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We Live in The Neuroshadows of a Functional Cerebral Past

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Abstract
The neural processing necessary for sensory perceptions in the brain, especially in the cerebrum, involves a delay in their registration from the peripheral nervous system as receptor potentials are initially generated, which then continue as action potentials toward the central nervous system, coupling with neurotransmitter exocytosis processes in multiple synapses. These neurophysiological requirements produce thoughts about the reality we experience in our brain, which is not immediate, but rather an imprint in the form of shadows from the functional cerebral recent past, since the immediate time of registration of the world is the appearance of an apparent present. It's the brain, the information processor, after the information from the world reaches it, since we experience progress or the passing of time internally and its more virtual than real.

Keywords: brain; reality; time

Introduction

Humans judge things according to the disposition of their brain.

Spinoza B

There are multiple brain functions, including sensory, motor, cognitive, perceptual, memory, and behavioral processes, among others. However, in addition to establishing afferent and efferent functional pathways, the brain actively compares predictions. This requires specialized neural populations, involved in both motor and sensory domains, to process information prospectively, functioning as a neurobiological processor that generates inferences (Duque Parra *et al*., 2025). To perform these tasks, our brain is isolated from the world, enclosed in the skull, producing thoughts that are generated within it, related to the aforementioned sensations, motor planning, emotional events, and cognitive processes, which are interpreted almost instantly due to the interface between the environment and the nervous system. The neural processing carried out entirely by the brain involves the generation of action potentials or, in the case of sensory input, the prior production of receptor potentials, which are necessary for neurons in certain areas to form synapses with others and produce thought or activity, which requires a few milliseconds (Barco Ríos & Duque Parra, 2023).

Determining how a neuron computes requires understanding the complex spatiotemporal relationship between its synaptic input resulting from external stimuli and the output of the action potential (Sakaki *et al*., 2018), so that axons connect distant brain regions like neurobiological cables in which reliable propagation occurs, which is dependent on the expression of specific ion channels at strategic points such as axonal nodes (Tamayo-Orrego & Duque-Parra, 2007). The shape and speed of conduction of these potentials are modulated by the activity of voltage-dependent Na^+ channel subunits, which are critical drivers of active conduction along the axon (Rama et al., 2018; Barco Ríos & Duque Parra, 2023). Therefore, the activation of action potentials is the hallmark of neuronal function in almost all types of neurons. At the biophysical level, a depolarizing Na^+ conductance interacts with one or more delayed hyperpolarizing K^+ conductances, causing acute depolarization followed by acute hyperpolarization of the membrane potential (Stiefel & Ermentrout, 2016; Barco Ríos & Duque Parra, 2023), so the action potential usually lasts less than 2 ms (Stiefel & Ermentrout, 2016). Therefore, the information that the brain ultimately registers as perception is not recorded at the moment in the central nervous system, for example, in order for humans to have mechanical perception, we require lamellar corpuscles, which are preferably located in the subcutaneous fat of the fingers, palms of the hands, tendons, ligaments, and synovial tissue. Due to their multiple lamellae of connective cells arranged concentrically and separated by thin layers of gelatinous material, which surround the nerve endings and take the form of encapsulated endings, which functionally serve to initiate a mechanoreceptor process in our nervous system when stimulated by pressure or palesthesia, important for our perception of touch, related to social and environmental interactions (Duque Parra *et al.*, 2015). Additionally, in the case of vision, for example, when we see something, the image that is formed in our occipital cortex is achieved some time after the light rays have entered through the components of the eyeball, such as the cornea, the aqueous humor, and the vitreous humor, and then inhibitively stimulate the photoreceptor transducers of the retina (Duque Parra *et al.*, 2011) and generate potentials in the neurons of this part of the eye, whose receptive fields have been fundamental to understanding the processing of visual signals, with a multidimensional representation that offers a Additionally, in the case of vision, for example, when we see something, the image that is formed in our occipital cortex is achieved some time after light rays have entered through the components of the eyeball, such as the cornea, the aqueous humor, and the vitreous humor, and then inhibitively stimulate the photoreceptor transducers of the retina (Duque Parra *et al.*, 2011) and generate potentials in the neurons of this part of the eye, whose receptive fields have been fundamental to understanding the processing of visual signals, with a multidimensional representation that offers insight into how visual neurons filter incoming stimuli in the retina, whose receptive fields arise from neural processing through a multilayer circuit (Vlasits, 2025). Then, the ganglion neurons will transmit information through the optic tracts to the metathalamus, where, particularly in the lateral geniculate bodies, synapses will be established and latency will be required when involving exocytosis mechanisms in the synaptic terminals with new neurons (Duque Parra *et al*, 1997) that will then project course potentials to the primary visual cortex and visual association cortex (Gyu Kwon & Ho Jang, 2014). In the cortex, in turn, new action potentials will be generated that will propagate with other elements of the brain, such as the hippocampi, linked to interpretations of memory function, It has therefore been proposed that this medial temporal region supports the online memory demands necessary to guide visual exploration, orchestrating memory-guided exploration that develops over time to construct coherent memories (Voss *et al.*, 2017) in order to somehow retrieve information in the form of files on what has been observed and compare or contrast it according to an established pattern. In this way, we can say whether the color of the mammal's blood is red or not; it was greenish blood emanating from a caterpillar. It is therefore the predictive function of the brain (Duque Parra & Mendoza, 2025) that does not instantly register the visual world. The same is true of what we hear, as sounds are an important communication tool that contain information about the surrounding environment and can signify danger or reward for an organism. whose production mechanism is produced by the vibration of the body in a medium containing molecule in the surrounding space, which, as a perception, begins in the human fetus around the third trimester, playing a vital role (Kulsoom & Karim, 2022). The voice emitted by our interlocutor, in order to be manifested, must be generated by the vibration of the vocal folds in their larynx, a vibration that produces an alteration in the air as a wave that will propagate from the vocal apparatus to the receiving organ of the listener, then alter the momentary conditions of endolymphatic equilibrium of the auditory system (Duque Parra *et al.*, 2011). When sound is emitted and leaves the larynx as a wave, it propagates through the air at 21 degrees Celsius at a speed of 344 m/s (Gallego Becerra *et al.*, 2011), until it reaches the interlocutor and generates receptor potentials in the listener, followed by action potentials, using multiple nerve pathways. It will take some time that we believe is immediate, but no, there is also a latency between the moment a sound is generated and travels through the auditory pathway from the ear to the brain, processing auditory signals evoked between 5 and 15 milliseconds after stimulation of the ear (Ried *et al.*, 2002).

