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BETWEEN SEEING AND EXPERIENCING. MULTISENSORY PERCEPTION AS A CONDITION OF PERCEPTUAL ACCESSIBILITY IN ARCHITECTURAL SPACE[1]

MIĘDZY WIDZENIEM A DOŚWIADCZANIEM. WIELOZMYSŁOWOŚĆ JAKO WARUNEK DOSTĘPNOŚCI PERCEPCYJNEJ PRZESTRZENI ARCHITEKTONICZNEJ

Abstract

The article examines architectural space as an environment experienced in movement rather than as a static visual representation. Its aim is to develop an analytical framework of perceptual accessibility, understood as the capacity to perceive and interpret spatial organisation and to navigate and use architectural space independently. It combines a problem-oriented review of literature on embodied perception, wayfinding, and universal and inclusive design with conceptual synthesis. The synthesis produces a model comprising four interdependent dimensions: sensory-impression, embodied-movement, orientational-sequential, and informational-semantic. The model is intended as a framework for further empirical verification and design assessment; it is not presented as a normative standard.

Keywords: *architectural space, multisensory perception, perceptual accessibility, spatial experience, universal design, wayfinding*

Streszczenie

Artykuł analizuje przestrzeń architektoniczną jako środowisko doświadczane w ruchu, a nie jedynie jako statyczną reprezentację wizualną. Celem jest opracowanie ramy analitycznej dostępności percepcyjnej, rozumianej jako możliwość odbioru i interpretacji organizacji przestrzennej oraz samodzielnego korzystania z przestrzeni. Opracowanie ma charakter teoretyczno-koncepcyjny. Łączy problemowy przegląd literatury dotyczącej percepcji ucieleśnionej, orientacji przestrzennej oraz projektowania uniwersalnego i inkluzywnego z syntezą pojęciową. Rezultatem analizy jest model czterech współzależnych wymiarów: sensoryczno-wrażeniowego, cielesno-ruchowego, orientacyjno-sekwencyjnego oraz informacyjno-znaczeniowego. Model stanowi ramę do dalszej weryfikacji empirycznej i oceny rozwiązań projektowych; nie jest przedstawiany jako standard normatywny.

Słowa kluczowe: *dostępność percepcyjna, doświadczenie przestrzeni, projektowanie uniwersalne, przestrzeń architektoniczna, wayfinding, wielozmysłowość*

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1. INTRODUCTION

Architectural space is commonly described in terms of form, function, scale, structure, and material relationships, while drawings, photographs, and visualisations reinforce a predominantly visual perspective. These tools are useful, but do not fully capture how a building is used. In this article, space is understood as a relationship between the built environment and the user's perception and action.

Users encounter space gradually and through movement: they stop, change direction, and respond to scale, light, texture, sound, temperature, and material. Recognition depends on visual, tactile, acoustic, and kinaesthetic information, as well as memory of the route already travelled.

Architectural accessibility is most often framed in terms of removing physical barriers, meeting technical requirements, and enabling specific activities. These criteria do not determine, however, whether a user will identify the entrance, understand the functional layout, choose a route, and confirm their location. Perceptual accessibility therefore complements, rather than replaces, technical accessibility.

The aim of the article is to develop a conceptual model of perceptual accessibility. The analysis considers which spatial properties support perception, understanding, and independent use, and how they can be organised. It assumes that multisensory perception supports accessibility when cues form a legible, hierarchical, and verifiable information system.

2. METHODOLOGY AND SCOPE OF THE STUDY

The article is theoretical and conceptual. It combines a problem-oriented review of purposefully selected Polish- and English-language literature on the multisensory experience of architecture, embodied perception, universal design, and spatial orientation with conceptual synthesis. The aim was not an exhaustive review, but the identification of relationships between perception, movement, information, and user independence.

The material was organised into three fields: phenomenology and embodied perception, research on orientation and wayfinding, and universal and inclusive design. Categories relating to sensory cues, bodily action, spatial sequence, and meaning were compared and grouped into four dimensions. The model is classificatory and hypothesis-generating; it is not derived from user studies and does not establish causal relationships.

3. FROM SEEN SPACE TO EXPERIENCED SPACE

In architectural discourse, architecture often functions as an image: a photograph, visualisation, framed façade, or formal composition. Such representations facilitate comparison, but omit time, movement, and changes in viewpoint. Users encounter space fragment by fragment, in a particular situation and under changing sensory and cognitive conditions.

