

VOL 8
SPRING/SUMMER
2024

Design Behaviors

INTERNATIONAL DESIGN RESEARCH JOURNAL

Jiajia Zhao

*Lead Author: Graduate Student
Hanyang University, Korea*

Research on the Image Narrative Strategy of Public Welfare Posters Based on Image Narrative Expression

2-19

Albert Young Choi, Ph.D.

*Corresponding Author: Graduate Advisor, Professor
Hanyang University, Korea*

Wang Haoyue

*Lead Author: Doctoral Student
Hanyang University, Korea*

Discover the impact of cultural factors on the design and branding of the fashion brand 'Gentle Monster' through the application of CCBD

20-33

Albert Young Choi, Ph.D.

*Corresponding Author: Graduate Advisor, Professor
Hanyang University, Korea*

Xie Zeyuan

*Lead Author: Graduate Student
Hanyang University, Korea*

Explore Somaesthetics for improving the Embodied Experience in Interactive Museums

34-53

Albert Young Choi, Ph.D.

*Co-author: Graduate Advisor, Professor
Hanyang University, Korea*

COPYRIGHT © 2024 BY UNITED DESIGNS ALLIANCE. The contents of the Design Behaviors Journal may not be reproduced in whole or part without consent of copyright owner, United Designs Alliance.



UDA

THE GLOBAL DESIGN ORGANIZATION
United Designs Alliance FIRMITAS • UTILITAS • VENUSTAS

Explore Somaesthetics for improving the Embodied Experience in Interactive Museums

Xie Zeyuan

Lead Author: Graduate Student, Hanyang University, Korea

Albert Young Choi, Ph.D.

Co-author: Graduate Advisor, Professor, Hanyang University, Korea

ABSTRACT

Museums are aggregations of a city's historical and cultural heritage, serving as pivotal sites for rich dialogues between human history and contemporary society. They often necessitate experiential and embodied perceptions, inviting visitors to immerse themselves in the narratives. Alongside the third wave of Human-Computer Interaction (HCI), interactive forms within museums are evolving, transitioning from traditional screen-based interactions towards exploring the potential of mobile device interactions focusing on human body movements. Within this distinctive context of museums, attention to users' bodily and sensory experiences intersects with the realms of Somaesthetics and Soma Design. Soma Design encourages a design approach rooted in sensibility and subjective self-perspectives, aiming to deepen aesthetic appreciation and create meaningful engagements, contrasting with traditional user experience and research paradigms. This paper navigates through a literature review on experiential cognition, embodied cognition, somaesthetics, and soma design to comprehend the developmental trajectory and future directions of user experiences. Employing bodily mapping as a research tool, the study extracts sensory experiences through autoethnographic exploration conducted by six designers. The research objectives are to iteratively enhance the methods and content of user research, furnishing visitors with more embodied perceptions, heightening their awareness of bodily consciousness, refining aesthetic sensibilities, and enriching museum experiences.

KEYWORDS

Somaesthetics, Soma Design, User Experience, Embodied Cognition

INTRODUCTION

EVOLUTION OF MUSEUMS AND INTERACTIVE TECHNOLOGY

The functions and definitions of museums undergo continuous iterations and updates with the development and changes of the times. The International Council of Museums (ICOM), as an international non-governmental organization, aims to promote cooperation, exchange, and sharing of experiences among museums and museum professionals, to advance the field of museology. In 2022, following a summary of museum functions by 126 national committees and hundreds of museum professionals, the definition of museums was once again iteratively updated based on the 2019 definition through a voting process:

“A museum is a not-for-profit, permanent institution in the service of society that researches, collects, conserves, interprets and exhibits tangible and intangible heritage. Open to the public, accessible and inclusive, museums foster diversity and sustainability. They operate and communicate ethically, professionally and with the participation of communities, offering varied experiences for education, enjoyment, reflection, and knowledge sharing.” (ICOM, 2022)

In 2022, museums have continued to maintain their fundamental essence as nonprofit institutions open to the public and dedicated to the research, preservation, and dissemination of tangible and intangible cultural heritage. Inclusivity, transparency, and engagement remain core attributes of contemporary museums. However, the latest iteration in 2022 provides a more detailed articulation of museums’ social responsibility, sustainability, and inclusivity, reflecting a broader and more modern understanding of their role. The latest definition enriches the concept and scope of museums, emphasizing that they should be “accessible and inclusive” and “foster diversity and sustainability.” Museums are expected to leverage community engagement to offer diverse experiences that encompass education, aesthetics, appreciation, and contemplation, thereby facilitating knowledge sharing.

The evolution of museum definitions signifies a gradual enrichment of their responsibilities and scope, as well as an increasing emphasis on concepts such as community-based design, participatory design, service design, design thinking, and user experience. Such requirements represent a research gap in museum functionalities, as museums’ initial responsibilities were primarily rooted in tangible objects. Today, these public spaces not only need to emphasize objects and materiality but also prioritize human-centered approaches, focusing on the feelings and experiences of individuals, the effectiveness of knowledge dissemi-

nation, and the physical and mental experiences of visitors.

