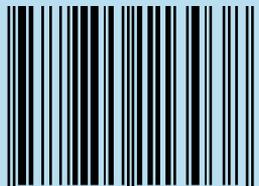


ARCHITECTURE  
AND AUTISM.  
SENSORY  
PERCEPTION  
AND  
INDEPENDENT  
LIVING

ISBN 978-88-5511-303-8



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The International Workshop 'Architecture and Autism. Sensory Perception and Independent Living' was proposed as a multidisciplinary discussion on the relationship between architecture and autism. The underlying hypothesis is that this is not only a necessary relationship to improve the living conditions of autistic people and their families, but also potentially useful to expand the possibilities and views of architecture rather than limiting them.

Designing for alternative models of mind and non-prevalent sensory perceptions can lead architecture to rethink ways of prefiguring future realities by moving from known patterns and experiences.

The Workshop was divided into two sessions. The first session, 'Design Processes: the Issue of Inclusion', aimed to raise some interdisciplinary reflections on the topic of inclusion as a non-obvious but problematic issue. The second session, 'Design Practices: Integrating Sensory Perception with Independent Living', proposed and compared some design practices and experiences.

ARCHITECTURE  
AND AUTISM.  
SENSORY  
PERCEPTION  
AND  
INDEPENDENT  
LIVING

PROCEEDINGS OF THE INTERNATIONAL WORKSHOP  
TRIESTE, 20th APRIL 2021



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ARCHITECTURE AND AUTISM  
SENSORY PERCEPTION AND INDEPENDENT LIVING  
International workshop  
Trieste, 20th April 2021

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SENS  
HOME





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ARCHITECTURE AND AUTISM  
SENSORY PERCEPTION AND INDEPENDENT LIVING

International workshop  
Trieste, 20th April 2021

in the frame of  
Interreg V-A Italy-Austria 2014-2020  
<https://senshome.projects.unibz.it/>

9:30     Giuseppina Scavuzzo (University of Trieste)  
WELCOME AND INTRODUCTION

9:45     Marco Caniato (Free University of Bozen-Bolzano)  
RECENT ADVANCES ON INDOOR COMFORT FOR IMPAIRED INDIVIDUALS: THE SENSHOME PROJECT

SESSION 1 – DESIGN PROCESSES: THE ISSUE OF INCLUSIVITY

10:00    Ann Heylighen (KU Leuven)  
BEYOND PREVAILING WAYS OF UNDERSTANDING AND DESIGNING SPACE: LEARNING FROM THE AUTISM SPECTRUM

10:30    Federica Bettarello, Anna Dordolin, Paola Limoncin (University of Trieste)  
CURRENT STATUS OF LIVING ENVIRONMENTS FOR AUTISTIC PEOPLE: THE SIGNIFICANT ASPECTS OF DESIGN

11:00-11:15 – COFFEE BREAK

11:15    Matteo Bianchin (University of Milano-Bicocca)  
DESIGN JUSTICE: DELIBERATIVE TOOLS FOR INCLUSIVE DESIGN PRACTICE

11:45    Philip Scharf (Carinthia University of Applied Sciences)  
PARTICIPATION OF USERS IN RESEARCH: HUMAN-CENTRED DESIGN IN THE PROJECT SENSHOME

12:15 – DISCUSSION AND OPEN QUESTIONS  
*send questions to [senshome@units.it](mailto:senshome@units.it)*

13:00-14:30 – LUNCH BREAK

SESSION 2 – DESIGN PRACTICES: INTEGRATING SENSORY PERCEPTION WITH INDEPENDENT LIVING

14:30 Francesca Giofrè (Sapienza University of Rome)

AUTISM SPECTRUM DISORDERS: BUILDINGS REQUIREMENTS ON EVIDENCED BASED RESEARCH AND ITALIAN CASE STUDIES

15:00 Javier Sánchez Merina (University of Alicante)

THE PICTOGRAM HOUSE

15:30 Phuong Lan Nguyen (KU Leuven)

DETAIL MATTERS: EXPLORING SENSORY PREFERENCES IN HOUSING DESIGN FOR AUTISTIC PEOPLE

16:00 Anna Dordolin, Paola Limoncin (University of Trieste)

SENSHOME STRATEGIC APPROACH FOR A HOUSE “AS NORMAL AS POSSIBLE, AS SPECIAL AS NECESSARY”

16:30 – DISCUSSION AND OPEN QUESTIONS

*send questions to [senshome@units.it](mailto:senshome@units.it)*

17:00 – CONCLUSION AND GREETINGS





*abstract*

Interior design studios are still too little concerned with designing for autism, instead, these issues are left to building regulations, accessibility manuals, supportive technology, or linked to the prescriptive application of guidelines. However, this approach to the design of living environments cannot suffice, since it does not take into account the multiple facets of autism in many aspects of life. In this paper, some examples will be described of design experiences of architects all over the world who have been able to mediate between the generalizations needed to build guidelines and the study of specific preferences.

