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The aesthetic experience between body and mind: multisensory museum fruition and the Boccioni VISIBLE Project

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ABSTRACT

The paper, starting from the concept of aesthetic experience in the museum context, explores the potential of the corporeal dimension during the interaction between visitors and artworks, both in the emotional sphere and in the intellectual one.
The Museum becomes "sensitive" when the body plays the role of a technical tool to receive and elaborate the educational message. From this perspective, the museum experience encourages participation and social inclusion using ICT and multisensory modes.
Considering the relevance of physical, sensory, and communicative accessibility, the paper summarizes the *Boccioni VISIBLE* project, designed for visually impaired people to enjoy the sculpture *Forme uniche della continuità nello spazio displayed* at the Galleria Nazionale di Cosenza The research also aims to offer other digital solutions for a synesthetic and interactive approach to Umberto Boccioni's masterpiece, implementing new strategies for audience engagement and edutainment.

Senses and intellect in a museum context

The relationship between perception and action, mind and body, has long been investigated by cognitive neuroscience (Lakoff, Johnson 1999; Borghi, Iachini 2004; Johnson 2017). The latest research shows the fundamental role of physical involvement in the development of thought and personal identity (Morabito 2020.) The pedagogical practice has redefined its educational and training approaches, adopting a vision of the body as a pedagogical device (Rivoltella, Rossi 2017), which «non esaurisce la sua essenza nella sua anatomia o nella sua fisiologia, ma determina risonanze nelle nostre esperienze psichiche, emotive ed affettive» (Sibilio, Galdieri 2022, p. 192). Corporality thus acquires its dignity within processes of knowledge and expression, on par with intellectual faculties and affective competencies (Isidori 2002; Cunti 2015; Gagliardo et al. 2024).

Considering museums as spaces for informal learning within an "educating society" (Vertecchi 1997), museum experiences can be understood as activities deriving from the interconnection between body mind/heart/spirit, as well as between physiological perception and the mental processes of the perceiving subject (Bartoli et al. 1996). In the museum, a "perceptive space" where the public interacts with environments, displays, and artifacts (Cataldo, Paraventi 2007), sensory data are registered, analyzed, and processed into a perceptive experience that engages both the sensory-motor system and psychic functioning (Hein 1998; Dudley 2009).

As a result, the perceptive behaviors and their corresponding internal resonances are significantly influenced not only by the characteristics of the exhibited objects but also by the specific conditions in which visitors engage with cultural artifacts and their structural qualities (Bartoli 2003). Through the capabilities offered by the body, the artwork becomes a perceived object within a system where interpretive action represents the first step toward identifying, understanding, and attributing meaning to the artistic representation (Secchi 2004).

When appropriately facilitated, sensory stimulation can activate all those intellectual and emotional components that underpin aesthetic emotion, such as attraction and interest (Ruggieri 1997). The aesthetic experience within the museum environment should be understood as

… l'atto di godere dell'opera artistica, del prodotto realizzato dall'artista. Dove godere non è inteso solo nel senso di ricavare piacere, appagamento da qualche cosa, ma pure di trarre un'utilità, un giovamento, un vantaggio di tipo affettivo o intellettivo o, *tout court*, cognitivo (Argenton 2011, p. 10).

The aesthetic experience within the museum environment should be understood as a multifaceted process involving the interplay of sensory perception, cognitive engagement, and emotional resonance. This dynamic interaction not only fosters a deeper appreciation of the exhibited works but also facilitates personal meaning-making and cultural understanding. The sensory engagement with art and artifacts serves as a link between the physical presence of the viewer and the symbolic dimensions of the objects, encouraging reflective and transformative experiences (Dewey 1934; Falk & Dierking 2013).

Accessibility, inclusion, and participation through multisensory approaches and ICT

Traditionally, visual perception has been the primary means of engaging with cultural objects, but recent research has shown that multisensory perception is essential for the museum experience (Howes 2002; Levent, Pascual-Leone 2014; Classen 2017).

In line with the concept of the participatory museum (Simon 2010) and recognizing the formative value of bodily experience, the contemporary museum evolves into a space «atta ad essere percepita, conosciuta e appresa attraverso i sensi [...] e capace di "sentire", di essere ricettiva rispetto alle mutazioni culturali e sociali» (Martini 2016, p. 8). As an «organismo sensibile

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che trova nel paradigma dell'interazione tra opera d'arte e visitatore la sua logica più evidente» (Spallazzo et al. 2009, p. 1), the development of mediation strategies that encourage engagement with collections through a corporeal dimension, supported by ICT, positions the museum as an ideal environment for stimulating the acquisition of new knowledge and experiences.

