**Embodying cultural practices: Some background.**

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**Introduction**

The present project on the embodiment of social cultural practices is the outcome of my research activity during the last two decades, devoted to the investigation of the possible far-reaching cross-disciplinary consequences of the discovery of mirror mechanisms in the human brain. This discovery led me to the formulation of the theory of embodied simulation: shortly, sensorimotor processes and their interplay with interoception constitute the embodied bases of intersubjectivity, social cognition and human culture, hence cannot be neglected when addressing these issues.

My approach, capitalizing upon the application of embodied simulation to aesthetics and cultural artifacts, is motivated by five starting assumptions. 1) All meaningful experience is aesthetic experience. 2) The aesthetic experience of cultural artifacts must be framed within the broader notions of intersubjectivity and social cognition, as cultural artifacts are mediators of the relationship between the subjectivities of creators and beholders. 3) We can now look at the aesthetic-symbolic dimension of human existence not only from a semiotic-hermeneutic perspective but starting from the dimension of bodily presence. 4) The notion of presence in social cultural practices entails a bodily synesthetic multimodal relationship with the cultural artifacts, modulated by the social, cultural and technological context. 5) The new digital era requires a thorough investigation of the role played by digital dispositives and their mediation on the embodiment of social cultural practices.

In my talk, I focus on the impact of digital technologies and the mediasphere on a relational definition of human cultural practices. Before getting there, however, a concise epistemological overture is in order.

**The neuroscience of what?**

What does our subjectivity consist of and what does it depend on? For a long time the only available empirical approach to these topics was that inspired by classic cognitivism. According to a still widely shared view, the human mind, similarly to a computer, would be the result of computational algorithms whose nature is totally disengaged from and independent of our bodily nature. However, the theoretical tenets of classical cognitivism have been challenged empirically. In the last decades of last century, empirical research in neuroscience and cognitive science, together with a series of theoretical proposals, radically changed our view of the mind and its relationship to the body, configuring the so-called "paradigm of embodied cognition." The notion of 'embodiment,' at the heart of the model of human cognition as 'embodied,' implies that body parts, bodily actions or bodily representations play a crucial role in cognition. However, bodily representations can be interpreted in terms of mental representations with a bodily content (representations *of the body*), or with a *bodily format*. The embodied simulation theory I proposed chooses the second option, arguing that the bodily format of a mental representation determines what that mental representation can map, because of the bodily constraints posed by the specific configuration of the human body. In other words, neurons and brain circuits function the way they do only because they are wired to the body (Gallese, 2016). Our biological nature and the relationships we have with the world through our bodies determine how the individual-world relationship is shaped, regulated, and represented.

In contrast to a too ‘craniocentric’ perspective shared by many quarters of contemporary neuroscience, I submit that to understand human cognition we cannot simply study the brain alone, but must tie it to corporeality and the environment in which bodies operate. Furthermore, it makes no sense to look for a 1:1 map between the concepts used to describe mental processes and their brain locations. This approach, still shared by too many neuroscientists, qualifies as a form of high-tech phrenology. The sub-personal level of description in neuroscience, which refers to the brain, to brain areas or individual neurons, is necessary but not sufficient to understand human cognition. To do so other elements need to be considered, like the body, the physical world, and others’ brain-bodies inhabiting it.

Another important but rarely considered aspect is that related to our 'neotenic' nature, that is, the fact that we are born immature. Our brain at birth weighs only a few hundred grams and reaches its full development at the end of adolescence. This means that much of our brain development takes place after birth, crucially depending on the quantity and quality of interpersonal relationships we establish, first with our caregivers and then with an increasing number of peers and other adult individuals. Relationships with other individuals are not only an opportunity but also a necessity for our survival, development and maturation (Gallese, 2017). This relational perspective on subjectivity has deep implications for an empirically-based account of cultural artifacts and cultural practices. Let us see now what are the putative neurobiological bases of human relational nature.

**Mirror mechanisms and embodied simulation**

Our discovery of mirror mechanisms, first in macaques then in humans, revealed the cognitive role of the motor system in social cognition, thanks to a neurophysiological mechanism that maps the relationship between individuals[[2]](#footnote-2). The same neuron that controls the execution of an action is also activated when that action is seen being performed by another. Mirror neurons decline intersubjectivity first and foremost as intercorporeality. The ability to recognize others as intentional agents does not depend solely on linguistic competence, but is primarily based upon the relational nature of action. Thus, intercorporeality becomes the primary source of knowing others. Empirical research has shown that the human brain is equipped with mirroring mechanisms even in the domain of emotions and sensations: the same brain structures involved in the subjective experience of emotions and sensations are also active when those emotions and sensations are recognized in others (Gallese 2009, 2014).

My theory of embodied simulation (Gallese 2005, 2014) proposes that there are mental states or processes that are bodily because of their bodily format of representation/modeling at the neurophysiological brain level. Embodied simulation consists of the reuse (see Anderson, 2010) of representations in bodily format to map others and understand their behavior, emotions, and feelings as *from within*, that is, empathically.