Technology, as an extension of the body, enables the generation of sensations and interactions across time and space. The fusion of technology and the body iteratively enhances the corporeal presence. From a physical interaction perspective, museum artifacts, through the stylistic decoration of venues and the arrangement of exhibits, establish a visual language to narrate spatial stories, eliciting an embodied experience that shapes audience cognition. Temporally, technology provides a visual opportunity for the historical transitions of artifacts, facilitating a dialogue between past and present for the audience. Spatially, the theory of embodied interaction cognition, in conjunction with technology, supports the integration of physical and virtual spaces, engaging the audience in a dialogue that blends reality and virtuality. This affords users an experiential journey that transcends time, space, and the boundaries between reality and virtuality.

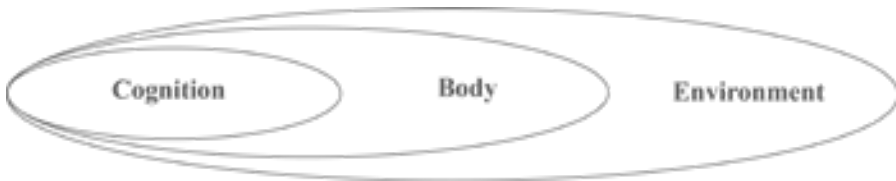


Figure 1 The initial relationship between cognition, body, and environment.



Figure 2 With the addition of technology, the relationship between cognition, body, and environment changes.

The transformation of museum functions and characteristics necessitates a focus on user experience. Particularly with the infusion of technology into museums, avenues for knowledge reception have been significantly diversified, thereby underscoring the importance of attending to visitors’ cognitive and sensory perceptions of this novel shift, reflecting on their experiences, and assessing presentation efficacy.

THE SIGNIFICANCE OF EXPERIENCE IN INTERACTIVE MUSEUMS

Modern museums are undergoing a paradigm shift from the traditional role of mere preservation and display of artifacts towards enhancing interactivity to stimulate the sensory experiences of visitors. The concept of information transcends mere verbal expression, rather, it permeates the entirety of the physical structure within a museum. As asserted, “a museum visit is first and foremost a physical encounter (Roberts, L. 1992),” highlighting the immersive nature of the museum experience and the diverse modalities through which information is conveyed beyond oral communication.

Simultaneously, museums leverage technology as a tool to empower themselves in attracting audiences from diverse backgrounds, transforming the museum experience into an exploratory process. When conveying information to visitors, exhibition designers encode through technological means, display techniques, and other physical spatial elements. The audience’s reception can be perceived as a decoding process (Sandell, 2007). The integration of extensive digital technologies and devices into the interpretative engagement of museums and art introduces a dynamic element (Jones-Garmil, 1997). However, if not deployed judiciously, these technological interventions may inadvertently increase cognitive complexity and prolong cognitive processing time, thus achieving counterproductive results.

Traditional cognitive theory holds that “cognition is computable” and regards the body only as a receptor for stimulus and an effector of behavior. However, this process is often “detached and disembodied”. The way of conveying information and knowledge in museums is more based on visual language and all exhibits cannot be touched. In the whole cognitive process, museums are extremely dependent on vision, which is often accompanied by misreading of information, resulting in and aggravating “museum fatigue”. In this disembodied experience, the cognitive load of the audience is increased while the pleasure of multi-dimensional embodiment is reduced. While the first two waves of HCI ignored aesthetics and experience, the third wave of HCI focused on “people” and “experiences.” Focus on people’s first experience (Bødker, 2006). Therefore, this paper hopes to use embodied cognition theory in interactive museums to provide a new theoretical basis and methodology for improving sensory experience and reducing cognitive load.

RESEARCH SIGNIFICANCE, OBJECTIVES, AND METHODS

Research Significance

Currently, there is abundant research on the embodiment of museums, yet when it comes to guiding practice, establishing clear metrics and evaluation standards remains challenging. Interaction designers have begun to focus on users' bodily experiences in specific contexts, understanding how space, lighting, and layout influence and suggest human presence. However, prioritizing "humanity" and the human body remains elusive. The perception of the audience towards the human body or activity, the specific sensations experienced during perception, and how to obtain holistic evaluation results are still difficult to capture. Furthermore, overall, the interaction design industry finds it challenging to genuinely design from the user's perspective or employ empathy in design. Somaesthetics advocates for the first-person perspective, exploring whether somaesthetic principles can resolve the design paradox present in spatial design.

Through this study and clarification of embodiment and somaesthetic, understanding the scope and developmental patterns of the discipline of Somaesthetics, further exploration and investigation into its applicable fields are hoped to be achieved. Whether a philosophical concept that integrates multiple disciplines and combines theoretical philosophy with practical disciplines can be developed into practical domains, enhancing our everyday emphasis on the body, increasing bodily awareness, and ultimately guiding life design. By perceiving people's own bodily sensations, training, and mastering them, can enhance our control over practice, cultivate empathy, design from a human-centric perspective, and improve our perception of aesthetic experiences in life.