The use of technological devices as facilitators of the museum experience allows for an expanded narrative of exhibited objects through tools that engage the visitor from a physical perspective as well. These include VR headsets, wearables (rings, bracelets, lenses), interactive monitors/totems/touch tables, fragrance diffusers, motion capture systems that record movements, and manipulable artifacts created through 3D printing (Tallon, Walker 2008). In museum contexts, the application of such mediation tools is justified solely by what is added to the normally perceived reality (Izzo 2017) and their ability to generate relevant forms of learning (Bonacini 2011).

The museum environment conveys meanings that influence the public's experience (Bitgood 2002; Falk, Dierking 2016), which is generally accustomed to receiving predominantly visual stimuli- verbal. Instructions such as "do not touch" or "do not get too close to the artwork" may impose a form of bodily constraint (Leahy 2012).

Nowadays museums are increasingly called upon to welcome more diverse audiences, harnessing the potential of technology to ensure that museum collections are accessible to all, regardless of physical, psychological, socio-cultural, or economic conditions (Da Milano, De Luca 2006). It represents certainly a significant step forward in addressing inequalities (Sandell 2002).

The Boccioni VISIBLE project

The Boccioni VISIBLE project (VISually Impaired and BLind's Engagement) focuses on the possibilities of involving visitors with visual impairments in the experience of Umberto Boccioni's sculpture *Forme uniche della continuità nello spazio*, exhibited at the National Gallery of Cosenza. Thanks to a 3D scaled model of the artwork, designed with tactile sensors, users will be able to manipulate the object with the support of an audio guide that will assist in the recognition of the artistic object and the interpretation of its historical and artistic content. The synchronization between haptic movements and listening to the verbal description will thus facilitate the creation of a mental representation of the artwork, enriched by new aesthetic impressions.

According to the ICF (International Classification of Functioning, Disability, and Health), disability arises from the interaction between an individual, their health condition, and the environment in which they find themselves (WHO 2001). Therefore, cultural products and services must be properly designed to identify and remove attitudinal and environmental barriers that may limit broader participation in cultural life, assessing both building accessibility and access to collections (Parente 2006; Garofalo, Conti 2012).

More accessibility interventions will be planned for the Galleria nazione di Cosenza: the creation of a tactile map of the building, tactile signage, and an audio file (downloadable on personal devices) for orientation within the museum path. A label with a QR code will be placed near the artwork, including Braille description and text in high-legibility fonts, with targeted color contrasts and font sizes designed for individuals with low vision. To engage the widest possible audience, the research also aims to implement multimedia and interactive technological solutions designed to offer a multi-sensory and immersive experience of Futurist sculpture.

Body Awareness and Listening

The three-dimensional modeling of the sculpture allowed for a detailed examination of its subject: the body of the aerodynamic figure appears shaped by speed and movement in space, key ideas of the Futurist movement, of which Boccioni was both a prominent exponent and theorist (Longhi 1914). In *Forme uniche della continuità nello spazio* there is no single viewpoint: the anatomical body appears "flayed," with alternating concave and convex surfaces, grooves, and edges (Calvesi, Dambruoso 2016, Birolli 2019).

Since tactile stimulation plays a dominant role in learning processes (Pye 2007; Chatterjee 2008; Candlin 2010), visitors will use their bodies as tools during the exploration of the scaled replica, which is organized into multiple operations aimed at deciphering the plastic and material value of the artwork. Among bodily techniques, manipulation is a practice regularly experienced for knowledge purposes (Mazzeo 2003), yet the process of identifying objects through active touch, known as haptic perception (Grunwald 2008), does not have the immediacy of visual perception nor the same perceptual field as vision (Heller, Schiff 1991). It is a process typically performed with both hands and involves movements directed at gathering specific information about an object's form, composition, weight, and spatial occupation (Lederman, Klatzky 1987). The image of the artifact can be reconstructed by a blind birth visitor from mental structures activated by touch, while someone who has lost their sight later in life can use their memory to form an image of the object they are holding (Bellini 2000). Transforming the sensory image into a mental image requires considerable intellectual effort (Cesa- Bianchi, Masini 1985). Moreover, if explored solely through touch, the subject of the case study may encounter decoding issues, as this tends to lean toward abstraction.

