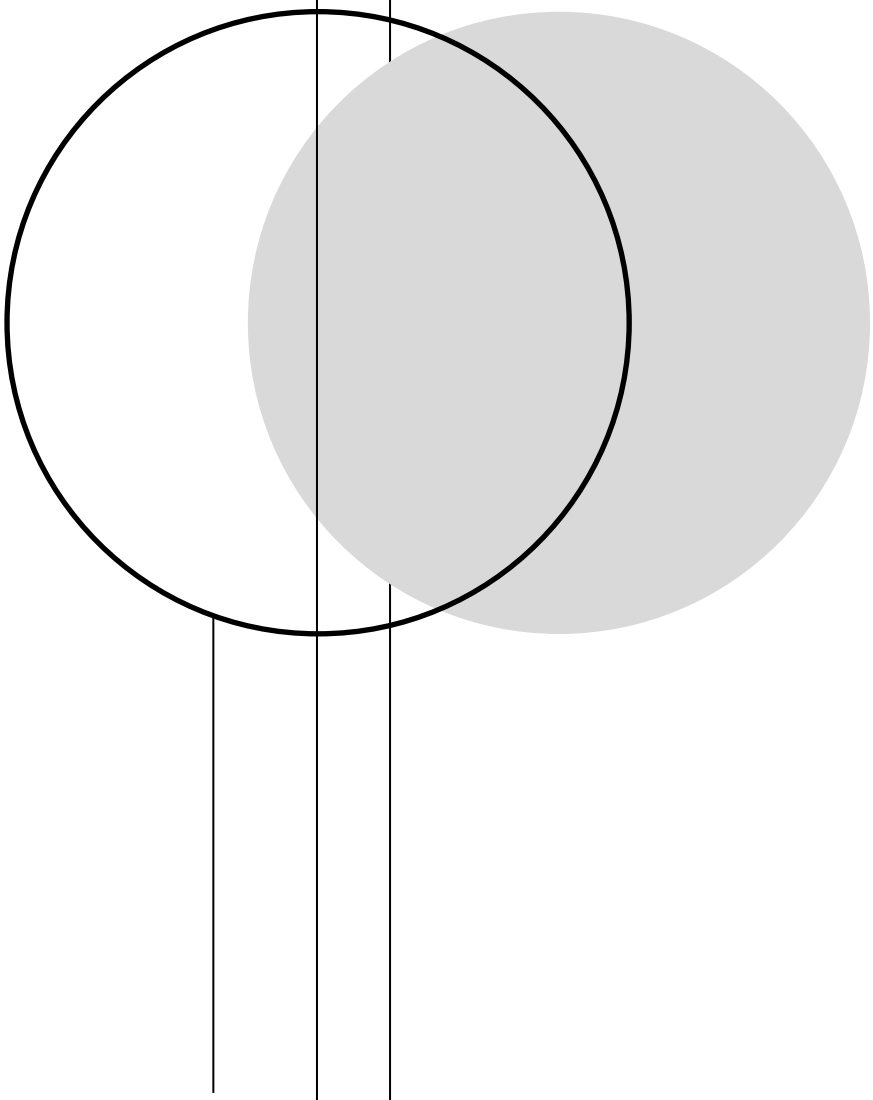
Architectural Design and the Dance of Space:

A Handbook for Movement and Emotion



Diploma Thesis
by Sana Halimović

DIPLOMA THESIS

Architectural Design and the Dance of Space:
A Handbook for Movement and Emotion

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by

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Abstract

Architectural Design and the Dance of Space: A Handbook for Movement and Emotion

This master's thesis explores the interrelationship between architectural design and its impact on the psychological and embodied experiences of the users of its product - space, with a specific focus on those engaged in dance and physical movement. It examines how architectural environments influence the emotional and physical well-being of users and provides practical guidelines for creating spaces conducive to movement and dance. The research bridges the domains of architecture and dance by offering a shared vocabulary and concepts useful to both fields, emphasizing embodiment, movement, and interaction with space.
The study addresses critical questions: How do architectural spaces influence the psychological and emotional states of their users? What role do embodied experiences, rooted in dance and movement principles, play in shaping interactions with these environments? How can architects integrate considerations of movement to design spaces that are more engaging and dynamic?
The outcome is not a comprehensive handbook but rather a resource that begins to bridge the fields of architecture and dance. For architects to design better spaces for dance and to gain insights into the importance of considering movement in architecture, for dancers to get inspired to introduce space for just more than a backdrop but an active entity to engage with.

Architekturentwurf und der Tanz des Raums: Ein Handbuch für Bewegung und Emotion

Diese Masterarbeit untersucht die Wechselbeziehung zwischen architektonischem Design und dessen Einfluss auf die psychologischen und verkörperten Erfahrungen der Nutzer seines Produkts – des Raums – mit einem besonderen Fokus auf Personen, die sich mit Tanz und physischer Bewegung beschäftigen. Sie analysiert, wie architektonische Umgebungen das emotionale und physische Wohlbefinden der Nutzer beeinflussen, und bietet praktische Richtlinien zur Gestaltung von Räumen, die Bewegung und Tanz fördern. Die Forschung verbindet die Bereiche Architektur und Tanz, indem sie ein gemeinsames Vokabular und Konzepte entwickelt, die für beide Disziplinen nützlich sind, und legt dabei besonderen Wert auf Verkörperung, Bewegung und Interaktion mit Raum.
Die Studie behandelt zentrale Fragestellungen: Wie beeinflussen architektonische Räume die psychologischen und emotionalen Zustände ihrer Nutzer? Welche Rolle spielen verkörperte Erfahrungen, die auf Prinzipien von Tanz und Bewegung beruhen, bei der Gestaltung von Interaktionen mit diesen Umgebungen? Wie können Architekten Überlegungen zur Bewegung einbeziehen, um Räume zu gestalten, die ansprechender und dynamischer sind?
Das Ergebnis ist kein umfassendes Handbuch, sondern vielmehr eine Ressource, die beginnt, die Felder Architektur und Tanz miteinander zu verbinden. Sie bietet Architekten Einblicke in die Gestaltung von bewegungsfreundlichen Räumen und regt Tänzer dazu an, den Raum nicht nur als Kulisse, sondern als aktive Entität wahrzunehmen und mit ihm zu interagieren.

Acknowledgements

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Introduction

"Traditionally, architectural practice has been dominated by the eye/sight."[1] The dominance of vision influences how spaces are conceived and understood, often overlooking the full range of sensory experiences that architecture naturally engages and that individuals continually interact with, whether consciously or not. As Juhani Pallasmaa observes, "The observer becomes detached from an incarnate relation with the environment through the suppression of the other senses, in particular by means of technological extensions of the eye, and the proliferation of images."[2] People interact with space in much more dynamic ways, using all their senses as they navigate, experience, and react to their surroundings. This is especially true in dance, where movement turns static structures into active, responsive partners.

This thesis bridges the gap between these disciplines by examining how architectural spaces can enhance not only human interaction and creativity but also the art of movement. It explores how architectural design, in its various phases, influences the psychological and embodied experiences of dancers. The key research questions are:

- How do architectural spaces influence the psychological and emotional states of their users?
- What role do embodied experiences, rooted in dance and movement principles, play in shaping interactions with architectural environments?
- How can architects integrate considerations of movement and sensory perception to design spaces that are more engaging and dynamic?

Architectural design is not only about creating functional spaces but also about shaping human experiences, emotions, and interactions within these spaces. The architectural design process can be examined through its various phases, such as schematic design, design development, and construction, and each phase plays a role in shaping the user's experience of the space. The schematic design phase, where ideas are visually conceptualized, sets the foundation for how the space will function. This is a crucial stage for gathering information and understanding user needs, particularly for spaces intended for physical activity like dance. The designer must consider not only the functionality of the space but also its emotional and psychological effects on its users.

During the design development phase, more detailed plans are created, integrating technical aspects such as materials, lighting, and acoustics—elements that greatly influence how a space feels and how it supports movement. For dancers, these sensory elements shape their interaction with space, making it critical for architects to design with movement in mind. The final construction phase brings these concepts to life, where the built space now directly impacts the users' embodied experience. Here, the design truly reveals its effect on how individuals move through and feel within the space.

To provide a comprehensive understanding of how these phases impact movement, this thesis draws on interdisciplinary knowledge from architecture, psychology, and dance. Through a review of literature, analysis of relevant examples of architectural spaces designed for movement, and feedback collected from architects, dancers, and other users

[1] Charles Spence, "Senses of Place: Architectural Design for the Multisensory Mind," *Cognitive Research: Principles and Implications* 5, no. 46 (2020): 1, https://doi.org/10.1186/s41235-020-00243-4.
[2] Juhani Pallasmaa, The Eyes of the Skin: Architecture and the Senses (London: Academy Editions, 1996), 27.

during a real-time event, this thesis investigates how architecture shapes emotional well-being, movement potential, and embodied experiences.

The study is organized into distinct steps. The lexicon provides a shared vocabulary, essential for aligning concepts across the fields of architecture and dance. This is followed by the chapter "Moving in Space: Everyday Interactions," which examines how people engage with spaces in their daily lives and sets a foundation for understanding more specialized interactions. The key concepts chapter explores principles like balance, rhythm, and spatial awareness that connect architecture and dance. Next, the embodiment chapter investigates how sensory and emotional experiences influence movement within architectural spaces, culminating in an exploration of improvisation as a shared creative tool in both disciplines. The methodological section features a real-time Experience Sampling Method (ESM) and interviews, conducted during a social dance event, to gather firsthand insights into how people perceive and interact with space in dynamic, real-world settings. These steps were chosen to combine theoretical depth with practical, embodied experiences, offering a holistic understanding of the interplay between architecture and dance.

Ultimately, this research aims to provide architects with a handbook for designing spaces that encourage human engagement, creativity, and emotional well-being. For dancers, it offers insights into how to better interact with architectural environments, enhancing their movements, creativity, and connection to space.

Lexicon

A Shared Vocabulary for Architecture and Dance

This lexicon connects the fields of architecture and dance, offering a collection of terms essential to understanding their intersection. The terms are presented in a clear format, allowing readers to understand their meanings and significance within the context of this thesis:

- **Term**
- **Antonym**
- **Cambridge Dictionary Definition**
- **Personal Meaning**

The lexicon serves as a foundation for exploring the ideas presented throughout the thesis. It provides a shared vocabulary to enhance interdisciplinary understanding and to facilitate meaningful connections between these two fields.

Table 1 Lexicon

Term	***Antonym***	***Cambridge Dictionary[3]***	***Personal meaning***
Balance	imbalance	The ability to remain standing, especially because your weight is equally distributed.	safety, harmony
Body	soul	The whole physical structure that forms a person or animal.	medium
Cognition	non-cognitive processes	The use of conscious mental processes.	mental processes
Connection	separation	The state of being related to someone or something else.	meaning, purpose, belonging
Context	detachment	The situation within which something exists or happens, and that can help explain it.	circumstances, story, truth
Culture	cultureless	The way of life, especially the general customs and beliefs, of a particular group of people at a particular time.	community, keeping
Dance	immobility	To move the body and feet to music.	expression, freedom, moment, harmony
Embodiment	disembodyment, abstraction	Someone or something that represents a quality or an idea exactly.	self-expression, awareness
Emotion	indifference	A strong feeling such as love or anger, or strong feelings in general.	life
Empathy	apathy	The ability to share someone else's feelings or experiences by imagining what it would be like to be in that person's situation.	understanding, connection
Engagement	Detachment	An arrangement to meet someone or do something at a particular time.	Connection, interest

[3] Cambridge University Press, *Cambridge Dictionary*, accessed December 2, 2024, https://dictionary.cambridge.org/dictionary/.

Environment	vacuum	The conditions that you live or work in and the way that they influence how you feel or how effectively you can work.	surrounding
Experience	inexperience	(The process of getting) knowledge or skill from doing, seeing, or feeling things.	enrichment
Flow	interruption	The movement of something in one direction.	natural progression
Handbook	non-guide	A book that contains instructions or advice about how to do something or the most important and useful information about a subject.	orientation, solution
Human-Centered	indifferent	Used to describe computers, technology, systems, etc. that are designed to work in ways that people can easily understand and learn.	empathetic
Identity	anonymity	Who a person is, or the qualities of a person or group that make them different from others.	uniqueness
Improvisation	planning	A performance that an actor, musician, etc. has not practiced or planned.	Being in the moment
Interaction	isolation	An occasion when two or more people or things communicate with or react to each other.	humanization, engagement
Movement	stillness	A change of position.	sense of progress, purpose, discovery, exploration, engagement
Perception	unconsciousness, ignorance	A belief or opinion, often held by many people and based on how things seem.	awareness, clearness
Proportions	Disproportion	The size, shape, or level of something.	balance within space
Response	silence	An answer or reaction.	inclusion

Rhythm	arrhythmic, irregularity	A strong pattern of sounds, words, or musical notes that is used in music, poetry, and dancing.	fluidity
Sensation	numbness	A feeling in your body resulting from something that happens or is done to it, or the ability to feel as the result of touch.	experience, feeling
Symmetry	asymmetry	The quality of having parts that match each other, especially in a way that is attractive, or similarity of shape or contents.	order, precision
Time	infinity	The part of existence that is measured in minutes, days, years, etc., or this process considered as a whole.	Relativity
Touch	separation	To put your hand or another part of your body lightly onto and off something or someone.	Dialogue, exchange, connection
Transformation	stagnation	A complete change in the appearance or character of something or someone, especially so that that thing or person is improved.	adaptation, life
Vision	Blindness	An idea or mental image of something.	imagination, foresight
Well-being	discomfort	The state of feeling healthy and happy.	peace

Word Cloud

fig 01 | Word Cloud

This figure illustrates a word cloud generated to visually represent the key terms and concepts discussed in this thesis.
The size of each word corresponds to its relative importance in the research, with larger words signifying higher relevance.
The colors indicate thematic groupings: yellow for "Body and Embodiment," blue for "Connection and Social Interaction," purple for "Sensory and Perception," red for "Emotion and Expression," green for "Movement," and gray for "Guide." This visualization emphasizes the interconnectedness of these themes and their roles in bridging architecture and dance.

Moving in space: everyday interactions

How We Move in Everyday Spaces

Everyday activities naturally involve movement, whether we're at home, at work, or in public spaces. The design of the spaces we move through has a strong influence on how we navigate them. Open layouts and easy access to outdoor areas tend to promote more freedom of movement, while spaces with narrow corridors and divided rooms can restrict our ability to move freely.

In some residential buildings, well-lit and easily accessible stairways can encourage people to choose stairs over elevators. On the other hand, poorly lit or cramped staircases often lead residents to prefer using elevators. Similarly, parks, bike paths, and pedestrian walkways are designed to guide people along specific routes, often influencing our movement without us consciously noticing.

People are mindful of how they move in relation to their surroundings. For instance, we tend to walk at a regular pace in a spacious room but may move faster in a narrow hallway. When going into a basement with a low ceiling, we instinctively lower our heads, and as we climb stairs, we naturally lift our feet higher to manage the steps. These movements demonstrate kinesthetic awareness, where we are aware of our actions in relation to the space around us. Proprioception, or the ability to sense where our body parts are positioned, also influences how we navigate different environments.

"In everyday activities we depend on signals coming from our moving bodies to be able to respond to the space around us and react rapidly in changing circumstances. Much of this knowledge about the position and movement of the limbs and trunk is provided by sensations arising in proprioceptors."[4]

Observations

By watching how people move in spaces, we can identify clear patterns in their behavior. Individuals naturally adapt to the architecture and layout around them, following the unwritten "rules" established by the space. For example, during a typical commute, people leave a building, walk through a park, cross streets, and pass through public squares on their way to a subway station. Throughout this journey, they navigate the shared space with others, each following their own route while being influenced by the design of the environment.

On narrow sidewalks next to busy streets, pedestrians tend to slow down to avoid bumping into each other, especially in areas where outdoor seating from cafes or shops narrows the walkway. In shopping malls, people often walk more slowly near stores or displays but pick up their pace in open corridors between shopping areas. In parks, paths made from gravel or uneven surfaces slow our pace, and we generally follow designated walking routes rather

[4] Uwe Proske and Simon C. Gandevia, *The Proprioceptive Senses: Their Roles in Signaling Body Shape, Body Position and Movement, and Muscle Force*, Physiological Reviews, October 2012, https://doi.org/10.1152/physrev.00048.2011.

than walking across the grass. In contrast, wide pedestrian streets, like those in downtown areas, allow for faster movement since they provide more space and separate us from vehicle traffic.

In busy transit stations, open platforms give people room to move quickly toward their train, while escalators or elevators help accommodate different types of movement between floors. Similarly, in large grocery stores, wide aisles allow shoppers to move more freely, while narrow, crowded aisles can slow them down. When walking through neighborhoods at night, poorly lit areas may lead us to choose safer routes, while well-lit streets and plazas with benches often encourage people to pause and interact. These common examples show how the design of spaces influences how we move and behave in public environments.

Interactions

INTERACTION WITH ARCHITECTURE

Our interaction with architecture often happens through physical contact. As we move through spaces, whether walking down corridors or going up stairs, we engage with the environment around us. Simple actions like leaning on a wall, holding a handrail, or pushing an elevator button are examples of how we connect with the spaces we inhabit through touch. As Pallasmaa observes, “The skin reads the texture, weight, density and temperature of matter. The surface of an old object, polished to perfection by the tool of the craftsman and the assiduous hands of its users, seduces the stroking of the hand.”[5] In addition, vision and hearing play a role in understanding and navigating space, helping us to interpret our surroundings.

Architecture has the ability to evoke emotional reactions, creating environments that can inspire comfort, relaxation, or discomfort. For example, museums frequently elicit feelings of admiration and pleasure because of their impressive designs. The connection between space and emotion highlights a subtle yet significant way that people engage with architectural structures.

INTERPERSONAL INTERACTIONS IN SPACE

The layout and design of spaces play a key role in shaping how people interact. Open areas typically promote conversation and teamwork, especially in workplaces, while smaller, more enclosed spaces provide privacy and are better suited for individual tasks. Group interactions are often more fluid in open environments where communication is unhindered. In residential buildings, features like communal seating or shared activity spaces can naturally encourage more social engagement among neighbors.

INTERACTION WITH PUBLIC SPACES

Public spaces like parks and squares are created to promote social interaction, but their effectiveness relies on their design. Spaces that are well-designed, easy to access, and safe encourage social engagement, while poorly designed areas can hinder it. For instance, public

[5] Juhani Pallasmaa, The Eyes of the Skin: Architecture and the Senses (London: Academy Editions, 1996), 56.

areas with playgrounds, seating, or recreational facilities tend to facilitate interactions among various groups of people.

Everyday Movement as Communication

NON-VERBAL COMMUNICATION IN SPACE

Movement within a space can act as a form of non-verbal communication, indicating a person's intent or emotional state. For example, walking slowly through a park suggests a relaxed mindset, while running through a crowded station shows urgency. Body language, such as posture, gestures, and the physical distance between people, also conveys messages about comfort, mood, and social interaction within a space**.** As Erwin Straus notes, "In all forms of animal motion, locomotion, in attack and defense, uttering and listening, incorporation and expelling, in begetting, in play, in productive movement, the total motorium is engaged, although in alternating distribution of components. It is not the quadriceps which flees, but the animal as a whole which is in motion and directed toward its environment."[6]

SPACE AND BEHAVIOR

Different types of spaces tend to encourage specific behaviors. Open environments like parks, filled with natural elements such as trees, water features, and birdsong, often help people feel more relaxed and promote casual social interactions. In contrast, enclosed areas designed for tasks like studying or working usually encourage concentration and limit socializing. The design and purpose of a space can influence how people behave, either fostering social engagement or encouraging privacy and focus.

Accessibility and Comfort

Creating spaces that are accessible to everyone is essential for fostering a comfortable and inclusive environment. Features like ramps, wide walkways, and clear signage enable individuals with different needs to navigate spaces more easily. Incorporating design elements such as large elevators, tactile paths for people with visual impairments, and sound cues further enhances accessibility and comfort, ensuring that spaces accommodate a diverse range of users.

Emotional Responses to Space

Different environments can elicit a range of emotional responses, and architecture can be crafted to provoke specific feelings. For instance, spaces in a home, such as bedrooms and living rooms, are designed to promote comfort and relaxation. In contrast, public areas like parks and shopping malls can generate feelings of excitement and energy through their use of light, color, and sound.

[6] Erwin Straus, The Primary World of Senses: A Vindication of Sensory Experience (London: Free Press of Glencoe, 1963), 232.