**The aesthetic experience of cultural artifacts as a mediated form of intersubjectivity**

The urge to tell something to someone by manufacturing objects of a very specific kind, like symbolic objects, is uniquely human (see Gallese, 2020 a,b). The main motivation leading me to experimentally address aesthetic experience is the conviction that it is one of the core aspects of human cognition. If cognitive neuroscience must shed light on who we are as humans and – cognitively speaking – where we come from, aesthetics is an unavoidable research topic. A further element pointing me to experimental aesthetics is the fact that aesthetic experience is a form of mediated intersubjectivity, where the symbolic object, or cultural artifact, or work of art is the mediator between the creator and the beholders.

In the paper co-authored with David Freedberg (Freedberg and Gallese, 2007), we hypothesized that embodied simulation could physiologically ground the fundamental role of empathy in aesthetic experience: when beholders stand in front of artistic images portraying acting bodies and the expression of emotions and sensations, beholders’ brain-body should react by simulating those same actions, emotions and sensations. Below and before the more frankly cognitive-linguistic aspects guiding our experience of art, we argued that there is a corporeal dimension – already glimpsed in the past by many philosophers and historians of art – that we could study experimentally. Beholders’ brain-body responses to works of art despite their being modulated by cultural, historical and contextual idiosyncratic factors, are supposedly universal. A further strong hypothesis put forward by our paper was that when beholding a work of art, the artist’s creative gestures are simulated within beholders’ brain-body.

Starting from these theoretical assumptions, we investigated the aesthetic experience of visual abstract art, as to challenge our hypothesis with the less anthropomorphic images we could choose, like the cuts on canvas by Lucio Fontana (Umiltà et al., 2012) or the dynamic brush strokes of Franz Kline (Sbriscia-Fioretti et al., 2013). The results were fully consistent with our hypothesis: when beholding the consequences of the artist’s gestures, beholders simulated them by activating part of their cortical motor system, in spite of not activating their arm and hand muscles. No matter how acquainted people are with these artistic images, they systematically carry out a sort of Peircean sensorimotor *abduction of inference* (see Gell, 1998), where the contemplation of the outcomes of the artist’s creative gestures leads to the simulation of their causes.

In a series of subsequent studies, we tackled the reception of representational art, both behaviorally and by eye-tracking (Massaro et al., 2012; Savazzi et al., 2014), and by means of fMRI (Di Dio et al. 2016). The relationship between the bodily dimension of the aesthetic experience of works of art and their explicit aesthetic judgment is still a contended issue. Two recent studies explored behaviorally and with fMRI the potential role of beholders’ sensorimotor engagement with the emotional content of works of art to the formation of the objective aesthetic judgment of their beauty: the results showed this to be the case (Ardizzi et al., 2018; Ardizzi et al., 2020).

Altogether, our results show that human-made images are a place of virtual interaction qualifying as a sophisticated form of mediated intersubjectivity. These elements are connected to the function of embodied simulation: the ways through which the beholder is involved with cultural artifacts are not just off-line mental processes, but primarily on-line bodily forms of simulation.

The results of the experimental investigation of aesthetic experience of visual art and film (see Gallese and Guerra, 2020) carried out so far have shown that similar neurophysiological and bodily mechanisms underpin both our experience of reality and of its representation. This similarity transpires even at the level of single neurons. Caggiano *et al.* (2011) showed that macaques’ mirror neurons respond to both the observation of actions performed by the experimenter physically present as well as to their filmed videos displayed on a 2D computer screen. In sum, the neurobiological mechanisms enabling the connection to the “real world” largely overlap with those mapping fictional worlds.

**Where do we go from here**

Embodied simulation can account for how we perceive and imagine the world, but also for how we build the parallel worlds of fiction and experience them: we feel for and empathize with fictional images and characters in ways that are similar to how we feel for our real social partners, although with qualifying differences (see Gallese 2017, 2020; see also Gallese and Guerra, 2020).

Any relational account of subjectivity –and of cultural practices- must address how technology shapes the social dimension of the self, hence influencing our relationship with cultural artifacts. This relationship can be interpreted in terms of social habits and social practices. Technological progress and the development of the digital mediasphere condition our relational nature, likely changing our subjectivity, that is, ultimately our self. As argued by the philosopher Gilbert Simondon (1958/2001), technology transcends any narrow utilitarian purpose. The development and expansion of technology produce new relationships between people, between things, and between people and things. According to Simondon, technology is a network of relationships. Our biological nature, therefore, cannot be fully understood apart from contemporary digital technology and the sociocultural practices it nurtures, inspires and conditions. The neuroscientific study of relationships and social practices mediated by digital technology thus offers an indispensable new contemporary perspective on the self, intersubjectivity and culture, much of which needs to be undertaken and developed.

The new aesthetic regime produced by the digital revolution – the Aesthetic world – has profound implications for all aspects of social life. Thus, experimental aesthetics is pretty well suited to understand several important aspects of contemporaneity, like our cultural practices. Neuroscience and experimental aesthetics can provide new interpretations of our aesthetic relationship with the world, exploring how remediation, relocation and scopic performativity affect and condition our being in the world.

The talk will address how these topics can be empirically investigated.

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2. For a recent updated review of mirror neurons and mirror mechanisms in humans, see Bonini et al., 2022. [↑](#footnote-ref-2)