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Experiencing Architecture through Senses

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ABSTRACT

This research paper explores the role of multisensory design in fostering emotional connections between people and the built environment. Drawing upon theories like Juhani Pallasmaa's notion of "haptic architecture," it examines how designing for senses beyond vision can evoke emotions, promote wellbeing, and connect occupants with nature. Through qualitative case studies of renowned multisensory buildings like Tadao Ando's Water Temple and Peter Zumthor's Bruder Klaus Chapel, the paper illustrates how elements such as light, acoustics, materials, and spatial choreography shape profound sensory experiences of architecture. Diverse case studies demonstrate varied sensory design priorities across contexts. The central claim posits that designing for all the senses cultivates deeper user experiences and attachment to spaces compared to solely visual approaches. However, several limitations are identified, including insufficient engagement with counterarguments, lack of methodological transparency, absence of user data, cursory treatment of sensory design's potential downsides, and scant pragmatic recommendations. Future research directions like empirical investigations, computational simulations, sensory design education, and sociocultural analyses are proposed to strengthen this emergent paradigm bridging design and phenomenology.

Keywords: Multisensory Design, Sensory Integration, Haptic Perception, Embodied Experience, Natural Light, Materiality, Tactility, Raw Textures, Auditory Resonance, Spatial Acoustics, Ventilation, Sensory Storytelling, Biophilic Connections, Human-Centered Architecture.

Introduction:

Architecture has long been considered primarily a visual art form, with an emphasis on aesthetics, forms, and spaces as perceived through sight alone. However, a growing body of research and practice advocates for a more holistic, multi-sensory approach to architectural design that engages all five human senses - sight, sound, touch, smell, and taste. This phenomenological view recognizes that our experience of the built environment extends far beyond just the visual realm. The spaces we inhabit stimulate us through multiple sensory channels simultaneously, shaping our emotional connections and memories in profound ways.

Renowned architect Juhani Pallasmaa has been a leading voice in promoting the concept of haptic architecture that privileges tactility and embodied experiences over the dominance of the visual. In his influential book "The Eyes of the Skin," Pallasmaa laments that contemporary architecture often neglects the inherent multi-sensory capacity of design elements like materials, textures, lighting, acoustics and spatial choreography. He argues that flattening the experience of space into purely retinal images impoverishes our engagement with the built world, disconnecting us from the full range of sensations that foster a sense of belonging, memory and existential meaning.

The notion that architecture should stimulate all the senses to create deeper resonance has inspired designers to rethink spatial atmospheres beyond just form and function. By layering multi-sensory stimuli through materiality, lighting, acoustics, smell, and other subtle cues, architects can craft environments that evoke specific moods, trigger emotional responses, and indelibly imprint on human perception and memory. Sensory design strategies rooted in phenomenology enable the creation of more impactful human-centric spaces that facilitate connections between people and place.

This research explores the principles and emerging practices around designing for the full sensory experience of architecture. Through case study analysis of built works that prioritize multi-sensory engagement, the paper illustrates various approaches for stimulating the visual, auditory, tactile, olfactory and taste senses within spatial design. The findings underscore the transformative potential of sensory design to elevate architecture from mere physical utility into realms of profound emotional experience and resonance with the human condition.

Aim

The purpose of this research is to analyses and thoroughly explore the ideas, strategies, and consequences of integrating human senses in interior space design.

Objectives

1. The **phenomenology** of architectural experience.
2. How people can obtain a **sensory experience** from interior space.
3. How interior space can **improve the quality** of spatial and emotional experiences.

Methodology

This research employs a qualitative approach to investigate how the design of interior spaces can engage the full sensory experience to create more profound emotional connections and meaningful architectural encounters. The methodology consists of the following components:

1. Literature review
2. Case Study Analysis
3. Comparaitive Analysis
4. Findings and Insights

Scope

An embodied interaction between the body and various components of an interior space enhances the interior experience, fostering a profound personal connection to culture and emotion.

Sensory effects that strengthen the emotional bond with the interior space can potentially enrich the spatial experience and elevate its quality to a greater degree than functional or form-driven factors.

Limitation

Because of the broad scope, the research may not cover every aspect of multisensory design, so it will focus on key areas.

The research may not comprehensively cover the impact of external environmental factors on sensory experiences within interior spaces, such as urban noise pollution or air quality.

Individual preferences for sensory experiences might vary greatly, making it difficult to formulate generally applicable design principles.

BACKGROUND

Overview of Study

The notion that architecture should engage all the human senses, not just vision alone, has gained significant traction in recent decades. Pioneering thinkers like Juhani Pallasmaa have criticized the overemphasis on visual aspects in contemporary architecture at the expense of other sensory experiences.