"By arranging spatial sensorial features, an architect can lead occupants through the functional and aesthetic rhythms of a created place."[7] For example, neutral colors and natural light often create a calming atmosphere, while bright colors and strong artificial lighting can energize a space. Narrow, confined areas may feel uncomfortable, whereas open, well-lit spaces tend to make people feel more at ease.

Introduction to Spatial Flow

The concept of flow in movement refers to the dynamic nature of space, where architectural elements guide movement smoothly from one area to another. "The directional quality and flow of the space defined by parallel planes are naturally manifested in spaces used for circulation and movement, such as the streets and boulevards of towns and cities."[8] Elements like thoughtfully designed hallways, proper lighting, and open layouts contribute to a smooth flow throughout a space. In contrast, features such as stairs or tight corridors can break this flow, influencing how people navigate and interact within the space.

Conclusion

This chapter explores how architectural design impacts the ways we interact with our surroundings, whether through how we move, what we observe, or how we communicate. Understanding these influences helps provide a foundation for more in-depth discussions on embodiment in the next chapter.

[7] Charles Spence, "Senses of Place: Architectural Design for the Multisensory Mind," Cognitive Research: Principles and Implications 5, article 46 (2020): 14.
[8] Francis D.K. Ching, Architecture: Form, Space, and Order, 4th ed. (Hoboken, NJ: Wiley, 2014), 156.

Key Concepts in Architecture and Dance

In both architecture and dance, certain key principles are essential for creative expression and human interaction with the environment. Although architecture is often viewed as static while dance is seen as dynamic, both rely on concepts like balance, rhythm, symmetry, proportion, and movement to create experiences that engage us physically, emotionally, and psychologically. These principles, while applied in different ways, inform the design of physical spaces in architecture and the movements in dance performances. This chapter examines these shared principles, highlighting their significance in both fields and relating them to previous discussions about embodiment and the psychological effects of space.

Balance

Balance is a key principle in both architecture and dance. In architecture, it involves creating visual and structural stability by evenly distributing weight, forces, and components. Architects achieve stability and functionality by balancing form with function and structure with aesthetics. There are various ways to establish balance in architecture, such as through symmetrical or asymmetrical designs, the choice of materials, or the arrangement of mass in a space. Symmetrical balance, where elements are mirrored, typically conveys a sense of stability and order, while asymmetrical balance can create a more dynamic feel, introducing tension through uneven distribution while still achieving overall harmony.
Ian Christopher McManus notes that while symmetry often evokes beauty, it can also feel rigid or static. Asymmetry, on the other hand, brings dynamism, movement, and unpredictability, which can make the architectural experience more engaging and vibrant.[9] By combining symmetry and asymmetry, architects create spaces that are both stable and dynamic, enhancing how people move through and interact with their surroundings.

In dance, balance is an ongoing process rather than a fixed state. Dancers continuously modify their posture, weight distribution, and center of gravity to stay balanced while moving. Balance involves both physical and mental elements; dancers need to control their movements while also responding to rhythm, music, and the actions of those around them. The relationship between a dancer's body and the surrounding space is always changing, requiring careful coordination and awareness. As Blazenka Slovenec**,** Aletea Rogulja Mart, and Nikol Radović explain, balance in dance involves understanding the forces at play, particularly friction and gravity, to maintain poise during movement.[10] They describe how dancers apply principles from physics, such as Newton's third law, to sustain balance as they interact with their environment.

In both architecture and dance, balance is important for functionality and for creating a feeling of harmony and stability. Architecture focuses on designing buildings that stand upright and work well over time, while dance looks at balance in a more dynamic way, needing constant adjustments to the environment. Both fields use balance to create order, even when things are asymmetrical, which can enhance movement and expressiveness.

[9] I. C. McManus, "Symmetry and Asymmetry in Aesthetics and the Arts," *European Review* 13, supp. no. 2 (2005): 157–80.
[10] Slovenec, Blazenka, Rogulja Mart, Aletea, and Radović, Nikol. "Dance Without Mathematics and Physics." *Journal for Methodology and Teaching of Mathematics*, 2015, 53–59.

Symmetry and Asymmetry

Symmetry is a prominent principle in both architecture and dance, characterized by a harmonious organization of components on both sides of a central line. In architecture, symmetry is commonly used to convey stability and harmony. For example, classical architecture often incorporates symmetrical designs to express power, strength, and order. Buildings with symmetrical features tend to feel solid and grounded, as if they are well-aligned with the natural forces around them.

While symmetry can create a sense of order, it can also come across as stiff or predictable. For this reason, architects often incorporate asymmetry to bring movement and energy to their designs. Asymmetrical elements break up the visual balance, creating tension and interest that invites observers to engage with the space. As McManus explains, while symmetry is frequently associated with beauty, it can appear monotonous. Asymmetry adds dynamism and interest, and when carefully integrated with symmetry, it creates an optimal balance of structure and excitement.[11] Asymmetry suggests movement, even in static forms, and gives the impression that a structure is evolving or changing.

In dance, symmetry and asymmetry serve similar purposes. Symmetrical movements are balanced and structured, often conveying a sense of order and precision. Dancers may mirror each other's actions, creating harmony and synchronization. In contrast, asymmetry adds complexity and variety to a performance, allowing dancers to move in different directions, levels, and tempos instead of sticking to mirrored movements. Rudolf von Laban's work on movement analysis provides tools to understand how dancers navigate space and time, emphasizing the qualitative and dynamic aspects of movement that can include both symmetrical and asymmetrical forms.[12]

In architecture and dance, symmetry establishes a basis for balance, whereas asymmetry brings in movement and tension. The relationship between these two concepts contributes to the dynamism of both fields. While symmetry provides stability and structure, asymmetry disrupts that structure, creating a sense of motion and fluidity that captivates both observers and participants.

[11] I. C. McManus, "Symmetry and Asymmetry in Aesthetics and the Arts," *European Review* 13, supp. no. 2 (2005): 157–80.
[12] Miguel A. Gómez, "Rudolf von Laban's Labanotation: The Origin of Notational Analysis Methods in Sport Sciences," *RICYDE. Revista Internacional de Ciencias del Deporte* 11, no. 39 (2015): 96–99.

Rhythm

Rhythm is an essential concept found in both architecture and dance, influencing the movement and design in each field. In architecture, rhythm is achieved through the repetition of forms, elements, and structures. This can be seen in the consistent arrangement of columns, windows, or other features, which creates a sense of continuity and flow. As Sanela Pansinger explains, rhythm can be simple or complex, depending on how elements are layered and spaced within a structure. This layering creates a rhythm that invites the observer to move their eyes or body through the space.[13]

In dance, rhythm dictates the timing of movements and serves as a framework for the dancer's body. It operates both externally, aligning with the music's beat, and internally, as dancers coordinate their breathing with the flow of the performance. The repeated patterns of movement enable dancers to explore variations and improvisation while maintaining structure. Rhythm is essential for creating fluidity and coherence in dance, linking movements through time and space.

Rhythm in architecture can create a sense of movement, even in stationary structures. The repetition of design elements helps guide the observer's eye or body through the space, creating a feeling of progression. In both architecture and dance, rhythm influences our perception of time. In architectural design, rhythm can make a space feel vibrant and energetic, as repeated elements connect different areas of a building. In dance, rhythm establishes the pace and timing of movements, enabling dancers to convey emotion, tension, and release through their steps.

Both architecture and dance depend on rhythm to establish structure, order, and flow. In architecture, rhythm influences the physical layout and directs how people move within the space, while in dance, rhythm arranges movements in time, serving as a framework for creative expression. Whether perceived visually or physically, rhythm is what gives both architecture and dance their dynamic quality.

[13] Pansinger, Sanela. "Architektur als Komposition, Komposition als Ausdruck." *Scribd*, 2020, p. 60.

Proportions

Proportions are an important aspect in both architecture and dance for achieving harmony and beauty. In architecture, proportions describe how different parts of a building relate to one another. The size, shape, and arrangement of various elements must be balanced to create a structure that is visually cohesive and appealing. A well-known method for achieving ideal proportions in architecture is the golden ratio, a mathematical principle used for centuries to create designs that are aesthetically pleasing.
As T. Nestorova notes, the golden ratio has been applied in architecture since antiquity, from the Parthenon to modern skyscrapers.[14] The golden ratio brings a sense of balance and order that is visually appealing. However, proportions in architecture are not solely about looks; they also influence the functionality of a building. A space with good proportions tends to feel comfortable and welcoming, while a space with poor proportions can feel cramped, overwhelming, or confusing.

In dance, proportions are physical rather than mathematical. Dancers need to be aware of their body proportions, the space they occupy, and the timing of their movements. A choreographer can design movements that are either large and expansive or small and confined, depending on the desired emotional effect. Proportions in dance also involve how dancers relate to one another as they move in connection with each other and their environment. Monika Palinkas-Molnar and Laszlo Bernath emphasize how proportions, including the golden ratio, influence the aesthetic experience of dance, just as they do in architecture.[15]

In both architecture and dance, proportions are crucial for achieving harmony and balance. Whether through the thoughtful arrangement of architectural features or the choreography of movements, proportions influence our experience and interaction with space and time. Well-proportioned designs and movements create a sense of beauty and order that appeals to both observers and participants.

[14] Nestorova, T. "Proportions in Architecture as a Possibility of Determining the Time of Establishment of Historical Buildings." *Conference Paper*, December 2021, DOI:10.29003/m2595.s-n_history_2021_44/123-133.
[15] Palinkas-Molnar, Monika, and Bernath, Laszlo. “Preference for Aesthetic Principles in Dance.” *Tanc es Neveles*, vol. 3, no. 2, 2022, pp. 21–38.

Movement

Although architecture is typically seen as static and dance as dynamic, both fields depend on movement to convey meaning and shape experiences. In architecture, movement is not direct but rather suggested. Buildings are designed to direct how people navigate through space, influenced by the layout of hallways, doors, and windows. As Mosleh Ahmadi explains, movement in architecture can be understood in various ways, from the physical movement of people through space to the visual movement created by the design itself.[16] For example, a well-designed hallway not only helps people move from one place to another but also creates a sense of connection and continuity that enhances the overall experience of the space.

In dance, movement is the main way to express ideas and emotions. Dancers use their bodies to communicate feelings, tell stories, and interact with the space around them. Dance movements are planned to form patterns, rhythms, and connections with other dancers and the environment. David Pilbäck explores the phenomenology of movement in dance, emphasizing how movement is experienced both physically and emotionally.[17] Movement in dance is not just about the body in space but also about how the body experiences time, rhythm, and connection with others.

Movement in architecture and dance connects the physical and emotional experiences of space. In architecture, movement influences how people engage with their surroundings, affecting their understanding of the space's design and purpose. In dance, movement fosters a relationship between the dancer and the space, enabling exploration and connection with the audience. While architecture provides the framework for movement, dance enlivens those spaces, turning the static into something dynamic.

[16] Ahmadi, Mosleh. "The Experience of Movement in the Built Form and Space: A Framework for Movement Evaluation in Architecture." *Cogent Arts & Humanities*, vol. 6, 2019, p. 3.
[17] David Pilbäck, *E=(motion)²: Between Movement and Dance*, Södertörn University, 2013, 9-12.

Time

We find a number of definitions of the term "time" in the literature, so it is mentioned in physics, philosophy, medicine, etc., but simply put, time is "the interval between two events". Or, "a continuous sequence of changes in which moments or their transformations can be imagined as a continuous series of forms that chase each other, so that a flow of different configurations and speeds is formed, which contains the possibilities of the new and the unpredictable".[18]

Time is essential in both architecture and dance because it affects how people interact with their surroundings, experience rhythm, and perceive movement. While dance is fundamentally connected to time through rhythm and movement, architecture also relates to time by influencing how people navigate and experience spaces over longer periods.

TIME IN ARCHITECTURE

In architecture, time goes beyond the mere passage of hours or minutes; it also encompasses how people experience a space over time. As individuals move through a building, they discover its features and details gradually, experiencing them moment by moment. Marc M. Cohen discusses how the concept of space-time, first proposed by Albert Einstein, suggests the profound interrelation between space and time in modern physics and how this concept can be extended to architecture. Time is a critical dimension in understanding how spaces are designed and inhabited: “Relativistic spacetime reveals a spectrum of physical and temporal reality that suggests infinite intersections between time and space”.[19]

Moreover, architectural spaces evolve over time. This evolution happens not just due to natural aging but also because light, weather, and seasonal changes influence how a building is perceived. For instance, a glass facade may appear different at dawn, noon, and dusk, giving the architecture a dynamic character throughout the day. Rara Warakanyaka and Yandi Andri Yatmo note that “interior space ‘is not made just once, but is made and remade over and over again each time it is represented through another medium, each time its surroundings change, each time different people experience it’”.[20]

David Pilbäck examines the phenomenology of movement and its relationship to space and time, emphasizing how the experience of moving through a space is deeply tied to our perception of time. In his work, Pilbäck highlights that the "danced body" interacts dynamically with its surroundings, revealing that both movement and time play critical roles in shaping our understanding and experience of space. He suggests that the way we traverse or engage with space is not only a spatial act but also a temporal one, as movement unfolds over time and contributes to the meaning and perception of the environment.[21]

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[18] "Vrijeme," *Hrvatska enciklopedija*, mrežno izdanje, Leksikografski zavod Miroslav Krleža, 2013–2024. Pristupljeno 27.07.2024. https://www.enciklopedija.hr/clanak/vrijeme

[19] Marc M. Cohen, “Space, Time, and Space Architecture,” *PHI Congress Proceedings* (2022): 8, https://doi.org/10.1201/9781003260554-2.

[20] Rara Warakanyaka and Yandi Andri Yatmo, "Understanding the Importance of Time in Interior Architectural Design," *SHS Web of Conferences* 41 (2018): 2, https://doi.org/10.1051/shsconf/20184104009.

[21] David Pilbäck, *E=(motion)²: Between Movement and Dance*, Södertörn University, 2013, 9-11.

TIME IN DANCE

Dance choreography is fundamentally based on space, time, and energy. When discussing "time," we refer to the timing of specific movements, the speed at which they are performed, the intervals between movements, and how a dancer's movements relate to those of other dancers during a given timeframe, as well as the overall tempo.

In dance, time influences how movements are structured and synchronized with music. The elements of time in dance include:

- **Clock Time**: The length of a dance, measured in seconds or minutes.
- **Timing Relationships**: Dancers move in relation to one another—before, after, or together.
- **Metered Time**: This refers to a rhythmic pattern often used in music, such as 4/4 time.
- **Free Rhythm**: Movements that do not follow a predictable rhythm, allowing for improvisation and exploration.[22]

"We can think of time in the following ways: - Clock Time: We use clock time to think about the length of a dance or parts of a dance measured in seconds, minutes, or hours. - Timing Relationships: When dancers move in relation to each other (before, after, together, sooner than, faster than). - Metered Time: A repeated rhythmic pattern often used in music (like 2/4 time or 4/4 time). If dances are done to music, the movement can respond to the beat of the music or can move against it. The speed of the rhythmic pattern is called its tempo. - Free Rhythm: A rhythmic pattern is less predictable than metered time. Dancers may perform movement without using music, relying on cues from one another".[23]

Furthermore, time affects the emotional and psychological experience of dance. As Judith R. Mackrell notes, dance movements are often organized into rhythmic patterns, which go beyond technical structure to shape the emotional and mental states of both the dancer and the audience. The pacing—whether fast or slow—affects the mood of the performance and plays a significant role in how the audience perceives the dancer's intention and expression.[24]

THE INTERACTION OF TIME IN ARCHITECTURE AND DANCE

In both architecture and dance, time is more than just a measurement; it is a key element that influences experience. In architecture, the design of spaces affects how people move over time. A well-designed environment enables smooth transitions from one area to another, creating a rhythm that resembles the flow found in dance. Similarly, dance employs

[22] The Kennedy Center, "Do You Wanna Dance? Elements of Dance: Time," accessed December 5, 2024, https://www.kennedy-center.org/education/resources-for-educators/classroom-resources/media-and-interactives/media/dance/do-you-wanna-dance/.
[23] Ibid.
[24] Judith R. Mackrell, "Dance," *Encyclopaedia Britannica*, last modified October 20, 2023, https://www.britannica.com/art/dance.

time to create rhythmic patterns of movement, leading both dancers and audiences through emotional or storytelling experiences.

In some ways, architecture can be seen as "frozen" time—buildings are static, but they are experienced dynamically as people move through them. Dance, on the other hand, is "unfolding" time—an art form that exists only in the moment, but that creates lasting impressions through the sequence of movements performed in time.

In both architecture and dance, time brings dimension, depth, and significance to space. For instance, a dancer's movements on stage temporarily alter the space, while an architectural design is perceived differently depending on the time of day, the season, or the era.

TIME AS A CONNECTOR BETWEEN DANCE AND ARCHITECTURE

Time links dance and architecture by shaping the sequence and experience of movement. In dance, time establishes the rhythm and framework for a dancer's actions, whereas in architecture, it influences how a space is perceived over time. Moving through a building involves transitioning from one area to another, much like a dancer shifts from one position to the next, creating a rhythm with each step.

Additionally, the space-time relationship in architecture has been discussed by authors like Marc M. Cohen, who emphasizes the dynamic interplay between space and time, particularly in the context of space architecture.[25] While Cohen highlights how architectural designs must account for the ways spaces are used and experienced over time, this notion finds a parallel in dance, where movements are inherently shaped by and respond to the space in which they occur. Both disciplines rely on the passage of time to create meaning, whether through the gradual discovery of architectural features or the unfolding of choreographed movements.

David Pilbäck explores the phenomenology of movement, emphasizing how dance provides a unique lens to understand the interplay between time and space. He suggests that dance, as a temporal art form, reveals layers of bodily awareness and self-awareness, demonstrating how time shapes the flow and rhythm of movement.[26] This perspective resonates with architecture, where the passage of time influences how spaces are experienced and reimagined through human activity.

In summary, time is a crucial element in both architecture and dance. It shapes how we experience space, establishes rhythm, and guides the flow of movements. Whether through thoughtfully designed architectural layouts or rhythmic dance patterns, time regulates our interaction with space and form, adding depth and significance to both fields.

[25] Marc M. Cohen, *Space, Time, and Space Architecture*, PHI Congress Proceedings, 2022, 7–10, https://doi.org/10.1201/9781003260554-2.
[26] David Pilbäck, *E=(motion)²: Between Movement and Dance*, Södertörn University, 2013, 9-11.

Sensory Perception

Sensory perception plays a fundamental role in both architecture and dance, connecting individuals to their environments through the experiences of sight, sound, touch, and smell. This section examines how sensory perception deepens the connection between people and their surroundings, influencing how we perceive and experience space, time, and movement.

SENSORY PERCEPTION IN DANCE

In dance, sensory perception involves the dancer's awareness of their body, movements, and surroundings. Choreography requires dancers to draw on a range of sensory inputs to both shape and interpret their movements:

- **Kinesthetic Awareness**: This is the dancer's inner sense of how their body moves in space, helping them stay balanced, coordinated, and smooth in their movements. It relates to proprioception, which is the body's ability to feel its position and movement, and is essential for performing precise steps and keeping harmony in dance.[27]
- **Touch and Proprioception**: In partner dances or contact improvisation, touch is important as dancers use physical contact to help guide their movements. Proprioception allows dancers to understand where their body parts are in relation to each other and the surrounding space, which is crucial for keeping good posture and moving smoothly with other dancers.[28]
- **Hearing**: Music or sound cues provide the rhythmic foundation for dance. Dancers synchronize their movements with auditory signals, and the type of music dictates the energy, speed, and mood of the performance.
- **Vision**: Dancers use their sight to navigate the space, coordinate their movements with other dancers, and react to visual elements like lighting and set designs. Being aware of the visual aspects helps them understand where they are in relation to the stage and the audience.
- **Emotional Perception**: Dancers show and interpret emotions through their movements by sensing the emotional atmosphere of the performance space and their interactions with other dancers. This sensory awareness helps them connect with the story or themes of the dance, enriching the emotional experience for both themselves and the audience.

[27] International Association for Dance Medicine & Science. "Proprioception: A Resource Paper." Accessed December 5, 2024. https://iadms.org/media/3592/iadms-resource-paper-proprioception.pdf.
[28] "The Role of Touch as a Teaching and Learning Tool in Dance." *Journal of Educational Dance Studies*. Accessed December 5, 2024. https://jedsonline.in/uploads/topics/16655760488639.pdf.