With the development and proliferation of technology, the utilization of electronic screens and devices has become ubiquitous in various aspects of life, including museums. Therefore, it is hoped that through this study and analysis of the requirements for embodied characteristics, museums' immersion can be effectively enhanced in the future. This will provide new perspectives for museum scene design, supported by theoretical analysis and theoretical support.

Research Objectives

To address the gaps, an attempt is made to utilize the somatic design's body mapping as a tool for qualitative user experience analysis. Through specific utilization of the body mapping design research tool, the practical application

and initial experimentation of the Soma design theory are achieved. This involves analyzing and exploring the practical significance of user experience in a new environment. By employing autoethnography as a qualitative research method, the aim is to concretize user experiences. Analysis and reconstruction of changes in users' bodily perceptions within museum settings are undertaken. Starting from users' tangible bodily experiences, the goal is to redesign user experiences, ultimately aiming to guide the interactive experiences of museums in the new era. The research objective is to develop the interactive experiences of museums in the new era from different perspectives.

The definition and function of museums are continuously evolving with societal development, while their core remains serving the public as nonprofit institutions. Therefore, the functionality and efficacy of museums depend on how people position and develop them.

Research Methods

This study primarily employs a qualitative research approach utilizing the body map from Soma Design as a cultural probe and research tool. Workshops were conducted with six designers who have had interactive museum experiences to gather first-hand research data. Subsequently, one-on-one interviews were conducted based on the experiential data obtained from the body map. This process ultimately yielded in-depth, authentic bodily sensations of visitors. The bodily experiences were categorized into physical and mental sensations according to the standards of Somaesthetics, analyzing the changes in users' bodily perceptions within the museum's space. It aims to identify which sensory experiences users evoke in the museum and explore the potential for designing and developing undeveloped senses. By starting from users' concrete bodily experiences, the study aims to reconstruct authentic user experiences in interactive museums.

THEORETICAL BACKGROUND

ORIGINS AND DEVELOPMENT OF SOMA DESIGN

Dualism posits that the world consists of two distinct substances that may influence each other but are fundamentally independent. Cartesian dualism asserts that the essence of the world is consciousness and matter, maintaining that consciousness exists independently of matter. It delineates a rational world where the soul resides and a real world where the body exists. According to this

perspective, the world perceived by the body's sensory organs is not the true reality. Rather, the world inhabited by the soul is deemed authentic, suggesting that the sensory world is a projection of the soul's realm (Todes, 2001). In essence, the dualism theory places the body in a subordinate position to the mind, considering the body as a temporary dwelling for the human soul (Forstmann et al., 2012).

As human exploration methods and means diversified, the scope of world exploration expanded gradually. Consequently, human cognition of the world is in constant flux and evolution, exposing the limitations and antiquated nature of Cartesian dualism. Beyond dualism, various integrated theories concerning the relationship between the body and mind have emerged.

American pragmatist aesthetician Richard Shusterman (1999) introduced the concept of somaesthetics, an interdisciplinary philosophical notion, in his extensive paper "Somaesthetics: A Disciplinary Proposal" published in *The Journal of Aesthetics and Art Criticism* (Shusterman, 1999). Somaesthetics, a portmanteau of "soma" and "aesthetics," signifies a synthesis of somatic and aesthetics. Richard Shusterman chose the Greek term "soma" over "body" due to the latter's susceptibility to ambiguity, as "soma" encompasses a more holistic notion of a body with a soul. "It embodies our dual attribute of being both object and subject: we are both something existing in the world and a sentient subject, experiencing, sensing, and acting within it (Richard Shusterman, 2006)"

Interaction designer Kristina Hook integrated this interdisciplinary philosophical concept into the field of human-computer interaction. With technological advancements, interaction modes have evolved beyond simple screen-based interactions to include wearable devices, necessitating close adherence to the human body, and involving real-time monitoring of bodily data. This shift implies that user research involving wearable devices is more intimate and diverse, requiring heightened attention to design ethics during the research process (Segura Anaya et al., 2018).

Somaesthetic design advocates for the use of a designer's entire body—limbs, flesh, and senses—in the creative process. It emphasizes a first-person perspective in design, recognizing that most adults, including designers, tend to engage in activities in a habitual manner based on routine experiences (Kaptelinin & Nardi, 2006). Hook argues that designers have traditionally approached design from a third-person perspective, emphasizing the need for designers to adopt a user-centric approach. Whether through user interviews or any quantitative or qualitative research analysis, designers must consistently refrain from

conflating themselves with the target audience. Sensations and experiences remain elusive to designers, always maintaining a certain distance and limitation. However, by documenting sensory changes from a bodily perspective—considering factors such as range of motion and bodily postures—a new dimension can potentially be introduced to user experience design. This approach enables user experience to delve into the relationship between the body, cognition, and perception, thereby fostering the development of bodily awareness. Liberating oneself from deeply ingrained habits allows designers to immerse in a new environment. For designers, concepts, designs, and digital materials are often novel. Interacting with these new technologies and materials dictates the resilience of digital materials and the direction of design development. Somaesthetic interaction design serves to create a boundary-less space for innovative exploration, touching, perceiving, extracting, and ultimately clearing preconceived notions about habits, materials, and attributes to discover the aesthetic potential and capacity (Hook, 2018).