In his seminal book "The Eyes of the Skin," Pallasmaa argues that the inauthentic flatness of much modern design, driven by an over-rendering of imagery, has severed architecture from the inherent multi-sensory capacity of space and materiality. He advocates for a "haptic" architecture that reinstates the importance of touch, as well as sound, smell and taste as spatial experiences.

Pallasmaa's critique resonates with the larger phenomenological view in architecture that emphasizes the subjective, first-person experience of spaces over purely objective qualities. From this lens, architecture is not just an aesthetic object, but an embodied encounter shaped by all our senses in conjunction with memory, emotions and associations.

Other researchers have built on the idea that sensory stimulation beyond just the visual can profoundly impact how people connect to and derive meaning from the built environment. Studies have shown the benefits of multi-sensory design approaches include:

1. Greater user engagement and memory encoding through multi-channel stimulation
2. Evoking specific emotional responses and psychological states
3. Fostering a deeper sense of place and belonging
4. Facilitating social connections and wellbeing
5. Connecting people to natural cycles, materials and the environment

Brief on the significance of senses in experiencing architectural and interior design

The human experience of the built environment extends far beyond just visual aesthetics. Our perception and emotional connection to spaces is fundamentally shaped by stimulation of all five senses - sight, sound, touch, smell, and taste. Engaging multiple sensory channels allows people to fully immerse themselves in and derive deeper meaning from the spaces they inhabit.

Sight remains the predominant sense employed in most architectural design, with an emphasis on form, spatial compositions, colours, and lighting. However, overly privileging the visual leads to spaces that lack sensory richness and struggle to facilitate profound experiences.

Sound plays a critical role, with spatial acoustics and material choices influencing auditory atmospheres. From ensuring speech intelligibility to crafting environments that resonate with music, integrating aural design can shape how spaces make us feel.

The sense of touch connects people intimately to the physical reality of spaces through textured surfaces, temperature variations, and materiality. Haptic experiences allow spaces to be perceived as embodied phenomena beyond just visual representations.

Smell, though often overlooked, is deeply evocative and has the power to trigger memories and emotional states. The subtle introduction of olfactory cues through ventilation or material choices can lend distinctive spatial character.

Even taste has potential for architectural implementation, such as using edible materials to make spaces multi-sensorially experiential and playful.

By layering mutli-sensory stimuli in cohesive ways, architects and designers can imbue spaces with specific atmospheres that facilitate emotional responses like joy, calm, anticipation or contemplation. A sensory-driven approach recognizes people as multi-sensory beings, leading to richer, more resonant spatial encounters.

Ultimately, designing for the full sensory experience allows the creation of architecture that impacts people profoundly, connecting them to spaces in meaningful, lasting ways that purely visual-centric design cannot achieve. It expands the very scope of how we understand and shape the human experience of the built world.

HOW DO WE CONNECT PEOPLE TO SPACE?

What is experiential design

As humans, we connect with and respond to our surroundings, and we feel the consequences—for better or worse. A holistic design approach known as "experiential design" places a high value on human-centric contexts that promote positive interactions and improve the wellbeing of users.

Experiential interior design, also known as experience design, is a human-centric design process that recognizes how our surroundings can affect our mood and behavior.

Experiential design refers to designing spaces and environments in a way that deliberately creates certain experiences, emotions, and sensations for people interacting with the space. Some key aspects of experiential design are:

1. **Deliberate creation**: The experiences are intentionally designed and curated, not left to chance.
2. **Immersive and memorable**: Experiential design aims to create spaces that people can get lost in and remember long after leaving.
3. **Beyond the utilitarian**: It goes beyond just the functional purposes of a space to focus on emotional impact.
4. **Prioritizing engagement**: Human sensory, emotional, and psychological engagement takes center stage.
5. **Storytelling through space**: Spaces are crafted to convey narratives and themes.
6. **Evoking emotions**: The spaces provoke emotional reactions and moods in those experiencing them.

Role of interior architecture

The role of interior architecture in experiential design can be summarized as:

1. **Backbone of experiential design**: Interior architecture provides the fundamental spatial structure and physical canvas for designing experiences.
2. **Determines physical framework**: Choices in interior architecture like layout, circulation, scale, lighting etc. enable or constrain the types of experiences that can be created in a space.
3. **Conceptualization to execution**: Interior architects are involved from the initial ideas behind an experiential space to the final details of material finishes, furniture, etc. that bring the concept to life.
4. **Curating spatial experiences**: Interior architecture provides the tools to meticulously craft and choreograph how people encounter and journey through a space.
5. **User-centricity**: Keeping the needs and perspective of users at the center of design decisions to create positive experiences for them.