*keywords*

SENShome; Autism; Design Process; Architecture; Inclusive Design.

Designing for autism, Asperger syndrome and other dis/abilities, especially cognitive ones, is hardly ever developed in interior design studies but rather entrusted to building regulations, accessibility manuals, supportive technology, or linked to the prescriptive application of guidelines. However, this approach to the design of living environments cannot suffice, since it does not take into account the multiple facets of autism in many aspects of life. An approach which considers social, cultural and aesthetic aspects, and not only regulatory ones, can contribute to making designed environments more “sensitive” to identities that are considered disadvantaged because of being more fragile, vulnerable, and low-performing.

Autistic people have a different sensory experience (Bogdashina, 2003), and this can cause situations of sensory overload. Moreover, they are not always able to select from among a lot of information received at the same time. Due to their particularities, autistic people interact with the environment in an atypical way.

Recent studies have highlighted that most of the work in the literature on architectural design for autism is focused on how to “adapt” the physical and functional limitations of autistic people to the environment, considering these differences simply as a deficit. In this way, a regulatory “people-repair” programme is often unintentionally pursued (Frauenberger, Spiel and Makhaeva, 2019, pp. 666–678). This attitude heavily limits the design possibilities and leaves out the ethical question of the inclusion of “neurodiverses” in society which has recently emerged in autism studies (Belek, 2019).

If we wanted to think instead about how the environment might conform to people on the autism spectrum, recognizing or enhancing their skills rather than their deficits, we can envision broader and more sensitive design opportunities. Thinking in terms of neurodiversity, considering the deficits but also the potential strengths of autistic people, such as visual and spatial

skills, can influence the conception of architectural projects. (image 1)

The author is a research fellow at the University of Trieste, in the project 'SENShome: Sensors for Special Environments. The home as normal as possible and as special as necessary', funded by the European programme Interreg V-A Italy-Austria 2014-2020. The aim of this project is to study and develop new design – interior architecture and special furnishings – and technologies for smart homes to be applied to homes “as normal as possible” which can be inhabited autonomously by more sensitive people, in particular people in autism spectrum conditions. In order to define the criteria for the SENShome project, useful information was collected on how to design environments for autistic people, in particular young adults in the spectrum. This target was identified to verify the possibility of an independent life with the aim of supporting autonomy when reaching adulthood or in the case of a lack of family support.

The methodology adopted for the SENShome research project was to devote an initial part of the research to a study and redesign of selected architectural projects to allow a comparative design analysis of them. This was conducted in parallel with a comparative analysis of the recommendations and guidelines for autism-friendly architecture.

Some architectural aspects were seen to be significant since they have appeared several times as important features in the design process and identified as key principle in guidelines. It is important to say, however, that these aspects must be combined with the specific need of the person to whom the project is addressed. (image 2)

In the last decade, scientific literature has emerged which questions the use of guidelines which tend to a simplification, by focusing on the identification of constants and common elements and not on differences and individualities (Kinnaer et al., 2016) (Heylighen et al., 2019). The design process itself involves an understanding of different needs of the end user, which are determined by his/her experience, character, and culture, etc. This becomes even more tricky when the architect, as in this case, has to face an even greater number of needs arising from the fact that there is not a single type of autism, but a spectrum, and that people often do not know how to express their needs.

Although it is difficult to meet all the needs of the end user since they are extremely variable, some distinctive elements emerge which are considered important to emphasize.

Current status of design for autistic people.

Several built and unbuilt projects were selected, developed in various countries – UK, Italy, Spain, Denmark, America, etc. – between 2005 and 2020. The main intention was to analyse various design experiences in order to compare approaches and solutions, and identify which aspects emerged from the project practices.

In the next paragraph, some aspects of these projects will be described, which the author considers relevant given that they represent the architect's ability to combine architectural quality, attention to detail, and above all a sensitivity towards the people for whom the project is intended, in compliance with the recommendations of autism-friendly guidelines.