SOMA DESIGN IN THE FIELD OF INTERACTION: DESIGN CASES

Numerous examples of aesthetic body design are prevalent in our daily lives, with wearable devices being the most conspicuous instances. For instance, fitness enthusiasts often utilize fitness trackers such as sports wristbands (Feehan et al., 2018) to monitor various exercise-related metrics, including duration, intensity, energy expenditure, real-time heart rate, sleep duration, and sleep quality. Wearable devices also find extensive application in medical diagnostics for chronic diseases (Bonato, 2010), offering non-pharmacological therapies for pain management among patients (Dobkin & Dorsch, 2011; Austin et al., 2021). Additionally, the use of wearable 3D virtual reality (VR) systems provides cognitive-behavioral therapy and mindfulness exercises for individuals with chronic conditions (Garcia et al., 2021).

Furthermore, individuals with diabetes often wear glucose meters to maintain real-time control over their blood glucose levels. This enables diabetic patients to conveniently monitor and manage their blood glucose levels at any time.

Beyond wearable devices, obtaining a driver's license and operating a vehicle also constitute a distinct embodied experience. When driving, the boundaries between the body and the vehicle gradually blur, intertwining the body's domain with the car's shell. The interaction between the "object" (car) and the "subject" (human) involves a mutual process of domestication, control, and

integration. The ability of humans to control the car lies in the embodied sense of communication and reflection. coordinating various body parts to send commands to the vehicle. In this sense, controlling a car is an extension of personal self-control. The car becomes like wheels attached to the body)-when the vehicle starts, it is akin to taking a step forward; when the headlights shine, it resembles body language. The joy of driving lies in the mastery of one’s body transforming the machine into a self-referential object and achieving unity between “human” and “vehicle” (Lin, 2014).

Simultaneously, the internal functions and external structure of skyscrapers can be viewed as the materialization and manifestation of human embodied sense and reflexivity.

EMBODIED COGNITION REVISITED THROUGH THE LENS OF EXPERIENCE

John Dewey redefined experience, emerging as a pioneer in the theory of embodied cognition. The material object ceases to be merely an “artwork”; instead, the entire process of experience becomes the artwork. For pragmatists, experiencing something goes beyond the mere occurrence; it involves active engagement in the event (Gao, 2003). In Dewey’s theory, experience transcends mere sensation or simple perception; it is a holistic and meaningful activity. He emphasizes that experience is the outcome of interacting with the environment, a product of the reciprocal relationship between the individual and the surroundings. Experience encompasses the integrated processes of perceiving, thinking, feeling, and acting in response to various elements in the environment. This process is not a passive reception of sensory inputs but an active involvement and shaping.

Table 1. The scope of experience

Two sides of one experience		Source
To do	Accept	(Dewey,1934)
Perception	The Perceived Object	(Ratcliffe, 2005)
Experience	Reflection	(Ng, 2012, May)
Subjective feeling	Objective thing	(Dewey,1906)

Embodied cognition, also known as “embodiment,” refers to the strong connection between physiological experiences and psychological states (Niedenthal et al., 2005; Landau et al., 2010). Physiological experiences activate psycho-

logical sensations, and vice versa (Barsalou, 2008). Embodiment is a theoretical concept in cognitive science, philosophy, psychology, and phenomenology, emphasizing the close association between the body and cognitive processes. The theory posits that the body is not only a tool for our thinking and perception but is directly involved in shaping our cognitive experiences and understanding (Dourish, 2004). Embodiment is also a phenomenological term, signifying the subjective self – how people perceive the world through people’s body and social existence. It narrates how people are constantly situated in the world, possessing people’s bodies, sociality, and practices – inseparably intertwined with our surroundings. People’s ways of perception and cognition are deeply and inseparably entangled with the environment around people, shaped by both people’s societal and physical contexts. Understanding our perception and cognition is impossible without active engagement with these backgrounds (Hook, 2018).

The theory of embodied cognition emphasizes the bidirectional influence between physiological experiences and psychological experiences. Researchers have demonstrated through controlled experiments that individuals unconsciously adopt an upright, expansive, and relaxed posture when feeling confident. Intentionally assuming such a posture leads to increased feelings of self-confidence (Cuddy, 2015). The paradigm of embodied cognition underscores the role of the body in cognitive processes, which can be understood in various ways. These include the proposition that cognitive processes and outcomes are shaped and constrained by the physicality of the body, and that the limits and thresholds of human perception are determined by bodily constraints such as height, physical proportions, stride length, visual and auditory range, and range of motion. The physicality of the body thus delimits the types and boundaries of what we can perceive.

