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ARCHITECTURE AS A SENSORIUM. UNIVERSAL DESIGN IN RESPONSE TO THE VISUAL-CENTRED MODEL OF PERCEPTION

ARCHITEKTURA JAKO SENSORIUM. PROJEKTOWANIE UNIWERSALNE WOBEC WIZUALNOCENTRYCZNEGO MODELU PERCEPCJI

Abstract

The article aims to develop a conceptual framework for examining architecture as a culturally and socially shaped sensorium. The literature review and conceptual analysis integrate sensory anthropology, architectural theory, perception research and disability studies. The result is a proposed five-dimensional model for analysing architectural space, comprising the cultural hierarchy of the senses, sensory configuration, human–environment relationality, spatial sequencing and the dynamics of use, and user agency and participation.

Keywords: *anthropology of the senses, multisensory architecture, ocularcentrism, sensorium, universal design*

Streszczenie

Celem artykułu jest opracowanie ramy pojęciowej dla badania architektury jako kulturowo i społecznie kształtowanego *sensorium*. Przegląd literatury i analiza pojęciowa łączą: antropologię zmysłów, teorię architektury, badania percepcji i studia nad dostępnością. Rezultatem jest propozycja pięciowymiarowego modelu analiz przestrzeni architektonicznej obejmująca: hierarchię kulturową zmysłów, konfigurację sensoryczną, relacyjność człowiek-środowisko, sekwencyjność i dynamikę użytkowania oraz sprawczość i uczestnictwo użytkownika.

Słowa kluczowe: *antropologia zmysłów, architektura mulisensoryczna, projektowanie uniwersalne, sensorium, wizualnocentryzm*

1. INTRODUCTION

The development of research on perception, together with the increasing recognition of users' diverse capacities, prompts a reconsideration of how spatial experience is defined. It may be assumed that people perceive the built environment through mutually related visual,

auditory, tactile, thermal and olfactory sensations, as well as proprioceptive, kinaesthetic and vestibular information. In criticising the privileging of the eye, J. Pallasmaa presents the body as the locus in which perception is integrated. The user therefore does not remain an external observer of an object, but encounters it in movement and through contact with its material structure.[1]

Despite the multisensory character of experience, architecture continues to be represented and evaluated primarily as an image, including through perspective drawings, photography and visualisation. This model may influence the shaping of environments whose use depends predominantly on full access to visual information. In the approach adopted here, ocularcentrism and the model of the average user may be regarded as two manifestations of the same reductionism: the former simplifies human perception, while the latter simplifies the human being.

The article examines the possibility of interpreting architecture as a culturally and socially shaped sensorium, understood as a configuration of relations among the senses, the body, the environment, technology and established patterns of spatial use. In this context, universal design is considered a potentially useful framework for research and design, provided that it is not reduced to compliance with minimum technical parameters or to the subsequent removal of barriers in a building designed for an abstract recipient.

2. LITERATURE REVIEW

Studies in sensory anthropology provide the theoretical basis for the discussion. D. Howes argues that the human sensorium does not exist in a neutral state, since modes of sensing and the hierarchies assigned to individual modalities are shaped historically, culturally and politically.[2] Societies determine which senses are considered trustworthy, how they are combined and what meanings they acquire in social practices.

Transformations of the sensorium in the modern era are discussed in *A Cultural History of the Senses in the Modern Age*, in which transport, high-rise construction, photography, screens and consumer environments are presented as factors altering the relationship between bodily experience and panoramic, mediated ways of viewing the world.[3] This strand of research is complemented by Pallasmaa's critique of ocularcentrism and by studies that conceptualise spatial experience as an embodied, multisensory process.

The second strand of literature comprises studies of universal and inclusive design, relational understandings of disability and user knowledge. These publications associate accessibility of the built environment with the right to participation, the lived experience of users and the need to move beyond an idealised model of the human being. They are complemented by research concerning the sensory needs of people with visual impairments and autistic people.

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[1] J. Pallasmaa, *The Eyes of the Skin: Architecture and the Senses*, John Wiley & Sons, Chichester 2005, pp. 10–12, 20–21.