Flexibility and customization of environments and furnishings.

The possibility of adapting the built space to the needs of the final user is an important issue, and was developed in the Danish project called Seniors House by Wienberg Architects. (1) Located in Hinnerup, this was the first residence for elderly autistic people in Europe (Bellini, 2020). This example is pioneering for the flexibility of its housing modules since it was designed to provide the greatest comfort and wellbeing for autistic residents, while also taking into account the changes in its inhabitants' life over the years – the property houses adults up to retirement age.

Flexibility is important not only in the home, where residents have very different spaces in terms

of layout and rooms, but also in the communal areas, which must be able to accommodate widely divergent functions. This Danish project is interesting because the flexibility has also been applied to the furniture: to avoid distribution solutions and permanent furnishings, a system of partitions and modular cabinets on wheels has been incorporated into the apartments, allowing residents to modulate space and light.

The Adult Autism Inpatient Unit in Mitford by Medical Architecture, (2) is an autism inpatient service for adults who are on the autism spectrum, who have extremely complex needs and display challenging behaviour. In this project, the spaces are designed so that the apparent volume of the rooms is visually reduced by a rail which runs along their entire perimeter and determines the height of the doors and closets. This provides home proportions to the rooms and at the same time allows the closets and doors to close so as not to become the object of patient attention. TVs and closets can be hidden from view by locking doors in a defined position to remove the stimulation.

The threshold, the transition spaces, and the inclusion of outdoor spaces.

To reduce the sensory overload of autistic people, areas that have different functions can be visually and spatially separated. The threshold is the place where the passage between these different environments takes place, it must be gradual, and it must be designed with devices that accompany this gradualness.

In the projects we analysed, special importance has been given to transition spaces (image 3) which connect/relate different environments of the built space, between inside and outside and between public and private.

There are spaces designed to help the person to have a “preview” of the situation he/she is about to face. For example, in the Danish AT Home project, designed by Pluskontoret Arkitekt, (3) the transition space is between indoors and outdoors, where a small waiting place is created at the entrance, from which the person can see the world outside, but stay safe in his/her environment, and be able to decide whether to go out or not. Similarly, in the Adult Autism Inpatient Unit by Medical Architecture, a long seat allows guests to look out through a large glass window, so that the outdoor space is visually integrated into adjacent rooms.

When a person has to move from one environment to another, he/she can decide whether to access it thanks to the ability to see in advance what is going on in the space where he/she has to go, for example by looking through a window. An alternative to the use of glass is proposed by Wienberg Architects in the Senior House. They design an entrance with the possibility of opening the top door to look through and a lower door to go out, after seeing what is happening beyond the threshold.

The colours and materials used have also been chosen to create an indistinct effect between the inside and the outside, creating an easy transition between the spaces.

Another important issue in projects for people in the autism spectrum condition is the possibility of having an outdoor space. It has been demonstrated that well-designed gardens can enhance focus and attention and reduce anxiety among those with autism (Steele & Ahrentzen, 2015). Gardens can have areas for activities, for privacy and for socializing (Gaudion & McGinley, 2012).

Seniors House by Wienberg Architects is conceived with three buildings which feature a path to access the residences in an area with a lot of vegetation. Trees and bushes have been planted to create a natural filter between indoors and the greenery outside, so that residents can sit behind the numerous windows, enjoying the daylight and feeling part of the community, while shielded by vegetation. The treatment of the exterior façades is also green, which is a recurring colour in this project, both inside and outside, bringing a sense of security and tranquillity.

Frequent is the presence of courtyards which represent a good solution for security purposes, in direct contact with the accommodation, easily accessible, private and controllable. A solution of patios and fences is found in the project of Grijalba Arquitectos in the "Residencia y Centro De Día Para Autistas – Unidades mínimas entre patios y recintos". (4) These open spaces filter between different areas and reduce stimuli.

Other research developments.