SENSORY PERCEPTION IN ARCHITECTURE

Architecture involves multiple human senses, and the sensory experience of a space greatly affects how it is understood and utilized. According to Juhani Pallasmaa, architecture is not solely a visual experience but a fully embodied one, in which all senses—sight, sound, touch, and even smell—contribute to how people understand and inhabit spaces. He emphasizes the importance of multisensory engagement, arguing that "the body, memory, and imagination" are intertwined in the way we experience architecture.[29]

- **Visual Perception**: plays a crucial role in how people experience architectural spaces. Factors such as layout, shape, and lighting significantly influence the sensory interaction with an environment. Both natural and artificial light can change the mood and purpose of a space, while textures, colors, and patterns add depth and personality to architectural designs. As Juhani Pallasmaa notes, “The eye collaborates with the body and the other senses,” emphasizing that vision in architecture is never isolated but always intertwined with the experiences of touch, sound, and movement.[30]
- **Auditory Perception**: Pallasmaa also highlights the "acoustic intimacy" of space, noting that sound shapes our emotional connection to architecture, whether through the echoes of a cathedral or the quiet hum of a well-designed library.[31] Acoustics are essential in architecture, especially in public areas such as theaters and libraries. The way sound travels within a space influences how individuals communicate and interact.
- **Tactile Perception**: The textures and materials used in architecture contribute to the overall sensory experience of a building. These tactile elements influence how people feel within a space and shape their interaction with the environment**.** According to Pallasmaa, "touch is the sensory mode that integrates our experience of the world," making tactile perception crucial in understanding a space.[32]
- **Olfactory Perception**: Our sense of smell, plays a subtle but significant role in architecture. Charles Spence notes that neglecting the olfactory aspect of a space can lead to issues like Sick Building Syndrome (SBS) and affect overall comfort.[33] He explains that the smells we associate with a space can create lasting memories, often more strongly linked to the space than its visual features.[34] In dance, although smell is not a primary focus, incorporating scents into performance spaces can enhance the experiences of both dancers and the audience. This underscores the significance of air quality, material selection, and ventilation in design to promote emotional and physical well-being.

[29] Juhani Pallasmaa, *The Eyes of the Skin: Architecture and the Senses* (London: Academy Editions, 1996), 11-12.
[30] Ibid., 41.
[31] Ibid., 49.
[32] Ibid., 11.
[33] Charles Spence, "Senses of Place: Architectural Design for the Multisensory Mind," Cognitive Research: Principles and Implications, 2020, p. 3.
[34] Ibid., p. 10.

- **Emotional Perception**: Just as in dance, architecture evokes emotions. Elements such as lighting, sound, and materials play a key role in shaping the atmosphere of a space, affecting how individuals feel within it. For example, warm lighting can create a sense of coziness, while sharp contrasts in materials may evoke excitement or tension.

THE INTERSECTION OF SENSORY PERCEPTION IN ARCHITECTURE AND DANCE

Architecture and dance both use our senses to create meaningful experiences. Dance relies on sensory information to direct movement, while architecture influences how people engage with and navigate spaces through their sensory experiences. The following are common aspects in both fields:

- **Spatial Awareness**: In dance, being aware of space helps dancers stay in sync with each other and the stage. In architecture, spatial awareness affects how people move through and experience buildings.
- **Sound and Movement**: Sound plays an integral role in guiding rhythm and tempo in dance. In architecture, sound design can either improve or interfere with how people move through a space. Spaces designed for dance performances, such as theaters or studios, are designed with acoustics in mind to ensure clarity for both performers and audiences.
- **Materiality and Touch**: The tactile experience of surfaces is important in both disciplines. Dancers are aware of the textures and surfaces they move on, as these affect their movements and stability. In architecture, materials contribute to how spaces feel, impacting both physical comfort and emotional responses.
- **Light and Vision**: Lighting is essential in both architecture and dance. In performances, lighting enhances the mood and focus, highlighting the movement and the dancers' bodies. In architecture, lighting shapes how spaces are perceived, creating atmosphere and defining functionality.

CONCLUSION

Sensory perception is essential for how people engage with both dance and architecture. It fosters a deeper connection between individuals and their surroundings, leading to a more immersive experience. The combination of sight, sound, touch, and even smell influences how we move through and comprehend our environment, whether through physical movement in dance or by experiencing a built space. In both fields, sensory perceptions are crucial for designing environments that are functional and emotionally impactful.

Embodiment in Architecture and Dance

The concept of embodiment is key to understanding how people interact with architectural spaces. Embodiment suggests that our psychological processes are closely connected to the body and expressed through physical actions. As Maja Storch explains, psychological experiences also find their expression in visibly observable bodily events, illustrating how emotions like pride or frustration are reflected in body posture, gestures, and movement.[35] This highlights the deep connection between the mind and body, and how internal experiences are physically expressed.

In architecture, embodiment goes beyond just psychological aspects to include the physical experience of space. The body actively interacts with its environment rather than simply occupying it, influencing and being influenced by the surroundings. The design of a space impacts how we perceive our environment and how we navigate it, affecting our emotional and mental states. People tend to adjust their movements and interaction with a space based on its architectural characteristics, often without even realizing it.

This chapter will explore how architectural spaces shape the physical experiences of people, particularly focusing on dancers and others who engage in movement. By considering how the body interacts with everyday environments, how architecture impacts well-being, and the importance of improvisation, we can understand that space is not just a backdrop for activities but plays an integral role in shaping human experiences and behaviors.

Synonyms & Similar Words

- Physical expression
- Bodily representation
- Somatic experience
- Incorporation of mind and body
- Embodied cognition
- Bodily manifestation
- Somatic awareness
- Corporeal presence
- Tangible experience
- Bodily engagement

[35] Maja Storch, "Wie Embodiment in der Psychologie erforscht wurde," in *Experiment Embodiment*, 37.

The Body in Everyday Spaces

Embodiment refers to how our body is an active participant in shaping and being shaped by the spaces we occupy. In everyday settings, we constantly adjust to the design of our surroundings, which can influence our movements, behaviors, and emotions. As Maja Storch explains, "Body feedback can have a massive effect due to the reciprocal influences between physical events and the psychological system,"[36] emphasizing how bodily feedback processes significantly shape our perception and behavior. This dynamic interaction between body and mind reveals how deeply interconnected they are in shaping and perceiving space.

In architectural spaces, the connection between mind and body becomes more evident. The layout of a room, the materials, lighting, and acoustics all influence how we move through a space. Whether we realize it or not, people naturally adjust their posture, speed, and movements based on the architecture they interact with daily. By recognizing this relationship, architects can design spaces that harmonize with the body's natural rhythms and encourage more meaningful interactions with the environment.

Spatial Awareness and Movement

In everyday life, humans develop a spatial awareness that governs their movements through space. For example, walking through a narrow corridor prompts the body to shrink or adjust its posture, while open spaces often lead to expanded movements and a more relaxed gait. These subtle adjustments demonstrate how architecture guides bodily movement, sometimes restricting and sometimes encouraging freedom of motion.

In her study of embodied experience, Katharina Voight examines how architectural spaces influence perception and interaction. She notes that "spatial perception is an enactive process of movement, exploration, sensual effects, and the sensorimotor encounter of the individual with the physical realm."[37] The body, therefore, doesn't just move through space; it actively engages and reshapes it.

Body and Everyday Tasks

The design of spaces where we perform everyday tasks, like cooking or working at a desk, plays a crucial role in how our bodies interact with the environment. Ergonomically designed spaces can promote comfort and efficiency, while poorly designed areas can lead to discomfort and potential injuries. Understanding this connection between our physical experiences and the built environment is vital for recognizing how architecture can either enhance or detract from our physical well-being.

A well-designed kitchen with countertops at a comfortable height and adequate spacing for movement enables smooth and natural interactions with the environment. On the other hand, a poorly designed office, with awkwardly placed furniture or cramped spaces, can

[36] Maja Storch, "Wie Embodiment in der Psychologie erforscht wurde," in Experiment Embodiment, 39.
[37] Katharina Voigt, "Corporeality of Architecture Experience," Dimensions Journal of Architectural Knowledge 1 (2021): 139, https://doi.org/10.14361/dak-2021-0118.

restrict movement and lead to static postures, potentially causing physical discomfort over time.

Emotional and Physical Reactions

The interaction between the body and space involves both physical and emotional elements. Enclosed areas can create feelings of safety or, conversely, claustrophobia, while spaces with high ceilings and openness often foster a sense of freedom and expansiveness. As Juhani Pallasmaa notes, "Significant architecture makes us experience ourselves as complete embodied and spiritual beings", reflecting the deep connection between architectural design and human experience.[38]

For example, in residential spaces, warm lighting and soft materials tend to create a relaxed atmosphere, while harsh lighting and rigid structures can contribute to feelings of stress. Similarly, workplaces that feature open areas for collaboration often foster engagement and creativity, whereas cramped environments can impede productivity and overall well-being.

Connection to Dance

Everyday interactions with space share similarities with how dancers navigate performance environments. In expansive studios or stages, dancers tend to use broader and more expressive movements, reflecting the spatial freedom often experienced in large public areas. Conversely, in constrained or narrow spaces, dancers adjust their choreography to incorporate smaller, more contained movements, much like how individuals adapt their physical actions in confined environments.

Sensory Impact on Movement

Architecture influences movement and perception through sensory cues such as sight, sound, and touch. For instance, different flooring materials can subtly impact the way people move—soft carpets often encourage slower, more relaxed movements, while hard floors promote sharper, quicker steps. Similarly, lighting plays a significant role in shaping how individuals experience and navigate spaces. Natural light tends to create a calming environment, while harsh artificial lighting can evoke tension or discomfort. Sound also influences behavior, as quiet spaces may encourage deliberate, slower movements, whereas noisy, bustling environments often prompt quicker, more hurried actions.
“Every significant experience of architecture is multi-sensory; qualities of matter, space and scale are measured by the eye, ear, nose, skin, tongue, skeleton and muscle.”[39]

[38] Juhani Pallasmaa, The Eyes of the Skin: Architecture and the Senses (London: Academy Editions, 1996), 11.
[39] Charles Spence, “Senses of Place: Architectural Design for the Multisensory Mind,” *Cognitive Research: Principles and Implications* 5, no. 46 (2020): 13, https://doi.org/10.1186/s41235-020-00243-4.

Conclusion

Understanding how the body interacts with everyday spaces lays the groundwork for exploring more intentional uses of space in both dance and architecture. This foundational knowledge of how we engage with our environments helps connect theoretical discussions about embodiment and movement to real-life experiences.

Responding to Everyday Architecture

Architectural spaces do more than fulfill functional roles; they play a significant part in shaping the psychological and emotional experiences of their users. Factors such as the materials selected, the arrangement of spaces, and the sensory environment all contribute to eliciting specific bodily and emotional responses. Everyday architecture affects us in subtle ways, influencing our feelings and how we navigate within a space. This interaction between the body and architecture can enhance comfort and productivity, or in the case of poorly designed spaces, it can lead to discomfort, anxiety, or stress.

Sensory Influence and Psychological Reactions

Our responses to architectural environments are shaped by various sensory inputs. For example, enclosed spaces often create a sense of safety, while open and expansive areas can evoke feelings of freedom. These emotional reactions are inherently linked to how our bodies interact with the surrounding space. Charles Spence explains that architectural practice has traditionally been dominated by the eye/sight, yet architects and designers have increasingly started to consider the other senses—sound, touch, smell, even taste—in their work.[40] The move toward multisensory design recognizes that architecture involves not just visual aspects but also the feelings and experiences we have within a space.

For instance, poorly lit and confined spaces can lead to feelings of stress, while areas filled with natural light and open designs tend to encourage relaxation and creativity. Various design elements, such as lighting, color, and texture, significantly influence how individuals perceive their surroundings and their overall well-being. This understanding clarifies why some environments feel soothing while others can feel oppressive. Additionally, the choice of materials and the arrangement of spaces can impact how comfortable or restricted we feel, with open and flowing designs often promoting a greater sense of freedom and well-being.

Body and Architectural Space

Architecture significantly affects how we move through different spaces. Elements like corridors, staircases, and open areas encourage various types of bodily movements and interactions with our surroundings. For example, narrow hallways often lead to smaller, more constrained steps, while expansive areas allow for slower, more fluid movements. Spatial awareness plays a critical role in how we interact with our environment, often dictating how we move, whether with ease or constraint.

Changes in body movement are inherent in daily tasks such as navigating public spaces, working at desks, or preparing meals. In work environments designed with user comfort in mind, individuals can move more freely and comfortably, which often leads to increased productivity and less physical strain. In constrast, environments that are poorly designed can

[40] Charles Spence, "Senses of Place: Architectural Design for the Multisensory Mind," *Cognitive Research: Principles and Implications* 5, no. 46 (2020): 1, https://doi.org/10.1186/s41235-020-00243-4.

result in awkward movements and prolonged static postures, leading to discomfort over time.
Additionally, well-designed spaces facilitate smooth and natural movement, while poorly designed spaces can create obstacles and even physically hinder individuals. This principle applies to everyday scenarios, such as navigating public transportation systems or office environments, as well as to performance spaces, where the ability to move freely and fluidly is crucial.

Emotional Resonance and Connection to Space

Juhani Pallasmaa hightlights the deep emotional impact of architecture: "Architecture articulates the experiences of being-in-the-world and strengthens our sense of reality and self."[41] The body does not just move through space; it feels space. The tactile qualities of materials, the acoustics of a room, and even the smells of a particular building all contribute to how we emotionally and physically experience a place.
In our everyday experiences, the relationship between architecture and our feelings can be both subtle and profound. Features such as the inviting texture of plush upholstery in a living room, the bright colors of an open kitchen, and the calming presence of greenery in a workspace significantly shape our emotional states. These architectural elements serve more than just practical purposes; they influence how we perceive ourselves and interact with others within those spaces.

For dancers, the relationship between movement and space is particularly profound. Space is not merely a backdrop but an active element that shapes their movements and influences their emotional expression. Similarly, in everyday environments, the design of space plays a crucial role in how people move, perceive themselves, and interact with others.

Cultural and Social Influences

Cultural and social factors greatly affect how we respond to architecture. Different cultures design and use spaces in their own ways, which influences how people act and move within those areas. In some cultures, open communal spaces encourage people to interact and socialize, while in others, private, enclosed spaces are preferred for personal reflection and solitude. The way people engage with space is shaped not only by its physical structure but also by cultural norms and social expectations.

Spatial Flow

Spatial flow refers to the way architecture influences movement, guiding individuals through spaces in a smooth or obstructed manner. Thoughtfully designed spaces enable seamless and intuitive movement, while poorly planned spaces can create barriers that disrupt this natural flow. Flow plays a vital role in both everyday environments and performance spaces, shaping how individuals navigate and experience these settings.

[41] Juhani Pallasmaa, *The Eyes of the Skin: Architecture and the Senses* (London: Academy Editions, 1996), 11.

Conclusion

Recognizing how the body reacts to everyday architecture is important for exploring the more complex psychological effects of space design. As we transition to the next section on how space influences well-being, we will look more closely at these principles of interaction and sensory response to understand how architectural elements affect mental and emotional health.

Psychology of Space for Well-Being

The concept of embodiment looks at the connection between our mind and body and how it influences our perception, movement, and emotions. When related to architectural spaces, this idea suggests that our experiences are not just about what we see or think but are also deeply physical and emotional. A well-designed space can impact our feelings, thoughts, and movements by engaging multiple senses, promoting comfort and creativity. In contrast, poorly designed environments can lead to feelings of anxiety and stress.

Embodiment and the Body's Interaction with Space

Embodiment suggests that our psychological processes are shaped by how our bodies interact with the environment around us. As Arthur M. Glenberg explains, "psychological processes are influenced by body morphology, sensory systems, motor systems, and emotions".[42] This indicates that our bodies significantly influence how we perceive, understand, and emotionally react to the spaces we inhabit. Our senses and movements interact with architectural features—such as light, materials, textures, and layout—to shape our cognitive and emotional experiences.

Maja Storch reinforces this view, stating that "the body is always involved when people think, feel, and act; we are not disembodied spirits".[43] In this way, we experience spaces not only through our vision but through our entire bodies. Our physical movements within a space, the emotions it evokes, and our memories of it are all influenced by the surrounding architecture.

Movement through space is a key aspect of how embodiment and architecture are connected. For example, our perception of space is influenced by how we physically interact with it: walking through a narrow hallway often leads to smaller, more constrained movements, while open and well-lit areas encourage broader, more expansive motions. As Katharina Voigt writes, "The sensual dimension of architecture experience, as well as its impact on the corporeality of its perceiver, becomes therefore intelligible and attainable to be included in the process of architectural design".[44] The continuous interaction between our bodies and the environment is central to understanding how spaces influence our well-being.

Multi-Sensory Design and Emotional Impact

The design of a space encompasses more than just visual elements; it also significantly influences how people feel, think, and engage with their environment. Modern architecture recognizes that well-being is shaped by a multi-sensory experience, where factors such as sound, touch, temperature, and even smell contribute to emotional and psychological responses.

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[42] Arthur M. Glenberg, "Embodiment as a Unifying Perspective for Psychology," *Wiley Interdisciplinary Reviews: Cognitive Science* 1, no. 4 (2010): 586, https://doi.org/10.1002/wcs.55.
[43] Maja Storch, "Wie Embodiment in der Psychologie erforscht wurde," in Experiment Embodiment, 37.
[44] Katharina Voigt, "Corporeality of Architecture Experience," *Dimensions Journal of Architectural Knowledge* 2021-01, no. 1 (2021): 140, https://doi.org/10.14361/dak-2021-0118.

As Rasoulpour and Charehjoo state, "The environment has a potential power to meet man's experiences and behaviors," [45] emphasizing that sensory stimuli significantly shape human interactions and mental states. Architects should take into account how a space feels to the touch, the sounds it produces, and even its smells to design environments that promote positive emotions and reduce stress.

For example, materials such as wood, natural stone, and soft fabrics offer a comforting tactile experience that can promote feelings of calm and well-being. In contrast, cold and hard materials like steel or glass may create a sense of detachment or sterility. The interaction of light, texture, and sound can greatly influence how individuals feel in a space. "As Rasoulpour and Charehjoo explain, "The architecture environment is formed by a surface of materials with colorful tones of textures, brightness and different degrees of transparency and spaces among them. These factors are one of the essential criteria of designing".[46]

Additionally, architectural acoustics can either enhance or diminish the user's sense of well-being. As Mubinova and Gokgol explain, "Factors such as ventilation, lighting, noise control systems, and a good choice of interior design are what determine the productivity and well-being of the occupant because their psychological and emotional responses to these factors are what motivate occupants."[47] A well-designed space with effective acoustic balance, such as a quiet library or a concert hall, can help minimize auditory stress and enhance feelings of peace and comfort.

Finally, color and lighting are also integral to a multi-sensory design approach. Colors have well-documented psychological effects: warm tones like red and yellow can energize, while cool tones such as blue and green promote calm and relaxation. Natural light has been shown to influence well-being. As noted, "Natural light has the power to improve mood and productivity. They can do this by adding more windows and glass walls, which will let light and air flow deeply into the office".[48] By incorporating these sensory elements, architects can design environments that engage the body in multiple ways, ultimately improving emotional well-being.

Architecture and Emotional Well-Being

Architectural design significantly impacts emotional well-being. Well-designed spaces provide not only functionality but also emotional fulfillment, promoting relaxation, creativity, and happiness. In contrast, inadequately designed environments can lead to stress, anxiety, and feelings of discomfort. As Rasoulpour and Charehjoo explain, "Human feelings and actions are made by capabilities of natural environment, cultural environment,

[45] Hazhir Rasoulpour and Farzin Charehjoo, "The Effect of the Built Environment on the Human Psyche Promote Relaxation," *Architecture Research* 7, no. 1 (2017): 18, https://doi.org/10.5923/j.arch.20170701.02.
[46] Ibid., 17.
[47] Shakhzoda Mubinova and Merve Kevser Gokgol, "What Are the Impacts of Architectural Design on Occupants' Well-Being, and How Can Architects Optimize Spaces to Enhance Productivity?" 10th London International Conference (November 2023): 36, https://doi.org/10.31039/plic.2023.8.158.
[48] Ibid., 38.

and human inner characteristics are limited."[49] They identify three factors that shape how people emotionally connect with a space: the ability of the space to respond to personal needs, the emotional effects of the space, and the individual's past experiences in similar environments.

Architects are responsible for creating spaces that address the psychological needs of users. For example, a well-lit, open office with natural materials can help reduce stress and boost productivity, whereas a dim, cramped environment may lead to feelings of anxiety or frustration. As Rasoulpour and Charehjoo note, "The conducted studies count three factors: the ability of place responding to individuals' needs, emotional effects in relationship with place, and individual's previous experiences rate of place as the dimensions of interestedness in place, and with these conditions, it increases the individual's interestedness in the environment and makes a sense of belonging to the place."[50] This viewpoint aligns with the concept of embodiment, as our physical interactions with a space significantly influence both our emotional and cognitive experiences within that environment.

