

*The Decision for Immersion: The Cognitive Possibility of
Virtual Reality*

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In 1935, the sci-fi author Stanley G. Weinbaum wrote *Pygmalion's Spectacles* (2006). It is a short story that describes an immersive experience and its effects on a subject. The experience is mediated by a particular type of glasses that presents a multisensorial and interactive immersive experience. In a sense, Weinbaum's core idea was updated with the envisioning of the 'Ultimate Display' by Ivan Sutherland: "The ultimate display would, of course, be a room within which the computer can control the existence of matter" (Sutherland, 1965, p. 2). Thus, in a certain sense, both authors anticipated several aspects of what we know since the early-1990s as virtual reality (VR), a technology that offers the possibility of experiencing something that is digitally controlled by a computer and is perceived as if it were 'real'.

Despite being usually associated with digital technologies, the experience of immersion is part of our daily lives. Immersion can be experienced in many forms, and one can feel immersed when reading a book (Ryan, 2015), playing videogames (Ermi & Mäyrä, 2005; McMahan, 2003), working (Csikszentmihalyi, 2007), visiting a place (Grau, 2003) and others. Immersion is related to the sensation of being surrounded "by a completely other reality, as different as water is from air, that takes over all of our attention, our whole perceptual apparatus" (Murray, 2016, pp. 98–99).

Therefore, immersion is a phenomenon that affects and depends on a subject that perceives her/himself as immersed. What in question is immersion, thus, is perception itself. In any case, there is something remarkable on the perception of immersion: one can become aware of it only *a posteriori*. Unlike other phenomena that we can be aware of as they happen (e.g., hunger, thirst, pain, heat, etc.), the awareness of immersion can occur only after it ceases, when one emerges. In VR, these moments of immersion happen not only when the equipment, head-mounted displays (HMDs) and controllers, are removed but also during the VR experience.

For instance, emersion occurs when something ‘reminds’ us of aspects that supposedly should not participate in the immersive experience, such as when we feel the weight of the HMDs in our faces, bump into some physical object, or even because we suddenly rationalize what we are doing. However, in most cases, these suspensions are temporary and do not prevent us from re-experiencing immersion.

The experience of being immersed, thus, depends on us not being aware of it. The idea of perception without awareness may appear counter-intuitive at first. However, this phenomenon has been studied at least since the end of the 19th century. As Merikle (2001) demonstrates through multiple experiments, perception can occur “in the absence of an awareness of perceiving” (Merikle, 2001, p. 125). The cycle of immersing-emerging – or, in other words, the switching between unaware-aware – during immersive experiences is somehow expected and points to a particular fragility of the state of immersion, which demands a particular cognitive engagement with the situation to sustain the experience.

According to Maturana (2008), immersion can be experienced due to our inability to distinguish between ‘perception’ and ‘illusion’. Our nervous system operates as a “closed network of changing relations of activities between the neuronal elements that compose it” and does not interact with the medium (Maturana, 2008, p. 109). Due to its closedness, the nervous system cannot distinguish between internal and external stimuli and between virtual and non-virtual realities. Any distinction in this sense can be made only by an observer through ‘linguaging’,¹ which is not just “a domain of abstractions or symbolization, rather linguaging occurs as a domain of concrete doings, whether these are things we do with our hands, or things we do in our thinking” (Maturana, 2008, p. 112).

Nevertheless, it is noteworthy that distinction has an active character. When the sensation of immersion is interrupted by any reason, the perception of its interruption is part of the domain of distinctions we can perform through language. For instance, when in VR, the system momentarily freezes, from the nervous system standpoint, there is no difference in the quality or intensity of the stimuli conveyed by the equipment to our sense organs at that moment. Still, we can actively distinguish the moment of emersion from the rest of the experience and, in the sequence, immerse once more.

What interests us is this ability to decide to immerse again and how this decision is at the roots of the possibility of experiencing VR. That is, how can we experience VR as ‘real’ even knowing that it is, in fact, an illusion?² It is necessary to turn our attention to cognition itself,

¹Linguaging can be defined as “the act of speech in all its forms” (Bottineau, 2010, p. 271).

