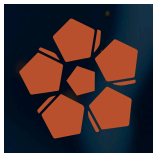


ART ^ NEUROSCIENCES

SEMILLA 05: The essence of being

0. CONTACT DETAILS

0.1 Surname and first name

Rocha Romero, Santiago

0.2 Contact e-mail address

santiagorocharomero2@gmail.com

0.3 Let us get to know you a little bit through your participation in websites, blogs, social networks, etc.

0.4 What is your background and in which institution do you work?

Bachelor of Medicine from the University of Extremadura
Specialist Physician in Neurosurgery at the Virgen del Rocío University Hospital

0.5 Gender

Male

0.6 Age range

31-40

1. ESSENTIAL DIMENSION

1.1 Seed name

The essence of being.

1.2 Seed summary

Phineas Gage was a 25-year-old American who suffered a workplace accident in 1848. Before the accident, Phineas was a kind, polite, and responsible man. In 1848, while holding a responsible position in railroad construction, Phineas experienced an accident in which, after an explosion, a 1-meter-long rod, 3.2 cm in diameter, and weighing about 6 kg, was propelled through his skull at high speed. The rod entered through his left cheek, destroyed his eye, passed through the left frontal part of his brain, and finally exited completely from the top of his skull on the right side.

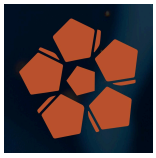
Phineas was treated by Dr. Harlow, who described how the physical injury profoundly altered Gage's personality. Although his memory, cognition, and strength were not affected, his once-kind personality slowly deteriorated. He became a rude, disrespectful man who was incapable of accepting advice. His plans for the future were abandoned, and he proceeded without considering the consequences. Gage became irritable, irreverent, rude, and profane, characteristics that were not part of his previous nature. His opinions changed radically. His transformation was so dramatic that everyone said, “Gage is no longer himself.”

Before this accident, the frontal lobes were considered silent structures of the brain with no function or relation to behavior. This event marked the beginning of a series of experiments that ultimately determined that the frontal lobes are largely responsible for our personality, emotions, and social behaviors.

1.3 Metaphor

Let us imagine this concept as the theory that states the flap of a butterfly's wings in one part of the world can cause a hurricane in another. Something as complex, abstract, and determinant as our personality, our faith or lack thereof, our way of relating to society, and the kind of people we choose as life partners… all of this resides in a physical space. It is striking that we can house our essence in specific brain areas, and that with a small alteration, we might lose ourselves in the abyss and never return. Something as ethereal as our being has a biological foundation. It can also be understood in the same way as the role bees play in ecosystems and biodiversity. Considering that without bees, life as we know it would not be possible.

1.4 Keywords



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Brain injury, Phrenology, Personality, Frontal Lobe

1.5 Scientific field (general)

Neuroscience

1.6 Scientific subfield (specific)

Neurobehaviour

1.7 Resources (File)

Shared folder

1.8 Resources (Links)

https://www.youtube.com/watch?v=7szAAF36cMo&ab_channel=BAPNE-BodyPercussionAcademic-Neuromotricity

https://www.youtube.com/watch?v=hGYOIwxUcWE&ab_channel=Psicoactiva

2. ADDITIONAL DIMENSIONS

2.1 SYNAESTHITIC DIMENSION

This dimension seeks to associate certain sensory characteristics to the seed.

2.1.1 What colours does this seed suggest to you?

The blinding sunlight when you step outside, the kind that prevents you from seeing anything clearly.

2.1.2 What sounds or music does this seed inspire you?

Sounds of gunshots, bombs, explosions. Loud, metallic noises that echo in your head, making it impossible to think. Music playing at a very high volume that causes your ears to hurt.

2.1.3 What aromas would you associate with this seed?

Alcohol, tobacco, dirty clothes, sweat, the smell of trash, decay.

2.1.4 What flavours does this seed avoke in you?

The taste you have upon waking up without having brushed your teeth before sleeping, a sour taste, like spoiled food.

2.2 EMOTIONAL DIMENSION

This dimension seeks to explore the personal meaning of the seed.

2.2.1 What was your motivation to dedicate yourself to this field of research?

The curiosity to understand how we function and how we can repair ourselves in case of failure.

What are your personal reason to suggest this seed?

I find the union of metaphysical and physical concepts very perplexing.

2.2.2 What metaphysical reflections does this seed provoke in you?

The fragility of being and identity.

2.2.3 What ethical reflection or challenges would you associate with this seed?

Are we responsible for who we are, or do we have a biological predisposition to be this way?

