
THE INFLUENCE OF SPATIAL QUALITY ON THE OCCUPANT PSYCHOLOGY: A STUDY OF THE EVOLUTION OF ARCHITECTURAL DEVICES

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Abstract: The person with a developmental disability or mental disease is confronted to many difficulties in perceiving his environment and consequently understanding several daily life situations. Sometimes, architecture can be disabling for them. The incapacity can be the consequence of an unsuitable space, which can accentuate the routine of daily practice. The therapeutic architecture offers spatial elements specific to the physiological and psychological needs of the user. Indeed, it can have an impact on the well-being of individuals, especially those whose sensory particularities problems must be taken into consideration in the design process. This architecture is conceived as an instrument of care, each component of the space responds to a particular need in order to create a space that becomes a complete place of recovery. We are interested, in this research, in the evolution of the sensitive approach and the qualitative dimension in therapeutic architecture specifically designed for people with disabilities as adults and children.

key words: psychology; sensitive dimension; evolution; mental health; architecture; conception; perception

Introduction:

Disability is a social phenomenon due to congenital or acquired health problems. The term disability refers to the consequences of this health problem on the person's relationship with his environment. The person concerned is in a situation of physical impairment or a functional disorder that limits his daily activities and participation in ordinary social life. As with disability, mental disability is not an illness, it is a limitation of the cognitive abilities to read, to plan, to imagine, to deduce solutions to everyday problems or to predict a danger or event. The development

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of mentally disabled people is slower than normal or neurotypical people, and the phases of their evolution are less predictable.

The person with a developmental disability or mental disease is in a situation of incapacity due to the limited cognitive abilities as well as the difficulties in perceiving and consequently understanding several daily life situations. Sometimes, architecture can be disabling for them. The disability can be the consequence of an unsuitable space, which can accentuate the clutter of daily practice.

In this paper, we are interested in the evolution of the qualitative dimension in curative architecture for adults and children. Thus, we have chosen to focus our bibliographical review on the integration of the sensitive approach in this evolution. We explain how standards have evolved towards quality in therapeutic architecture by evoking flagship examples of modern architecture.

THE INTERACTION BETWEEN THE ENVIRONMENT AND HUMAN BEHAVIOUR

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Environmental psychology is interested in understanding the dynamic interrelationships between the individual and his physical and social environment, in its spatial and temporal dimensions. It is also interested in the effects of environmental conditions on individual behaviours and emotions (Moser, 2009). Its role is to identify and explain the processes of interaction between humans and their environment through their perceptions, emotions, attitudes, representations and behaviours. Its objective is to reduce the influences and harmful effects of the environment on our mood, our physical and mental health.

This recent discipline began to emerge in the 1950s and 1960s in a post-war context. This period saw a wave of massive reconstruction of housing and collective dwellings accompanied by a need to reduce construction costs. This situation led architects and urban planners to question psychologists about the cognitive and behavioural impact that the environment can have on individuals. In 1956, Lewin proposed the notion of "vital space". He announced that human behaviour must be considered within the framework of a global field. This space must be conceived as a whole and in which many forces intervene and influence it simultaneously. The environment is no longer considered as a simple decoration surrounding the individual or group of individuals. Indeed, each individual is inscribed in several environments (Moser, 2009). Each

of them influences our behaviours, emotions and feelings and provides us a social, cultural and economic identity.

The role of the environmental psychologist is to carry out quantitative and qualitative studies on the experience of Humans in their environment. To be able to analyse the way in which human perceives, reacts, adapts and appropriates his space. In order to propose improvements, educational tools and indicators for urban or architectural space planners. It has now been proven that physical or architectural and material or immaterial characteristics in medical care surroundings have a strong impact on psychological well-being and on the care methods provided to the people with mental disorders. These methods differ depending on the disease and the population: the elderly, children, ... It is therefore essential to study all environmental and atmospheric parameters and their impact on the cognition, behaviour and well-being of the users, during the different phases of the design or rehabilitation of spaces for a specific population.