The body serves as the most primitive unit through which we develop and cognize the world. This viewpoint finds support in the work of Lakoff and Jonathon, who argue in “Metaphors We Live By” that human thought is largely abstract and metaphorical. People tend to use familiar concepts to understand and interpret unfamiliar ones. Exploration and cognition of the body have shaped human language and thought systems, serving as the primitive unit through which humans comprehend and interpret the unfamiliar. Concepts such as up and down, front, and back, near and far, tall and short, fat and thin, cold and warm, are all anchored to the body’s position in the world, thus defining the content of human cognition.

QUALITATIVE RESEARCH AND ANALYSIS

FORMS AND TOOLS OF QUALITATIVE RESEARCH

Considering the continual progress in both technology and society, there is a pressing need to incorporate innovative research methodologies for the analysis and exploration of user experiences. The objective is to uncover authentic firsthand perceptions and genuine needs. To delve deeper into the intricacies of users' embodied experiences and sensory engagement within museums, the chosen research approach involves hosting a small-scale workshop followed by one-on-one interviews. The workshop, consisting of six designers, aims to facilitate a comprehensive understanding of users' embodied sensations and sensory activations in museum settings. Materials provided during the workshop include body maps and related tools such as markers. The research process encourages diverse artistic expressions and explores a broad range of experiential dimensions. The facilitator remains neutral, refraining from any suggestive remarks.

The Body Biography

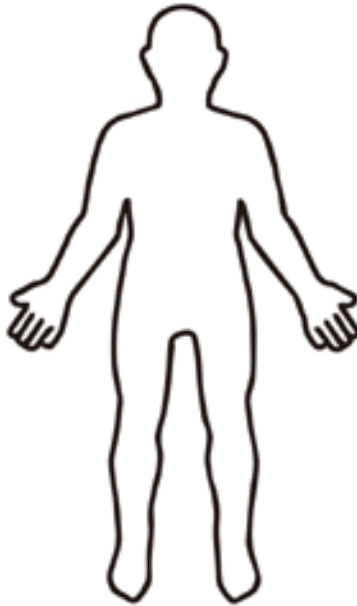


Figure 3. Illustrates the body map which is the research tool employed during this workshop.



Figure 4 Showcasing the workshop environment.

The workshop incorporates the use of body maps (Figure 3), inspired by Soma Design, as a research tool. The intention is to adopt a self-ethnographic approach within qualitative research, acting as a cultural probe to collect insightful data on users' thoughts and feelings within the museum context. The aim is to derive authentic self-ethnographic data through concrete research surveys as the foundation for a nuanced exploration of users' cultural perspectives.

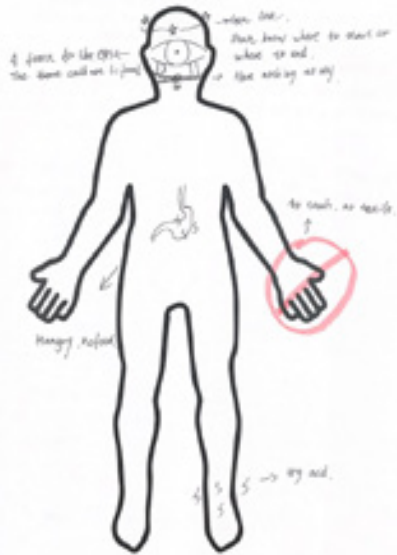
DATA COLLECTION AND PRESENTATION OF RESEARCH FINDINGS

The body maps obtained during the workshop are depicted in Figures 5 to 10. Each of the six designers individually completed sensory autoethnographies within an embodied museum setting. Subsequently, through face-to-face small-group interviews, they elucidated and expounded upon their respective autoethnographies to the conference facilitator. This procedure afforded the designers an opportunity for in-depth exploration of their perceptions and experiences within the embodied museum context.