The research on living for autism has also been developed by the author in her own teaching experience. The theme of the course in Architectural Design at the University of Trieste concerned the design of environments for fragile, vulnerable or disadvantaged people. (5) Some of the students' projects became degree theses, of which the author was assistant supervisor. One of these theses was about designing a small residential centre for the hospitality and life of families with an autistic member. (6) The aim was to create a spatial and life bond with a non-profit association in that area, which supports autistic people and their families. The individual housing units have been designed taking into account the different degrees of autonomy of the autistic people for whom they are intended. From a zero degree of independence, in which the person in the autistic condition lives in the care facility and the house is designed only for his/her family in a nearby location, up to a degree of maximum autonomy which can allow an independent life. This gradualness meant that the independent unit was gradually positioned further away from the main nucleus, to represent an ever-growing feeling of autonomy. The independent housing units and the house for the family were conceived as two clearly separate nuclei and conceived externally as a volume made of unclad reinforced concrete. The roof has been tapered upwards, placing a skylight at the top to allow the entry of diffused natural light inside the house. Externally, the entrance area includes a rounded wall which represents an element leading towards the interior of the house. (image 4)

Conclusion.

It is important to note the impossibility of creating a generic design output due to the heterogeneous nature of autism, but the attempt to contain and reduce the sensorial and environmental discomfort of the people in autism spectrum conditions and to ensure a sense of security in living are the first goal which all of the projects analysed have set.

The attention of the architect to the design choice of spaces and materials comes not only from building regulations and accessibility manuals, but also from listening to and involving the final beneficiary and other experts in this field. Architectural solutions cannot be separated from social and cultural issues, just as solutions relating to comfort cannot be separated from the data relating to the autistic condition as defined by the biomedical disciplines.

The involvement of the end user in the design phase can be a decisive strategy for the realization of an environment that considers as much as possible his/her wellbeing and specific needs. To do this, the architect must be able to foster reciprocity in creating an inclusive process, without the autistic person losing his/her uniqueness, but by exploiting the potential of diversity.

### *notes*

(1) Seniors House in Hinnerup (DK), Wienberg Architects (architectural design), Frier Architecture og Møller og Grønborg A/S (furniture, interior), 2014.

(2) Adult Autism Inpatient Unit in Mitford (UK), Medical Architecture, 2016.

(3) AT Home is a project undertaken by Specialområde Autisme (Central Denmark Region's Specialist Area Autism), these are flexible mobile homes for people with autism. The first prototype was built on the outskirts of the city of Tørring, Denmark, 2015-2016 (put into use).

(4) Residencia y Centro De Día Para Autistas in Valladolid (ES), Grijalba Arquitectos, 1997-2006 (two phases).

(5) Course in Architectural Design A.Y. 2019/2020, 2020/2021, 2021/2022, coordinator prof. Giuseppina Scavuzzo.

(6) Master's Degree Thesis "Progetto Autismo: abitare gradi di autonomia", Simone Culot, A.Y. 2018/2019 in Master's degree course in Architecture at the University of Trieste, supervisor prof. Giuseppina Scavuzzo.

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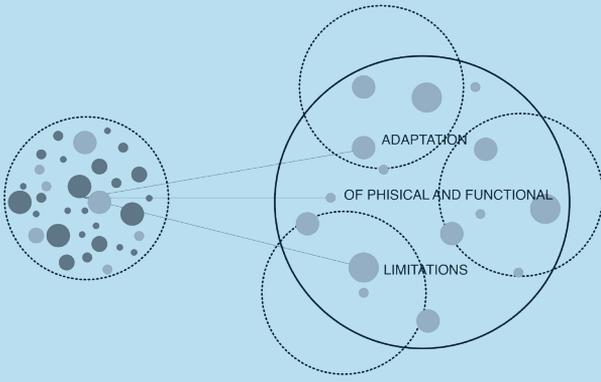
Steele, K., & Ahrentzen, S. (2015). 'At Home with Autism: Designing Housing for the Spectrum'. Policy Press.

(image 1) Conception of architectural projects. Starting point of most projects: how to adapt to limitations? / Changing point of view: how to conform to skills?

(image 2) Design process. Realization or adaptation of a residential environment for people on the autism spectrum. How can we optimize the project?

(image 3) Threshold spaces as places and times for gradual adaptation to the environment.

(image 4) Master's Degree Thesis "Progetto Autismo: abitare gradi di autonomia", Simone Culot, 2018/2019 in Master's degree course in Architecture at the University of Trieste, supervisor prof. Giuseppina Scavuzzo, assistant supervisor PhD Paola Limoncin.