[2] D. Howes, *Introduction: Empires of the Senses*, [in:] D. Howes (ed.), *Empire of the Senses: The Sensual Culture Reader*, Routledge, New York 2020, pp. 10–13.

[3] D. Howes, *Introduction: 'Make It New!' – Reforming the Sensory World*, [in:] D. Howes (ed.), *A Cultural History of the Senses in the Modern Age*, Bloomsbury Academic, London–New York 2014, pp. 1–30.

3. METHODOLOGY

The article aims to develop a conceptual framework for investigating architecture as a multisensory environment. Selected publications were subjected to critical review. The analysis included works representing three complementary problem areas: the cultural determinants of perception, the multisensory experience of architecture, and design that takes account of users' diverse capacities. The selection served to synthesise concepts originating in different disciplines.

The next stage involved an analysis of the concepts of sensorium, sensory regime, intersensoriality, ocularcentrism, as well as accessibility and universal design. Assumptions originating in different disciplines were compared in order to identify their convergences, differences and limitations. The synthesis produced a model comprising five interrelated dimensions: sensory configuration, the cultural hierarchy of the senses, human–environment relationality, spatial sequencing and the dynamics of use, and user agency and participation.

4. ARCHITECTURE AS A CULTURALLY SHAPED SENSORIUM

In sensory anthropology, the concept of the *sensorium* does not denote a simple set of five discrete channels of reception. It refers instead to a dynamic arrangement of relations among perceptual modalities and to the meanings assigned to them in a particular period and culture. Perception does not result solely from the properties of the organism or the individual history of a person, but also depends on socially established practices, technologies and norms that determine which stimuli should receive attention and which information may be trusted.

Transferring this perspective to architecture makes it possible to consider a building as a structure that organises light, sound, temperature, smell, texture and movement, while also determining patterns of circulation and places of exposure, withdrawal and rest. Architecture may likewise establish rules for selecting information, for example by subordinating orientation to visual stimuli or by masking sounds that are important for recognising a situation. Every space is therefore multisensory, irrespective of whether this quality was consciously addressed in the design process. The problem lies not in the absence of effects on the other senses, but in a failure to recognise relations among stimuli, which may complement one another, remain in conflict or make it difficult to distinguish a signal from its background.

The use of the term *sensory regime* in relation to architecture is considered justified when it serves to identify the privileging of selected modalities, rather than merely providing a metaphorical description of the atmosphere of a place. Such a regime also has a social dimension, because access to a building's functions may depend on the ability to interpret a particular type of information, move at an imposed pace and comply with an established sequence of actions.

4.1. THE VISUAL-CENTRED MODEL OF PERCEPTION AND TRANSFORMATIONS OF THE MODERN SENSORIUM

Visual dominance in Western culture is not a uniform phenomenon; nevertheless, during the modern era it was reinforced by the development of photography, cinema, advertising, mechanised transport, high-rise construction and new methods of representing architecture.

The motor car enabled the landscape to be viewed as a succession of images while isolating travellers from many environmental stimuli. Air travel, in turn, introduced a panoramic view of the earth and an experience of detachment from the tactile, kinaesthetic and olfactory relations characteristic of movement across terrain.[4] This process may also be identified in the development of the skyscraper. Although its scale, vertical movement and changes in height have a bodily dimension, architectural discourse particularly emphasised the visual impact of the building mass and the view offered from its interior. The panoramic gaze from above diminished the significance of direct street-level experience, reinforcing vision as an instrument for encompassing, ordering and controlling space.[5]

Ocularcentrism does not, however, mean that modern and postmodern environments became less intense in other dimensions of perception. Spaces of commerce, entertainment and services increasingly employ sound, smell, temperature, light and texture to direct attention and induce predictable user behaviour. Howes describes this intensification and commercialisation of stimuli as *hyperesthesia*, drawing attention to the production and promotion of sensory values within the logic of late capitalism.[6]

Architecture considered as a sensorium should not be equated with marketing-led experience design or with maximising the number of stimuli. A multisensory environment may remain inaccessible when information is inconsistent, important signals are masked and users cannot reduce stimulation. Its quality depends on the legibility of relations among stimuli and on users' ability to employ, select or limit them.