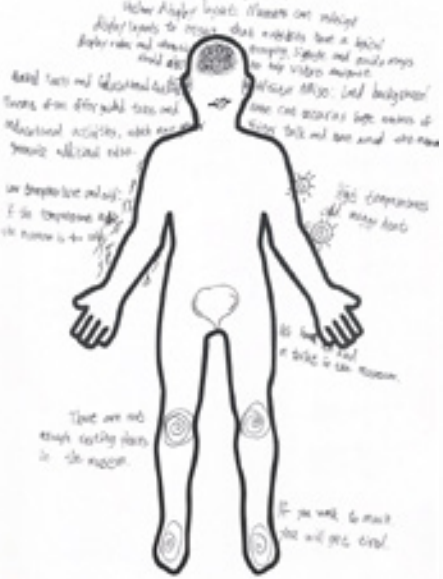
The Body Biography



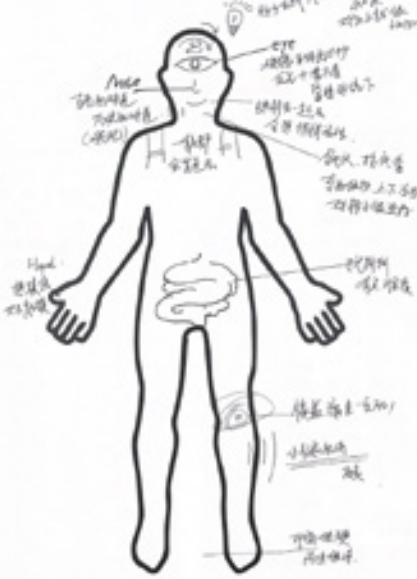
The Body Biography



The Body Biography



The Body Biography



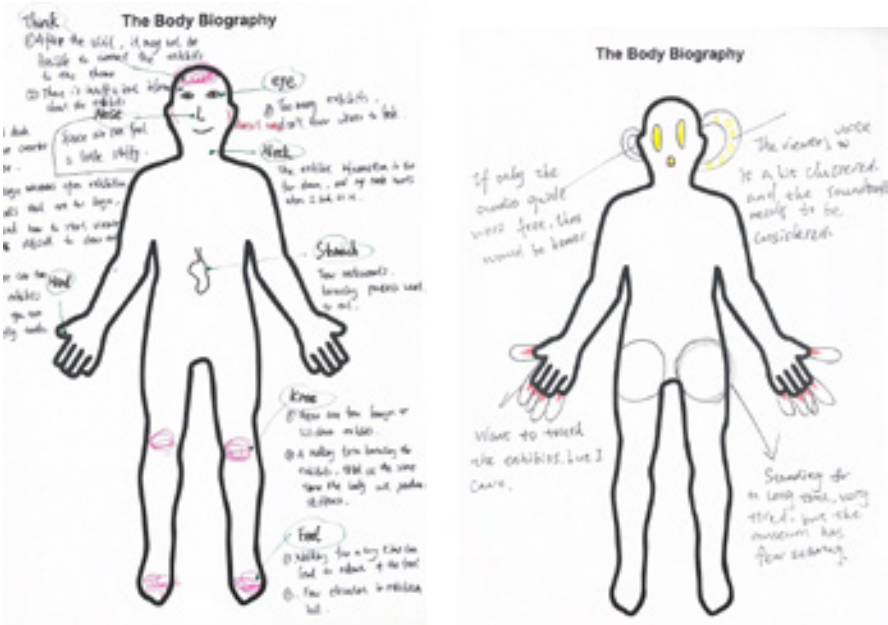


Figure 5 to 10. Self-ethnographic (Body Maps) of 6 participants

DISCOVERY AND INTEGRATION OF RESEARCH RESULTS

Following an in-depth discussion during the workshop, a thorough reexamination and profound reflection were conducted on the research content. In this process, reference was made to Dewey's early concepts of embodied teaching, wherein he emphasized the cultivation of perceptual abilities in body parts below the head. To align more closely with Dewey's foundational theory, the research tool-body map-was categorically divided into two major classes: head and torso. The head section was further categorized based on the "five senses," including the mind(thinking), eyes(seeing), ears(hearing), nose(smelling), and tongue (talking), while the torso was classified according to limbs and internal organs. In the integration of research findings, a reevaluation of the various body parts mentioned by participants during the study was undertaken. The visualization of these aspects was presented, and data were systematically compiled using Table 2 for statistical analysis. This process contributes to a clearer understanding of the research discoveries, providing essential analytical data support for subsequent research and practical applications.

Body Map							
Participants	Head					Torso	
	Mind	Eye	Ear	Nose	Tongue	Limbs	Viscera
Participant 1	√	√	√	√		√	
Participant 2	√	√				√	√
Participant 3	√	√	√			√	√
Participant 4	√	√	√	√		√	√
Participant 5	√	√	√	√		√	√
Participant 6	√	√	√			√	

Table 2. Based on body parts mentioned by participants.

VISUAL DOMINANCE

Through the collection and organization of research data after workshops, it was found that visiting museums is a finely tuned activity that combines physicality and perception. Feedback from user surveys indicates that perception primarily occurs in the head, aligning with human cognitive habits. Among all types of perception residing in the head, development of other senses lags far behind that of visual development. Visual perception continues to hold an irreplaceable position in aesthetic perception and understanding. Considering the museum’s inclusivity, attention needs to be given to the sensory experience of visitors with visual impairments. Exploring how to compensate for the dominant role of vision in perception through cross-modal sensory perception is not only a concern for designers, but also a necessity. Furthermore, in embodied museums, the intention is not to usurp the primary position of vision as the main source of information acquisition, but rather to encourage the coordinated activation of visitors’ sensory abilities, allowing other senses to participate in the processing of knowledge and information, thereby providing users with a comprehensive embodied experience.

AUDITORY-VISUAL INTEGRATION AS A PRIMARY COGNITIVE MODALITY IN MUSEUMS

In the unique setting of museums, auditory-visual integration emerges as a predominant cognitive modality. In this particular context, visitors rely not only on visual perception but also extensively on the synergy between auditory and visual senses. Visitors utilize their auditory and visual faculties in

tandem to enhance their perception of the museum environment, deepen their understanding of exhibits, and engage in the aesthetic appreciation of displayed items.

It is evident that auditory assistance complements visual stimuli, constituting the most frequently employed modality by visitors, aside from visual perception alone. To alleviate cognitive challenges for visitors and mitigate the strain on visual senses, museum developers should prioritize the development of auditory assistance within the venue.

