HOUSING TYPOLOGY FOR PEOPLE WITH AUTISM SPECTRUM DISORDER

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ABSTRACT: The article Typology of Housing for People with Autism Spectrum Disorder (ASD) focuses on the still insufficiently addressed area of accessible and appropriate housing for individuals with ASD. It highlights a serious lack of capacity as well as the limited typological differentiation of such housing in professional practice. In both the Czech Republic and abroad, the topic remains under-researched, leading to generalized design solutions that fail to reflect the specific needs of people on the spectrum. The article analyzes key housing limitations — from sensory stimuli and the degree of independence to the need for support services, safety, and privacy concerns. Conceptual measures are introduced as a foundation for creating functional and dignified living environments, applicable to both independent and supported housing. Furthermore, a typology is proposed that differentiates housing design based on the type of autism and level of support — ranging from fully independent housing with remote assistance to intensively supported facilities with high structural organization and staff presence.

KEYWORDS: autism; ASD; housing typology; supported housing; independence; architectural design; housing support; sensitivity; social services; inclusion; individual needs; spatial arrangement; functional environment; design for neurodiversity

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INTRODUCTION

Housing for people with autism spectrum disorder (ASD) is significantly neglected in terms of both availability and quality. Although the right to housing is declared in basic human rights documents [1], in practice it remains unfulfilled for many people with ASD. Due to the lack of housing, even in adulthood, these people often stay with their families as long as they have enough strength. In the event that the family is no longer able to provide care, this lack leads to placement in psychiatric hospitals for severe and sometimes even moderate forms of autism (sometimes for life).

Current support for the construction of housing for people with ASD in Europe is mainly the domain of the non-profit sector. In the Czech Republic, municipalities draw state funds, which, however, are not specifically intended for autistic people and are often insufficient. In addition, there is a lack of experts in spatial solutions for ASD and available professional literature dealing with the design of housing for people with ASD. Although ASD is as common as other disabilities, regulations in the field of architecture for this group are still completely lacking.

AUTISM BY DESIGN

The prevalence of ASD in the European and North American population is estimated to be 1–2%, with boys being up to four times more likely to have the disorder than girls. [2] Autism spectrum disorder (ASD) is a heterogeneous spectrum of conditions with changing needs over time, and that individual forms of ASD require different approaches in terms of support, therapy and environment. The DSM-5 diagnostic classification distinguishes three levels of support – from mild (level 1), through moderate (level 2), to very severe (level 3), each of which requires specific therapeutic and spatial interventions. [3] The diversity of ASD manifestations, including hypersensitivity and hyposensitivity, also plays an important role in housing design. Individuals with ASD may experience sensory overload, meltdowns or shutdowns, if they are unable to escape from an incomprehensible environment. When designing a space, it is important to take into account different types of perception (proprioception, interoception, kinesthesia).

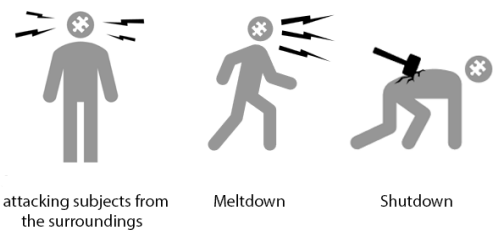

Fig. 1.: Diagram expressing meltdown and shutdown (Source: Anna Janosova, VŠB-TUO)

Fig. 2.: Schematic of perception in persons with ASD (Source: Anna Janosova, VŠB-TUO)

Another aspect of the behavior of people with ASD is the so-called triad of symptoms. These symptoms also significantly affect the housing needs of people with ASD: impaired social interaction, communication disorders and rigid behavior [4]. Social interaction means that a person with ASD requires privacy, a clearly defined space, and minimal contact. Small households or separate units with the possibility of controlling social interactions are suitable. In terms of communication, an environment with visual support (pictograms, schedules), simple language of the staff and alternative means of communication (AAC) are recommended. Rigidity and imagination can be supported by greater stability, predictability and structure. [5] Furniture should be unchanging, the daily routine should be visually represented. Space for calming down and tolerance of stereotyped activities is important.