Juhani Pallasmaa criticises the reduction of architecture to an image, pointing to the neglect of its bodily, haptic, and multisensory character. This does not mean rejecting vision, but questioning its exclusivity. The difference between a building viewed and one used

emerges in specific events: the rhythm of footsteps, the resistance of a door, the reverberation of a hall, the temperature of a material, light that reveals an entrance, or uncertainty at a decision point.[2]

Maurice Merleau-Ponty's phenomenology of perception describes this relationship without separating body and cognition. The body is not a passive receiver of stimuli, but a medium of orientation and action. Users recognise space by relating current impressions to movement, bodily reach, memory of the route travelled, and anticipation of the next step.[3]

The concepts of atmosphere and place complement this reasoning. Peter Zumthor relates atmosphere to the simultaneous operation of material, light, sound, temperature, scale, and human presence.[4] Christian Norberg-Schulz describes place through the capacity for orientation and identification. Both perspectives shift attention from architecture as a neutral arrangement of functions towards an environment that may facilitate recognition and understanding or cause disorientation.[5]

An experiential perspective does not diminish the importance of vision; it enables the legibility of a building to be assessed through cooperation between perceptual channels rather than the replacement of one sense by another.

4. MULTISENSORY PERCEPTION AS A CONDITION OF PERCEPTUAL ACCESSIBILITY

Multisensory perception is understood here as a means of communicating spatial information, not as a multiplication of aesthetic effects. Cues support the recognition of boundaries, directions, functions, and changes in level when they form a coherent hierarchy. Excessive or conflicting stimuli may instead impede orientation.

Light can reveal an entrance or circulation axis, contrast distinguish an edge from its background, texture signal a boundary, and acoustics help users judge the scale of an interior. Excessive reverberation may, however, hinder the comprehension of messages. The usefulness of cues therefore depends on context, the user's task, and perceptual capacities.

James J. Gibson's ecological approach to perception explains this relationship through the concept of affordances. The environment is perceived in terms of what it enables a person to do: enter, pass through, stop, avoid an obstacle, select a direction, or recognise a hazard. Light, texture, sound, and form are therefore not merely impressions, but cues concerning possible action.[6]

The importance of alternative and complementary information channels is particularly evident in the experience of blind and partially sighted people. Route recognition may rely on landmarks, changes in surface, tactile information, acoustic properties, and repeated

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[2] J. Pallasmaa, *The Eyes of the Skin: Architecture and the Senses* (3rd ed.), Wiley, Chichester 2012, pp. 14–34.

[3] M. Merleau-Ponty, *Phenomenology of Perception*, Routledge, London–New York 2012, pp. 100–148.

[4] P. Zumthor, *Atmospheres: Architectural Environments. Surrounding Objects*, Birkhäuser, Basel 2006, pp. 11–13, 21–63.

[5] C. Norberg-Schulz, *Genius Loci: Towards a Phenomenology of Architecture*, Academy Editions, London 1980, pp. 5–23.

[6] J.J. Gibson, *The Ecological Approach to Visual Perception*, Houghton Mifflin, Boston 1979, pp. 127–143.

sequences. A review of research on sensory disabilities shows that access to spatial information and the representation of different groups' needs are important but unevenly investigated areas.[7]

The principle of perceptible information in universal design requires information necessary for using a product or environment to be communicated effectively, regardless of ambient conditions or the user's sensory abilities.[8,9] In architecture, this entails using complementary channels: direction, function, or hazard should not be communicated through a single code alone. This is particularly relevant to autistic people, who may experience difficulties in processing stimuli, sensory overload, and problems with orientation in complex or illegible environments.[10]

Multisensory perception supports accessibility not by intensifying experience, but by enabling information to be recognised and confirmed through different channels. Space is more legible when its layout, sensory cues, and signage lead to consistent conclusions.

5. EMBODIED AND SEQUENTIAL EXPERIENCE OF SPACE

Users occupy buildings as people who move, stop, and search for a destination. There is no single model of a "typical" user: pace, reach, balance, ways of seeing and hearing, tolerance of stimuli, and capacity for concentration vary. Inclusive design treats these differences as a starting point for shaping the environment, rather than deviations requiring later correction.[11]

Spatial features influence possible actions. A door may be a legible invitation to enter or difficult to recognise; a handrail supports balance and confirms the route; a change in material may signal a boundary but should not itself create an obstacle. Spatial information is therefore contained both in architectural elements and in the way they are combined.[12]

The experience of a building is sequential: it includes the approach, recognition of the entrance, crossing the threshold, orientation, selection of a direction, arrival at the destination, and retracing the route. Each stage requires different information and a decision; a missing cue may interrupt independent use of the entire route.

