

INTRODUCTION TO THE MEETING “MIND, BRAIN, NARRATIVE”
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Alessandro Rossi

Department of Medicine, Surgery and Neuroscience, University of Siena, Italy

Abstract. The purpose is to highlight the current challenges of neuroscience and to introduce the concept of reality as a holographic simulation of our brain.

Key words: human brain connectome, sensorial perceptions, reality.

If we asked ourselves which scientific results in the 21st century could compete with the ones in the 20th century (theory of relativity, quantum physics, DNA and molecular biology, the discovery that the Universe is expanding and cooling), the answer is that this century will be the century of the brain. Indeed, we could finally have a complete and detailed comprehension; reductionist and supplementary at the same time. In that regard, the brain revolution will not only be a scientific revolution, but also a revolution in thought and culture. We could finally come to terms with Daniel Dennett's claim that it is true that we have a soul, but this is made of 100 million of neurons and 100 trillion of neural connections, that is at least 1.000 times the number of stars in our galaxy. In other words, the brain revolution will represent the completion of the Darwinian revolution, where the human conscience will come into contact with the biologic world. Extraordinary progresses have been made, where philosophers and humanists have undertaken the role of linguistic tutors, of interpreters of the neuroscientific results.

The neurosciences introduce us to the concept of the connectome, the ever-changing map of connections between the brain's neurons that makes each of us who we are. An important step toward understanding the function of human brain is to map its elements and connections to create a comprehensive structural description of the network architecture. The hypothesis is that the architecture of our connections is unique, and in this web of 100 trillion of connections is contained a huge amount of information from which arise our perceptions, behavior, mental and physical functions and all the aspects of our individuality. Our individuality expresses the organizational differences of cerebral connections. It has been demonstrated that our brains are different and unique as snowflakes.

Because each of our brains are different, are our perceptions of the world different? The last book by Enrico Bellone has an evocative title: *“Something there outside: how the brain creates the reality”*. It seems exaggerated to affirm that the brain creates the reality, as if it only existed a fictional reality (unless we want to interpret this with rhetorical and hyperbolic effects). For instance, that would imply that cats didn't exist in our world. Rather, we should say that our perceptions of a cat are created ex nihilo (from nothing) by the brain. However it is true that we don't perceive think as they are, but by taking into account what we are.

The universe is colorless, soundless, odorless and tasteless. Our perception does not identify the external world as it really is, but it is allowed to recognize it thanks to transformations acted by our senses: a) we perceive electromagnetic waves: not as waves, but as images and colors; b) we perceive distant vibrating objects: not as vibrations, but as sounds; 3) we experience chemical compounds dissolved in air or water not as chemical substance, but as specific scents and tastes.

Therefore, colors, sounds, scents and tastes are produced by our mind and they do not exist outside it. Let's consider an apparently common situation: the view of a house in a bucolic context. It is a visual, auditory and olfactory experience. It seems that images, sounds and scents come inside ourselves. It is not like that: the objects in the reality cause actions potentials in the sensory organs, and they travel through our brain complex connective architecture. In other words, in the brain it doesn't come the picture of the house, but the action potentials that the house produces in retinal ganglion cells. Once arrived in the consciousness “area” they give birth to the experience of the house. However, during the journey throughout the brain, the action potentials have qualities that the ob-

Correspondence to:

Alessandro Rossi

Department of Medicine, Surgery and Neuroscience, University of Siena, via Banchi di Sotto 55, 53100, Siena, Italy.

E-mail: alessandro.rossi@unisi.it

jects do not have. Therefore, we can now answer one of the traditional philosophical questions. Does a sound exist when a tree falls in a forest, if no one is there to hear that? No. The fall of the tree only generates vibrations. The sound will exist if the vibrations are perceived by a human being.

Given that our brains are different, it follows that our color perceptions are different. The sky is blue, right? Nevertheless, your blue is different from mine. Maybe very different. It isn't a question of right or wrong. Both are blue. Both are the simple result of our individual brains that encode the same signals in a different way. According to neuroscientist Anil Seth, we're all "hallucinating" all the time; when we agree about our "hallucinations", we call it "reality." In fact, we interact with success in many complex social contexts, and it would be difficult to understand how that is possible unless we agree that we share common experiences. We all enter the theater from the same door: if each of us had an individual entrance (therefore an individual reality), in the theater there would only be one spectator. Even the use of language would be impossible without a shared background of experience and knowledge.

We know now that our brain modifies itself physically and continually according to our personal experiences. We don't have to consider them only in terms of sensations, movements, education or knowledge, but also in terms of concepts and spirituality. The brain is subject to perpetual changes, and in this aspect resides the superpower that everyone has. This is our strength and our weakness at the same time. We have the power to deliberately modify the variables that the brain uses for the interpretation of the world. If it is possible to modify the brain (and this has been demonstrated), it follows that also the interpretation of the reality can be modified. Education, culture, the development of the critical understanding as well as our consciousness, are all tools of analysis and interpretations of the reality. The weakness of this tools leads to impersonal interpretations.

It is absolutely remarkable that the deliberate addition of new influences, and therefore new variables, physically modify the brain. In other words, that molds the organizational architecture of certain connection patterns. By extension, this can reshape not only the present, but also the past and the future. Of course, we cannot literally change our past. However, we can have different interpretations and different feelings about previous events. We modify their relevance in the pres-

ent. This can affect our thoughts and the behaviors and consequently our future. The past implies the concept of memory. Research has confirmed that our brain does not memorize everything, word after word in an exact sequence as a computer can do. Our memories are re-elaborations. Indeed, the brain rebuilds memories from key characteristics, but then it fills the gaps on the basis of both implicit and explicit connections and knowledge.

Traditional science has considered our memories something like unchangeable words on a book page. This is not true. The experiments carried out by the New York University in 2000 have demonstrated that the act of remembering changes the brain. Therefore, the recalled memories, as well as what we add in a lifespan, are affected by such a change. Every time that we recall a memory, it is filtered by what you are and what you know at the moment of the memory. There isn't any possibility to know what is objectively recalled and what is subjectively rebuilt.

The brain ability to constantly build finds its greatest expressions in the imagination. Albert Einstein claimed that *"Imagination is more important than knowledge. Knowledge is limited, while imagination surrounds the world"*. Paradoxically, only recently the imagination has been recognized as a pivotal element in the human thought: for planning and creating, for our memory and our problem-solving ability. William James (Principles of Psychology, 1890) wrote: "When we acquire a general perspective of the extraordinary flow of our consciousness, what strikes at first is the different rhythm of its parts. As the life of a bird that seems to be an alternation of moments of flight and rest. The moments of rest are usually occupied by imagination, while the moments of flight are full of relations, static or dynamic, that in most cases derive from what we have contemplated in the moments of rest." (Cited in the article "Mind-wandering as spontaneous thought: a dynamic framework", Nature reviews 2016). Research in this field has been overlooked by cognitive neurosciences. After 120 years from James's claims, the resting state fMRI technique has rekindled the interest for the "mind-wandering"; an area that has been so familiar and so mysterious at the same time.

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