ASD Type	Characteristics	Housing recommendations
Childhood Autism	Severely disturbed behavior, often mental retardation [6]	Simple environment, high level of support, safety measures [7]
Atypical Autism	Milder symptoms, often delayed diagnosis [8]	Flexible and individually adjustable environment [9]
Asperger Syndrome	High intellectual abilities, impaired social intuition [10]	Autonomous housing, logically arranged, quiet environment [11]
Rett Syndrome	Girls with severe physical and mental disabilities [12]	Barrier-free housing with continuous care [13]
Disintegrative Disorder	Developmental regression after 2–4 years of age [14]	Adapted, adaptable environment with comprehensive support [15]
PDD-NOS	Vague features, child cannot be accurately classified [16]	High level of flexibility, individualized approach [17]

Tab. 1.: Summary of autism types and housing recommendations, (Data sources: Anna Janošová, 2025, VŠB-TUO)

Phenomenon / Property	Characteristics	Impact on behavior	Requirements for housing design
1. Hypersensitivity [18]	Hypersensitivity to sounds, light, touch, etc.	Anxiety, panic, meltdowns	Dim lighting, sound insulation, natural materials, soft surfaces
2. Hyposensitivity [19]	Low response to stimuli (pain, noise, etc.)	Seeking intense stimuli (self-stimulation)	Possibility of safe stimulation (rocking chairs, tactile walls, structured floors)
3. Differences in all senses [20]	Can affect sight, hearing, smell, taste and touch	Reactions to common stimuli tend to be unpredictable	Possibility of individual environmental modification (regulation of light, ventilation, scents, surface textures)
4. Detailed perception [21]	Focus on details, difficulty understanding wholes	Confusion, disorientation in space	Clear, logically structured environment; visually legible structure of rooms
5. Literal perception [22]	Poor ability to abstract, difficulty with generalization	Misunderstanding the function of space, expectations of rigid logic	Pictograms, marking of functions, permanent placement of objects and equipment
6. Emotional overload [23]	Emotions are difficult to understand, stressful	Anxiety, withdrawal, affective reactions	Quiet zone, space for withdrawal, minimization of visual and sound chaos
7. Reaction to stress and change [24]	Unexpected situations and stimuli lead to disruption of psychological balance	Meltdown, anxiety, escape behavior	Predictable arrangement, unchanging rituals, clearly defined daily routine in the space
8. Neurophysiological basis [25]	Different activity of brain areas for perception and emotions	Sensory overload or deficits	Environmental design with regard to neurodiversity – balanced stimulation, possibility of choosing the intensity of stimuli

Tab. 2.: Summary table of the phenomenon of manifestations and their impact on housing for people with ASD, the way housing is affected and recommendations for modifications, (Data sources: Anna Janošová, 2025, VŠB-TUO)

TYPOLOGY OF HOUSING FOR PEOPLE WITH AUTISM SPECTRUM DISORDER

The typology of housing for people with ASD is and will be a complicated discipline, primarily due to the individuality of not only individual types of disabilities but also due to the individuality of each individual with autism. Therefore, it does not make direct sense to distort the exact dimensions of rooms or the exact rules of design. For a successful design, it is necessary to understand what specifics the entire autism spectrum may have and then adapt the entire design to the given individual, group or family housing. Several criteria are therefore specified for the typology in this research and when designing it, it is necessary to determine whether this issue concerns the people for whom it is designed or not. If you are designing housing as a place for living, not a place for surviving or resolving an acute condition (e.g. a hospital or institution), this place should suit the person who lives in it. This is mainly because the space for people with ASD has a great influence on their emotional well-being, which can in extreme cases lead to shutdown (up to long-term deterioration of cognitive functions).

Before starting to design housing for these people, it is necessary to make a thorough analysis of the family situation (or current housing) and also of the future housing. When designing, it is also necessary to work with the free will of people with ASD. As part of the research, Anna Janošová conducted an experiment in which 15 autistic people and their parents participated, most of the participants chose a different subject than the parents had expected. Communicating autistic people appreciated the possibility of choice and expressed that their opinion is not usually interested. The results confirm the importance of directly involving people with ASD in decisions about the environment in which they live, instead of relying solely on the judgment of caregivers.

From the issues listed below, we select only suitable elements for the given group or individual for the design. The analysis should be based on the following points:

- Type of autism and its manifestations
- Age of the autistic person
- Analysis of the requirements of the given target group or individual
- Identification of sensory needs, level of autonomy, orientation abilities
- Typical behavior, phobias and crisis scenarios
- Hygienic and destructive behavior
- Analysis of possible deterioration of the condition in the future
- Clear definition of the type of housing and detailed requirements from the point of view of the client
- Preferred type of housing
- Space requirements (size, number of rooms)
- Necessary support (staffing, monitoring, assistance)
- Specific equipment or elements

From the results of the analysis, it is necessary to decide which of the following elements explained below is suitable for the given person with ASD: flexibility and individualization, environment for people with ASD, organization of space, housing requirements from the perspective of the psychology of people with ASD, housing limits for people with ASD - visual communication and orientation, therapeutic elements of housing, sensory integration, room size, barrier-free and spatial accessibility, smart technologies, ideological measures for people with ASD.