The evolution of normative considerations:

Before the 16th century, people who suffered from mental or psychic disorders were considered as evil beings or possessed by demons or madmen. In Europe, psychiatric structures appeared since the 16th century in Italy and Spain and began to develop in France, only from the 18th century. They played the role of a hospital-prison or an asylum that sheltered the alienated in order to isolate them from society, from which it was located outside the city limits. Its design answered the standards of classical architecture: symmetry, functional aspect, spatial dispatching and the classical typology. Until the 18th century, comfort recommendations were very limited and restricted to the benefits of ventilation, hygiene and the classification of patients. So therapeutic architecture began to be discussed with hygienist theorists (Pinel, 1836).

The premises of the sensitive approach appeared towards the end of the 18th century. They were summarized in the importance of green spaces, the choice of the position to be exposed to the east, good air and the site safe from soil moisture. All of these instructions were translated into a standard plan which was based on the idea of separating patients from each other and from "normal" people, but which also prescribed the appropriate choice of site. Esquirol (1817), an alienist physician and precursor of psychiatry, insisted on the judicious choice of a large field exposed to the east, a little elevated, with a dry soil, but with abundant water. For the precursors of psychiatry, psychiatric architecture should not be disclosed only to architects (Kovess-Masfety & al. 2004). Until

then, the openness to the environmental consideration was restricted to technicality, hygiene, control and security which were the key words of any spatial and conceptual instruction for therapeutic architecture (Esquirol, 1817). In 1875, there were a dozen specialized children's wards included in large hospital structures.

The beginnings of atmospheric reflection:

At the beginning of the 20th century, precisely from the thirties, new environmental factors were taken into consideration. Indeed, it was stipulated that, institutions had to open up to the outside by avoiding the prevailing winds. Acoustic preoccupations were born and we started to think about acoustic insulation between the rooms. Favourable orientations were also evoked to naturally ventilate and light spaces as well as the distribution of spaces such as corridors and staircases. However, these sensitive considerations were still of a hygienic nature, aiming more at the normative comfort of the user than at spatial quality. They could be resumed in an aesthetic and essentially luminous and technical approaches focused on ventilation, heating, aeration, insulation and artificial lighting. In their book, Doctors Raynier and Lauzier (1935) stated that everything in construction must aim to make the establishment as healthy as possible, both outside and inside (Raynier and Lauzier, 1935). They propose to close the access to the staircase with a door with unbreakable glass. For them, lighting and ventilation of stairs and corridors should normally be provided by sufficient openings. Their heating contributes to the good conditions of the general installations of the establishment (Noël, 2004). All premises, especially those occupied by patients, must be adequately ventilated. They insist that all rooms without exception shall have direct access to the outside. Patient areas should be well-lit and sunny in all their parts (Léothaud, 2006).

It was only after the Second World War that a sensitive approach was put in place with the expansion of social therapy. This approach comes to restore the patient's connection with the outside world. Architecture opens up to the outside world. Walls are destroyed, community life is promoted and the social dimension prevails, this is the new concept of the "hospital-village". This organization was quickly criticized and judged artificial because it ultimately favoured segregation despite its openness to the outside. In reality, it privileged the capacity of reception, the number of beds and the functional and security aspects much more than the spatial and environmental aspects. In response to this configuration, Ferrand and Roubier (1967), mentioned that the artificially conditioned environments, certainly highly secure, but which we may

wonder whether they are not too secure, and whether as a result, the atmosphere of these institutions does not contribute to a certain chronicisation of the patients (Ferrand and Roubier, 1967).

The importance of projected atmospheres:

From the 1960s onwards, new methods such as occupational therapy and biology emerged and set new standards for therapeutic architecture (Zribi, 2021). The World Health Organization (WHO), in its 1960s Public Health Papers, prescribed standards for the modernization of old psychiatric structures (WHO, 1960). However, it also stresses that the architecture of new hospital and psychiatric establishments must no longer be limited to the needs of patient control and monitoring. Thus, it emphasized the importance of the projected atmospheres, without however specifying their components. The spatial organization is fragmented and dispersed, contrary to the old structures. The architectural dispositions must be closer to domestic architecture by finding the right balance between the comfort and amenities of a semi-domestic environment. In these instructions, the role of the staff is evoked before intervening on the building, drawing inspiration from Freud's work, which shakes up psychiatry and puts the relationship between doctor and patient at the center of preoccupations, with the built environment in the background. We talk about flexibility and diversity, rather than order and power. The architecture of psychiatric hospitals is currently being revolutionized by the new idea of their functions. The hospital staff must try to create a therapeutic environment and the architecture must also contribute to this (WHO, 1960).