Figure 1 presents typical stages of spatial use at which the user recognises a situation, makes a decision, and confirms its correctness.

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[7] S.E. Chidiac, M.A. Reda, G.E. Marjaba, *Accessibility of the Built Environment for People with Sensory Disabilities – Review Quality and Representation of Evidence*, "Buildings" 2024, no 14(3), art. 707.

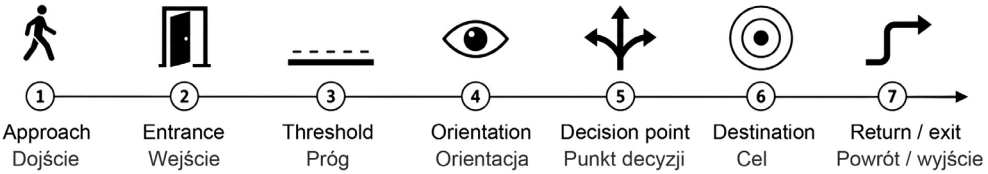
[8] B.R. Connell et al., *The Principles of Universal Design, Version 2.0, Center for Universal Design*, North Carolina State University, Raleigh 1997, https://design.ncsu.edu/wp-content/uploads/2022/11/principles-of-universal-design.pdf (access: 15.07.2026).

[9] E. Steinfeld, J. Maisel, *Universal Design: Creating Inclusive Environments*, Wiley, Hoboken 2012, pp. 28–44.

[10] M.H. Black et al., *Considerations of the Built Environment for Autistic Individuals: A Review of the Literature*, "Autism" 2022, no 26(8), pp. 1904–1915.

[11] R. Imrie, P. Hall, *Inclusive Design: Designing and Developing Accessible Environments*, Spon Press, London–New York 2001, pp. 1–28.

[12] J.J. Gibson, *The Ecological Approach to Visual Perception*, Houghton Mifflin, Boston 1979, pp. 127–143.



Ill. 1. Sequential experience of architectural space from the perspective of perceptual accessibility. Source: author's own work

At successive stages, spatial information, sensory cues, and action are interrelated. Information identifies directions, functions, and boundaries; cues enable recognition or confirmation; and action reveals whether the message is legible. Entrance legibility, the logic of circulation, recognisable decision points, and consistent signage affect the ability to construct and retrace a route. Kevin Lynch's categories of paths, nodes, edges, and landmarks can be applied to building analysis, although they were developed for the urban scale.[13] In the approach of Paul Arthur and Romedi Passini, wayfinding is a process of spatial problem-solving that includes planning, decision-making, and execution. Signage is only one component. Perceptual continuity requires architecture, signs, and confirmation points to convey consistent information about location, destination, and return.[14,15]

6. PERCEPTUAL ACCESSIBILITY: PROPOSED DEFINITION AND MODEL

Perceptual accessibility is not identical to technical accessibility, visual legibility, or a signage system. It describes the relationship between environmental organisation and the user's ability to recognise a situation and act.

The term perceptual accessibility has previously appeared in studies of the multisensory reception of the built environment and perceptual access to public space. In this article, it is specified in relation to architectural space and organised into an original model of four interdependent dimensions.[16]

Technical accessibility concerns the physical possibility of using a space or element; perceptual accessibility concerns recognising spatial structure, functional relationships, direction of movement, the next stage, and one's own location. A building may therefore meet technical requirements while remaining difficult to interpret independently.

For the purposes of this article, perceptual accessibility in architectural space is defined as a property of the built environment that enables its structure, functions, directions, boundaries, and meanings to be perceived, interpreted, and used in action by people with diverse sensory, motor, and cognitive capacities. It results from the interaction of spatial

[13] K. Lynch, *The Image of the City*, MIT Press, Cambridge, MA 1960, pp. 46–83.