This analysis is best done through a guided interview with autistic people and their caregivers. The result of the analysis may look like this: "The proposal will be carried out for an autistic person with low-functioning autism, more precisely childhood autism with mental retardation and visual impairment. The autistic person is 18 years old. The autistic person has a strong fascination with water, a need to overeat, and frequent uncontrollable escapes. He has a big problem with echoes, with too much sunlight in the room, he cannot stand mirrors and wallpaper. He tends to eat chemicals, he hurts himself during seizures, and a large space is needed during seizures. When overloaded for a long time, he destroys furniture and dirty walls. Due to the shutdown he experienced, it is likely that he will end up in a wheelchair. He needs to live in a smaller group with continuous supervision. He needs his own bathroom, chair and swing." Another result of the analysis may give, for example, the following answers: "A twenty-year-old autistic person with Asperger's syndrome without other associated health problems needs independent housing. He has only a slightly reduced intellect, is unable to go to work regularly due to pressure to be disciplined. He has a problem with noise coming from outside and at the same time listens to very loud music as self-therapy. He does not like light. He is able to live independently with the need for occasional control and supervision of finances. He has a strong phobia of unpredictable events and space. The meltdown occurs through screaming. Significant deterioration of the condition is not expected in the future. He needs a small, dark bedroom and stimming cords." The third analysis of, for example, a high-functioning autistic person would be significantly similar to the usual housing of the neurotypical population, with the difference that he would require one room exclusively for himself, where he could be alone all day.

HOUSING REQUIREMENTS FOR PERSONS WITH A ASD

Flexibility and individualization of the environment
Housing for autistic people must take into account the great variability of needs. Supporting the choice directly from the autistic person themselves (e.g. choosing furniture, the possibility of changing the lay-

out) strengthens autonomy and reduces stress. At the same time, it is necessary to work with a degree of flexibility. Some autistic people need a stable arrangement without changes. Flexible furniture and variable interior elements can be beneficial, but they must be robust and safe. Individual solutions, such as soft lights around the bed or pleasant structures, significantly affect the feeling of safety and comfort. It is important to respect the specific perception of personal space for people with ASD - they often require greater distance, have difficulty with touch and physical proximity. [26] We distinguish four basic types of territory: personal space, primary territory (0.5 m), secondary territory (1.25 m), public territory (3.5 m and more).

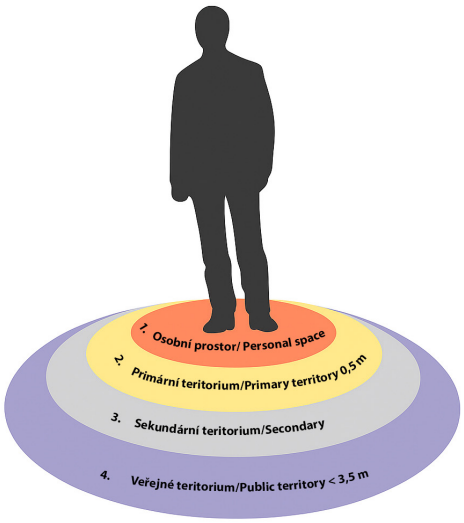

Fig. 3.: Hall's theory of proximity (Source: GAINES, Kristi; BOURNE, Angela; PEARSON, Michelle; KLEIBRINK, Mesha. Designing for Autism Spectrum Disorders. 1st ed. London: Routledge, 2016, ISBN 978 0 367 03046 9)

Environment for people with ASD

The location of the property has a fundamental impact on daily functioning. The location should offer: accessibility to therapeutic and health services, connections to the community (avoid institutional areas), transport accessibility, a quiet environment with low noise and the presence of nature. [27] A suitable location contributes to reducing sensory overload, supports routine and stability and facilitates integration.

The design of the environment can actively contribute to reducing social isolation. Important things are: the inclusion of community elements (e.g. shared gardens, shared rooms), facilitating pressure-free interactions (e.g. views from windows, vistas), supporting accessibility of information and orientation in space. [28]

The physical space should reflect the need for safe social inclusion while respecting the limits of individuals. A functional environment should support the development of independence, e.g. training in life skills (cooking, cleaning, communication) in real situations, visual plans and pictograms for orientation and independent decision-making, modular approach to housing – transitional phases between assisted and independent living.