2.2.4 What aesthetic dimensions does this seed suggest to you?

The absence, the emptiness from the loss of oneself. Metallic, cold colors representing the rod that invades the body, destroying everything in its path. A blend of colors and shapes marking the emergence of a new, uninhibited personality.

2.3 PROCEDURAL DIMENSION

This dimension seeks to explore the scientific processes that are usually followed when investigating this topic.

2.3.1 Description of the research process

Since this is a historical event, there is no established neuroscientific research process, but when discussing brain functions and their localization, we could introduce the concept of functional neurological tests such as SPECT or functional MRI.

Single Photon Emission Computed Tomography (SPECT) is an advanced imaging diagnostic technique used in nuclear medicine that allows the three-dimensional visualization of the distribution of a radiopharmaceutical within the human body. This technique provides detailed information about the function and structure of the organs and tissues being examined, contributing to a more accurate diagnosis and the selection of the most appropriate treatment for a wide range of diseases. During a SPECT exam, the patient is injected with a radiopharmaceutical, a substance that emits gamma radiation. This radiopharmaceutical is absorbed by the body and is distributed differently in healthy tissues and diseased tissues. A special detector rotates around the patient's body, capturing the signals emitted by the radiopharmaceutical. These data are then processed by a computer to create three-dimensional images showing how and where the radiopharmaceutical has been distributed. SPECT allows doctors to visualize blood flow to the heart, identify areas of cerebral infarction, assess the distribution of neurotransmitters in the brain, investigate the presence of cancerous tumors, among many other applications.