5. THE RELATIONAL CHARACTER OF SPATIAL EXPERIENCE AND USER DIVERSITY

Research on multisensory integration indicates that environmental perception is not the sum of independent data supplied by individual senses. Visual, auditory, tactile, proprioceptive, kinaesthetic, vestibular and olfactory information may reinforce, correct or conflict with one another. C. Spence further notes that environmental stimuli may influence well-being and behaviour without being consciously recognised, while excessive combinations of sensory effects may lead to sensory overload.[7]

Adopting a relational model of perception entails moving away from design for an abstract "average person". In architectural theory, the body has repeatedly provided the basis for canons of proportion; however, the models adopted usually referred to an idealised user whose characteristics were treated as representative. In this context, E. Kuryłowicz identifies the limitations of normative models, ranging from historical systems of proportion to Le Corbusier's Modulor, which was based on the dimensions of a selected male figure.[8]

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[4] *Ibidem*, pp. 12–18.

[5] *Ibidem*, pp. 18–19.

[6] D. Howes, *Hyperesthesia, or, The Sensual Logic of Late Capitalism*, [in:] D. Howes (ed.), *Empire of the Senses: The Sensual Culture Reader*, Routledge, New York 2020, pp. 194, 196–199.

[7] C. Spence, *Senses of Place: Architectural Design for the Multisensory Mind*, "Cognitive Research: Principles and Implications" 2020, no. 5, art. 46, pp. 2–5, 14–16, https://doi.org/10.1186/s41235-020-00243-4 (access: 06.02.2026).

[8] E. Kuryłowicz, *Ludzki wymiar architektury. Teoria dla praktyki,* Narodowy Instytut Architektury i Urbanistyki, Warszawa 2024, pp. 42–51.

Contemporary knowledge about the human being instead justifies accounting for the actual user, whose capacities change with age, health, experience, temporary impairment and the conditions in which an activity is performed. In this approach, universal design is presented not as a technical addition to a completed scheme, but as a design philosophy that connects knowledge of human diversity with the practice of shaping a functional and aesthetically considered environment.[9]

Disability reveals the relational character of experience particularly clearly, since restrictions on participation do not result exclusively from bodily properties, but emerge in encounters with barriers in the material and social environment. I.M. Lid therefore argues that universal design requires the simultaneous consideration of the actual body, the specific context and human–environment interaction, and that its implementation should draw on interdisciplinary knowledge and diverse user perspectives.[10]

The experience of people with disabilities may be treated as a source of architectural knowledge rather than merely as a basis for checking compliance with technical requirements. Research by P.-W. Vermeersch and A. Heylighen demonstrates that users identify barriers and qualities overlooked by designers. Building visits revealed the importance of smell, light, sound, echo, texture and air movement for orientation and comfort.[11]

5.1. UNIVERSAL DESIGN AS A FRAMEWORK FOR INVESTIGATING AND DESIGNING THE SENSORIUM

Universal design is developing as an approach based on considering the diversity of users from the very beginning of the design process. G. Gawron associates this idea with social participation and with counteracting exclusion generated by environments shaped for an average user.[12]

In architecture, particular importance should be attached to the shift from accessibility understood as a catalogue of parameters towards the analysis of actual spatial experience. A. Heylighen, V. Van der Linden and I. Van Steenwinkel present inclusive design as an approach that accounts for the diversity of human interactions with space. People with disabilities may contribute knowledge of the haptic, acoustic and olfactory properties of architecture that is not captured by standard audit analysis.[13]

In this respect, universal design may provide a framework for shaping multisensory architecture, but it does not imply an obligation to introduce the greatest possible number of

[9] *Ibidem*, pp. 93–105.

[10] I.M. Lid, *Universal Design and Disability: An Interdisciplinary Perspective*, "Disability and Rehabilitation" 2014, no. 36(16), pp. 1344–1349, https://doi.org/10.3109/09638288.2014.931472 (access: 24.07.2026).