Space organization

People with ASD often need to view the space before entering – so-called previewing reduces stress and supports orientation. It can be supported [29]: with windows, internal windows, partially glazed doors, open interior layout, clear views from one part to another. The design should offer the possibility of observing what is happening, but also shelter (prospect-refuge principle).

Interior layout significantly affects orientation, behavior and feelings of safety. For people with ASD, it is appropriate to choose clear and logically structured environments with clearly defined room functions. Open space without significant division can be confusing, while structured zones (e.g. using furniture, colors or lighting) facilitate orientation [30].

Minimizing visual and functional clutter reduces cognitive load. Space organization refers to [31]: clearly defined zones (e.g. work, relaxation, stimulation), built-in storage to eliminate clutter, use of neutral and calm colors, minimalism in decoration.

Fig. 4.: Possible view into the space, In: GAINES, Miran Kambič (Spurce: ArchDaily, 2023, Bohinj, Available from: https://www.archdaily.com/1003278/bohinj-kindergarten-arrea-architecture-plus-kal-a/649dea08cb9c-465929084c2f-bohinj-kindergarten-arrea-architecture-plus-kal-a-photo?next_project=no)

Fig. 5.: Illustrative photo of suitable office equipment (Photo author: unknown, available from: https://cz.pinterest.com/pin/211174977694259/)

HOUSING REQUIREMENTS FROM A PSYCHOLOGY OF PERSONS WITH ASD PERSPECTIV

The psychology of housing deals with the relationship between the physical environment and the psycholog-

ical, social and cultural experience of an individual. For people with autism spectrum disorder (ASD), the environment plays an extremely important role, influencing their mental well-being, behavior, level of stress and ability to function in everyday life.

An important aspect when getting used to a new home. For people with ASD, a sense of “hominess” (home), which evokes a familiar, stable and safe environment, is important [32].

Housing should allow for the regulation of social contacts. People with ASD often need a greater degree of privacy and quiet zones, which serve for self-regulation. A larger number of people in one household without the possibility of escape increases the risk of conflict situations. If there is a lack of space, it is appropriate to use curtains, furniture zoning or acoustic barriers.

LIMITATIONS OF HOUSING FOR PEOPLE WITH ASD

Visual communication and orientation
People with ASD more often use visual systems to understand the environment and communicate. The use of pictograms, schedules, diagrams or visually divided space helps with better orientation, reduces uncertainty and supports independence. Visual marking and a clear structure of the environment contribute to the management of common activities and increases the effectiveness of support. [33]

Colors, materials and spatial division communicate meaning without words. However, for people with ASD they can send ambiguous signals - bright colors, mosaics or zones with unclear designation can lead to disorientation or even a meltdown. Housing design should be consistent, simple and predictable, without disturbing visual phenomena. For example, the differentiation of material for a person with ASD divides the space, and this can mean: "watch out here, don't go here". Which can help an autistic person respect their personal space.

Fig. 6.: Bistro with colour differentiation on the floor (Source: Alesya Kasianenko, Available from: https://www.behance.net/gallery/142495921/-lotus-bistro-)

Optical illusions and spatial illusions are perceived differently by autistic people. Autistic people often do not perceive optical illusions in the same way as the neurotypical population. Their perception is more detailed, less contextually modulated. In interiors, it is advisable to avoid distorted perspectives, diagonal patterns, or mirrored surfaces. [34] A stable and visually legible environment helps orientation and reduces risky behavior.

Therapeutic elements of housing
Interior design must respect individual needs and the type of therapy. The key is to create a structured, safe, and sensory-friendly environment. Furniture should allow for clear orientation, organization, and at the same time provide opportunities for hiding or distancing. [35] These can include: shelves, racks, screens, quiet corners (quiet places), toys, and aids.