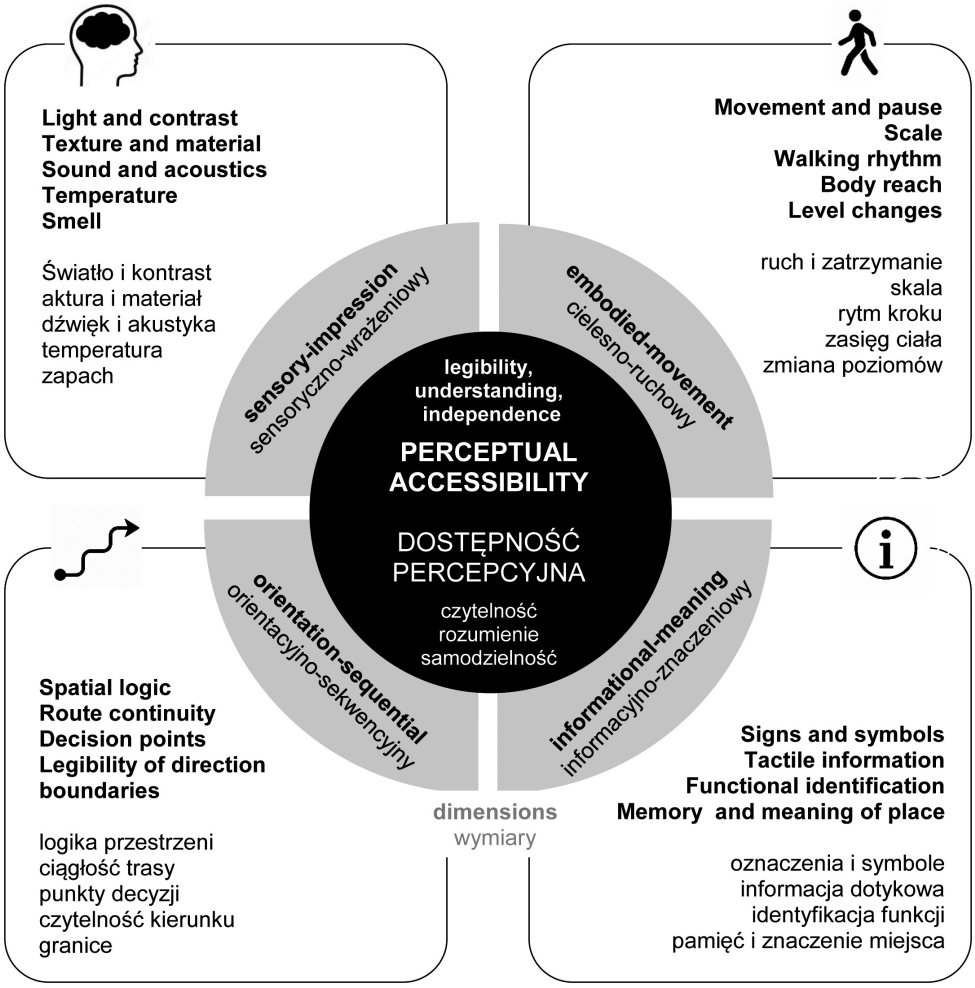
[14] P. Arthur, R. Passini, *Wayfinding: People, Signs, and Architecture*, McGraw-Hill Ryerson, Toronto 1992, pp. 20–38.

[15] R. Passini, *Wayfinding in Architecture*, Van Nostrand Reinhold, New York 1984, pp. 27–44.

[16] J. Herssens, A. Heylighen, *Haptics and Vision in Architecture: Designing for More Senses*, [in:] R. Lucas, G. Mair (eds.), *Sensory Urbanism Proceedings 2008*, The Flâneur Press, Edinburgh 2008, pp. 102–112.

features, sensory cues, information, and conditions of movement, rather than from a single solution.

This interpretation is consistent with universal design, according to which an environment should communicate necessary information accessibly to the broadest possible range of users. It does not imply that one solution will be equally effective for everyone; the model helps identify potential barriers and conflicts between modes of perception.[17, 18]



Ill. 2. Model of the four dimensions of perceptual accessibility in architectural space. Source: author's own work

[17] B.R. Connell et al., *The Principles of Universal Design, Version 2.0, Center for Universal Design*, North Carolina State University, Raleigh 1997, https://design.ncsu.edu/wp-content/uploads/2022/11/principles-of-universal-design.pdf (access: 15.07.2026).

[18] E. Steinfeld, J. Maisel, *Universal Design: Creating Inclusive Environments*, Wiley, Hoboken 2012, pp. 28–44.

Perceptual accessibility is shaped by both information and spatial organisation: the hierarchy of entrances, functional relationships, continuity of movement, light, materials, acoustics, scale, and opportunities to pause. The synthesis groups these properties into four interdependent dimensions (Ill. 2).

The operational meaning of the definition is indicated by questions asked along a route: Where am I? Where can I go? How will I recognise the direction? What lies ahead? What action is possible? Where will I receive confirmation? How can I return? These questions do not yet constitute an assessment tool, but define the scope of future criteria.