²I started to address this issue in my Ph.D. thesis, in press: Vasconcelos, G.N., (2021). Atmospheres of Immersion: Designing and Experiencing in Architecture and Virtual Reality. Ph.D. Thesis, Universidade Federal de Minas Gerais, Belo Horizonte, Brasil).

more specifically to the enactive theory of cognition, to answer this question.

Varela et al. (1993) proposed the enactive approach to cognition as an alternative from the traditional theories on the theme. The enactivist theory argues that organisms have agency over their experience, emphasizing that the “experienced world is portrayed and determined by mutual interactions between the physiology of the organism, its sensorimotor circuit, and the environment” (Wilson & Foglia, 2017, para. 15). Enactivism is sometimes called ‘embodied cognition’ and is based on the idea that cognition depends on a physical body. The enactivists are interested in understanding not only how “physicality opens up the experience of the self, the world, and the others, but rather aims to specify the *mechanisms* that explain just how cognition is grounded in, and deeply constrained by, the bodily nature of cognitive agency” (Wilson & Foglia, 2017, para. 28). This premise has its roots in phenomenology and was developed mainly by Merleau-Ponty (1961, 1945/2012), Clark (1997, 2017), Varela et al. (1993), Shapiro (2011), and Noë (2004, 2012).

Thus, under enactivism, the distinction between body and mind is no longer possible, and immersion is a phenomenon that we experience through our embodied cognition. In this sense, our body can be regarded as the ground zero for our experiences, the invariable and persistent place from where the observer observes. Merleau-Ponty (1968) teaches us that the body is structured as a *chiasma*, or the intertwining of sensible and sentient, and it is this “essential link between sentience and sensibility, which first opens the body to the world” (Toadvine, 2012, p. 340).

It is our ability as observers to distinguish ourselves from this structural chiasma that allows us to experience immersion in VR. Therefore, the possibility of experiencing immersion depends on distinguishing it from non-immersion. Nevertheless, the operation of distinction occurs in language, which is ‘invisible’ to the domain of our nervous system, as described by Maturana (2008).

Merleau-Ponty (1945/2012) uses the example of two hands of the same subject touching each other to explain reversibility, a concept that can be useful for our discussion. The author says:

”when I touch my right hand with my left, my right hand, as an object, has the strange property of being able to feel too. We have just seen that the two hands are never simultaneously in the relationship of touched and touching to each other. When I press my two hands together, it is not a matter of two sensations felt together as one perceives two objects placed side by side, but an ambiguous set-up in which both hands can alternate the roles of ‘touching’ and being ‘touched’” (Merleau-Ponty, 1945/2012, p. 106).

The possibility of reversibility enables us to choose among the distinctions we can make despite its coincidence or simultaneity, in this case, between touching and touched. Thus, immersion in VR can be regarded as an experience that has points of contact with touching and being touched.

When in VR, I am in a state where I can perceive myself as immersed and non-immersed since I can distinguish that the experience is an illusion. For example, when I am immersed and think that I might be too close to a wall, I choose to reach out my arm to see if I am safe. This movement of my body is not driven by the stimuli that came from the HMD or the controllers. I chose at that moment not to be immersed, guaranteeing my safety. When the necessary positional adjustments are made, I can offer myself to be immersed once again.

Therefore, the illusion needed to experience immersion in VR can be taken as just a moment in reversibility where I choose to distinguish myself from the next moment of non-immersion. The reversibility or the change of roles in either situation is possible, according to Dillon (1983), because “after all, they are roles played by a unitary sensor, my own body” (Dillon, 1983, p. 369). From what we discussed, we can say then that our body is a unity that interfaces our nervous system and the world, holding the potency to reunite what language can distinguish.

Therefore, we can see that immersion in VR is a phenomenon that captures us at different cognitive levels, an experience of intertwining that occurs at the level of sensations, language, and the body. In short, the possibility of experiencing VR is due to our ability to distinguish VR from non-VR and choose through our body what distinction to experience.

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