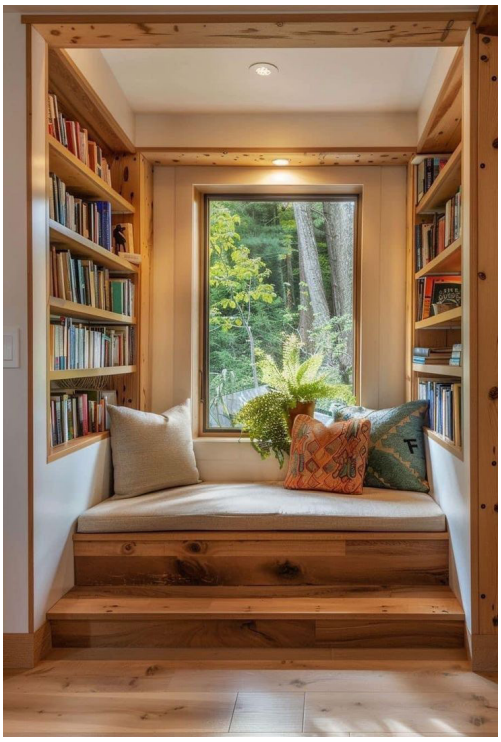

Fig. 7.: Illustrative photograph of a quiet place (Source: Northwood Supply Co, Etsy, available from: https://www.etsy.com/listing/1731578407/scandinavian-home-paint-palette-sherwin)

Fig. 8.: Snoezelen - relaxation multisensory room (Source: Grandir avec Mino, available from: https://grandiravecmino.fr/montessori/education-positive/le-sommeil-chez-lenfant/snoezelen-sommeil-enfants/principes-seance-snoezelen/)

The therapy environment for people with ASD includes multisensory rooms (e.g. snoezelen), occupational therapy and speech therapy aids, and group therapy adaptations. These elements promote relaxation, motor and sensory integration, and the development of speech and social skills.

A safe room is used to manage seizure states and affective overload. It minimizes the risk of injury. It includes soft walls, floors (crash pads), rounded furniture, soft lighting, acoustic panels and soundproofing. Design in muted colours, without perfumes, without smooth and shiny surfaces, with the elimination of harsh lights. The safe room should be separate, marked and adaptable.

Stimming is a natural part of self-regulation. It is not advisable to suppress it, but to support its safe implementation. Stimming zones must be clearly separated from teaching and therapeutic spaces. Visual cues and free movement are appropriate. [36]

Sensory integration

Texture is a specific aspect. Autistic people's reactions to the texture of surfaces are manifested by hypersensitivity (oversensitivity) or hypersensitivity (low sensitivity). Hypersensitive individuals react negatively to sharp, cold or sticky surfaces. They may have difficulty perceiving textures with unexpected changes (e.g. tiles with pronounced joints) and may cause discomfort or an attempt to avoid them. Hyposensitive individuals seek out strong textures and vibrating elements. These individuals may seek out stronger tactile stimuli, such as repeatedly touching structured surfaces (walls, reliefs) or may prefer clearly shaped surfaces. [37] Structures can assist in spatial navigation, zoning, and sensory regulation. Mirrors and shiny surfaces are risky. They cause stress or excessive preoccupation in some autistic individuals, and can be dangerous in crisis situations. It is advisable to limit or cover them.

Fig. 9.: Illustrative photograph showing an alarming interior design with a high threat of space overcrowding (Source: Cottager & Cottager, available from: https://www.chatar-chalupar.cz/stylova-i-moderni-koupelna/)

Fig. 10.: Sensory Texture Wheel - a sensory texture wheel for children (Source: Extreme Kids World, available from: https://extremekidsworld.com/products/sensory-texture-wheel?variant=40376449302615)

The texture of, for example, wallpaper representing real tactile stimuli can be pleasant or repulsive. It is necessary to investigate the reaction of a given individual or target group before using it in an interior. [38] Anna Janošová conducted a second experiment on this topic. An experiment with painting and wallpaper in a child with severe autism demonstrated the importance of texture on spatial behavior. The wallpaper was perceived positively or negatively depending on the pattern.

Colors influence behavior and emotional state. Cold and muted colors (blue, green, beige, gray) stabilize and calm. Rich and contrasting tones (red, yellow) cause anxiety and aggression. Individual testing is recommended before use in buildings for people with ASD.

Acoustics People with ASD have a high degree of sensitivity to noise, which manifests itself in hyperacusis, phonophobia, or misophonia. [39]. Autistic people also react to low-frequency stimuli that influence their behavior. Research on this phenomenon is currently limited. Sound filtration disorders and sensory overload have been confirmed by neurophysiological studies. [40] When designing, it is necessary to avoid smooth and hard surfaces with low acoustic absorption. It is recommended to design zones with different acoustics and monitor the noise level in traffic.