7. FOUR DIMENSIONS OF PERCEPTUAL ACCESSIBILITY

The four dimensions are analytical categories that interact. The same element may belong to several: a handrail supports movement, indicates direction, and conveys tactile information. The division organises observations and identifies where the absence of one message should be compensated for by other spatial features.

The sensory-impression dimension includes light, contrast, colour, texture, material, sound, acoustics, smell, and temperature. What matters is the function and consistency of cues: contrast reveals the edge of a step, light reinforces the hierarchy of entrances, texture signals a change of zone, and reverberation helps users judge the size of an interior. A cue that is too intense, ambiguous, or inconsistent with other information may disrupt perception.

The embodied-movement dimension concerns how the body moves through and interprets space. It includes scale, pace, reach, opportunities to pause, changes in level, thresholds, vertical circulation elements, handrails, and resting places. A long route without a break, an unexpected change in level, or an element beyond reach may reduce independence even when it is not a formal technical barrier.

The orientational-sequential dimension describes understanding a building's layout through movement: the relationship between the approach and entrance, the legibility of the threshold and entrance space, circulation organisation, decision points, functional hierarchy, and the ability to retrace a route. Users recognise a situation, select a direction, assess the result, and correct their action; information is therefore needed after each significant change.

The informational-semantic dimension includes names, pictograms, directional systems, maps, tactile maps, tactile and auditory messages, as well as functional recognisability and memory of place. Information is not an addition applied to completed architecture; its effectiveness depends on consistency with the spatial layout and hierarchy of decisions. Its semantic aspect concerns place identification: users should not only reach a point, but also recognise its function and distinguish it from other parts of the building.[19]

The model assumes interaction between the dimensions. A sign is insufficient at an ambiguous junction, a material change is ineffective when its meaning is unclear, and an accessible ramp is of little use when it cannot be found. Perceptual accessibility is a property of relationships, not a sum of facilities.

Examples of multisensory carriers of information are presented in Ill. 3.

[19] C. Norberg-Schulz, *Genius Loci: Towards a Phenomenology of Architecture*, Academy Editions, London 1980, pp. 5–23.



Ill. 3. Examples of multisensory carriers of spatial information: a) entrance legibility supported by contrast and a colour accent; b) entrance, threshold, and transition sequence; c) light and colour supporting place identification; d) a tactile map and directional information supporting orientation; e) a change of material and a contrasting warning at a threshold; f) a change in level and the associated bodily movement. Source: photographs and compilation by the author

8. FEELINGS, ATMOSPHERE, AND EMOTIONAL EFFECTS OF PERCEPTUAL ORGANISATION

Emotions are not a separate dimension of the model, but a possible effect of the user's relationship with space. Legibility, predictability, and opportunities to confirm information may support safety and agency, whereas conflicting messages or sensory overload may increase uncertainty and dependence on assistance. These are plausible mechanisms, not results of empirical research conducted in this study.

Atmosphere is understood as an overall experience arising from the interaction of material, light, sound, temperature, scale, and movement. It may support accessibility when it reinforces functional recognisability and spatial hierarchy, but weaken it when atmospheric effects obscure boundaries and directions. Wayfinding research indicates that difficulty finding one's way may be associated with stress and frustration; this does not mean that a particular architectural form will produce the same response in every user.[20]

Feelings may signal a problem in perceptual organisation, but are not an independent measure of spatial quality because they also depend on personal and situational factors. Assessing the emotional effects of accessibility requires research involving diverse users.

9. CONCLUSIONS

Describing space through form, function, and technical parameters does not exhaust the question of accessibility. Users must also recognise the situation, understand the layout, make a decision, and confirm it; perception, movement, and information should therefore be analysed together.

The synthesis results in a definition of perceptual accessibility, a sequential account of the route, and a four-dimensional model comprising sensory-impression, embodied-movement, orientational-sequential, and informational-semantic dimensions. Multisensory perception supports independent use when channels convey coherent, hierarchical, and verifiable information.

The framework can support the formulation of research questions, comparison of design solutions, and development of a tool for assessing the entire sequence of building use. Further research should operationalise indicators, include diverse user groups, and determine the significance of the dimensions in different building types. Perceptual accessibility can thus complement universal design by analysing how space enables recognition, understanding, and independent use.

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[3] Chidiac S.E., Reda M.A., Marjaba G.E., *Accessibility of the Built Environment for People with Sensory Disabilities–Review Quality and Representation of Evidence*, "Buildings" 2024, no 14(3), art. 707.

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