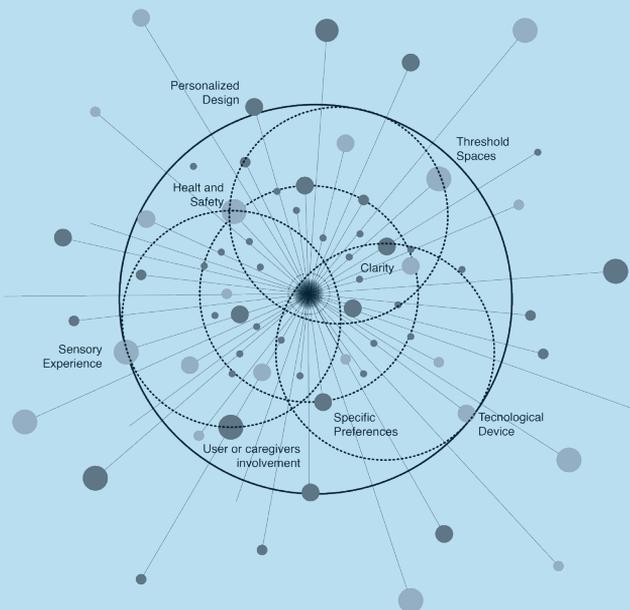
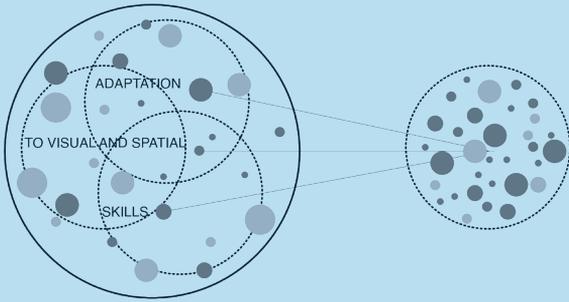


PEOPLE ON THE AUTISM SPECTRUM

ENVIRONMENT

DEFICIT OF PEOPLE ON THE SPECTRUM

POTENTIAL STRENGTH OF PEOPLE ON THE SPECTRUM



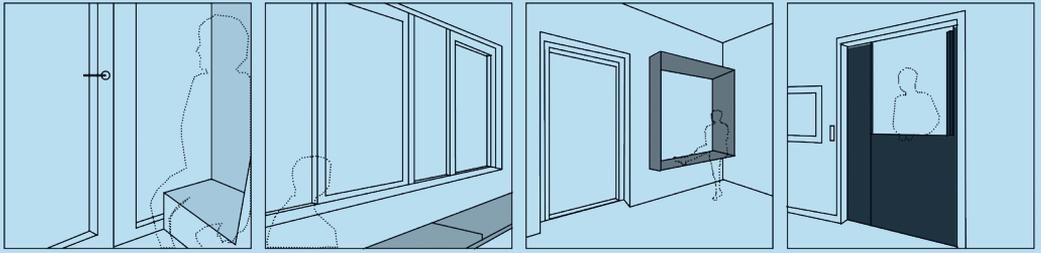
PEOPLE ON THE AUTISM SPECTRUM

ENVIRONMENT

OPTIMIZATION OF THE PROJECT

SPECIFIC NEEDS OF PEOPLE ON THE SPECTRUM

GUIDELINES/DESIGN ASPECTS OF ENVIRONMENT



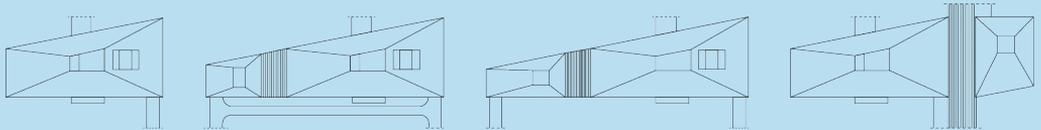
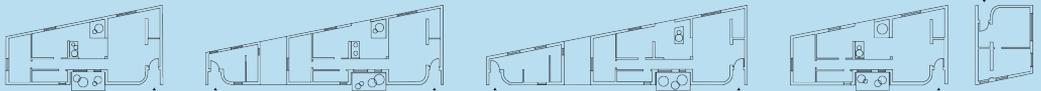
PLUSKONTORET ARKITEKTER  
AT HOME  
TØRRING (DK)  
2015-2016

MEDICAL ARCHITECTURE  
ADULT AUTISM INPATIENT UNIT  
MITFORD (UK)  
2016

PLUSKONTORET ARKITEKTER  
AT HOME  
TØRRING (DK)  
2015-2016

WIENBERG ARCHITECTS  
SENIORS HOUSE  
HINNERUP (DK)  
2014

PROGRESSIVE INTENSITY OF INTIMACY





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