By leveraging the fundamental principles of cross-modal communication, along with psychological cues and scientific technologies, sound can be employed to aid visitors in perceiving and memorizing visual colors. Furthermore, auditory cues may assist visitors in discerning and evaluating tactile shapes. Therefore, the integration of sound as a complementary element holds the potential to enhance the overall museum experience and contribute to a more accessible and enriched cognitive engagement for visitors.

THE INABILITY TO SPEAK IN MUSEUMS AND THE LACK OF COMMUNICATION

Within the museum setting, silence may bear both favorable and unfavorable implications. During this research, it was observed that each respondent delineated the mouth on their bodily maps; however, some employed the imagery of a padlock to signify an unequivocal reluctance to articulate thoughts within the museum premises. Human communication predominantly relies upon language and dialogue, and within the unique confines of a museum, the sudden deprivation of the right to free expression induces discomfort in many individuals. For those visitors who sense a dissonance in this environment, the question arises as to whether they would seek alternative means to compensate for this perceived loss. In such circumstances, is the imperative for self-expression truly essential?

Simultaneously, there exists a cohort of interviewees who appreciate the tranquility afforded by the inability to speak within the museum, safeguarding themselves from external disturbances. Engaging in a dialogue and communion with “objects” and “history” within the museum, they relish the sense of diminutiveness it imparts, constraining the intrusion of linguistic systems and allowing other senses to intercede and amplify. Consequently, the innovation of communication modalities within the museum remains a promising domain, necessitating continuous exploration and development. In this delicate equilibrium, the question persists as to whether museums can discover a distinctive

mode of communication that caters to the diverse needs of visitors, thereby remaining a subject of considerable attention.

IMPORTANCE OF TACTILE PERCEPTION IN THE TRUNK

Tactile perception extends beyond the realm of head-based sensory experiences. Through in-depth analysis of research data, we ascertain the pivotal role of tactile sensation during museum visits. Participants not only acquire information through visual means but also deepen their understanding and memory of exhibit content through tactile interaction with displayed items. This unequivocally underscores the unique and indispensable role of tactile perception in the museum experience.

Each interviewee emphasizes the significance of the hands, expressing a desire for tactile engagement. However, due to the necessity of protecting artifacts, casual touching is restricted, resulting in a deficit in tactile experiences. This absence of tactile perception diminishes individuals' bodily awareness and instinctual experiences within the museum. Nevertheless, within the developmental process of museum construction, technology and interactive installations within museums may serve to compensate for this tactile void, imbuing it with significance and value.

Upon further scrutiny of user feedback, we observe that tactile feedback is not limited to the hands but extends to other bodily regions. For instance, some participants, when describing their museum experiences, mention the tactile sensations of the soles of their feet, particularly during transitions between different flooring materials in corridors. This signifies that the tactile qualities of the ground in museum design can also impact visitors' perceptions and sensory experiences.

REFLECTING ON RESEARCH

The senses are not isolated but interconnected and mutually supportive. Synesthesia and cross-modal communication play a crucial role in our ability to gather and capture information (Williams, Gumtau, & Mackness, 2015).

Upon analyzing research data, it is evident that the museum experience is a multisensory integration process, extending beyond visual and head-based perception. In future design and exhibition endeavors, acknowledging the significance of auditory, tactile, and non-verbal expressions of visitors will contribute to crafting a more immersive and engaging museum experience.

In this study, our focus transcends the previously mentioned body parts, delving into various captivating creative aspects. Participants shared sensations related to temperature, bodily soreness, as well as the discomfort of hunger or urgency to find a restroom. These elements added a layer of inspiration and intrigue to the research process. It was only at this point that designer truly immersed themselves in the respondents' experiences, empathizing with the states they described and resonating with the feelings they had once undergone. Throughout the ongoing process of description and documentation, a reflective attitude was consistently maintained. Whether participants or researchers, the genuine rewards of qualitative research lie in deeply appreciating and understanding the sensations of the subjects. Building on this, cultivating empathy becomes a prerequisite, laying the groundwork for human-centric design through research.

CONCLUSION

Amidst the continuous advancements in technology, humanity still needs to pay attention to corporeal sensations. Despite the rapid proliferation of technologies such as Virtual Reality (VR), Augmented Reality (AR), and the Metaverse, wherein people are beginning to explore intangible virtual spaces, their demand for products or services still emphasizes sensory experiences. This signifies that the ways in which users experience products need continual updating to incorporate more forms and content. With the evolving trends in museums towards new interactive forms and immersive exhibition spaces, while wearable devices and technologies like virtual reality strongly relate to bodily aesthetics, people often overlook the body itself, captivated instead by technology and visual representations. However, the body is not only the carrier of senses but also the emitter of consciousness, ideas, and all senses. Therefore, methods of Soma design centered on the body allow sensory experiences to take precedence, helping individuals focus on the connection between the body, thoughts, and emotions, as well as the interaction between consciousness and the subconscious. This trend of focusing on the body is becoming increasingly important in the field of interaction design, demanding more attention and exploration.

