness?

It is quite tempting to ask which is “more real”, or “more fundamental”, between our physical brain or our immaterial consciousness. Perhaps more humbly, at the current stage of knowl-

edge, we feel that none of these two elements should be denied, and that their apparently illogical coexistence in our nature should be simply recognized – also opening to the possibility that a similar condition might be present in other living creatures as well. Whether all elements could merge into a single comprehensive understanding is a formidable and fascinating challenge.

The Euresis Symposium held in the Republic of San Marino at the end of August 2011 focused on these questions in a friendly, intense and passionate debate, involving scholars from various disciplines. This issue of Euresis Journal reports some of the contributions offered during the Symposium, from which the cultural relevance of the issues at stake, well beyond the boundaries of the scientific progress of neuroscience, is immediately clear. While not attempting a summary of the discussion, we take advantage of these introductory notes to outline some of the issues that have emerged in the debate.

The experience of freedom is at the core of our intimate perception of our self. At the same time, various studies are showing that our freedom is subject to rules, regularities, conditioning. The combination of these evidences provides a powerful incentive to better ponder what we mean by “freedom”. A purely conceptual definition would identify freedom with the capability of making a “free choice”, i.e., the capacity of unconditionally adopt action A vs. action B as the person is in a given condition. Accordingly, when put repeatedly in the same *identical* situation, the person could act differently. However, since verifying this concept would also require creating exactly identical mind states, this notion of freedom appears as ill-defined. Moreover, the very bases of this approach imply a statistical account of the propensity toward A or B, making it fundamentally contradictory with the first-person experience of freedom, which is not that of a “choice within statistical boundaries”. An alternative is to identify freedom in what stands “before” or “outside” the choice, i.e., in the capacity of a person to connect to a notion (programmed action, concept, emotion) involving his/her interest, affection, propensity to act. In this way, freedom would lose its mechanistic role of “decider between options”, and would gain the role of polarizing our state when confronted with upcoming possibilities. Indeed, freedom could be better described as the capacity of affectively and rationally adhere to a possibility before acting, rather than the capacity to chose and control the decided action.

A parallel discussion can be formed around consciousness. Again, since each of our conscious states correspond to a brain function, one is easily tempted to identify the two. However, an important distinction has to be made between the functional description of consciousness – sorting sensorial inputs, managing emotions, making decisions, defining concepts – and the qualia, giving the internal qualities of perception, such as “the redness of red”, the painfulness of pain, the cheerfulness of laughing, and so on. Functions can in some way be identified with some neural network acting in the brain. Despite the fact that such identifications are often quite indefinite and speculative, knowledge in specific areas of neuroscience

induces us to believe that the functional behavior of the brain will eventually be understood. *Qualia*, however, that provide the texture to our intimate experience, are hardly understood in functional terms. This irreducibility of levels has given strength to dual views that, with widely different expressions, have characterized the western civilization. If and how it may be possible to reconcile these poles of our being into a single view is a matter of discussion and has been a topic of debate at the 2011 San Marino Symposium.

Language appears as a unique crossroad in the investigation on mind and brain. Indeed, language is at the very heart of research on human nature for historical and epistemological reasons. First of all, speculations on the human mind started with reflections on language and the central role of linguistics has never been dismissed up until the so-called analytical philosophy. Second, the structure of our language appears to be unique among all other species and displays clear biologically driven traits. Third, it is so deeply entangled with human reasoning and cognition that the latter domains cannot be approached without exploring the nature and structure of language. The capacity of modulating our linguistic expressions into a seemingly infinite amount of possibilities is a defining property of human experience, and one that still defies algorithmic approaches to language.

Knowledge is another challenging topic, again strongly connected to the duality discussed before. On the one side, we experience the sense of knowing, such as the experience of certainty in cognitive domains, including prototypically mathematics but also moral certainty. On the other hand, knowledge can be gauged on its functional success, witnessed by all the achievements in human history. The objective knowledge and the feeling of knowing appear to match to a surprisingly high degree, investing areas where evolutionary pressure may not have had a significant importance, such as the development of mathematics. To what extent this coincidence goes, is an outstanding question.

Ultimately, all these challenging topics are captured in the – still unexplained and apparently paradoxical – contrast between the unity of our experience of ourselves and of reality, with the plurality of specialized brain functions acting during any of our physical, cognitive or emotional experience.