The WHO recommendations establish a sensitive approach based on research results from Great Britain, Sweden and the United States. In addition to issues of comfort and technicality (lighting, ventilation, acoustics and heating), we note innovative recommendations on natural lighting, colours, decoration, curtains, contrasts, variety and stimulation. We insist on the importance of the premises characterized by the harmony, proportions, colours and materials. Natural wood, wool and leather please (...) people like to look and touch. (...) Light and colour should ensure a degree of variety and contrast. Variety and contrast have a stimulating value, in contrast to uniform lighting and pastel shades. On the other hand, if the contrast is excessive, lighting and colour can cause glare. For the first time, the user is considered as a subject acting and perceiving the space. A space where we can recognize and understand the nature of the behaviour of all its users. It is a familiar, explored, integrated space that is easy to perceive and represent, and whose shape

makes the facility to identify the behaviour of other occupants (WHO, 1960).

Development of a sensitive approach:

Gradually, we are witnessing the humanization of specialized structures. They are now more than hospitable and integrated into the urban fabric. The recommendations describe warm, personalized, original and non-standardized aspects. Indeed, the essential must be devoted to the warm and welcoming aspect for the patients and the interior offers an original, personalized aesthetic (Dumoulin, 1991).

The perception and lived experience of the mentally patient and his environment would be at the center of the reflection. Maillot a doctor, Sonolet psychiatrist, Sivadon a doctor and Ponsart a doctor (1983), all discussed the patient environnement (Pascal, 2014) and (Donato & Kovess-Masféty, 2017). They talk about the importance of the diversification of spaces, the clarity of forms and spaces, the importance of landmarks, of proxemics, the fact that space and its characteristics can promote or reduce interpersonal relationships, the fact that all physical characteristics and their combinations must stimulate perception and promote memorization of light, materials and colours, to make people aware of the complexity of what participates in the creation of a place (Léothaud, 2006).

Since the Universal Declaration of Human Rights adopted in 1948, the first steps have been taken towards non-discrimination and the autonomy of people with disabilities. Starting in the 1990s, international strategies implemented new integration policies aimed at adapting the architectural and urban environment to people with disabilities. The environment must be transformable, modular and adaptable so that it is accessible to all in order to welcome difference and become inclusive (Demelly, 2014).

"Out-of-hospital structures such as consultation centers or day hospitals are diversifying and are integrated into the urban fabric. No longer is the goal to isolate this population, rather not to disconnect it from its living environment but to promote its reintegration into society" (Léothaud, 2006, p. 49). The classification of these structures is changing to become more medicalized care homes, specialized care homes, day support services, work assistance institutions and services, for adults with disabilities (Demelly, 2014).

But what about situations with children with mental disabilities? In the previous historical review, we have shown that architectural recommendations have gone beyond quantitative standards, to evolve to

qualitative, sensitive and well-being recommendations. the child is a sensory machine, his perception of space is different from the adult. the sensitivity of the child suffering from a developmental disorder influences his perception and consequently his occupation of space and therefore his behaviour. this is why we decided in this theoretical research to continue the study of the evolution of the integration of the sensitive approach in the architecture of care of children with disabilities.

THE ATMOSPHERIC RECOMMENDATIONS IN THE CHILD'S ARCHITECTURE

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In 1950, in his book *The New School*, A. Roth mentioned a new category of school, which he called the special school, for children who were constitutionally fragile, backward, handicapped, disabled, or deaf-mute (Donato & Kovess-Masféty, 2017) and (Roth, 1950). To design this kind of school, the architect is confronted to additional constraints, compared to the "ordinary" school. "Spiritually or physically handicapped children are generally particularly sensitive. For this reason, it is necessary to provide them with a particularly friendly atmosphere, a duty that unfortunately has been all too neglected" (Roth, 1950, p. 53). So, Roth recommends a close collaboration with doctors, psychiatrists, pedagogues and directors of children's homes. These structures respond to the different recommendations of the modern school. A. Roth evoked a general atmosphere, of cheerfulness, air, sunshine, colours and motives. So that later, in their private lives, they would seek to find the same atmosphere again. He underlines the role of this atmospheric environment in the aesthetic and moral development of the child. These recommendations were taken up by the *Bulletin Technique de la Suisse Romande*, published in 1954 by the International Union of Architects. For specialized schools, Roth proposes that these ambiances should be the main concern, especially for children suffering from certain forms of mental handicap and particularly sensitive to environmental factors.