This article, through a systematic examination of somaesthetics, soma design, and experiences, aims to understand new trends in experience design. It delves into the exploration of the relationship and potential of the body, move-

ment, senses, and aesthetic experiences within the space of museums, which serve as educational platforms for the public to engage in diverse experiences. In the research process, reflexive and narrative approaches of autoethnography can help reconstruct users' psychological states during museum visits, their perceptions during the visit, and reflections afterward. Visualizing user experiences can provide new insights into exploring museums and support the direction of updating digital exhibits in museums with firsthand experiential cases. Through the analysis of autoethnographic conclusions, preliminary findings suggest: 1) Research tools like body maps can offer first-person qualitative data in user experience research, suitable for activities involving bodily interaction. 2) In interactive museums, there is a need to focus on developing tactile experiences and cross-modal communication between senses.

However, this article has some limitations. Due to the cognitive and philosophical domains respectively of embodied cognition theory and bodily aesthetics concepts, which are not thoroughly developed in the design field, there are fewer established methodologies available for researchers to explore. During the research process, it was found that there are limited theoretical frameworks applicable to design practices and research methodologies, requiring continual exploration and trial and error. The author hopes to use this exploration as a foundation for further research in this area and in the interactive realm of museums. Furthermore, there is a desire to optimize and proficiently employ autoethnographic methods like body mapping in later research processes, enhancing the credibility and observability of research results.

REFERENCES

- Jones–Garmil, K. (1997). *The wired museum*, New York: The American Association of Museums.
- Sandell, R. (2007). *Museums, prejudice and the reframing of difference*. Routledge.
- Bødker, S. (2006, October). When second wave HCI meets third wave challenges. In *Proceedings of the 4th Nordic conference on Human-computer interaction: changing roles* (pp. 1-8).
- Cuddy, A. J., Wilmuth, C. A., Yap, A. J., & Carney, D. R. (2015). Preparatory power posing affects non-verbal presence and job interview performance. *Journal of Applied Psychology*, 100(4), 1286.
- Roberts, L. (1992). Affective Learning, Affective Experience: What Does it Have to do With Museum Education?" In *Visitor Studies: Theory, Research and Practice*. Vol. 4, edited by A. Benefield, S. Bitgood and H. Shettel, 162–168. Jacksonville, AL: Center for Social Design.
- Todes, S. (2001). *Body and world*. Mit Press.
- Forstmann, M., Burgmer, P., & Mussweiler, T. (2012). "The Mind Is Willing, but the Flesh Is Weak": The Effects of Mind-Body Dualism on Health Behavior. *Psychological Science*, 23(10), 1239-1245.
- Shusterman, R. (1999). Somaesthetics: A disciplinary proposal. *The journal of aesthetics and art criticism*, 57(3), 299-313.
- Shusterman, R. (2006). Thinking through the body, educating for the humanities: A plea for somaesthetics. *Journal of Aesthetic Education*, 40(1), 1-21.
- Segura Anaya, L. H., Alsadoon, A., Costadopoulos, N., & Prasad, P. W. C. (2018). Ethical implications of user perceptions of wearable devices. *Science and engineering ethics*, 24, 1-28.
- Hook, K. (2018). *Designing with the body: Somaesthetic interaction design*. MIT Press.
- Höök, K., Caramiaux, B., Erkut, C., Forlizzi, J., Hajinejad, N., Haller, M., ... & Tobiasson, H. (2018, February). Embracing first-person perspectives in soma-based design. In *Informatics* (Vol. 5, No. 1, p. 8). MDPI.
- Kaptein, V., & Nardi, B. A. (2006). *Acting with technology: Activity theory and interaction design*. MIT press.
- Garcia, L. M., Birkhead, B. J., Krishnamurthy, P., Sackman, J., Mackey, I. G., Louis, R. G., ... & Darnall, B. D. (2021). An 8-week self-administered at-home behavioral skills-based virtual reality program for chronic low back pain: double-blind, randomized, placebo-controlled trial conducted during COVID-19. *Journal of Medical Internet Research*, 23(2), e26292.
- Feehan, L. M., Geldman, J., Sayre, E. C., Park, C., Ezzat, A. M., Yoo, J. Y., ... & Li, L. C. (2018). Accuracy of Fitbit devices: systematic review and narrative syntheses of quantitative data. *JMIR mHealth and uHealth*, 6(8), e10527.
- Dobkin, B. H., & Dorsch, A. (2011). The promise of mHealth: daily activity monitoring and outcome assessments by wearable sensors. *Neurorehabilitation and neural repair*, 25(9), 788-798.
- Gao Jianping. (2003). Practicality and Bridge—Interview with Richard Shusterman. *Philosophical Trends*, (9), 16-19.
- Lakoff, G., & Johnson, M. (2008). *Metaphors we live by*. University of Chicago press.
- Ratcliffe, M. (2005). The feeling of being. *Journal of Consciousness Studies*, 12(8-9), 43-60.