Cognitive Psychology and the Perception of Space

Cognitive psychology helps us understand how we perceive architectural spaces and how these environments impact our thinking and decision-making. According to the American Psychological Association, "cognitive psychologists study how people acquire, perceive, process and store information. This work can range from exploring how we learn language to understanding the interplay between cognition and emotion".[51] In the context of architecture, understanding how people process sensory information from their environment helps explain its impact on behavior, mood, and overall well-being.

In this context, grounded cognition indicates that we perceive spaces not only through abstract reasoning but also through our bodily interactions and sensory experiences. As Barsalou states, "Grounded cognition rejects traditional views that cognition is computation on amodal symbols in a modular system, independent of the brain's modal systems for perception, action, and introspection. Instead, grounded cognition proposes that modal simulations, bodily states, and situated action underlie cognition."[52] This means that how we move through a space shapes how we feel about it. For example, a well-lit, open room can inspire feelings of freedom and creativity, whereas a dark, cluttered space might lead to stress and tension.

Moreover, research by Parastou Naghibi Rad et al. highlights that "various architectural design features impact human experience types such as work motivation, stress, anxiety,

[49] Hazhir Rasoulpour and Farzin Charehjoo, "The Effect of the Built Environment on the Human Psyche Promote Relaxation," *Architecture Research* 7, no. 1 (2017): 18, https://doi.org/10.5923/j.arch.20170701.02.
[50] Ibid., 21.
[51] American Psychological Association, *"Cognitive Psychology Explores Our Mental Processes."* https://www.apa.org/action/science/brain-science
[52] Lawrence Barsalou, "Grounded Cognition," *Annual Review of Psychology* 59 (2008): 617, https://doi.org/10.1146/annurev.psych.59.103006.093639.

pleasure, and restrictiveness in built environments."[53] Their study categorizes architectural spaces into interior design, urban design, spatial organization, and facade design, each of which has unique influences on human perception and emotion. For example, the height of ceilings, curved versus flat surfaces, and color schemes can significantly impact how people feel within a space.

Dance and Embodiment: Movement in Space

Dance provides a strong example of how our bodies engage with space, influencing emotional and psychological well-being. Participating in dance therapy can enhance emotional regulation, lower stress levels, and improve cognitive functions. In fact, research on dance therapy reveals that "dance therapy can effectively regulate the concentration of serotonin and dopamine, and improve the psychological pressure of adolescents with mild depression."[54] Dance, similar to architecture, is closely connected to how the body moves through space.

In this way, both dance and architecture focus on the embodied experience of space, where movement, sensory perception, and emotional responses are influenced by the environment. Just as dancers utilize space to convey emotion and creativity, architectural designs can also encourage movement, relaxation, and emotional well-being. Developmental psychology research highlights that dance therapy has expected intervention effects on these emotional problems, such as impulsiveness, anxiety, depression, and loneliness.[55]

The Architect as a Psychologist: Understanding Embodied Needs

To create spaces that promote well-being, architects must understand the psychological and embodied needs of their users. As Prof. S.T. Janetius and Thekkechangarampatt Mini explain**,** "an architect who fails to read the inner psyche of the complex human personality will fail to build meaningful, satisfying buildings".[56] They highlight that an architect's role is similar to that of a psychologist, exploring the thoughts, emotions, and physical needs of users to design spaces that are both emotionally impactful and functional.

Embodied cognition plays a key role in understanding how people physically and emotionally connect with their surroundings. Architects can enhance well-being by designing spaces that consider how individuals move, feel, and interact within them. Whether creating a home, dance studio, or public area, the focus should be on crafting environments that are not only functional but also support mental and physical health.

[53] Parastou Naghibi Rad et al., "Cognitive and Perceptual Influences of Architectural and Urban Environments with an Emphasis on the Experimental Procedures and Techniques," *PsyArXiv* (2021): 1, https://doi.org/10.31234/osf.io/d2h4m.
[54] Yidan Chen, "The Impact of Dance on Health: From the Perspective of Developmental Psychology," *The 3rd International Conference on Educational Innovation and Philosophical Inquiries (ICEIPI 2022)*, DOI: 10.54254/2753-7048/2/2022371, 152.
[55] Ibid., 151.
[56] P S.T. Janetius and Thekkechangarampatt Mini, "The Marriage of the Conscious and Unconscious in Architecture," *EC Psychology and Psychiatry* 8, no. 2 (2019): 79.

Conclusion

The relationship among architecture, embodiment, and well-being is essential in space design. By understanding how multi-sensory elements, physical interactions, and cognitive perceptions affect emotions and behaviors, architects can create environments that enhance both mental and physical health. Through thoughtful choices in lighting, materials, and layout, the design of a space can significantly influence our emotional and psychological well-being.

Improvisation in Space and with Space

Improvisation is important in both architecture and dance, allowing for spontaneous creativity that involves both the body and mind. It is a reaction to the current moment, influenced by the surrounding space, sensory experiences, and the individual's skills and background.

In dance, improvisation means that dancers need to be very aware of their surroundings, their bodies, and the movements they are making. They have to pay attention to how they move in relation to the space around them. Additionally, improvisation can involve using the space itself—whether it's empty or has objects in it—as part of the dance. Dancers use their environment as a tool, interacting with different features and connecting their movements to the space.

Similarly, architects also improvise in both space and with space. Improvising in space refers to the architect's ability to adapt their knowledge and techniques to create a space that fulfills the requirements of its occupants. When architects improvise in space, they draw upon their expertise to create environments that respond to both functional and aesthetic requirements. However, improvising with space pushes the boundaries further. It occurs when an architect takes an existing space, with its limitations and constraints, and uses it as a canvas to innovate and create something new. Whether it involves working with natural surroundings, existing structures, or limited materials, improvisation with space opens up opportunities for creative architectural solutions.

Improvisation in Architecture and Dance: Common Ground

Both fields draw upon improvisation as a creative tool. As noted by researchers in urban design, "improvisation is understood as a productive force in urban development that gives space to what occurs in urban encounters."[57] Architects often use improvisation to deal with challenges in city designs, adjusting their plans based on how people naturally interact with spaces. This is similar to how dancers change their movements to fit the area around them.

In dance, Pil Hansen describes how "improvisation in dance ranges from the widespread practice of contact improvisation, which involves interpersonal exploration of physical weight sharing and balance, through forms of structured and task-based improvisation, to the more controlled dance-generating systems in which source materials, tasks, and rules of interaction are predefined".[58] Improvisation can be a tool for creating new dance material that can later be polished into choreography, or it can serve as a performance style on its own. This flexibility enables dancers to react to their surroundings, incorporating the environment as a key element of their performance.

[57] Anne-Lene Sand et al., "Improvisation and Planning: Engaging With Unforeseen Encounters in Urban Public Space," *Urban Planning* 8, no. 4 (2023): 119, https://doi.org/10.17645/up.v8i4.6318.
[58] Pil Hansen, "Minding Implicit Constraints in Dance Improvisation," in *The Routledge Companion to Theatre, Performance, and Cognitive Science*, ed. R. Kemp and B. McConachie (London: Routledge, 2018), 1.

Improvisation as a Response to Space

In both architecture and dance, improvisation is not just about creativity; it also requires a response to the surrounding environment. Factors like layout, materials, and sensory elements shape how architects and dancers engage with the spaces around them. Dancers adapt their movements to the spatial and physical constraints of their environment, just as architects adjust their designs to fit the specific conditions and limitations of a space.

In the field of architecture, improvisation can result in the creation of dynamic, flexible spaces that encourage spontaneous interaction and adaptation. As the research explains, improvisation in urban public spaces is a dynamic process, enabling diverse and spontaneous interactions that foster creativity and unexpected engagements.[59]

Conclusion

Improvisation in both architecture and dance highlights the strong link between the body, mind, and space. Whether it's a dancer adapting to the shape of a performance area or an architect reimagining a limited environment into something new, improvisation encourages flexibility, creativity, and engagement. Both disciplines use improvisation to enrich the embodied experience, expanding the possibilities within a space.

[59] Anne-Lene Sand et al., "Improvisation and Planning: Engaging With Unforeseen Encounters in Urban Public Space," *Urban Planning* 8, no. 4 (2023): 119, https://doi.org/10.17645/up.v8i4.6318.

Final Conclusion of Embodiment in Architecture and Dance

This chapter explores the interplay between the human body, its movements, and the architectural spaces it inhabits, emphasizing how these elements influence and shape one another. Each subchapter contributes unique insights that collectively deepen our understanding of embodiment in architecture and dance.

The discussion begins by examining how the body interacts with everyday spaces, adapting its movements and postures to the design and layout of the environment. These adaptations happen instinctively, often shaping emotional and physical states in ways we might not consciously realize. Movement and spatial awareness play a central role in this interaction, with architecture guiding and sometimes limiting how we move through spaces, whether in daily life or in the context of dance.

The chapter further highlights the sensory dimensions of movement. Elements like lighting, sound, texture, and spatial proportions profoundly affect not only how we navigate a space but also how we feel within it. These sensory inputs create a dialogue between the body and the environment, influencing behavior, emotional responses, and the quality of movement. This interplay is especially apparent in dance, where performers respond to the physical characteristics of their surroundings to shape their movements.

Improvisation emerges as a strong theme, showcasing how humans adapt creatively to the constraints and opportunities presented by their environment. Whether in dance or architectural design, improvisation reflects an active engagement with space, allowing for spontaneous and innovative interactions that enhance both the physical and emotional experience.

Building on these discussions, the next phase of this research involves applying these theoretical insights in a practical setting. The Experience Sampling Method (ESM) study transitions from abstract exploration to real-world observation. By capturing participants' reflections on their interactions with space during a dynamic social event, the study provides a deeper understanding of how embodiment principles manifest in practice. This shift from theory to lived experience underscores the relevance of the concepts explored in this chapter and sets the stage for the detailed findings of the ESM research.

Insights from Dancers and Architects: A Methodological Perspective

This chapter examines how individuals' experiences evolve over time, with a focus on the data collected using the Experience Sampling Method (ESM). The aim is to explore not just how people differ from each other but how their experiences shift or remain consistent in dynamic environments. By using ESM, this study captures participants' reflections on their moods, perceptions, and interactions during a dance event in real time.

"ESM refers to structured self-report diary techniques assessing mood, symptoms, context and appraisals thereof as they occur in daily life. One crucial aspect is that participants are providing data in the real world. In contrast to an experimental approach, where one zooms in on one specific aspect of experience or behavior in a very controlled environment, real-life research focuses on the complexity of the experience in an ever changing and uncontrollable environment."[60]

This method was chosen over others due to its ability to capture nuanced, real-time data in a natural setting, allowing for a deeper understanding of how participants interact with their environment. The flexibility of ESM makes it ideal for studying the social dynamics and sensory experiences of dancers and architects during a shared activity, offering insights that other methods might miss.

INTERVIEW SETTING

- **Event:** Salsa and Bachata Social
- **Location:** Salzbar, Vienna
- **Number of Sessions:** Conducted twice (over two separate nights)
- **Questions:** Seven quantitative questions (rated on a Likert scale) and two descriptive (open-ended) questions
- **Repetition of Questions:** Each set of questions was repeated three times during a single night, capturing data at intervals to observe temporal changes.
- **Participants:**
    - 2 architects
    - 2 dancers
    - 2 individuals in the control group (non-dancers and non-architects)
- **Purpose:** The experiment aimed to assess participants' subjective perceptions and interactions with the social environment during a dance event. The study focuses on movement freedom, environmental influences (e.g., music, lighting, crowd), spatial awareness, and overall comfort.
- **Methodology:** Experience Sampling Method (ESM) was used to collect data in real-time, ensuring immediate feedback from participants without relying on recall.
- **Environmental Details:** This location is new for hosting such events, as the salsa and bachata socials were previously held at a different venue. The venue's underground setting creates a cozy, intimate atmosphere, but its somewhat hidden location might impact first impressions and accessibility.
- **Data Analysis:** Quantitative responses will be averaged across groups and time points, and descriptive answers will provide context and depth to the quantitative findings.

[60] Inez Myin-Germeys and Peter Kuppens, *The Open Handbook of Experience Sampling Methodology*, 2nd ed. (Belgium: The Center for Research on Experience Sampling and Ambulatory Methods Leuven, 2022), 10.

fig 02 | Salzbar, Vienna

Quantitative Questions

1. **Does the environment make you feel free or restricted in your movements?**

Scale: 1 = Very restricted, 5 = Very free

Table 2 Quantitative Question 1

Time	Week	Architect 1	Architect 2	Dancer 1	Dancer 2	Control Group 1	Control Group 2
09:45	**Week 1**	5	4	4	3	5	4
	Week 2	5	5	3	2	5	5
10:45	**Week 1**	3	4	2	1	4	4
	Week 2	3	4	2	2	4	4
11:45	**Week 1**	5	5	2	1	5	5
	Week 2	4	5	2	1	4	5

2. **How much does each factor influence your perception of this space?**
Scale for each factor: 1 = Not at all, 5 = Strongly influences

- **Music**

Table 3 Quantitative Question 2.1.

Time	Week	Architect 1	Architect 2	Dancer 1	Dancer 2	Control Group 1	Control Group 2
09:45	**Week 1**	3	4	4	4	4	4
	Week 2	3	4	5	4	4	5
10:45	**Week 1**	3	5	4	5	4	4
	Week 2	2	4	4	5	4	4
11:45	**Week 1**	3	5	4	5	4	4
	Week 2	3	4	3	4	4	5

- **Lighting**

Table 4 Quantitative Question 2.2.

Time	Week	Architect 1	Architect 2	Dancer 1	Dancer 2	Control Group 1	Control Group 2
09:45	**Week 1**	3	3	5	2	2	3
	Week 2	3	5	5	4	3	3
10:45	**Week 1**	4	4	2	2	3	3
	Week 2	4	4	2	3	4	4
11:45	**Week 1**	4	5	2	2	3	4
	Week 2	4	4	2	3	3	3

- **Crowd**

Table 5 Quantitative Question 2.3.

Time	Week	Architect 1	Architect 2	Dancer 1	Dancer 2	Control Group 1	Control Group 2
09:45	**Week 1**	2	2	2	3	3	4
	Week 2	2	3	2	3	3	4
10:45	**Week 1**	5	4	4	5	5	5
	Week 2	3	2	4	4	4	5
11:45	**Week 1**	2	5	5	5	5	4
	Week 2	2	2	4	5	4	4

3. **How balanced and organized does this space feel to you?**
   Scale: 1 = Very unbalanced, 5 = Very balanced

Table 6 Quantitative Question 3

Time	Week	Architect 1	Architect 2	Dancer 1	Dancer 2	Control Group 1	Control Group 2
09:45	**Week 1**	4	5	3	3	5	5
	Week 2	4	3	3	3	5	4
10:45	**Week 1**	4	4	3	2	4	5
	Week 2	4	3	2	2	4	3
11:45	**Week 1**	4	4	3	1	5	5
	Week 2	4	4	3	1	4	3

4. **How comfortable do you feel in this space?**
   Scale: 1 = Very uncomfortable, 5 = Very comfortable

Table 7 Quantitative Question 4

Time	Week	Architect 1	Architect 2	Dancer 1	Dancer 2	Control Group 1	Control Group 2
09:45	**Week 1**	4	5	4	5	4	3
	Week 2	4	4	4	5	4	4
10:45	**Week 1**	4	5	3	1	4	4
	Week 2	3	4	3	1	3	4
11:45	**Week 1**	5	5	3	2	4	3
	Week 2	4	4	3	2	5	3

5. **How aware are you of your body and personal space here?**
   Scale: 1 = Not aware at all, 5 = Highly aware

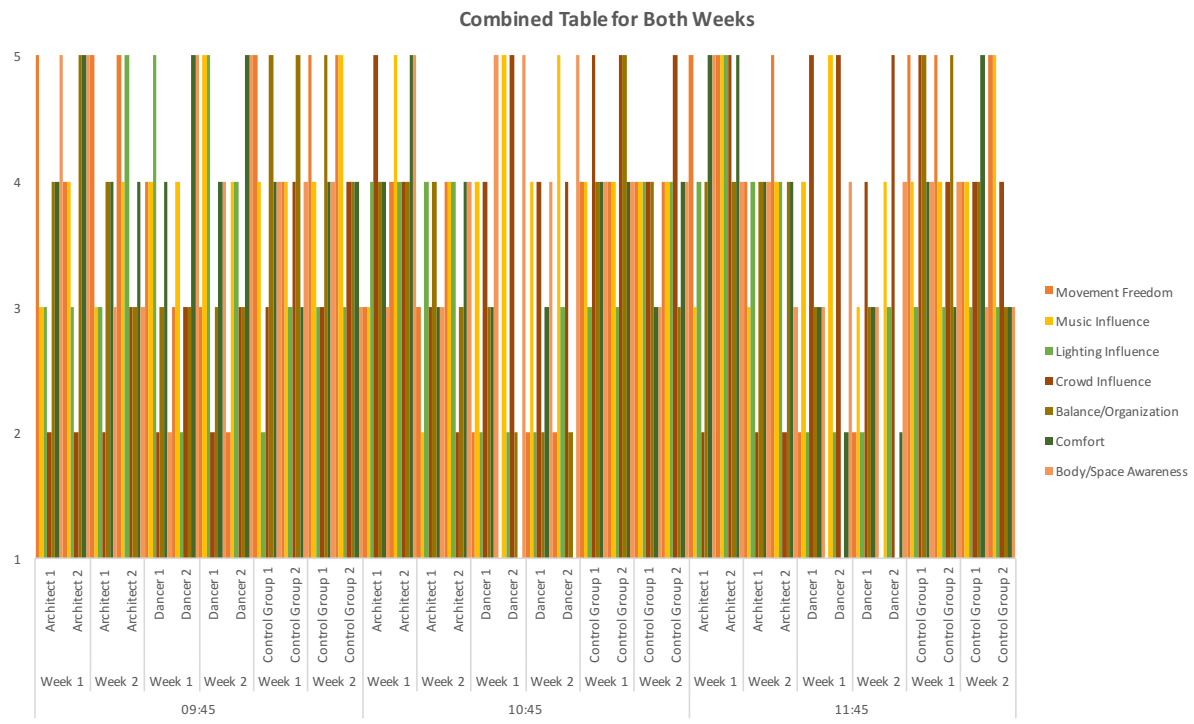
Table 8 Quantitative Question 5

Time	Week	Architect 1	Architect 2	Dancer 1	Dancer 2	Control Group 1	Control Group 2
09:45	**Week 1**	5	5	2	5	4	4
	Week 2	3	3	4	5	4	3
10:45	**Week 1**	3	5	5	5	4	4
	Week 2	3	4	4	5	3	4
11:45	**Week 1**	5	4	3	4	4	4
	Week 2	4	3	3	4	3	3

COMBINED TABLE FOR BOTH WEEKS

Table 9 Combined Table

Time	Week	Group	Movement Freedom	Music Influence	Lighting Influence	Crowd Influence	Balance/Organization	Comfort	Body/Space Awareness
09:45	Week 1	Architect 1	5	3	3	2	4	4	5
		Architect 2	4	4	3	2	5	5	5
	Week 2	Architect 1	5	3	3	2	4	4	3
		Architect 2	5	4	5	3	3	4	3
	Week 1	Dancer 1	4	4	5	2	3	4	2
		Dancer 2	3	4	2	3	3	5	5
	Week 2	Dancer 1	3	5	5	2	3	4	4
		Dancer 2	2	4	4	3	3	5	5
	Week 1	Control Group 1	5	4	2	3	5	4	4
		Control Group 2	4	4	3	4	5	3	4
	Week 2	Control Group 1	5	4	3	3	5	4	4
		Control Group 2	5	5	3	4	4	4	3
10:45	Week 1	Architect 1	3	3	4	5	4	4	3
		Architect 2	4	5	4	4	4	5	5
	Week 2	Architect 1	3	2	4	3	4	3	3
		Architect 2	4	4	4	2	3	4	4
	Week 1	Dancer 1	2	4	2	4	3	3	5
		Dancer 2	1	5	2	5	2	1	5
	Week 2	Dancer 1	2	4	2	4	2	3	4
		Dancer 2	2	5	3	4	2	1	5
	Week 1	Control Group 1	4	4	3	5	4	4	4
		Control Group 2	4	4	3	5	5	4	4
	Week 2	Control Group 1	4	4	4	4	4	3	3
		Control Group 2	4	4	4	5	3	4	4
11:45	Week 1	Architect 1	5	3	4	2	4	5	5
		Architect 2	5	5	5	5	4	5	4
	Week 2	Architect 1	4	3	4	2	4	4	4
		Architect 2	5	4	4	2	4	4	3
	Week 1	Dancer 1	2	4	2	5	3	3	3
		Dancer 2	1	5	2	5	1	2	4
	Week 2	Dancer 1	2	3	2	4	3	3	3
		Dancer 2	1	4	3	5	1	2	4
	Week 1	Control Group 1	5	4	3	5	5	4	4
		Control Group 2	5	4	3	4	5	3	4
	Week 2	Control Group 1	4	4	3	4	4	5	3
		Control Group 2	5	5	3	4	3	3	3