Discussion

As can be inferred from the aforementioned neurophysiological sensory approximations, several stations are required to relay information so that the information we register from the world finally reaches the brain. The image, sound, or touch on the skin that we register does not reach the brain immediately; it is not instantaneous, but rather takes some time, although to our consciousness it seems to be ipso facto. When we reflect on this, we find the transducing neural shadows that tell us about the past, however brief. We are therefore incapable of acquiring immediate knowledge of the true nature of reality, similar to Plato's (427-347 BCE) assertion that the earthly world is the shadow of a world, that of ideas, of which humans can acquire only approximate knowledge (Dekonski & Berguer, 1966), This note is consistent with what Gregory said: the senses do not give us a direct view of the world, but rather provide us with evidence to contrast the hypothesis about what is before us, so that in effect, we can say that a perceived object is a hypothesis (Ferguson, 1991) and in reality, apparent time exists only in a phantasmagorical, fleeting form: that of an apparent present. But it is our brain that processes this information after it reaches us from the outside world, because we experience progress or the passing of time in an internal and intimate way; it is more virtual than real. In this way, the organs of sight, smell, hearing, and touch, among many others, take raw information and process it in a way that is convenient for sending it to the central nervous system. Thus, recognizing a horse as such implies having a prototype engraved in our minds that serves as a comparison; that is, the concept of a horse, an abstraction that our rational apparatus creates after encountering the first horses (Vélez, 1998). Therefore, the body and brain of any of us are observable by third parties; however, the mind is only accessible to its owner (Damasio, 2000), since the concepts of thought do not come from outside, the absolute coincidence of our ideas with the world cannot be guaranteed, hence colors only exist in our minds as optical illusions, since in the outside world only light exists, with different degrees of energy (Ganten, 2004). As in the Aimara worldview, which indicates that the past is ahead and what is seen with the eyes, and the future, a conception that is exemplified in the aphorism that indicates that by looking back and forward we can walk in the present-future, referring to the experience of the past that lies ahead (Secades Gómez, 2013) like neuroshadows, and the raw information we receive through our senses makes no sense unless it is brought into the conceptual system produced by consciousness, and this requires time; so-called material objects are not things that exist totally independently of consciousness, but rather constructions of consciousness itself (Rubia, 2009).A construction that is present for the brain, but past for reality: the neuroshadows of the past in which we live permanently.

Conclusion

We live in a future construction in the time of the world that our central nervous system fabricates as neuroshadows of the past, because the brain is not in direct contact with reality, which it generates due to the multineuronal and polysynaptic construction that leads to varied latencies in the neurophysiological processing of multiple sensations, due to the processes of propagation of receptor potentials, action potentials, exocytosis and endocytosis mechanisms in the various neuroanatomical stations, before these generate cerebral perceptions and we recognize the world as such.

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