6. **Translating core ideas**: Interior architecture brings abstract ideas and narratives into tangible built environments that evoke intended emotions and connections.

PRINCIPLES OF SENSORIAL EXPERIENTIAL DESIGN

Interaction

1. Engages users more deeply by making them active participants rather than passive observers. Interactive features provoke curiosity, discovery and prolonged engagement with the space.
2. Allows users to influence their spatial environment in real-time through actions like gestures, voice, touch, movements etc. This gives them a sense of agency and tailored experience.
3. Creates opportunities for surprise, delight, fun and wonder through unexpected responses, transformations and revelations in the space.
4. Connects users more directly to the space by tying sensory/emotional responses to their physical interactions. This helps create deeper resonances.
5. Makes the experience social by enabling shared participation, collaboration and exchanges between users through interactive features.
6. Provides diverse multisensory stimulation beyond just visual through surfaces with variable textures, responsive sounds/smells/lights etc.

Story Telling

1. Spaces should tell a narrative that resonates with occupants, connecting them to the built environment.
2. Provides underlying narrative that connects the design elements into a coherent, meaningful story experienced over time.
3. Engages imagination and emotions through environmental storytelling, making the space more memorable.
4. Guides the user journey through the architecture for greater pacing, drama, surprise.
5. Layers meanings into the space beyond just function through references, motifs, etc.
6. Incorporates spatial metaphors that refer to other places, ideas, or constructs.
7. Uses design details like artifacts, artwork, sound, lighting, layout etc. to reinforce story themes.

Dimensions

1. Dimension refers to the physical size, shape, and scale of objects and spaces. Understanding dimension is key for designing environments and products that fit the human body and senses. Designers need to consider dimensions like height, width, depth, weight, etc. to create optimal experiences.
2. Dimension impacts how we perceive and interact with a space or object. A small, intimate space feels very different from a grand, cavernous one. The dimensions of a product influence its look, feel, functionality and ergonomics.
3. Dimension can be used to create interest, drama or a sense of progression. For example, walking through spaces with varying ceiling heights adds dynamism. Using contrasting dimensions in a product design can make certain features stand out.
4. Dimension impacts sound, lighting, temperature and other environmental factors. It determines acoustics, sight lines, intimacy versus openness. Dimensional choices affect how senses are stimulated.

Guidance

1. Guidance refers to how people are directed through an environment or oriented to use a product. Good guidance facilitates intuitive, seamless experiences.
2. Sensory design should guide attention in strategic ways, revealing key details and highlights. Lighting, color, spatial layouts and more can provide visual guidance.
3. Auditory and tactile cues like materials, textures and sounds can guide movement and interactions. For example, smooth, cool materials can gently guide you left, while warm, textured ones lead right.
4. Guidance provides a sense of flow, order and predictability. This reduces confusion and creates confidence. Simple guidance like clear labelling, logical layouts and visible pathways helps users navigate spaces easily.
5. Guidance can influence pace, creating slow meandering paths or quick efficient routes. This impacts the sensory rhythm and intensity of an experience.

6. Effective guidance balances giving direction with allowing freedom to explore. Too much guidance feels controlling, while too little is disorienting. Multi-sensory cues allow for both guided and open experiences.
7. Guidance helps connect and relate different components of an environment or product. For example, consistent style, materials and colors create relationships between disparate items.
8. Guidance should adapt to context. More guidance is needed in dense, information-heavy settings compared to sparse, calming ones.
9. Good guidance feels effortless rather than instructional. Sensory cues are intuitive ways to guide that don't require literal directions.

Surprise and Delight

1. Elements of surprise or unexpected moments can leave a lasting positive impression.
2. Unexpected sensory elements can create wonder, excitement and joy. These peak, emotionally-engaging moments become memorable highlights of the experience.
3. Delight comes from sensory contrasts - introducing something strikingly different from the existing aesthetic. A splash of colour in a muted room or a sudden texture change against smoothness.
4. Moments of surprise and delight are powerful but should be used judiciously. Too many become overwhelming or lose impact. Careful pacing allows each one to resonate fully.
5. Interactivity enables delightful surprises, like unexpected sounds when touching an object or a scent released when opening a drawer. Discovering these interactions is engaging.
6. Surprise can also come from defying expectations - making something feel different than anticipated. For example, a metal object that's feather-light or a cold surface that's comforting to touch.
7. Delight relates to sensory pleasures - the wow factor of a beautiful vista, the soul-warming feel of sunlight, an energizing aroma. It speaks to our emotions through our senses.
8. Surprises attract our attention and awaken our senses. We engage more actively when experiences have an element of the unexpected.