Graph 1 Combined Table

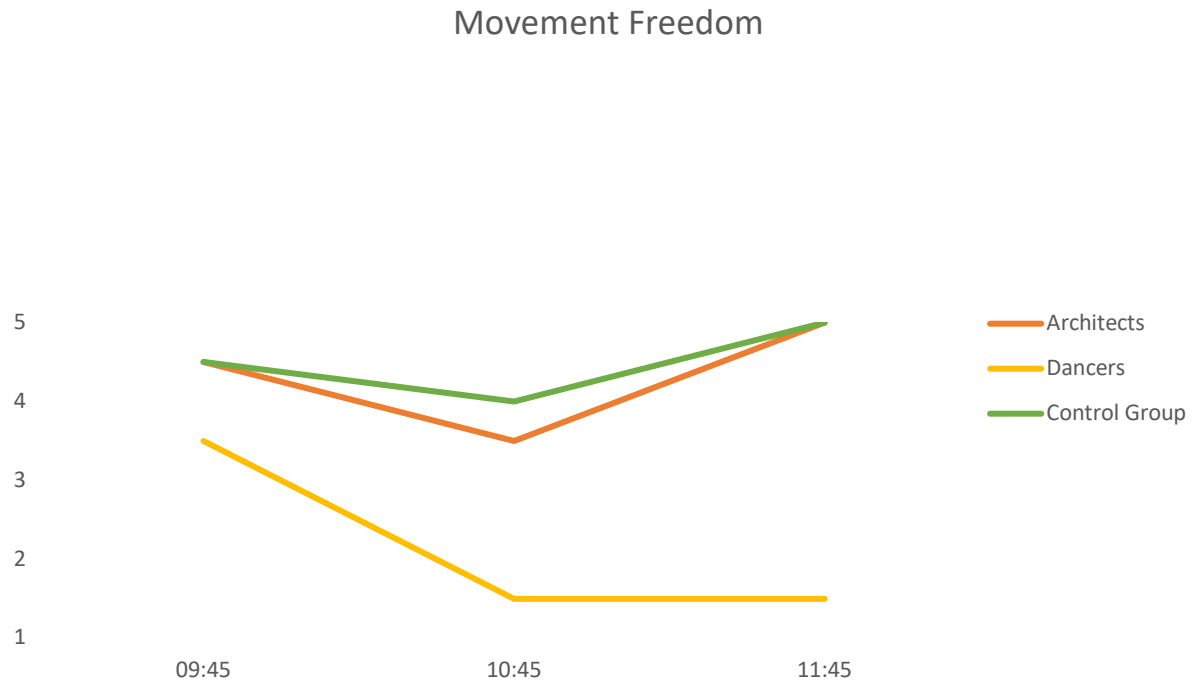
GENERAL OBSERVATIONS

- Week 2 shows more consistent responses across groups, suggesting adaptation to the experimental setup or environment.
- Architects seem to be less influenced by social factors like crowd, whereas dancers are more attuned to these, reflecting their reliance on the dynamics of the space.
- Responses suggest time-based changes in comfort and spatial awareness, possibly indicating fatigue or increased familiarity with the environment as the session progresses.
- Lighting and crowd influence appear to have a more significant impact on dancers than architects, emphasizing the role of these factors in spatial interaction for dance.
- Control group exhibit the least variation across factors and time, possibly due to their lack of direct engagement in movement or dance activities.
- Dancers consistently rate body awareness higher in week 1 and week 2, reflecting their heightened awareness due to their discipline.
- At 11:45, there is a notable improvement in "Comfort" and "Body Awareness," possibly due to participants adapting to the environment.

GROUP AVERAGES FOR BOTH WEEKS ACROSS TIME POINTS

Table 10 Group Averages

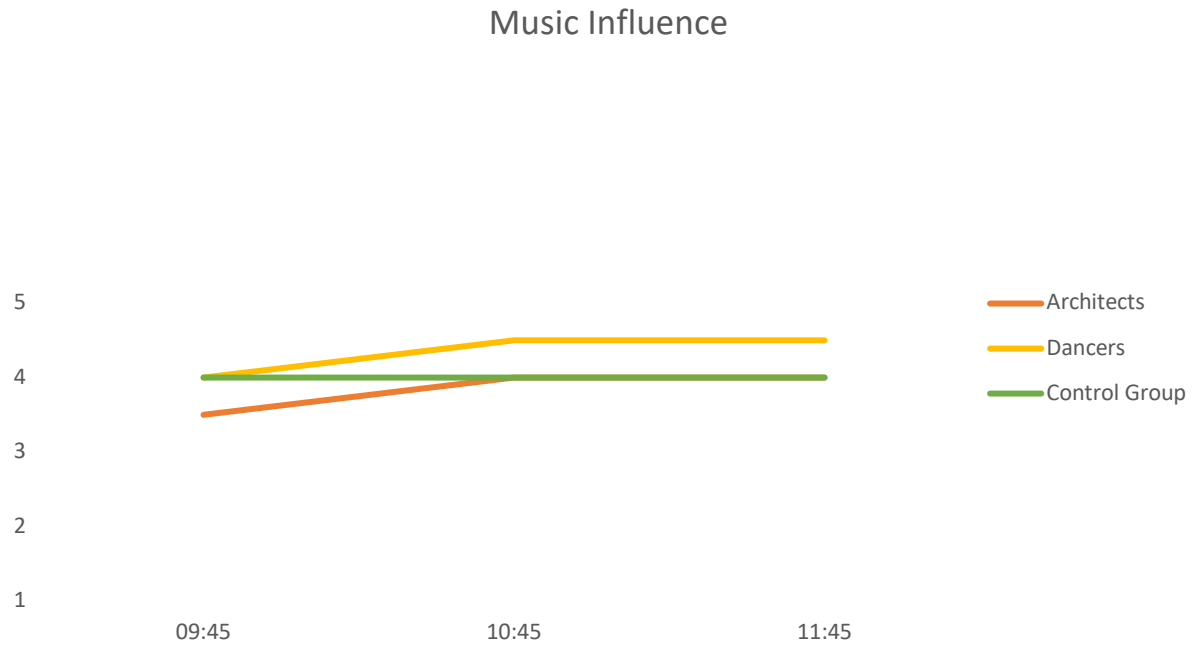
Group	09:45	10:45	11:45
Movement Freedom			
Architects	4.75	3.5	4.75
Dancers	3.0	1.75	1.5
Control Group	4.75	4.0	4.75
Music Influence			
Architects	3.5	3.5	3.75
Dancers	4.25	4.5	4.0
Control Group	4.25	4.0	4.25
Lighting Influence			
Architects	3.5	4.0	4.25
Dancers	4.0	2.25	2.25
Control Group	2.75	3.5	3.25
Crowd Influence			
Architects	2.25	3.5	2.75
Dancers	2.5	4.25	4.75
Control Group	3.5	4.75	4.25
Balance/Organization			
Architects	4.5	3.75	4.0
Dancers	3.0	2.25	2.5
Control Group	4.75	4.0	4.25
Comfort			
Architects	4.5	4.0	4.5
Dancers	4.5	2.5	3.0
Control Group	3.5	3.75	3.5
Body/Space Awareness			
Architects	5.0	3.75	4.25
Dancers	3.5	4.25	3.25
Control Group	3.75	4.0	3.75



Graph 2 Movement Freedom

GENERAL OBSERVATIONS

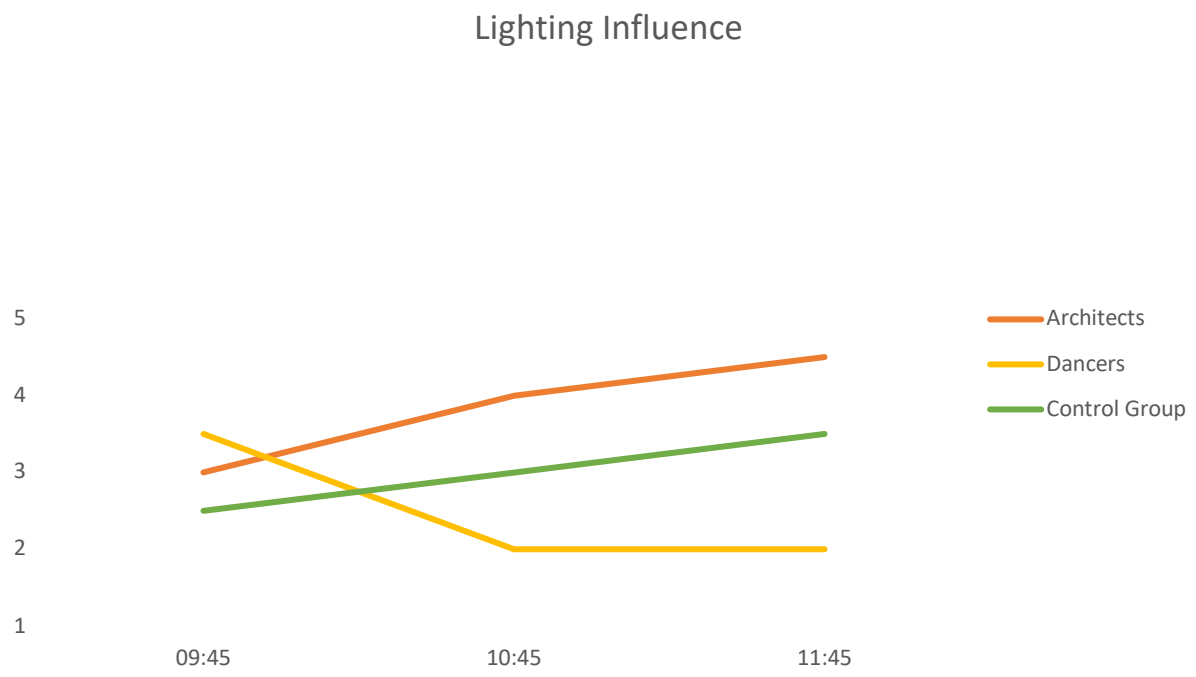
- The Control Group consistently rated "Movement Freedom" higher across all time points, indicating that they might perceive fewer restrictions in the environment compared to the other groups.
- Dancers rated "Movement Freedom" the lowest among all groups throughout all time points, showing a significant restriction in their perception.
- Architects show a noticeable dip at 10:45, suggesting that their perception of movement freedom decreases as time progresses in the middle of the observation.
- The rise for architects and the control group at 11:45 suggests they adjusted to the space better than dancers.



Graph 3 Music Influence

GENERAL OBSERVATIONS

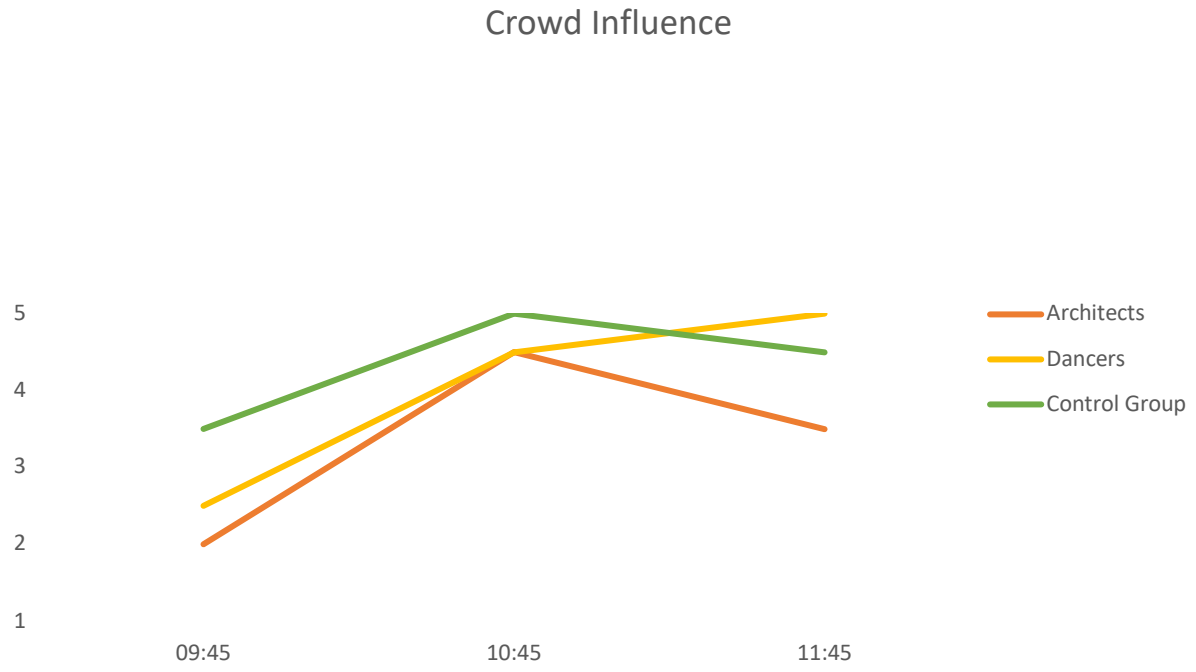
- All groups rate "Music Influence" similarly high, with values converging around 4 or above. This suggests that music is consistently a strong factor in shaping their perception of the space.
- Unlike "Movement Freedom," there is no significant mid-point dip here, demonstrating that music remains a stable and impactful element across all time intervals for all groups.
- Architects show a noticeable increase in the perceived influence of music from 09:45 to 10:45, aligning closer to the other groups by 10:45 and maintaining this level through 11:45. This progression could indicate growing immersion or adaptation to the music's role in the environment over time.
- Dancers rate the influence of music consistently high across all time points, indicating that music plays a critical and constant role in their experience, likely because of its direct connection to their activities.
- The control group maintains a steady perception of music's influence throughout the time intervals, suggesting stability in their relationship with the sound environment.



Graph 4 Lighting Influence

GENERAL OBSERVATIONS

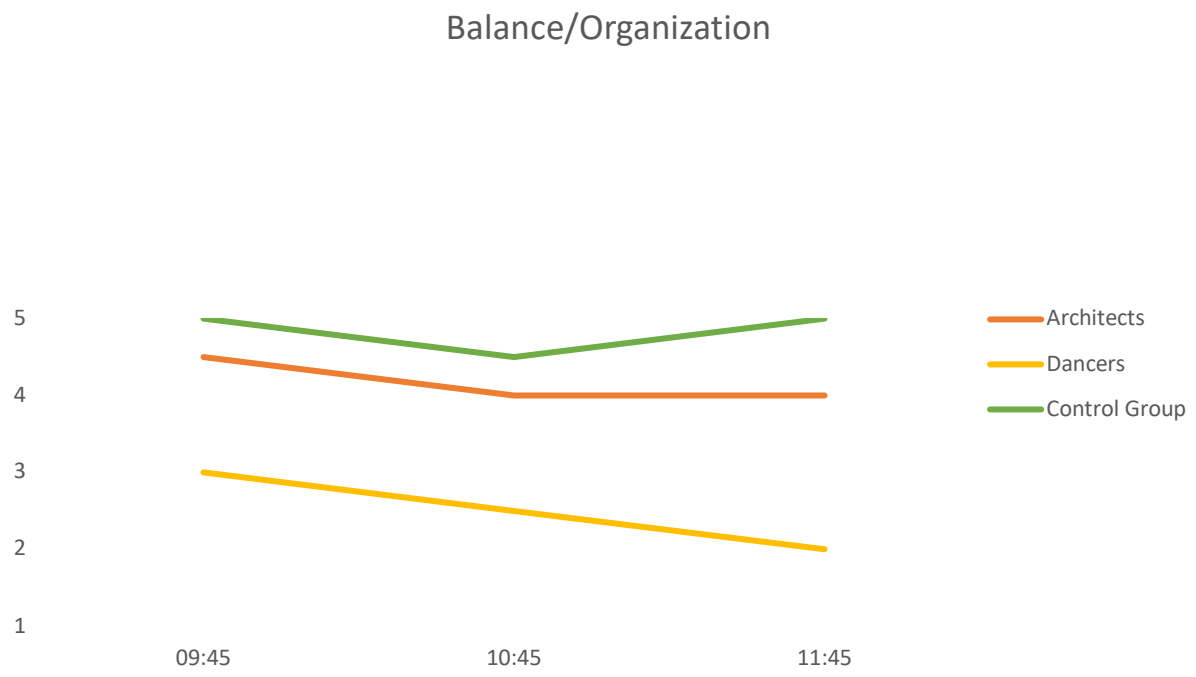
- The influence of lighting shows varying perceptions across groups, indicating that lighting's impact on spatial experience is not equally significant for all users.
- Dancers exhibit a sharp decline in perceived lighting influence. By 10:45 and 11:45, they rate lighting the lowest among all groups. This decrease may indicate that dancers are more focused on other factors (e.g., music, movement), reducing lighting's relative importance as their engagement increases.
- Architects perceive an increasing influence of lighting as time progresses. This trend suggests that lighting becomes more noticeable or integral to their spatial experience over time, possibly due to environmental changes.
- The control group shows a steady, gradual increase in lighting's influence, reflecting a consistent but subtle awareness of lighting's role in shaping their environment.



Graph 5 Crowd Influence

GENERAL OBSERVATIONS

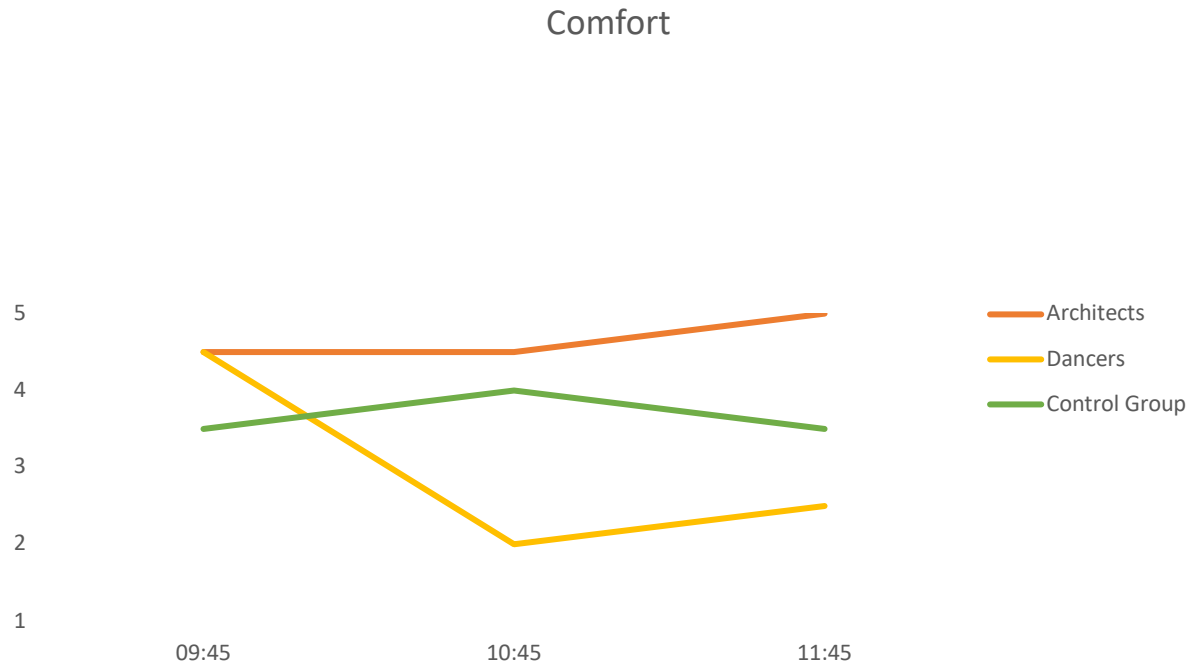
- Crowd influence shows distinct variations across groups, with different trends observed as time progresses. This indicates that the perception of crowd impact is highly subjective and context-dependent.
- Architects start with the lowest crowd influence perception at 09:45 but show a significant rise by 10:45. This suggests that architects are initially less sensitive to crowd dynamics but may become more aware as the environment becomes busier or more active.
- Dancers exhibit the highest awareness of crowd influence at 10:45. This could reflect their dependence on crowd density and movement patterns for navigation or interaction in the space. Their perception slightly drops by 11:45 but remains elevated, indicating a sustained focus on crowd impact compared to architects.
- The control group shows a steady increase in crowd influence from 09:45 to 10:45, followed by a slight decrease at 11:45. This suggests that their sensitivity to crowd dynamics increases with time but stabilizes as they adapt to the environment.
- The peak crowd influence for all groups at 10:45 indicates that this time period might represent a heightened level of activity or crowd density in the environment.
- Architects' declining awareness at 11:45 contrasts with dancers' and the control group's relatively consistent perceptions, hinting at group-specific adaptation or priorities.