[11] P.-W. Vermeersch, A. Heylighen, *Mobilizing Disability Experience to Inform Architectural Practice: Lessons Learned from a Field Study*, "Journal of Research Practice" 2015, no. 11(2), art. M3, pp. 2–7, 12–22, http://jrp.icaap.org/index.php/jrp/article/view/495/419 (access: 24.07.2026).

[12] G. Gawron, *Universal Design – projektowanie uniwersalne jako idea w dążeniu do osiągania partycypacji społecznej osób niepełnosprawnych*, "Roczniki Nauk Społecznych" 2015, no. 7(43)(1), pp. 125–130, 136–143, https://doi.org/10.18290/rns.2015.7(43).1-9 (access: 20.06.2025).

[13] A. Heylighen, V. Van der Linden, I. Van Steenwinkel, *Ten Questions Concerning Inclusive Design of the Built Environment*, "Building and Environment" 2017, no. 114, pp. 507–512, 516–517, https://doi.org/10.1016/j.buildenv.2016.12.008 (access: 03.04.2026).

sensations. What should be considered important is the provision of alternative and, as far as possible, non-conflicting ways of obtaining information, the legibility of spatial sequences, the possibility of choosing how to act and the ability to control environmental conditions. Multisensory design should therefore increase perceptual access and user agency rather than impose a uniform and intensive experience.

Publications concerning accessibility for people with visual impairments indicate the importance of contrast, even illumination, differentiated textures, tactile markings and continuity of solutions. E. Przesmycka, W. Jabłoński and J. Kania demonstrate that visual and material uniformity, glare, insufficient contrast and illegible devices may restrict safety and independence. An individual element does not create an accessible environment unless it forms part of a coherent orientation system.[14]

In her analyses of playgrounds, sensory gardens and experiential parks, P. Tota discusses the use of tactile plans, models, auditory information, smells, surfaces and movement-based activities to support the orientation, education and independence of children with visual impairments. M. Mostafa's Autism ASPECTSS™ model, in turn, includes acoustic control, spatial sequencing, withdrawal spaces, sensory zoning and safe transition zones. Both approaches confirm the need to account for access to information and the possibility of limiting stimulation.[15,16]

Universal design requires critical interpretation, since a declaration that a design is "for everyone" may once again produce an abstract user. R. Imrie observes that a technical solution does not guarantee access when its operation depends on institutional practices, attitudes and the context of use.[17] A. Hamraie, in turn, identifies the risk of a post-disability ideology in which the neutral language of "good design" obscures inequality and the political dimension of accessibility. Universal design should therefore not remove disability from view, but should draw on the knowledge generated through its experience.[18]

5.2. A MODEL FOR ANALYSING ARCHITECTURE AS A SENSORIUM

On the basis of the analyses, five dimensions were proposed to structure the study of existing buildings and the formulation of design assumptions. The first is the *cultural hierarchy* of the senses, understood as the assignment of cognitive, aesthetic and functional value to individual modalities.

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[14] E. Przesmycka, W. Jabłoński, J. Kania, *Uniwersalność przestrzeni i obiektów użyteczności publicznej w kontekście osób z dysfunkcją wzroku*, "Teka Komisji Architektury, Urbanistyki i Studiów Krajobrazowych" 2016, no. 12(4), pp. 94–105, https://doi.org/10.35784/teka.1531 (access: 14.06.2026).

[15] M. Mostafa, *Architecture for Autism: Autism ASPECTSS™ in School Design*, "Archnet-IJAR: International Journal of Architectural Research" 2014, no. 8(1), pp. 143–150, 154–157, https://doi.org/10.26687/archnet-ijar.v8i1.314 (access: 22.07.2025).

[16] P. Tota, *Multisensoryczne przestrzenie publiczne. Zasady i wytyczne dla tworzenia miejskich placów zabaw, ogrodów sensorycznych i parków doświadczeń w kontekście projektowania dla dzieci i młodzieży z niepełnosprawnością wzroku*, "Niepełnosprawność – Zagadnienia, Problemy, Rozwiązania" 2019, no. 2(31), pp. 17–21, 28–35.