Through the correct integration of the remaining senses, the mind-body knowledge acquisition system will also utilize the auditory channel in reconstructing the artwork imaginatively (Axel, Levent 2003).

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The touch points placed in specific areas of the copy (head, chest, back, knee, calf) will help capture particular aspects of the artwork through audio description.

The evocative and metaphorical power of verbal description (Snyder 2014) will enrich the tactile analysis with information about Boccioni's concept of sculpture, his style, and the historical-cultural context in which he worked. In addition, proprioceptive sensations and kinesthetic stimuli will be encouraged to interpret the artist's creative act (Galati 1992).

During tactile manipulation, the user...

… si orienta principalmente verso la conoscenza e l'acquisizione di informazioni concernenti la forma degli oggetti e lo studio della loro identità […] a spese delle attività ludiche, delle sensazioni di piacere e delle emozioni estetiche. (Hatwell 2006, p. 79).

For its "filling" value, the guiding voice will make the tactile exploration more effective (Neves 2015; Cabeza Gay 2017), while simultaneously encouraging a contemplative attitude towards the artwork (Chottin, Thompson 2021).

In this regard, it is specified that the aesthetic experience for a visitor with visual impairment is the result of the interplay between two components: the pleasure of sensation (generated by tactile impressions, sounds, or smells) and the creation of a mental image, based on verbal and multisensory input that stimulates both in the emotional sphere and in the cognitive one (Grassini 2003). The simultaneity of tactile manipulation and guided verbal description will, therefore, trigger a chain reaction in the visitor, composed of memories, past experiences, associations of concepts and notions, and references to events and people they have truly lived (Secchi 2006).

Conclusions and Future Developments

According to Rudolf Arnheim (1992), even for a person without visual impairments, viewing a sculpture without touching it represents a "deprivation of enjoyment." With the introduction of tactile reproduction, any visitor will be able to explore a new way of interacting with Boccioni's artwork, gaining valuable insights into its physical and material aspects, while also benefiting from audio descriptions to understand it more deeply.

Since the bodily experience guides both cognitive and emotional processes (Contini et al., 2006) for everyone, other digital products were considered to encourage bodily engagement during interaction with *Forme uniche della continuità nello spazio*. Among these, a video mapping will be projected onto the surface of the original sculpture: high-definition images of the artist's works, period photographs, and excerpts from writings of the Futurist movement will evoke strong emotional responses by pairing the voices and music of the Futurists. The visitor will be encouraged to move around the sculpture to observe and discover specific details of the work, enhanced by lighting effects and sounds. As a result of the hybridization between technology and traditional museography, video mapping is undoubtedly a proposal with significant appeal (Solima, 2022), especially when enriched by sound stimuli capable of amplifying the potential of perception (Lariani, 2002; Gabrielsson, Lindström, 2010).

To experiment with alternative ways of engaging with the artwork by combining the physical and learning spheres, an immersive Experience Room will be designed in the museum. A motion capture system will register users' body movements, translating them into three-dimensional virtual images of the sculpture. The sculpture will animate differently each time, bringing to life the key.

Elements of the Futurist Sculpture Manifesto. These projections, to be set up with background music to create the right atmosphere, have a strong impact on the audience, as they appear incredibly realistic (Pietroni et al., 2019). By simulating the possible movements of the sculpture with gestures and body positions, the digital image will come to life thanks to the visitors' tangible knowledge of the artwork.

This contribution opens up further investigations into how the body, as an action device for learning and skill acquisition, can serve as an instrumental vehicle for sensations, thoughts, and emotions within educational experiences in museum contexts.

The multisensory approach, utilizing the opportunities offered by ICT, represents an innovative engagement that enables the visitor to interact with the artwork autonomously, while guided by a "knowledge transposition" process that the museum ensures.

This demonstrates that accessibility fosters a more direct and participatory experience of cultural heritage, not only for people with specific needs but for all individuals who constitute both the actual and potential audience of museums.

The Boccioni VISIBLE project highlights the importance of adopting measures that link the visitors' bodies with the artwork, in the perspective of fostering engagement that can reduce the distance between the audience and the objects displayed (Black, 2005).

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