The therapeutic architecture for the child must respect the child's scale, his motricity and sensory characteristics. The space must therefore be rich in textures, materials, colours, patterns, flowing water, sand and earth... Such the example of the playground of the "coler hospital" in New York City, where each low wall in the courtyard is crowned with a gutter in which flowing water runs, in addition to a large sand box. This building was designed by the American architect Richard Dattner in 1970

and is part of an interest in children's architecture such as schools, playgrounds or children's playgrounds, ...

Nowadays, we are witnessing the introduction of new learning and therapy methods and new architectural recommendations adapted to the sensory specificities of the disabled persons and children. Designers take care of the choice of materials, as in the Collombey-Muraz, Galetti and Matter school and the Fully school, designed by Bonnard and Woeffray. The idea of the spaces' flexibility through a module has precedence over the designs because it allows individual and group work. A single space allows for various activities and accommodates the different needs of the host population. More and more, designers are looking for spatial quality through friendly atmospheres created by materials, colors and lights. The school in Paspels, in the Grisons, built from 1996-1998 by Valério Olgiati in Zurich is an example. What is important is that the space is flexible and modular with good light and acoustics for various activities.

The new teaching or specialized centers offer a flexible use and become real pedagogical units: garden, classroom, terrace, ... The stimulating atmosphere can then become a third pedagogue (Dudek, 2021). The configuration of the space allows the organization into different play areas, helps to create a friendly atmosphere and micro environments for the individual and the group. Indeed, each child, with his or her multi-sensory qualities and sensitivity, will be able to produce micro environments and to appropriate the space.

We must note that these specialized structures, dedicated to children with cognitive and assimilated handicaps, also respond to the different therapeutic recommendations of the environment, namely: light, acoustics, thermal, spatial organization, ... and are in line with the new concepts of "ordinary" modern school architecture such as the "articulated class", the "open school", or the "learning street", developed by Herman Hertzberger, this pioneer who revolutionized early childhood architecture (Layeb, 2020).

Disability in the interest of spatial design:

Today, some designers base their reflections on the notion of disability. "Blindness" becomes a starting point for the creation of multi-sensory spaces. Heylighen, and Strickfaden both architects and urban planners, assert that what seems constraining at the beginning can become a source of creativity later on (Schelings, 2016). We give the example of the "Glass House" project, designed by the architects Penezic and Rogina, in 2001, for people with impaired vision. As its name indicates, it is a glass pavilion, designed on two main properties of this

material, which are transparency and reflection. The two designers then used technological means so that all users, clairvoyant or visually impaired, experience the building in an equivalent way.

In other configurations, the architecture becomes curative. Thanks to its different spatial and atmospheric specificities, it is transformed into a real healing potential. Numerous "Maggie's Centres", created to accompany people suffering from cancer, witness to this. These centers have been designed with psychological therapeutic objectives to help these patients to overcome their distress. We also mention the example of the "New Stuan Centre", managed by the Scottish Society of Autism (SSA), designed by Aitken and Turnbull. This project is designed to provide daytime care for children with ASD. It contains a center for diagnosis, assessment, training and awareness (Scott, 2011). It is designed to be coherent and stimulating. The autistic child was taken into account from the early stages of conception. This center is qualified by its designers as the most advanced center in the world. It meets the principles of zoning and transition. The circulation spaces are "T-shaped" for "better visibility and trajectory ", as prescribed by the recommendations of the designers Mostafa (2014) et Scott (2011).

Because people with autism often have difficulties on managing the transition from one activity or environment to another, Aitken Turnbull Architects resolved this problem by proposing threshold spaces or "lay-bys" between each classroom and the circulation space. Within each classroom, the scale is broken down again to include a small individual area. The architects hope that this progression of scale will facilitate the transition from one space to another. In both the circulation spaces and the classrooms, the designers opted for indirect natural lighting (zenithal lighting) and horizontal sun shades in the learning spaces.