For lighting for people with ASD, it is recommended to design LED lights without flickering, diffuse lighting, colored relaxation light and lights with the possibility of intensity regulation. [41] Circadian lighting affects sleep, hormones and mood. Simulation of the daily rhythm (strong white light in the morning, subdued warm light in the evening). The effect of light on performance and psyche is a key problem for people with ASD. [42]

Room size, barrier-free and spatial accessibility

As part of Anna Janošová's research on the topic of Housing typology, a questionnaire survey was conducted directly with people with ASD. A total of 9 respondents of different ages and with different autism diagnoses answered. In terms of housing size preferences, 77.8% prefer medium-sized spaces (main space around 30 m2, bedroom 16 m2), 22.2% prefer large spaces (main space around 50 m2, bedroom 20 m2). Based on this and a survey of available literature, research recommends increasing the minimum standard room sizes for people with ASD due to the need for more space, predictability and zoning options. Movement and vision disorders are common in people with ASD. Clear navigation, contrast and plenty of space are necessary.

At the same time, due to associated disabilities, the design must take into account Act No. 283/2021 Coll., the Building Act, which newly includes the requirement of "accessibility" as a basic requirement for buildings (§145) and stipulates in which areas accessibility should be applied (§149)., more precisely Decree No. 146/2024 Coll., on construction requirements — this decree is an implementing regulation for the new Building Act and contains basic functional requirements for accessibility (§29). For public buildings, it is necessary to create a floor accessible by elevator, or an alternative solution (platform), wide entrances, sufficient manipulation space. Minimum widths of doors, ramps, heights of switches and sinks must be observed. For wheelchair users, it is necessary to address the space for turning, undertaking and movement. Emphasis on functional layout and ergonomics - space in the kitchen, bedroom, bathroom, and garage is important.

Smart technology

Smart technologies and artificial intelligence represent an important tool for increasing the safety, autonomy

and efficiency of care for people with ASD. They help detect crisis situations using sensors (movement, noise, fall), automatically alert caregivers and reduce the need for constant supervision. For people with a higher level of independence, these technologies can enable independent living, while in more severe cases they contribute to a safer environment.

Artificial intelligence is gradually being applied to monitoring emotions and neurophysiological reactions, which can help to better understand and manage sensory overload or affective fluctuations. This trend is still in the research phase, but it brings the potential for deeper personalization of care. [43]

Housing measures for people with ASD

The design of the environment for people with ASD requires an individualized approach due to the great variability of autism manifestations, from independent functioning to the need for constant supervision. Research among 30 families caring for individuals with low- to moderate-functioning autism identified key priorities: safety, environmental resilience, ease of maintenance, and flexibility. [44] Safety is essential due to impulsivity, sensory hypersensitivity, and impaired ability to recognize risks. Resilience of space mainly concerns seizure behavior and stimulation habits. Ease of maintenance is especially crucial for caregivers of severely disabled individuals.

CONCLUSION

The design of housing for people with ASD is complex, because each individual has different needs and manifestations, so it is not possible to establish universal dimensions or fixed rules for design. The key is an individual approach based on the analysis of a specific person or group.

The design itself must be based on a clear spatial structure, readability and zoning, which ensure psychological and physical safety, sensory stability and the possibility of individual adaptation. The goal is to create an environment that supports orientation, peace and active participation in life.

The contribution of the work lies in the comprehensive connection of architectural, psychological and social aspects of the design and in the creation of a methodology for analyzing the needs of people with ASD. This is based on knowledge of sensory perception and spatial orientation and allows for the formulation of individual architectural assignments according to the degree of support needed.

The research is based on available professional literature and on our own empirical investigation, which included a series of experiments focused on the relationship of people with autism spectrum disorder (ASD) to the environment in which they live. In Experiment 1, 15 people with ASD and their parents participated in the selection of objects, with most autistic people choosing different objects than their parents had expected, which confirmed the need for direct involvement of people with ASD in spatial decisions. Experiment 2, conducted in the form of a workshop on the topic of Housing Typology for People with ASD, demonstrated positive reactions of children and adults with autism to structural visual-tactile images, which led to calming and repeated interaction. Experiment 3 then confirmed the importance of texture and visual pattern in the interior – a child with severe autism reacted to various wallpapers and colorful paintings differently, from calm to rejection. Together, these experiments demonstrate that the environment has a fundamental influence on the sensory and emotional experiences of people with ASD and that their active participation in the design process is crucial for creating a supportive and stable living space. The research was also supported by a questionnaire survey.

The research represents the first comprehensive approach to defining typological principles of housing for people with ASD in the Czech context. It offers a methodological framework, practical recommendations, and empirically validated findings that can serve as a basis for future legislative and design standards for inclusive architecture.

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