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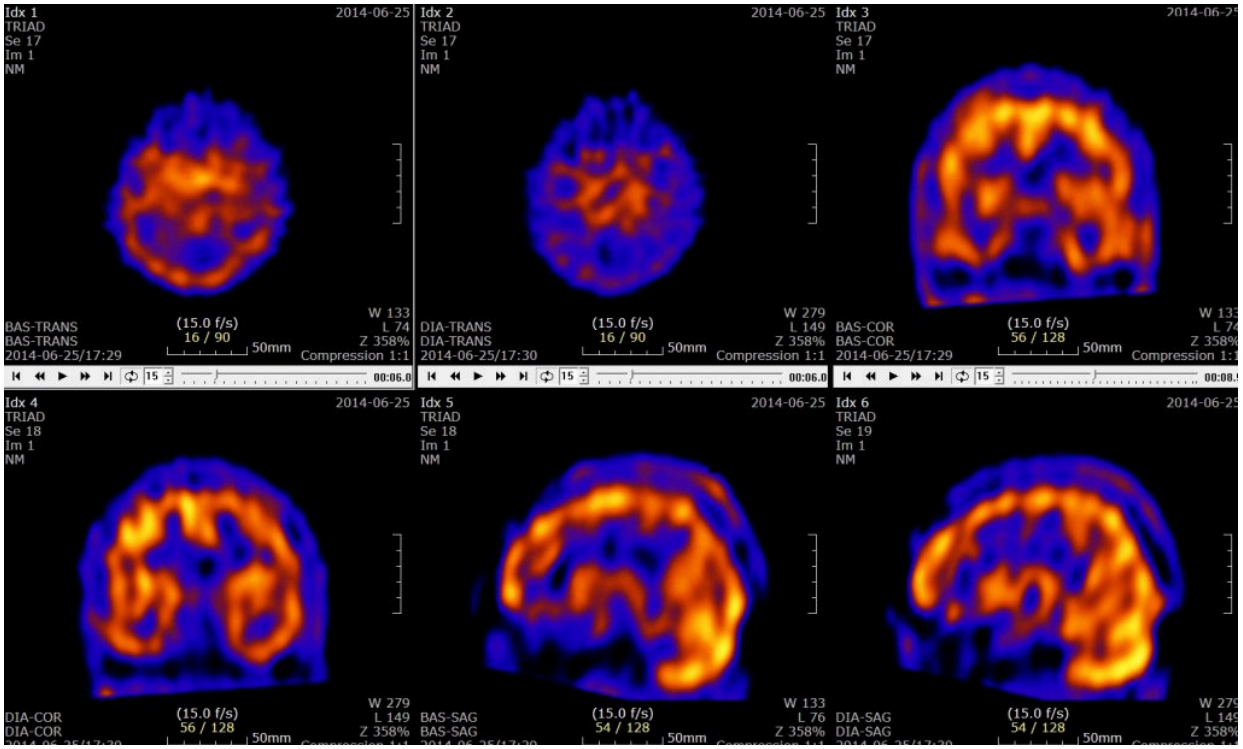
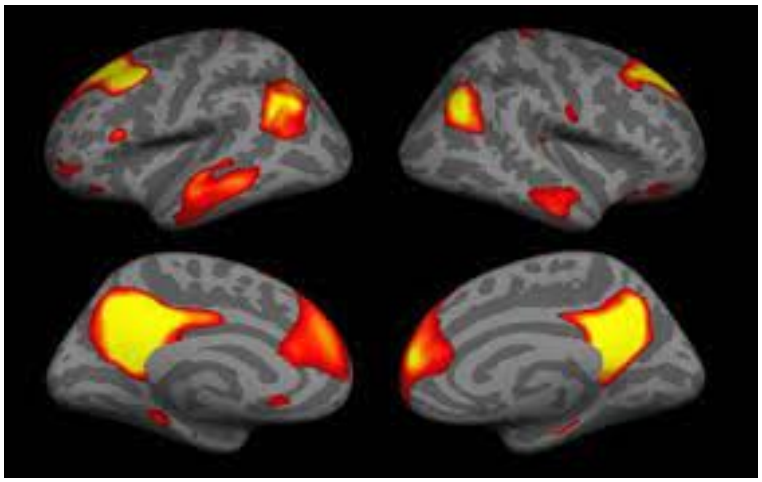
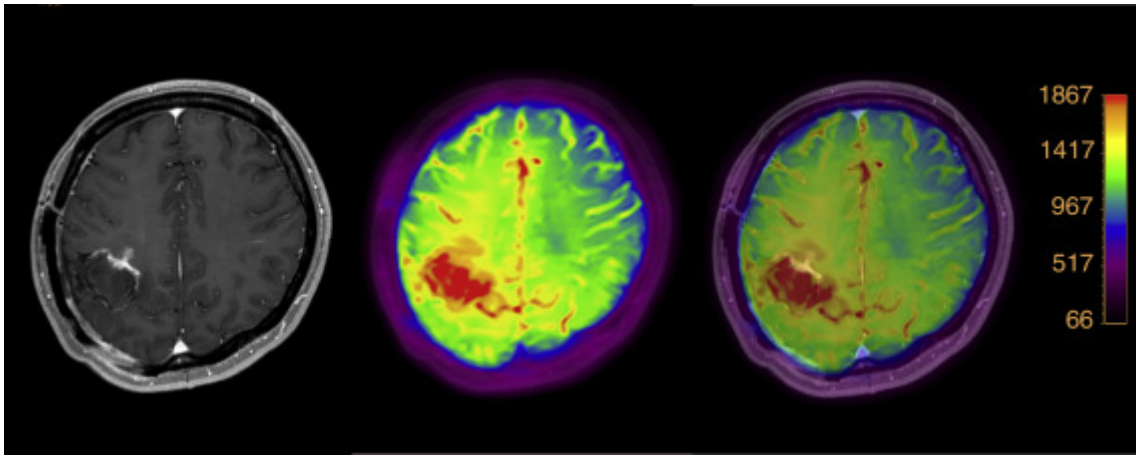


Functional magnetic resonance imaging (fMRI) uses the general principles that closely link neuronal activity with metabolism and blood flow. It can record cerebral hemodynamic changes that accompany neuronal activation and allows the functional evaluation of regions responsible for sensory, motor, cognitive, and affective processes in both normal and pathological brains. Neurons require nutrients to function, and given their inability to store energy, the brain depends on vascular flow to supply glucose, oxygen, vitamins, amino acids, and fatty acids. Thus, the regional increase in neural activity is associated with a local increase in metabolism and cerebral perfusion. Based on this principle, and considering that deoxyhemoglobin acts as an endogenous, intravascular contrast agent, this effect increases in direct relation to the concentration of deoxyhemoglobin, which will affect the behavior of hydrogen protons contained in water molecules, generating a shortening of the transverse relaxation times (T2 and T2*), thus attenuating the signal intensity in MRI images.





2.3.2 Research process diagram

2.3.3 Link to the descriptive video of the process

2.3.4 What tools are typically used in this field of research? Whether instruments, technologies, hardware or software.

3 PERSONAL SUGGESTIONS

4 INVOLVEMENT OF THE SCIENTIST IN THE CREATIVE TEAM

4.1- What role would you like to play in the co-creation process of the SciArt work?

Only as a "sower of a seed"