Graph 6 Balance/Organization

GENERAL OBSERVATIONS

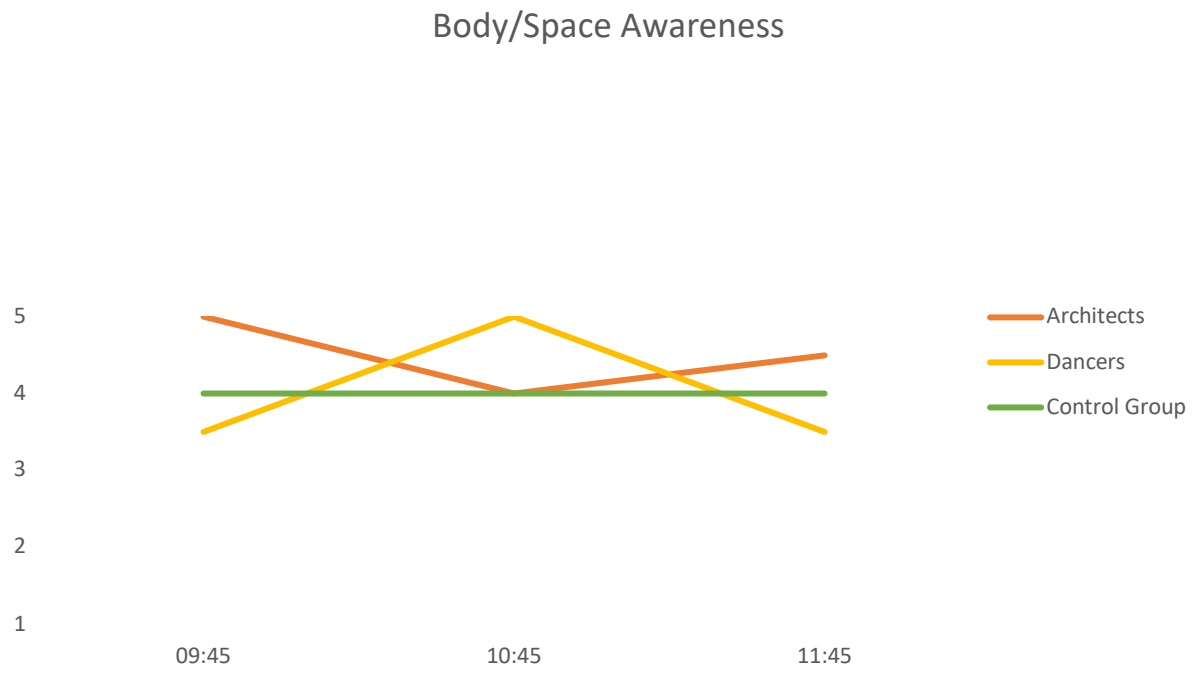
- Balance/organization perception varies notably between the groups, with architects and the control group showing higher consistency, while dancers perceive decreasing levels of balance over time.
- Dancers exhibit a sharp decline in perceived balance. This could reflect increasing sensitivity to disruptions in spatial organization. This steep decline might indicate the need for dancers to have clearly defined or harmonious spatial arrangements to maintain comfort and functionality.
- Architects maintain a relatively stable perception of balance across all time intervals. This suggests that architects might rely on objective spatial cues or their professional understanding to assess balance, leading to consistent evaluations.
- The control group reports consistently high perceptions of balance and organization. This suggests they are less critical in their evaluations compared to the other groups.
- The highest balance scores are reported at 09:45, potentially indicating a quieter or less dynamic environment early in the observation period.



Graph 7 Comfort

GENERAL OBSERVATIONS

- Comfort perceptions vary significantly among the groups, with architects showing the highest levels of comfort and dancers experiencing a steep decline over time.
- Architects maintain consistently high comfort levels. This stability suggests that architects may find the environment conducive to their needs or that their professional background enables them to adapt well to spatial changes.
- Dancers exhibit a dramatic drop in comfort after 09:45. This sharp decline could be due to environmental factors like crowd density, spatial constraints, or lighting changes that interfere with their physical or psychological comfort while dancing.
- The control group displays relatively stable comfort levels. Their consistent evaluation suggests they are less sensitive to environmental changes compared to dancers.



Graph 8 Body/Space Awareness

GENERAL OBSERVATIONS

- Body and space awareness fluctuates most significantly for dancers compared to the architects and the control group, indicating varied sensitivity to the environment.
- Dancers start with high awareness at 09:45, peak sharply at 10:45, and then drop significantly by 11:45. The peak at 10:45 suggests that certain factors (like lighting, crowd dynamics, or music influence) may enhance their spatial awareness temporarily. The decline at 11:45 could indicate fatigue or frustration due to environmental constraints impacting their ability to maintain awareness.
- Architects demonstrate consistently high levels of body and space awareness, with slight variations across time intervals. Their professional expertise in spatial understanding may account for their stability in this dimension.
- The control group shows stable body and space awareness across all time points, likely because their activities are not dependent on spatial interactions to the same extent as the other groups.
- While architects and the control group maintain steady levels, the dancers' dramatic rise and fall suggest a unique sensitivity to environmental or task-specific variables.

GROUP-SPECIFIC INFLUENCES ON SPATIAL EXPERIENCE DURING DANCE EVENTS

Table 11 Group-Specific Influences

Group	Factor	Perception Time	Average Score (1-5)
Architects	Lighting	Early	4
Architects	Crowd	Mid	3,8
Architects	Movement Freedom	Late	3,6
Dancers	Lighting	Early	4,5
Dancers	Crowd	Mid	4,2
Dancers	Movement Freedom	Late	3,7
Control Group	Lighting	Early	4,2
Control Group	Crowd	Mid	3,9
Control Group	Movement Freedom	Late	3,5

GENERAL OBSERVATIONS

- The interaction between individuals and their environment during dance events is shaped by a combination of sensory, social, and spatial factors. Different groups—architects, dancers, and a control group—perceive these factors uniquely.
- Architects tend to prioritize structural and spatial design elements such as lighting and crowd distribution. Early in the evening, they often describe the lighting as balanced and conducive to interaction, but as the event progresses, perceptions shift due to increasing crowd density and reduced movement freedom. These observations align with the architects' focus on functionality and spatial balance.
- Dancers emphasize embodied experiences, with their responses highlighting the importance of movement freedom and sensory aspects like music and floor quality. Early in the evening, they report high spatial awareness and satisfaction with lighting, but crowding and inadequate floor conditions later in the event impact their ability to move expansively, underscoring the relationship between movement and spatial constraints.
- Control group participants experience space primarily through social and emotional interactions. Their perceptions of lighting and crowd comfort remain relatively stable throughout the event, but their engagement often depends on how inclusive and accessible the space feels. Factors such as crowd density and conversational zones play a significant role in shaping their emotions and interactions.
- Over time, the evolving dynamics of the environment influence all groups, revealing the interplay between perception, emotion, and behavior in shared spaces.
- By considering these nuanced perspectives, architects and event organizers can better address the needs of diverse users.

Descriptive (Open-Ended) Questions

21:45

1. **What emotion or mood does this space evoke in you right now?**

WEEK 1

Architect 1: "I feel like I'm in a club where we have a good time, I just miss my music (I want to say only the environment creates a feeling of happiness, looks for movements and interactions)."
Architect 2: "Music is definitely not my vibe, I don't feel it generally. But the sound settings are nice and also not that loud. Lightning is comforting for enjoying drinks but also dancing. People are fine."
Dancer 1: "The party has an easy vibe. Music is quite important, it's good. As friends are crowd, I enjoy it."
Dancer 2: "My emotions on a dancing party are always influenced by first music and then crowd, for now ok."
Control Group 1: "Happiness, hips wanting to start to move."
Control Group 2: "Well at the moment as I said I feel out of place because the music and the crowd are not what I am used to. Maybe as time passes I get more comfortable."

WEEK 2

Architect 1: "The familiarity makes the space feel welcoming now, but certain limitations are more apparent. It's still a good space for socializing and dancing, but the lighting doesn't feel balanced—it works for sitting areas but doesn't highlight the dance floor effectively."
Architect 2: "The space is cozy, and it's still nice to see people enjoying themselves. However, I notice the compactness of the layout more now—it feels tight for the type of activity here. The music works well, but the lighting lacks energy and focus."
Dancer 1: "It feels nice to be back, and the music is already setting a good vibe. The familiarity is comforting, but I can tell it'll get warm quickly once more people start dancing."
Dancer 2: "I feel okay for now, but the floor feels as bad as last time. The heat hasn't kicked in yet, but I know it'll be an issue later."
Control Group 1: "The space still feels inviting, and the energy is building up nicely. It's nice to see the dancers enjoying themselves."
Control Group 2: "I feel more comfortable than last time, but I still don't completely fit in with the crowd. The lighting and music are pleasant."

2. **Is there anything you would change about this space to improve your experience?**

WEEK 1

Architect 1: "Everything seems ok now."
Architect 2: "The layout is great for interactions. It's small tbh but for now enough space for dancers and people who only want to talk, enjoy the vibe, and drink some drinks."
Dancer 1: "Size of the dance floor."

Dancer 2: "Move tables."
Control Group 1: "Nothing."
Control Group 2: "Make the bar more accessible."

WEEK 2

Architect 1: "Add dynamic lighting to emphasize the dance floor and improve visibility at the bar. The entrance area could also be redesigned to encourage more movement and interaction."
Architect 2: "The tables near the dance floor could be moved or reduced to open up the space. I'd also consider defining zones more clearly—for example, a more inviting transition from the seating area to the dance floor."
Dancer 1: "It's still early, but fixing the floor would make dancing so much better. Maybe add some fans before it gets too warm."
Dancer 2: "The tables near the dance floor still bother me. They take up space, and we really need more room to move."
Control Group 1: "Nothing comes to mind yet. Everything seems fine for now."
Control Group 2: "I'd still like the bar area to be more accessible. It feels a bit disconnected from the rest of the space."

22:45

1. **What emotion or mood does this space evoke in you right now?**

WEEK 1

Architect 1: "It's relatively dark, so it's a little strange, but the music still carries and it's a pleasant feeling."
Architect 2: "Well. Nothing special. I feel comfortable, people doing what they love, dancing. A group of people doing what they love, dancing and enjoying it. And it's nice to see them."
Dancer 1: "Limiting and more cramped."
Dancer 2: "Bad mood, frustration."
Control Group 1: "Same, although the emotions are more influenced by the crowd now."
Control Group 2: "I feel a bit more comfortable now and I like the vibe, the music, although I still don't feel like a part of the group here so I can't relax fully."

WEEK 2

Architect 1: "It feels more crowded now, and the compactness starts to feel limiting. The music keeps the energy up, but the physical space doesn't adapt well to the larger crowd, which makes it less comfortable."
Architect 2: "The vibe is good because people are dancing and enjoying themselves, but the space feels very tight now. The lighting doesn't adapt to the increasing energy, which makes the environment feel static despite the activity."

Dancer 1: "The floor space is too small, and it's hard to focus on the music when the heat is building up. The mood feels more frustrating now."
Dancer 2: "I'm starting to feel annoyed. It's cramped, the heat is making it worse, and I'm constantly worried about bumping into tables."
Control Group 1: "The atmosphere is still fun, but I notice the dancers looking tired. I like the energy of the music, though."
Control Group 2: "I feel more at ease than last time, and the vibe is improving. The lighting and music make it pleasant, even if I'm not dancing."

2. **Is there anything you would change about this space to improve your experience?**

WEEK 1

Architect 1: "Use the space close to the entrance more."
Architect 2: "Size."
Dancer 1: "Floor, make it bigger."
Dancer 2: "Tables, size, floor."
Control Group 1: "Still same."
Control Group 2: "Add some lights."

WEEK 2

Architect 1: "Use the entrance area better to balance the crowd and improve flow. Consider adding more standing zones without furniture to create flexibility for movement."
Architect 2: "The seating arrangement needs to be more flexible to accommodate peak times. Better lighting for the dance floor would also enhance the atmosphere and draw attention away from the crowding."
Dancer 1: "We need better airflow and more space. The floor size is just too small for this many people."
Dancer 2: "Get rid of the tables and improve the ventilation. It's unbearable to dance when it's this warm."
Control Group 1: "Adding some fans might help keep the dancers from overheating."
Control Group 2: "I think a larger bar area would make the flow better for everyone. It's too small for this crowd."

23:45

1. **What emotion or mood does this space evoke in you right now?**

WEEK 1

Architect 1: "The number of people is already decreasing, so the atmosphere has also dropped a bit."

Architect 2: "My perception and feelings have nothing to do with the space. In other words, it hasn't changed. Even though I'm tired and the concept is off, I still think the space is pleasant."
Dancer 1: "People are nice, but the floor is sooo bad, so the feelings are mixed."
Dancer 2: "I don't want to come back unless they change the place where the party will be next time. The setup and lack of space killed the mood."
Control Group 1: "Music is really good and makes you want to dance. Emotions are still positive, although I'm getting a bit tired."
Control Group 2: "I feel a bit tired. The music/lighting/crowd is ok, but there are not enough people similar to me here to stay entertained for 3 hours, so I did feel a bit bored towards the end. With a larger group of non-dancers, it would be more fun, I think, as then we could maybe also try dancing a bit without feeling too out of place."

WEEK 2

Architect 1: "With fewer people, the space feels calmer, but also less engaging. The layout highlights empty areas like the entrance and bar, which could be better integrated to maintain a lively atmosphere."
Architect 2: "The drop in energy is noticeable, and the space doesn't compensate for it. It feels functional, but it could be more engaging visually or spatially to adapt to the reduced crowd size."
Dancer 1: "I'm completely drained. The floor is bad, the heat is overwhelming, and it's hard to enjoy the music or the crowd anymore."
Dancer 2: "I don't feel like dancing anymore. The lack of space and ventilation ruined the mood, even though the music is still good."
Control Group 1: "I'm starting to feel tired, but the music and the remaining crowd keep the energy alive. It's still fun overall."
Control Group 2: "The space feels quieter now, but the atmosphere is still okay. It's not as engaging as earlier, though."

2. **Is there anything you would change about this space to improve your experience?**

WEEK 1

Architect 1: "It's still very easy to interact with others, space permitting. I would change the wall that 'divides' the dance floor and the seating area because it organizes views and movement."
Architect 2: "Even though there are fewer people dancing on the dance floor, everyone is still well distributed, and I don't see any major barriers. There is a lot of unused space at the entrance; it could be better connected to the rest to encourage interactions there as well."
Dancer 1: "Still same."
Dancer 2: "Change the place completely."
Control Group 1: "Same."
Control Group 2: "As previously said, it does encourage interaction, and even if I'm not dancing, people still come to talk. I think it is mostly because the DJ is at the other end of the room from where the bar is, so you're still able to talk. Those tables around the dance area seem to work well for dancers for interacting with each other."

WEEK 2

Architect 1: "Reconfigure the seating so it doesn't dominate the room when the crowd thins out. Lighting could also be adjusted to make the space feel warmer and more dynamic as the night progresses."
Architect 2: "Consider creating more defined zones, such as a lounge area near the entrance or bar. The dance floor could also use a surface that supports smoother movement—it feels limiting for dancing."
Dancer 1: "The floor has to be fixed, and there needs to be a better cooling system. These two things would change everything."
Dancer 2: "This space just isn't working for dancers. They should completely rethink the layout and prioritize comfort for people who are actively moving."
Control Group 1: "It's still enjoyable, but more ventilation could make it better for everyone."
Control Group 2: "Maybe more comfortable seating or better organization of the tables could make the space feel more inviting."

COMPARISON OF GROUPS

Table 12 Comparison of Groups

Category	Architects	Dancers	Control Group
Lighting Comfort	Well-balanced	Good for vibe	Comfortable
Music Suitability	Neutral	Essential, rhythmic	Positive but non-critical
Floor Quality	Not applicable	Unsatisfactory	Not applicable
Crowd Interactions	Moderate	Highly engaged	Moderate

GENERAL OBSERVATIONS

- Lighting: Architects consistently pointed out lighting as a factor that could enhance or detract from the spatial experience. Their feedback became more critical in the second week, suggesting that familiarity made them more aware of its limitations.
- Heat as a Dominant Factor: During the second week, heat was frequently mentioned by dancers as an impediment to their comfort and performance, especially later in the night. Architects and the control group did not emphasize this as much, indicating varied sensitivity to environmental conditions.
- Dancers were the most affected by crowd density, highlighting discomfort due to limited space and proximity to others. The control group showed moderate sensitivity, while architects commented on crowd dynamics only in relation to spatial functionality.
- Returning participants demonstrated increased criticality. This indicates that familiarity with the space enabled deeper reflection on its strengths and weaknesses.
- Dance Floor: All groups pointed out the inadequacy of the dance floor, with dancers stressing its size and quality. Architects suggested optimizing the entrance and seating to balance crowd flow better.
- Seating Areas: Control group members found the seating arrangement conducive to interaction, while dancers found it obstructive. Architects offered solutions to integrate seating with the active dance areas.
- Positive emotions were more prominent early in the evenings, driven by music and initial energy levels.
- Frustration and fatigue grew progressively, especially among dancers, due to heat and space limitations. Architects and the control group maintained relatively stable emotional responses throughout.
- Feedback on movement freedom, lighting, and comfort aligns with lower quantitative scores for these dimensions, especially for dancers.

GROUP SENTIMENT SUMMARY OVER TIME

Table 13 Group Sentiment Summary

Group	Time	Predominant Sentiment	Supporting Keywords
Architects	Early	Neutral	balanced, organized
Dancers	Early	Positive	happy, rhythmic
Control Group	Early	Neutral	comfortable
Architects	Mid	Neutral	adequate, crowding
Dancers	Mid	Mixed	cramped, good vibe
Control Group	Mid	Positive	engaged, social
Architects	Late	Neutral	pleasant, unused space
Dancers	Late	Negative	frustration, heat
Control Group	Late	Neutral	tired, conversational

COMMON THEMES AND SUGGESTIONS

Table 14 Common Themes and Suggestions

Category	Common Feedback	Proposed Change
Comfort	Lighting pleasant early but dim later	Dynamic lighting adjustments
Layout	Underused entrance, crowded dance floor	Reconfigure unused spaces for better flow
Atmosphere	Heat buildup over time	Improve ventilation and cooling
Floor Quality	Floor too small and slippery	Install larger, non-slip flooring
Crowd Management	Overcrowding reduces interaction	Limit capacity or create zones for movement

SUGGESTIONS FOR SPACE IMPROVEMENTS

- Both architects and dancers emphasized the need for better airflow and cooling systems to counteract the heat during peak activity times.
- Dynamic and targeted lighting could enhance the dance floor and improve spatial awareness.
- Reconfiguration of Tables and Bar Area - To free up space for movement and interactions while maintaining a balance between seating and standing zones.
- A better-quality floor would address dancers' consistent feedback about discomfort.
- The entrance area was noted as underutilized. Better integration with the main space, such as creating a welcoming lounge or extending interactions to this zone, could reduce crowding near the dance floor.
- Better defining zones for dancing and socializing. This would prevent overcrowding and allow for a more dynamic use of space, particularly during peak times.
- Improved acoustic design could balance sound levels across the space, ensuring that the music energizes dancers while allowing for comfortable conversation in other areas.
- Integration of Post-occupancy evaluation (POE): Post-occupancy evaluation (POE) is "a process of systematically evaluating the performance of buildings after they have been built and occupied for some time."[61] While this study provides real-time insights through the ESM, POE would assess how these changes impact the long-term performance and usability of the space. For example, monitoring air quality and ventilation effectiveness during future events could ensure sustained physical comfort, or, testing alternative materials for the dance floor and gathering extended user feedback would help identify solutions that enhance comfort and movement efficiency. By combining ESM insights with POE, future designs can more effectively support both functional and experiential needs.

[61] Wolfgang F.E. Preiser, "The Evolution of Post-Occupancy Evaluation: Toward Building Performance and Universal Design Evaluation," in *Learning from Our Buildings: A State-of-the-Practice Summary of Post-Occupancy Evaluation*, ed. Federal Facilities Council (Washington, DC: National Academy Press, 2001), 1.