Atmospheric aspects in therapeutic architecture:

Some researchers think that people with autism may be monitored and feel threatened in small spaces with other people. Each of us maintains a bubble of space to perceive, assess and respond to potential dangers. Presumably, the comfort level provided by this bubble may be more easily compromised for people with low body awareness. This can stress them because they are unable to discern if other individuals are invading their personal space. Many architects seek to resolve these conflicting spatial needs through flexibility, a variety of spaces, or a mixture of the two, such as the example of River Street School. At the Netley School in London, designed by Haverstock Associates, Jenkins

designed small recess spaces adjacent to spacious classrooms. The flexible concept used provides spaces that can accommodate multiple functions.

GA Architects took a similar approach to Aitken Turnbull when they designed Sunfield's Rowan and Oak House. The circulation space outside each child's room also serves as a small group play area. The proximity of the bedrooms allows children to easily escape to their rooms if they are overwhelmed. This ability to easily withdraw can also give them more comfort in the social area. For children who are afraid of large spaces, these small social spaces can also allow them to increase their level of convenience to take advantage of larger area, as they represent a space for rest and emotional evacuation

In France, there was the inauguration in December 2014 of a new, unique and innovative center of its kind. It is the home of life: "*L'éveil du scarabée*" which replaces the home "*Les Vinots*", closed in 2003. Negroni, the architect-designer and Sanchis, the owner and director, have opted for a participatory approach. To avoid the imbalance caused by the relocation, the future residents were involved in the project in the choice of colors for the rooms and their layout, right up to the symbolic act of delivering the keys. In the image of a design hotel, this architecture presents an individualized medicalized environment in the middle of the countryside to welcome about fifteen adults with autism. The plan is structured around a common space like the "village square" covered by a protective vault that creates a protective cocoon. Around the concept of therapeutic architecture, each architectural element is reflected according to the hyper-sensitivity of the residents with ASD. The designers have privileged the consideration of the senses in their reflections. Everything has been designed to avoid a maximum of stress: the choice of materials, volumetry, shapes, coloured light, colours, absence of narrow corridors, the organization of the light, canopies, moucharabiehs and the sound-proof walls... The nursing team has noticed an improvement in the behavioural responses of some residents, since their arrival in this new structure.

From specialized space to shared space:

Other designers opt for a neurotypical approach, which is directly opposed to the sensitive approach. This approach is based on the low capacity of the person with autism to generalize his abilities. The founders of this theory see that the faculties that a child can acquire in a sensitive learning environment do not necessarily make it easier for him to assimilate and to be integrated. This is the case of the school for

autistic children "Celebrate the Children", designed in a similar way to an ordinary school. The corridors are decorated with colorful banners, photographs and artwork of the students. Parents preoccupied by their children's sensitivities often ask the school administration "if there is too much stimulation". The director responds that her students need to learn, in the real world, to use their acquired skills outside the classroom. USA Architects designed the building around a main corridor as a replica of a typical American main street. This "street" includes several shops and a fictitious apartment with living and dining rooms, kitchen, bedroom, laundry room and playrooms. The aim is to simulate the real world in the school should make the transition to the real world much less intimidating.

Conclusion:

The therapeutic architecture offers spatial elements specific to the physiological and psychological needs of the user. Indeed, it can have an impact on the well-being of individuals, especially those whose sensory particularities or psychological problems must be taken into consideration in the design process. This architecture is conceived as an instrument of care, each component of the space responds to a particular need in order to create a space that becomes a complete place of recovery.

In this paper, we have previously tried to give some milestones on the evolution of therapeutic architecture, whether psychiatric, educational or other, through significant moments in history up to the modern era. The countries of North Africa were often influenced by the winds of change coming from the West, given their geographical locations, the historical context, and their inclusion in the various world organizations and international conventions and charters. There, the support of mental diseases has evolved since the Roman period until today. It has evolved from the hospices through the Demnas, the Mâristân and the Tekyas, to arrive at the origins of current structures and their evolution.

It seems to us that spatial recommendations should not be limited to establishments specifically designed for people with disabilities. They can as well respond to neurotypical people and even in urban spaces.

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