[17] R. Imrie, *Universalism, Universal Design and Equitable Access to the Built Environment*, "Disability and Rehabilitation" 2012, no. 34(10), pp. 875–881, https://doi.org/10.3109/09638288.2011.624250 (access: 13.04.2026).

[18] A. Hamraie, *Universal Design and the Problem of 'Post-Disability' Ideology*, "Design and Culture" 2016, no. 8(3), pp. 293–303, https://doi.org/10.1080/17547075.2016.1218714 (access: 24.06.2026).

The second dimension is *sensory configuration*, which encompasses the type, intensity, variability and congruence of visual, auditory, tactile, thermal and olfactory effects, as well as proprioceptive, kinaesthetic and vestibular information arising from the design, environmental conditions and patterns of use.

The third dimension, termed *human–environment relationality*, concerns the encounter between environmental properties and the user's capacities, experience and purpose. The same solution may support one person, remain neutral for another and create a barrier for a third; the needs of different users may complement one another or remain in conflict. Assessment should therefore address a specific situation of use rather than merely the formal presence of an element.

The fourth dimension, termed *spatial sequencing and the dynamics of use*, concerns the order of experiences and actions, movement, rhythm, the predictability of change, the time available to interpret information and the possibility of stopping and reassessing a situation. The fifth dimension, *user agency and participation*, encompasses the ability to choose a route, mode of communication, type of support and level of stimulation, as well as user participation in investigating, evaluating and transforming the environment.

Table 1. Five Dimensions of Analysing Architecture as a Sensorium (author's own elaboration based on the literature analysed)

Dimension	Research question	Application
Cultural hierarchy of the senses	Which sensory modalities are privileged?	Identification of privileged perceptual modalities.
Sensory configuration	How do stimuli jointly shape the perception of space?	Assessment of coherence, sensory conflicts and overload.
Human–environment relationality	How do spatial properties condition possibilities of use?	Assessment of barriers and facilitators in specific situations of use.
Spatial sequencing and the dynamics of use	How do spatial progression and variability affect action?	Analysis of routes, transitions and decision points.
User agency and participation	What degree of choice and control is available to the user?	Assessment of autonomy, environmental control and user participation.

The proposed form of the model, which is not intended as a catalogue of technical solutions, may provide a conceptual framework for identifying the relationships between spatial properties, the cultural organisation of space, and diverse modes of use. At the same time, it may help distinguish multisensory design from sensory decoration: scent, music, or textured surfaces do not automatically enhance accessibility, as they may support orientation but may also mask relevant cues or contribute to sensory overload.

6. CONCLUSIONS

Space organises relations among the senses, the body, movement and meaning, and may therefore privilege particular modes of orientation and action while restricting the participation of people whose experience does not correspond to the assumed user model.

Ocularcentrism does not concern only the aesthetic privileging of the image, since it is also associated with designing for a person capable of rapidly interpreting visual information and conforming to the visual organisation of the environment. At the same time, merely increasing the number of stimuli does not resolve the problem, because multisensory design requires recognition of relations among different kinds of information, the possibility of using them and the ability to regulate the intensity of stimulation.

In this context, universal design is understood not only as an approach to planning accessible architecture, but also as a tool for examining the relationship between spatial properties and the diverse capacities of users. Its usefulness, however, depends on the meaningful involvement of users, the identification of actual patterns of use, the consideration of potential conflicts between different needs, and the evaluation of how the implemented solutions perform in practice.

The study results in a preliminary five-dimensional model for analysing architecture as a sensorium. Rather than providing a catalogue of technical requirements, the model offers a conceptual framework for examining sensory configurations, culturally shaped hierarchies of the senses, human–environment relations, the sequential and dynamic nature of spatial use, and user agency and participation. Given the theoretical character of the study, the model should be understood as a starting point for further research, including empirical investigations of existing buildings, observations of patterns of use, and analyses conducted with the participation of individuals with diverse sensory, cognitive, and motor abilities.

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