VALIDITY

Quantitative Validity

Compliance:
The study demonstrated a high level of compliance, with participants responding consistently at each scheduled time point (09:45, 10:45, 11:45). This indicates that participants were engaged and followed the study's real-time prompts.
The absence of significant delays or skipped responses also supports the reliability of the data collection process.
Attrition:
Attrition, referring to participants dropping out or providing incomplete data, was minimal. All key participant groups (architects, dancers, and control) remained actively involved across the observation periods.
However, there is a noticeable decrease in the depth of responses (e.g., frequent "same" answers in later prompts), which may suggest fatigue rather than outright attrition. This highlights the importance of addressing participant engagement during extended sampling periods.

Qualitative Validity

Interference:
The event's structured setting (e.g., the music, crowd dynamics, and lighting) may have inadvertently influenced participants' perceptions. For example, loud music or sudden changes in crowd density could momentarily affect how participants perceive spatial elements such as movement freedom or comfort.
Some participants, particularly in the control group, may have felt out of place, as reflected in responses like "I still don’t feel like a part of the group." This discomfort might have affected their ability to provide neutral or uninfluenced feedback.
Reactivity:
Participants may have been influenced by their awareness that their feedback was being collected for research purposes.

Practical Applications for Architects and Dancers

This chapter synthesizes the theoretical and analytical considerations discussed earlier in the thesis, including the shared lexicon, observations, and interview findings, to apply them directly to the practices of architects and dancers. It explores how the embodied experience of space can inform the design of dance spaces and influence how dancers interact with their environment.

For architects, the focus is on designing spaces that not only fulfill functional requirements but also cater to the sensory and emotional needs of their users. By integrating the principles of movement, sensory perception, and embodiment discussed earlier, architects can create environments that enhance creativity and well-being. For dancers, understanding the interplay between their movements and the architectural environment can deepen their engagement with space, enabling choreography to respond dynamically to spatial constraints and opportunities.

This chapter serves as a bridge between analysis and practice, demonstrating how insights from the preceding sections can be applied to real-world contexts. It highlights the value of interdisciplinary collaboration in creating dance spaces that are not merely functional but actively contribute to the artistic and emotional experience of their users.

Practical Tools for Architects

BODY AWARENESS IN DESIGN

Designing spaces that align with the human body's needs and movements is an essential consideration for architects. Emphasizing body awareness in design can enhance the kinesthetic experiences of the people who use these spaces. To explore this further, architects could engage more physically with their designs by walking through similar environments, imagining how movements might flow within the space, or even utilizing virtual reality (VR) simulations.[62] These methods offer opportunities to better understand the spatial and sensory dynamics of their projects, ultimately leading to designs that feel intuitive and supportive for the body.

Physical engagement with a space helps architects gain a deeper understanding of how the human body navigates different environments. When designing spaces like dance studios, it is essential to consider how users interact with the floor, walls, and ceiling, ensuring the space allows for free and fluid movement. Architects can also reflect on their own movements during the design process, using this awareness to create environments that feel harmonious, comfortable, and responsive to the physical presence of their users.

Rudolf von Laban's work, which explores the relationship between movement and space, offers valuable insights for architects. His theories emphasize the dynamic interaction between the body and its surrounding environment, which can inspire architectural designs that prioritize fluid and adaptable spatial experiences.[63]

SPACE/SIZE

Designing spaces with an understanding of size is critical for both practical and aesthetic reasons. Size and proportion impact how individuals move through a space and whether the space feels comfortable or constricting. For dance spaces, this consideration is especially significant because dancers require open, unobstructed areas for movement. According to industry guidelines, minimum dimensions of 10x9 meters are recommended for dance studios to ensure that dancers have ample room to perform without crowding each other.[64]

Architects should also think about ceiling height, which directly impacts vertical movement in spaces used for dancing, gymnastics, or acrobatics. A minimum ceiling height of 3.5 meters is often recommended to accommodate jumps and lifts.[65] Well-sized spaces not only ensure safety and practicality but also help users feel psychologically comfortable. People generally feel more relaxed in spaces that match their physical size.

DESIGNING FOR MOVEMENT

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[62] "VR in Architecture: The Comprehensive Guide to Virtual Reality in Design," *Ugreen.io*, accessed December 5, 2024, https://ugreen.io/the-comprehensive-guide-to-vr-in-architecture/.
[63] Rudolf von Laban, *The Mastery of Movement*, 4th ed. (Boston: Plays, Inc., 1988).
[64] Eric Housh, "Building a Dance Studio the Right Way," *TutuTix*, accessed December 5, 2024, https://tututix.com/building-dance-studio-right-way/.
[65] Stage Studio Projects, 'Dance Studio Requirements & Guidance Part 1,' accessed December 5, 2024, https://stagestudioprojects.co.uk/dance-studio-requirements-guidance-part-1/.

Movement within a space should feel natural and uninterrupted, with pathways and transitions that seamlessly connect different areas. Architects have the ability to design spaces that align with the natural flow of human activity, creating environments that guide movement without imposing rigid pathways. This approach is especially important in spaces like dance studios or performance venues, where movement needs to remain fluid and adaptable to the spatial design. Elements such as curves, open pathways, and smooth transitions can enhance how users navigate and experience a space.

Example: Parks with winding pathways or buildings with open atriums encourage natural movement, allowing individuals to explore the space freely. These designs mirror the fluidity of movement found in dance, where choreography often adapts to and interacts with the surrounding environment.

ACOUSTICS

Acoustic design is a key consideration in creating functional and emotionally engaging spaces. Acoustics play a vital role in ensuring sound clarity and balance, particularly in spaces like dance studios where music is central to activities. According to Pro-Coustix, large, reflective surfaces such as laminate flooring and mirrored walls can cause sound reflections that interfere with concentration and communication. To address this, architects can incorporate sound-absorbing panels or specialized wall treatments to manage sound reflections and prevent noise disturbances between rooms.[66]

Soundproofing is another important aspect, helping to isolate sounds within the space and reduce interruptions from external environments. Additionally according to Pro-Coustix, dance spaces benefit from well-designed sound systems that deliver clear and dynamic audio. Adjustable systems are particularly useful, allowing customization based on the type of activity—whether it's a calm background melody for stretching or high-energy beats for intense dance sessions.[67]

Example: In dance studios, installing acoustic panels on walls and ceilings can absorb excess sound and reduce echoes, ensuring that music remains clear and consistent throughout the space. Similarly, incorporating curved surfaces or strategically placed barriers helps to direct sound evenly, creating an environment where instructors can communicate effectively and dancers can synchronize with the music without distraction.

LIGHTING

Lighting plays a crucial role in shaping how a space is experienced and used. Achieving a balance between natural and artificial light is essential in dance studios. Natural light can enhance the atmosphere during the day, but it should be adjustable using blinds or curtains to avoid glare or excessive brightness that could distract dancers or impact their performance.

[66] Pro-Coustix Team, "A Guide to Improving Acoustics in Music & Dance Studios," *Pro-Coustix*, accessed December 5, 2024, https://www.pro-coustix.com/blogs/tips-advice/a-guide-to-improving-acoustics-in-music-dance-studios.
[67] Ibid.

Evening rehearsals or performances often depend on artificial lighting, which should ensure even light distribution throughout the studio. LED lights are a popular choice because they are energy-efficient, long-lasting, and capable of providing bright, uniform illumination. Incorporating dimmable lighting options allows for flexibility in creating different atmospheres, such as bright, focused lighting for energetic rehearsals or softer, ambient lighting for reflective or intimate performances.[68]

MATERIALS

The choice of materials plays a crucial role in determining the functionality and comfort of a space. In dance studios, flooring is especially important as it directly impacts the safety and performance of dancers. Floors need to absorb shock to reduce the risk of injury during high-impact movements while maintaining a balance of firmness and flexibility. Sprung wooden floors are preferred because they provide the necessary support and cushioning for dancers.

Avoid using cement floors, as they can lead to joint problems and injuries due to their rigidity. Instead, a layer of padding or wood over the cement base can transform the floor into a dancer-friendly surface.[69]

The choice of wall materials plays a significant role in shaping both the functionality and atmosphere of a space. In dance studios, textured walls can help manage acoustics by reducing echoes, while mirrors on one or more walls are essential for allowing dancers to monitor their movements. Neutral or light-colored walls can create a calm and focused environment, whereas brighter colors may add energy and vibrancy, making them suitable for spaces designed for dynamic dance styles.

Lastly, ceiling height and material should be considered to support the verticality of movements such as jumps or lifts. Acoustic panels can be added to ceilings to further enhance the sound quality within the space.[70]

Example: Studios with high ceilings, mirrored walls, and sprung floors provide an ideal setting for dancers, offering both visual feedback and physical support for various movements.

VENTILATION AND AIR QUALITY

Good ventilation and air quality are crucial when designing dance spaces. Dancing involves a lot of physical activity, which necessitates constant airflow and proper temperature control to keep dancers comfortable and safe. Insufficient ventilation can make spaces feel stuffy, resulting in fatigue, discomfort, and health risks such as dehydration and heat-related issues. Additionally, spaces with poor ventilation can hold onto unpleasant odors and airborne particles, harming air quality and the overall experience in the space.

[68] Spark Membership Team, "Dance Studio Lighting Ideas," *Spark Membership*, accessed December 5, 2024, https://sparkmembership.com/dance-studio-lighting-ideas/.
[69] Eric Housh, "Building a Dance Studio the Right Way," *TutuTix*, accessed December 5, 2024, https://tututix.com/building-dance-studio-right-way/.
[70] Pro-Coustix Team, "A Guide to Improving Acoustics in Music & Dance Studios," *Pro-Coustix*, accessed December 5, 2024, https://www.pro-coustix.com/blogs/tips-advice/a-guide-to-improving-acoustics-in-music-dance-studios.

In designing dance spaces, architects must ensure that ventilation systems allow for efficient airflow, the regulation of temperature, and the removal of humidity. A combination of natural ventilation, such as operable windows, and mechanical systems can help achieve this balance. High ceilings can also improve air circulation, which is particularly beneficial for physically demanding activities. Maintaining a moderate temperature is important, as cold rooms can cause muscles to tighten, while excessive heat may lead to fatigue and reduced performance.

As stated in the guidelines for building a proper dance studio: Proper ventilation is crucial in dance studios to maintain air quality and prevent overheating, which can lead to heat exhaustion, and effective ventilation systems help regulate temperature and humidity, ensuring a comfortable environment for dancers.[71]

EMOTIONAL AND PSYCHOLOGICAL WELL-BEING

The environment in which dancers practice and perform significantly impacts their emotional and psychological well-being. Elements such as layout, lighting, acoustics, and air quality all play a role in shaping the dancer's experience. Thoughtfully designed spaces not only support movement but also foster a positive mental state, encouraging creativity, concentration, and a sense of calm.

Dancers thrive in environments that promote openness, freedom, and a sense of connection to their surroundings. The design of a dance studio or performance space, including its size, layout, and materials, plays a significant role in shaping how dancers emotionally engage with the space.

"In the choreography, the lighting design highlights the link between the dancer's movement and the director's perception and the coherence between the actors' bodies and the stage design."[72]

Interior spaces that engage multiple senses contribute to deeper emotional connections. As described in research, "qualities of space, matter and scale are measured together by the eye, ear, nose, skin, tongue, skeleton, and muscle."[73] Engaging multiple senses ensures that dance spaces are not only visually pleasing but also provide a physical and emotional connection, creating an environment that supports and enhances the dancer's experience.

Creating spaces that support emotional well-being involves designing environments that go beyond mere functionality, addressing deeper psychological needs. Architects can shape spaces that either uplift or drain energy, which is especially crucial in areas dedicated to creativity and expression, like dance studios. Thoughtful design choices—such as

[71] Dance Studio Safety: Innovative Safety Solutions for Dance Entrepreneurs," *FasterCapital*, accessed December 5, 2024, https://fastercapital.com/content/Dance-studio-safety--Innovative-Safety-Solutions-for-Dance-Entrepreneurs.html.
[72] Murali Basa, "Lighting Design Schemes and Colours in Dance Performances: The Magical Illusion," *ShodhKosh: Journal of Visual and Performing Arts* 4, no. 1 (2023): 358, https://doi.org/10.29121/shodhkosh.v4.i1.2023.289.
[73] Keunhye Lee, "The Interior Experience of Architecture: An Emotional Connection between Space and the Body," *Buildings* 12, no. 326 (2022): 2, https://doi.org/10.3390/buildings12030326.

appropriate lighting, materials, and acoustics—can foster environments that enhance both physical activity and mental focus.

Practical Tools for Dancers

ENGAGING WITH ARCHITECTURAL SPACES

Dancers typically see the spaces where they perform as just backgrounds for their movements, but these architectural environments can provide much more. By interacting with the architecture, dancers can discover new ways to move and express themselves. This creates a mutual relationship between the dancer and the space, where each one influences the other.
In site-specific performances, dancers should see architectural features—like walls, floors, ceilings, and windows—as essential components of the choreography rather than just a backdrop. Instead of moving separately from these structures, dancers can interact with them by integrating them into their movements. For example, a dancer might use a railing for support, climb onto a ledge to gain a different perspective, or use reflective surfaces to create intriguing visual effects. As Esin Hasgul and Saime Gumustas note, “Body being subject or object can be analysed understanding body and space in a correlative relation while distinguishing the position of body in space”.[74]

EXPLORING DIFFERENT LEVELS:

Architecture offers various levels and forms in space that dancers can utilize to make their movements more intriguing and complex. Often improvising, dancers interact with spaces that are not typically designed for dance performances. They incorporate elements such as stairs, elevated platforms, slanted surfaces, curved and irregular shapes, giving a new dimension to their performance. Dancers can modify their movements based on different heights, angles, or the "less accessible" parts of a space. This adds a vertical element to their performance, enhancing and influencing the overall dynamics of the space. By exploring different levels within a space, dancers introduce a new, unexperienced dimension, making both the space and the dance more engaging and captivating. As Rudolf Laban notes, “A multilateral description of movement which views it from many angles is the only one which comes close to the complexity of the fluid reality of space.”[75]

MOVEMENT THROUGH SPACE:

Movement in architecture and dance involves more than just physical action—it encompasses how space is experienced visually, emotionally, and conceptually. In architecture, movement can refer to the way forms guide the eye, the physical paths created for exploration, or even the imagined movement sparked by the design itself. Space itself can be understood through a grid-like system, where intersecting planes and axes create active areas for the body to engage with, reflecting the inherent geometry of both the body

[74] Esin Hasgül and Saime Gümüştaş, "The Choreography of Space with Body," in *The Time, Space + Body Project: 5th Global Meeting Proceedings*, (Oxford: Inter-Disciplinary Press, 2015), 2.
[75] Rudolf Laban, *The Language of Movement: A Guide to Choreutics*, ed. Lisa Ullmann (Boston: Plays, Inc., 1966), 8.

and the environment.[76] As noted, “Speaking of movement in architecture, the first thing that comes up is the existing movement in architectural form and space that has stemmed from architectural elements in motion. Then, the visual movement of a spectator followed by the physical movement of an explorer attracts the attention. There are other movements derived from the spectator’s mind. There are some other movements in architecture that do not need the explorer’s presence."[77]

INTERACTION WITH SPATIAL BOUNDARIES**:**

Spaces with defined boundaries and constraints can inspire creative exploration in dance performances. Dancers often engage with areas such as corners or narrow passages, using them to add tension and contrast to their movements. By navigating and adapting to these constraints, dancers can demonstrate how physical limits shape and influence their movement choices and freedom of expression. This interplay between movement and spatial boundaries enhances the connection between the performer and the environment, creating a dynamic and engaging experience.

SITE-SPECIFIC PERFORMANCES**:**

Site-specific performances take place in unconventional spaces such as public squares, historical landmarks, or industrial areas, where the characteristics of the location influence the choreography. By adapting movements to the unique features of these spaces, performers can create a strong connection between the environment and the audience. As noted, “Spatial experiences, movements and behaviours convert space into a time-wise and performative content.”[78] For example, sharp, angular movements may align with the structured forms of urban architecture, while expansive and fluid motions may complement the open shapes of natural or historical settings. This interaction between performance and space offers new perspectives, enhancing both the artistic expression and the audience's experience of the environment.

USING ARCHITECTURE TO ENHANCE EMOTIONAL EXPRESSION**:**

Architecture can evoke various emotions, such as a sense of openness or enclosure, excitement, awe, confinement, discomfort, anxiety, warmth, or coldness. The emotional tone set by the architectural space influences how dancers can adapt their performance to connect their emotional expression with the mood of the environment. By doing so, they integrate their performance with the space, making it more impactful for the audience. For example, performing in a large, awe-inspiring building can create a sense of grandeur, leaving the audience "breathless." In contrast, performing in a cozy, intimate space with

[76] Esin Hasgül and Saime Gümüştaş, "The Choreography of Space with Body," *The Time, Space + Body Project: 5th Global Meeting Proceedings* (Oxford: Inter-Disciplinary Press, 2015), 3.
[77] Mosleh Ahmadi, "The Experience of Movement in the Built Form and Space: A Framework for Movement Evaluation in Architecture," *Cogent Arts & Humanities* 6, no. 1 (2019): 4, https://doi.org/10.1080/23311983.2019.1588090.
[78] Esin Hasgül and Saime Gümüştaş, "The Choreography of Space with Body," *The Time, Space + Body Project: 5th Global Meeting Proceedings* (Oxford: Inter-Disciplinary Press, 2015), 6.

softer, gentler movements can create a calming and relaxing atmosphere, evoking a sense of tranquility in the audience. As Charles Spence notes, “While the impact of each of the senses, however many there might be, can undoubtedly be analyzed in isolation, as has largely been attempted in the preceding sections, the fact of the matter is that they interact one with another in terms of determining our response to the environment, be it built or natural.”[79] This highlights the importance of considering the interplay of sensory inputs in shaping our experience and emotional reaction to architectural spaces, making them a vital element for dancers to incorporate into their performances.

CONCLUSION:

Dancers need to recognize that space is not just a background. The architectural features of a space can be just as important to a performance as the dancers, props, or music. By appreciating the layout, structure, and even the history of a space, dancers can strengthen their connection to the environment and take their performances beyond the traditional stage. This relationship between space and movement can enrich both the dancer's experience and the audience's involvement.

[79] Charles Spence, "Senses of Place: Architectural Design for the Multisensory Mind," *Cognitive Research: Principles and Implications* 5, no. 46 (2020): 13, https://doi.org/10.1186/s41235-020-00243-4.

USING SENSORY PERCEPTION IN DANCE

Sensory perception is crucial in both dance and architecture, enabling dancers to connect deeply with the space, their own bodies, and the audience. By engaging their senses—such as sight, sound, touch, and smell—dancers can enhance their performances, making them more immersive and attuned to their surroundings. These sensory experiences also allow the audience to form a richer, more layered connection to the performance.

Sight:
The visual aspect of dance is often the first element noticed by both dancers and audiences. Dancers can utilize lighting—whether natural or artificial—reflections, shadows, and the surrounding architecture to create visual effects that enhance their movements. For instance, performances in spaces with large windows or reflective surfaces can interact with natural light and shadows, adding depth and complexity to the presentation. In enclosed spaces, artificial lighting can be adjusted to highlight specific parts of the performance, guiding the audience's attention to key moments. By creatively engaging with light and illumination, dancers not only emphasize their movements but also make the performance more captivating. As Juhani Pallasmaa explains, “The imagination and daydreaming are stimulated by dim light and shadow. In order to think clearly, the sharpness of vision has to be suppressed, for thoughts travel with an absent-minded and unfocused gaze. Homogenous bright light paralyses the imagination in the same way that homogenisation of space weakens the experience of being, and wipes away the sense of place.”[80] This highlights the idea that lighting not only influences visual perception but also affects imagination and the emotional atmosphere of a performance, making it a powerful tool for enhancing the connection between dance and the surrounding space.

Sound:
In site-specific dance performances, sound is not limited to the music but extends to the acoustic properties of the space. The materials and design of a space influence how sound behaves. For example, hard surfaces such as stone floors or high ceilings may create echoes, while softer materials like wood or carpet tend to absorb sound. Recognizing these qualities allows dancers to adapt their movements and the volume of their steps to complement the acoustic environment. Additionally, ambient sounds too can become part of the performance, enhancing its sensory depth. By responding to the rhythmic patterns created by their interaction with the space, dancers can transform the environment into an active participant in the musical experience. “The sound of space: are you listening?”[81]

Touch:
The tactile experience of dance is often overlooked but is just as essential as other sensory aspects. As dancers move, they interact with the textures and surfaces of the space they occupy. Floors, walls, and other architectural elements possess distinct qualities that influence a dancer’s movement and emotional expression. For instance, a polished floor might invite sliding movements, while the roughness of a brick wall can offer resistance, enhancing the dynamic range of motion. This tactile engagement mirrors the way dancers interact with a partner, establishing a connection that is physical and sensory. As Charles

[80] Juhani Pallasmaa, The Eyes of the Skin: Architecture and the Senses (London: Academy Editions, 1996), 46.
[81] Charles Spence, "Senses of Place: Architectural Design for the Multisensory Mind," *Cognitive Research: Principles and Implications* 5, no. 46 (2020): 7, https://doi.org/10.1186/s41235-020-00243-4.