CASE STUDY

The Water Temple, Japan by Tadao Ando

The Water Temple seamlessly integrates nature and built form to create a transcendent, multi-sensory experience that facilitates meditation and spiritual contemplation. Ando's use of raw, exposed concrete establishes a tactile, material-centric atmosphere resonant with the asceticism of Buddhist philosophy.

The choreographed journey through the temple engages all the senses in sequence. The approach through vegetation awakens the senses of smell and touch. The lotus pond courtyard combines stimuli like the sight of still water reflections, sounds of flowing streams, and aromas of aquatic plants. Transitioning inside, plays of natural light across the concrete amplify visual and textural perceptions. The minimalist interior shape containing silence evokes a hushed, inward-focused sonic atmosphere.

By meticulously layering multi-sensory experiences tied to nature, Ando creates an architectural space that elevates spiritual awareness and consciousness of presence.

City Wealth Hub, Singapore by Ministry of Design

This project transforms a conventional banking space into an invigorating, multi-sensory workplace environment using principles of biophilic design. The centrepiece indoor conservatory immerses occupants in nature through lush landscaping, natural ventilation, and stimulation of sight, sound, smell and touch.

Strategic incorporation of water features, wood surfaces, and interior greenery provides olfactory stimulation and auditory cues of natural environments within the office. Diverse textures, from cool stone to warm timbers, engage the tactile senses. Dynamic lighting choreographs visual ambiances that shift with circadian patterns.

The sensory-driven design facilitates psychological rejuvenation, creativity and community-building in contrast to typical sensory-depleted workspaces. The biomimetic approach makes the workplace experience more enriching and attuned to human multi-sensory needs.

Chapel of Saint Benedict, Switzerland by Peter Zumthor

Zumthor's design for this minimalist chapel near the village of Sogn Benedetg privileges light, material and spatial choreography to create a powerful multi-sensory atmosphere for spiritual contemplation and liturgical ceremonies. Entering through a rocky, uphill path builds anticipation through an experiential procession.

The tall, narrow windows allow controlled rays of natural light to dramatically wash over the interior's textured concrete and timber surfaces. The play of light and shadow amplifies material tactility and a sense of dynamism despite the modest interior space. Carefully shaped geometry facilitates long reverberation periods that resonate with liturgical singing and chanting. The exposed materials and open ventilation allow freshness of mountain air and subtle outdoor aromas to mingle within the sanctum.

Through sensory artistry in lighting, materials, spatiality and acoustics, Zumthor's chapel design transcends its physical confines to conjure an emotionally profound experience of spiritual architecture.

FINDINGS AND DISCUSSION

The central premise that designing for all the senses fosters profound user experiences and attachments to spaces aligns with environmental psychology and experience design theory. Case study analyses persuasively demonstrate how architectural elements orchestrate emotionally-engaging multisensory narratives and atmospheres. Yet an arguably optimistic stance overlooks sensory design's potential pitfalls like overstimulation and ethical concerns around manipulating users' emotional states. A more balanced critique of constraints would have been prudent.

Furthermore, while advocating expansion of multisensory curricula and practice, the paper lacks actionable insights into implementation challenges like costs, evaluation metrics, computational aids, and training architects. Grounding phenomenological perspectives in practicalities could strengthen real-world relevance.

CONCLUSION

This research establishes the immense potential of multi-sensory design approaches in enriching how people experience and emotionally connect with the built environment. The profound impact of stimulating our visual, auditory, tactile, olfactory and taste senses in experiential ways is illuminated through case studies of architectural works by Tadao Ando, Ministry of Design and Peter Zumthor.

These case studies demonstrate diverse strategies for layering multi-sensory elements focused on materiality, light, spatial choreography, acoustics and integrating nature. The sensory-rich designs craft atmospheres that transcend mere functionality to facilitate emotional resonance, memory formation and heightened mindfulness.

Whether evoking spirituality through material tactility and dynamic illumination or energizing workplaces with biophilic integrations of water, wood and vegetation, the multi-sensory approach allows shaping profoundly impactful experiences tailored to human phenomenological needs.

While reflecting on the strengths and opportunities, the research also acknowledges weaknesses and threats that must be navigated. These include standardizing sensory design principles, managing subjectivities in perception, overcoming practical constraints, and evolving architectural paradigms.

Overall, by departing from visual primacy towards a balanced engagement of all the human senses, the designs analysed authenticate and honour our multi-sensory mode of being. This expanded sensibility in architectural practice can catalyse deeper connections between people and the spaces they inhabit, seamlessly interweaving the physiological and psychological into cohesive spatial experiences.

The findings validate the transformative value of designing for the full sensory experience as means of elevating architecture into realms of emotional resonance and perception that enrich the human condition. This calls for advancing sensory design thinking in education, innovation and widespread implementation across diverse spatial typologies.

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