Spence observes, “The tactile element of architecture is often ignored.”[82] Yet, touch plays a vital role in shaping our experience of space. Similarly, Juhani Pallasmaa states, “The skin reads the texture, weight, density and temperature of matter.”[83] These insights highlight the importance of incorporating tactile awareness into both architectural design and dance, allowing for a deeper interaction between the body and its surroundings.

Smell:
Although it’s often overlooked, the sense of smell can also affect a dancer's experience of a space. Every environment has its unique scent, which can trigger various emotions or memories. For instance, a performance in an old building might have the smell of aged wood, while an outdoor performance might feature scents of flowers, grass, or even rain. Charles Spence discusses the importance of multisensory architecture, noting how neglecting the olfactory experience in built environments can have negative effects on occupants. He argues that “sick building syndrome” is often attributed to poor air quality and the neglect of sensory stimulation, particularly smell. "And while a thorough examination of the building subsequently failed to reveal the presence of any particular toxic airborne pollutants that might have been responsible for the outbreak, in the majority of cases, it turned out that the symptoms of SBS were preceded by the perception of unusual odours and inadequate airflow in the building."[84] Dancers can investigate how the scents in their surroundings influence their movements and emotions, making smell a key element of site-specific performances.

Proprioception and Kinesthetic Awareness:
Proprioception, or the awareness of one’s body in space, is crucial for dancers as they move through architectural environments. This ability allows dancers to assess distances and determine the amount of force needed for their movements. As Rudolf Laban explains, “Man's movement arises from an inner volition which results in a transference of the body or one of its limbs from one spatial position to another. The outer shape of each movement can be defined by changes of position in space.”[85] This perspective underscores how movement is not only an expression of internal intent but also a direct response to the spatial framework in which it occurs. By developing their proprioceptive skills, dancers can more effectively interact with architectural spaces, allowing their movements to align with the layout and design of the environment.

Emotional and Psychological Responses:
The way a dancer engages with their environment on a sensory level greatly influences their emotional and psychological connection to the space. Different environments evoke specific feelings—for instance, a large, open area might inspire a sense of freedom, while a small, enclosed room may create a feeling of intimacy or introspection. Dancers can respond to these emotions by adapting their movements to align with the atmosphere of the space. In a dimly lit, low-ceilinged room, for example, slow and deliberate movements might convey a sense of constraint or deep reflection. To strengthen the emotional and psychological impact

[82] Charles Spence, "Senses of Place: Architectural Design for the Multisensory Mind," *Cognitive Research: Principles and Implications* 5, no. 46 (2020): 8, https://doi.org/10.1186/s41235-020-00243-4.
[83] Juhani Pallasmaa, The Eyes of the Skin: Architecture and the Senses (London: Academy Editions, 1996), 56.
[84] Charles Spence, "Senses of Place: Architectural Design for the Multisensory Mind," *Cognitive Research: Principles and Implications* 5, no. 46 (2020): 10, https://doi.org/10.1186/s41235-020-00243-4.
[85] Rudolf Laban, *The Language of Movement: A Guide to Choreutics*, ed. Lisa Ullmann (Boston: Plays, Inc., 1966), 10.

of their performance and deepen the connection with the audience, dancers can also incorporate sensory elements such as touch, sound, or sight into their expression. " The architect must act as a composer that orchestrates space into a synchronization for function and beauty through the senses – and how the human body engages space is of prime importance. As the human body moves, sees, smells, touches, hears and even tastes within a space – the architecture comes to life."[86]

Conclusion: Enhancing Performance Through Sensory Engagement

Dancers who fully engage their senses while performing in architectural settings can deliver more meaningful and immersive performances. By taking into account the visual, auditory, tactile, olfactory, and proprioceptive aspects of a space, dancers strengthen their connection with the environment, making the architecture a vital part of the performance. This approach invites audiences to experience a multisensory interaction, deepening their connection to both the dance and the surrounding space.

[86] Charles Spence, "Senses of Place: Architectural Design for the Multisensory Mind," *Cognitive Research: Principles and Implications* 5, no. 46 (2020): 14, https://doi.org/10.1186/s41235-020-00243-4.

Applied Concepts: Architecture Meets Dance

The interplay between architecture and dance offers unique insights into how spaces shape human movement and how movement, in turn, transforms spaces. Through various examples, it becomes evident that architectural design influences the way individuals perceive and navigate their environment, while dancers animate these static spaces through their movements, transforming them into dynamic and interactive environments. By examining real-world instances where architecture and movement intersect, we can better design with embodiment, spatial awareness, and sensory engagement. These examples highlight the dynamic dialogue between physical structures and human expression, offering valuable lessons for both architects and dancers.

Hypnotic Dancing around an Abandoned Swimming Pool

Scottish Ballet dancers Madeline Squire and Javier Andreu dance through the emptied Govanhill Baths in the south side of Glasgow to the sounds of JPT.[87]

fig 03 | Ballet dancers go deep in an abandoned swimming pool

This example is an excellent demonstration of the relationship between architecture and dance. The space itself is defined by high ceilings, tiled walls, and a large open area—characteristic features of early 20th-century bathhouses. The "hole" of the pool adds a unique dynamic to the space, with its boundaries shaping the dancer's movements. The dancer's movements emphasize the reciprocal relationship between human motion and architectural form. The pool serves as both a stage and a collaborator, its contours dictating the rhythm, scale, and direction of the choreography. This is a clear example of embodied cognition, as the dancer adapts to the pool's constraints, such as its depth and edges. Here, the body actively engages with the environment, interpreting and redefining the spatial boundaries through dynamic movement. The dancer's interaction with the pool transforms it from a static structure into a space with fluid, responsive dimensions, shaped by the choreography and the dancer's spatial awareness.

As previously discussed in the thesis, sound, texture, and visual elements influence how we perceive space. In this case, the hard tiled surfaces amplify sound, becoming an integral part of the choreographed performance, with the dancer's movements intentionally designed to engage with and highlight the unique acoustic qualities of the environment. The dancers

[87] "Hypnotic dancing around an abandoned swimming pool," YouTube video, 3:02, uploaded by NOWNESS, April 05, 2016, https://www.youtube.com/watch?v=Ihvy1-VhFBY&t=45s.

navigate the pool's geometry with fluid, expansive gestures, establishing a visual dialogue between the body and architecture.

As Juhani Pallasmaa emphasizes, an architectural work generates an indivisible complex of impressions. The live encounter weaves volumes, surfaces, textures, and even smells into a uniquely full experience.[88] This highlights the multi-sensory engagement architecture fosters, aligning with the thesis's exploration of how designed spaces influence dancers' psychological and physical experiences. By creating environments that appeal to multiple senses, architecture not only supports functional movement but also enhances emotional and sensory connections.

The abandoned state of the pool evokes a poignant atmosphere of nostalgia and melancholy. This space illustrates that sentiment through its dereliction and raw materiality. The emptiness of the pool accentuates a sense of isolation, contrasting with the vitality of the dancer's movements. This juxtaposition reinforces, as previously explained, that architecture can evoke emotional and sensory responses that shape our interaction with space. It also reflects the idea that "movement is both a reaction to and a reinterpretation of architecture." The performance highlights the importance of sensory and psychological responses in understanding space and demonstrates how architecture and dance co-create meaning, emphasizing the embodied experience of navigating architectural environments.

Additionally, the reimagining of an abandoned utilitarian space as an artistic stage illustrates how design and movement can reclaim and redefine environments. The derelict structure gains new cultural significance through creative reinterpretation.

This example aligns with the argument presented earlier in the thesis that architecture is not merely static but actively shapes and reshapes human interactions, as seen through its sensory and functional impact on movement and perception.

[88] Juhani Pallasmaa, The Eyes of the Skin: Architecture and the Senses (London: Academy Editions, 1996), 44.

Villa Savoye Becomes an Unlikely Stage

fig 04 | Villa Savoye

One of the most important buildings by architect Le Corbusier from the 17 that have been to UNESCO's World Heritage List is Villa Savoye.[89] Villa Savoye is not only an iconic example of architectural design; it has evolved into a performative space, as demonstrated in its use as an unexpected stage for dance in recent years. Projects like the Villa Savoye Dance Series by Vogue offer a fascinating lens through which to analyze the villa, aligning it with the intersection of movement, sensory engagement, and embodiment as explored in this thesis.[90]

Le Corbusier's "Five Points of Architecture"—pilotis, free plan, free façade, ribbon windows, and roof garden[91]—create an environment that invites movement and interaction. The open layout and the flow between indoor and outdoor spaces not only emphasize freedom of navigation but also transform the villa into a dynamic environment. The dancers in the Vogue series physically embody these principles, moving freely across the open plan and using the wraparound windows and rooftop garden as visual and spatial frames for their

[89] Eleanor Gibson, "Le Corbusier's Villa Savoye Encapsulates the Modernist Style," *Dezeen*, July 31, 2016, https://www.dezeen.com/2016/07/31/villa-savoye-le-corbusier-poissy-france-modernist-style-unesco-world-heritage/.
[90] Laura Regensdorf, "With a New Dance Series, Le Corbusier's Villa Savoye Becomes an Unlikely Stage," *Vogue*, August 23, 2019, https://www.vogue.com/slideshow/le-corbusier-villa-savoye-dance-series.
[91] "Le Corbusier's Five Points of Architecture," *Wikipedia*, last modified on 20 October 2024, https://en.wikipedia.org/wiki/Le_Corbusier%27s_Five_Points_of_Architecture.

performances.[92]

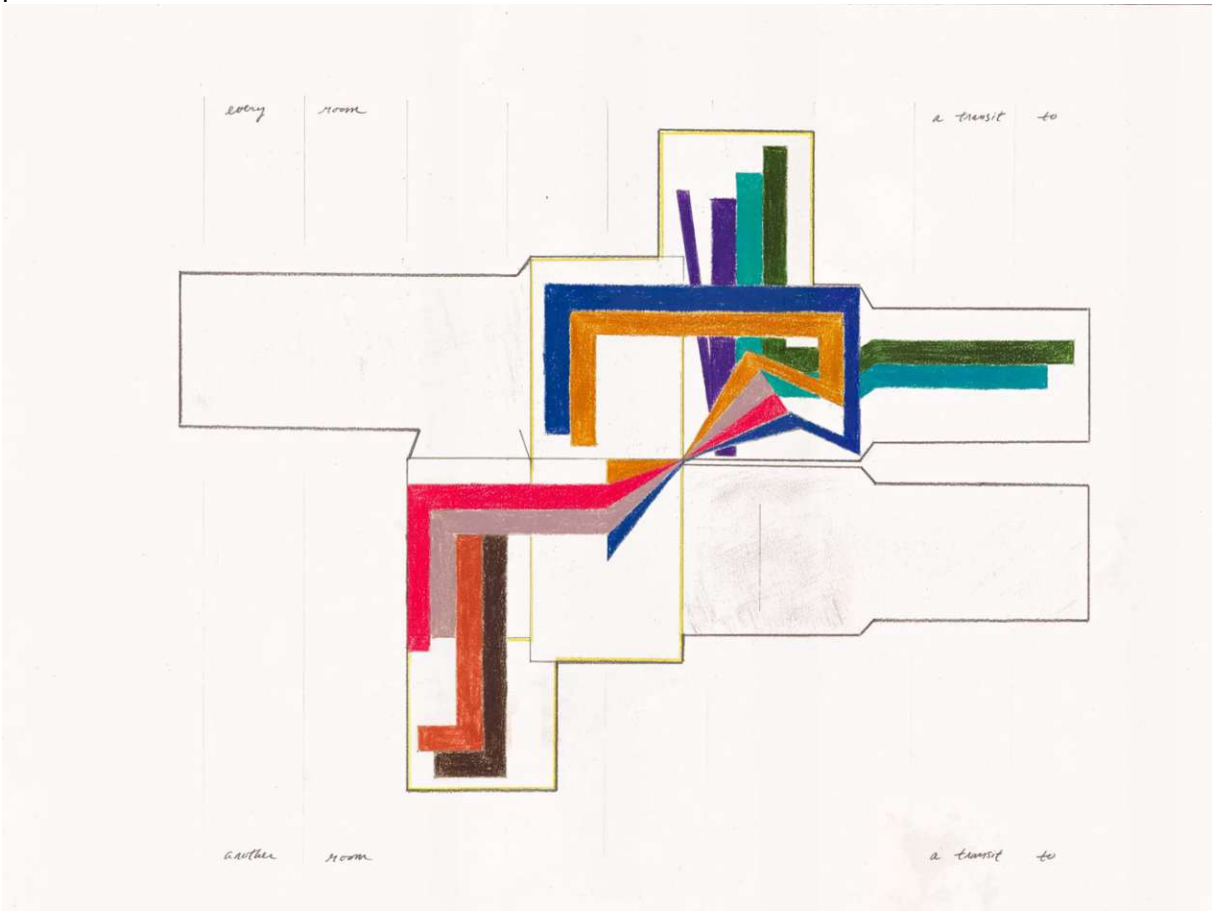

fig 05 | A drawing by Gerard & Kelly. Le Corbusier.

EMBODIMENT AND SPATIAL ENGAGEMENT

The interaction between dancers and the villa exemplifies embodied cognition, as explored earlier in the thesis. The dancers adapt their movements to the architectural constraints and opportunities presented by the villa's design. For example, the pilotis create a rhythmically interrupted yet open ground floor that challenges dancers to navigate vertical and horizontal structures. The choreography, in this sense, is shaped by the villa's layout. Here, the dancers "reshape" the space through their movement, as their physical engagement transforms the static architecture into a dynamic, lived environment.

SENSORY AND EMOTIONAL CONNECTIONS

The sensory qualities of Villa Savoye also play a vital role in this performance. The expansive ribbon windows frame natural views, allowing light and shadow to interact dynamically with the dancers' movements, as discussed in the thesis's exploration of lighting and emotional perception. The play of light and shadow on both the architectural surfaces and the dancers' bodies creates a multisensory experience that heightens the audience's awareness of both the space and the performance.

[92] Ibid.

Furthermore, the tactile materiality of the villa's design—such as the smooth plastered walls and the stark contrast between its reinforced concrete structure[93]—engages the dancers' proprioceptive awareness, enabling them to interact intuitively with the space. As the dancers perform, they transform the villa from a static object into an environment that evokes a deeper emotional and sensory connection.

A STAGE FOR MOVEMENT AND DESIGN

The reinterpretation of Villa Savoye as a stage aligns closely with this thesis's argument that architecture and dance share an intrinsic relationship, one in which space actively participates in shaping human experiences. By using the villa as a backdrop for choreography, the project challenges traditional notions of architecture, demonstrating how design can foster movement, creativity, and interaction. The performance shows how Villa Savoye's open layout, flexible design, and connection between indoor and outdoor spaces provide a stage for creative expression, enhancing the relationship between the space and movement.

[93] "Villa Savoye - Data, Photos & Plans," *WikiArquitectura*, accessed December 6, 2024, https://en.wikiarquitectura.com/building/villa-savoye/.

Pina Bausch's Tanztheater

Pina Bausch's Tanztheater explores the relationship between the dancers' bodies and architectural elements, and with that shows the interactive and transformative nature of space. Her choreographies also enable an embodied experience, because movements are shaped by the dancers' perception of their surroundings. Materials and spatial constraints significantly influence their movements.

Furthermore, the space is presented as a partner rather than a backdrop, with architectural elements integrated into the choreography as active components. Elements like water, rubble, and walls evoke strong emotional and sensory reactions in both dancers and audiences by engaging their perception and sensation. The tactile and visual properties of these elements heighten awareness of the environment, while the unpredictable textures and movements foster a sense of presence and connection.

Improvisation and interaction are prominent themes, as dancers continuously adapt to the environmental elements, thereby exploring spatial awareness. The spaces in her performances are not static but are constantly transformed through the dancers' movements, aligning with the idea that architecture and dance co-create meaning.

PALERMO PALERMO

fig 06 | "Palermo Palermo"

"Palermo Palermo" begins with the collapse of a massive wall on stage. This architectural element becomes central to the performance, as dancers interact with the rubble, treating it not as a static set but as a dynamic partner. The debris transforms into a medium through which the dancers explore spatial awareness. The collapsed wall and uneven surfaces embody the constraints and unpredictability of urban ruins, forcing dancers to adapt their movements. This interaction emphasizes the embodied experience, as physical engagement with the space shapes how performers navigate and interpret their environment. The architectural debris evokes emotional responses, such as a sense of destruction, resilience, and rebirth. The tangible qualities of the rubble (its hardness, irregularity, and weight) invite dancers to interact with it in ways that evoke sensory and emotional reactions. This engagement aligns with the concepts of sensation and perception, as the physical properties of the space directly influence the choreography.

The fragmented architectural space invites improvisation, as dancers adapt to its tactile and visual qualities. Movements are constantly redefined by the evolving environment, reinforcing themes of interaction and spatial transformation.

Conclusion

Spaces influence interactions, behavior, and emotions, opening doors for growth and connection. By understanding and applying concepts like embodiment, spatial awareness, and sensory perception, architects and dancers can design and use environments that promote well-being and creativity.

Movement is not only a response to space but also a tool to reinterpret and transform it. When spaces align with the needs of the body—through thoughtful layouts, tactile materials, adaptable lighting, and balanced acoustics—they become more than functional settings; they become active participants in the experiences they host.

Movement, as a form of daily activity, respects the rules of space, its design, and its architecture. Beyond the physical contact of the body with architecture, architecture also influences internal states, evoking different types of emotions. Architecture and design have the ability to connect, unite, and create interpersonal relationships or to restrict them. Moreover, body language and human behavior, in general, can provide feedback on the effectiveness of specific architectural designs and spaces.

Architecture and design can either facilitate or hinder our physical movements, just as they can influence the atmosphere of a space, whether it is relaxing or induces discomfort, stress, or anxiety. Specifically for dancers, architecture affects freedom of movement as well as perception through sight, sound, and touch.

Architectural elements can impact mental and emotional health. Touch (through certain materials), sounds, smells, colors, lighting, and room temperature are responsible for eliciting specific emotional reactions. Architects, in turn, are "responsible" for the functionality of spaces that support the mental and physical well-being of their users while considering these factors.

Improvisation in space further emphasizes the adaptability of both architects and dancers to spatial environments. It demonstrates a shared capacity to creatively respond to spatial constraints and possibilities, enriching human interaction with the space.

The shared features of architecture and dance, such as balance, symmetry and asymmetry, rhythm, proportions, movement, time, and particularly sensory perception, help in designing more functional environments and influencing the experience of space itself. This strengthens the connection between individuals and their surroundings, creating a holistic experience. This common ground between the two disciplines highlights their mutual focus on enhancing movement, creativity, and emotional engagement.

Finally, positioning one's body and movement in a specific space (in relation to floors, walls, and ceilings) helps architects understand the nature of movement and its execution within that space. Furthermore, by considering the arrangement of elements, adequate acoustics, sound insulation, lighting, materials, ventilation, and air quality, architects can create spaces that not only meet the aesthetic and visually pleasing needs of users—specifically dancers—but also significantly protect their physical and psychological health, while simultaneously fostering inspiration, creativity, and artistic expression.

On the other hand, a dancer dances in and with the space, utilizing all its architectural features. Architecture can help dancers establish a connection with the space and their own bodies, allowing them to express emotions through dance performance, which in turn creates a specific relationship and interaction with the audience. Through the visual aspects of dance, lighting, acoustics (sound), touch, and smell, dancers enhance and push the boundaries of their artistic performance. By developing an awareness of their bodies within the space, dancers align their movements with the environment, where architecture itself can become part of the artistic performance.

All of this points to the deep connection, mutual interplay, and interaction between architecture and dance, where architectural space has the power to transform human movement, and human movement has the power to transform architectural space.

This handbook emphasizes that architecture and dance share a dynamic relationship. By integrating embodied knowledge into spatial design and embracing improvisation and commonalities, both disciplines can create environments that inspire and engage, transforming the ordinary into something profoundly human and connected.

Appendix

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Annex

List of Abbreviations

ESM | Experience Sampling Method

POE | Post-Occupancy Evaluation

UNESCO | United Nations Educational, Scientific and Cultural Organization