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Autism and Architecture

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1. Introduction

"At the International Congress "Building, Dwelling, Thinking" held in 2001, Heidegger concludes by highlighting the convenience and importance for the scientific architect to develop architecture by "*building from living and thinking about dwelling*".

Architecture has been defined in many ways throughout history, but its focus, its aim, its purpose, is dwelling. For this reason, Norberg-Schulz (1980) affirms that in order to research and understand an architectural space, it is necessary to understand *existential* space, that is, the concept of space that allows man to create a stable image of what surrounds him, at the same time allowing him to belong to a society and culture.

In an architect's work, there is an underlying notion, which may be evident to a greater or lesser extent, that the built environment is a space that is to be *lived in*, inhabited, for it to be considered architecture. It is this existential experience of the space which gives it a sense of place and not a mere sense of the abstract.

Likewise, for many years, architecture has taken into account the existence of people with different types and degrees of disabilities (mainly visual, hearing and motor), and the architect has planned and designed, either in accordance with their convictions or purely down to legal guidelines, so that spaces can also be inhabited by these people. So, here we are talking about "accessibility", which is a clearly (although not exclusively) physical concept: this is a matter of enabling disabled people to access buildings/spaces, which subsequently makes it possible for them to inhabit them.

However, there are other deficiencies or disabilities that are not so "visible", and that are obviated in making a built environment "accessible". According to Dianne Smith (2009), in the design process (of a building, of a street, of a town, of an interior space...) two paradigms

intervene, almost exclusively: that of the client/property developer and that of the architect. That is, it is the visions that these two agents have of reality, of how things work and are perceived, which give shape to the building. This, moreover, on numerous occasions, with the prior assumption that said environment is to be practically limited to being a container or backdrop for certain activities or functions.

Nonetheless, for people with certain cognitive and sensory deficiencies, etc., which are “*less visible*”, as Smith herself affirms, including people suffering from autism, this supposition regarding how spaces are to be perceived and inhabited is far from the truth: due to their deficits, they have to make an effort, sometimes an enormous one, to be able to assimilate and understand the environment surrounding them. In this struggle, due to the problems that they have in processing the information that they receive via their senses, many factors may imply a great barrier and, at certain times, may cause a “blockage” in their comprehension of the environment, which, at the same time, leads to frustration and strange behaviour in the eyes of a chance observer (gestures, verbal expression, movement...).

Therefore, the surroundings, the built environment, is a factor which notably affects (directly and in many other indirect ways) people with certain *less visible* deficiencies. As the architect John Jenkins states, with reference to the design of educational areas for autistic children, although it may be generalised to people of any age and to other types of buildings, “*mainstream children are probably more ‘able to cope’ with badly designed spaces than an autistic child would be. So the responsibility to create a ‘good’ environment is brought into sharp relief.*” (Quoted in Humphreys, 2008, pg.41).

2. Autism

In this section, the intention is to give a global vision of what is understood by the term ‘autism’, and what the characteristics of people with autism are.¹ It is true that the definitions of the disorder, its etiological explanations, the nosological considerations, and even the treatment of people with autism, have changed over time, in keeping with the progress that has been made in research into autism from diverse, although complementary, fields such as medicine, psychology, pedagogy or even philosophy. However, it is necessary to know what peculiarities people with autism show in order to determine what the characteristics are that a built environment has to have in order to make it easier for them to grasp and so achieve other objectives that go beyond, but to a certain point depend on, the architecture itself, such as encouraging learning, promoting autonomy, making it easier to socialise, ensuring independence or even preserving the dignity of the person with autism.

¹ The intention is not to assert that the characteristics are unique. Each person with autism shows symptoms in an almost unique manner. It is a matter of seeing the common characteristics, aspects and behaviour that are frequently apparent in people with autism.

2.1. General concept

Autism is one of the most fascinating disorders that medicine and psychology have had to face. Isolation or solitude is one of the most enigmatic characteristics of autism. In fact, when American psychiatrist Leo Kanner (1943) describes the autistic disorder for the first time, he points out that the pathognomic sign is the inability to relate to other people, which causes an “*extreme autistic solitude*”. In this first description, Kanner specifies a series of common characteristics in the children that he studied, which we can summarise below:

- Inability to relate to other people, at least in a normal way
- Extreme autistic solitude which apparently isolates the child from the outside world
- Deficiencies in the language, which may include muteness, pronominal inversion, echolalia or an idiosyncratic way of speaking, among others
- In some cases, an excellent literal memory
- Preference for certain specific foods (from a very young age)
- Fear of intense noises
- An obsessive desire to repeat and insistence on an invariable environment²
- Scarce repertoire of spontaneous activities (like normal play)
- Strange motor stereotypes, like spinning or swaying
- Normal physical appearance
- Appearance of the disorder in the first three years of life

2.2. Historical evolution of the consideration of autism

During the years prior to the appearance of Kanner and Asperger’s articles, as a consequence of the wide diffusion of psychoanalytical theories, and in spite of the fact that Kanner himself had suggested a biological deficiency, it was considered that autistic disorder had a psychodynamic aetiology, that is, that it had originated due to emotional causes, leading to the blame being laid on the parents (there was talk of cold mothers, unaffectionate fathers...). So, it was finally affirmed that the cause of autism was the parents’ wish for the child not to exist (Bettelheim, 2001). The psychoanalytical therapies used tried to restore these alleged emotional wounds and reconstruct the supposedly broken affections. This type of psychodynamic treatment, in the opinion of many contemporary researchers, has not made many contributions. (for example JK Wing, 1968: Escobar Solano, Caravaca Cantabella, Herrero Navarro and Verdejo Bolonio, s.d.).

² The term used by Kanner is sameness, which could be interpreted as “similarity” or “monotony”, but none of these two words can completely describe the original meaning (situation in which there are no changes). This is often interpreted as “invariance in the environment” or “Kanner’s autism”

From the mid 1960s until around the middle of the 1980s, autism has gone from being considered an emotional disorder to the opinion that it has a neurological origin, finally being treated as a cognitive disruption, rather than affective (Escobar Solano et al., s.d.). Methodical and rigorous research began on autism, to try to understand alterations in communication and language, as well as in social relationships, resistance to change, etc (for example, Rutter and Schopler, 1984; L. Wing and Gould, 1979).

From that moment, and thanks to the progress made in research, autism is now considered to be a developmental disorder. Autism is included among the so-called Generalised Development Disorders, which, as well as autistic disorder³, include others such as Asperger's Syndrome, Rett's Syndrome, child disintegrative disorder, and the non-specified generalised development disorder. Recently, it has also come to be understood that on many occasions it is not easy to set a clear limit among these disorders, instead there is a type of continuum in which three essential areas are affected to a greater or lesser extent⁴: communication (verbal and non-verbal, as this does not only refer to language), social reciprocity, and the absence of imaginative behaviour and symbolic play, with highly repetitive interests and activities. For this reason, talk of Autistic Spectrum Disorders (ASD) came about, which nowadays is a common term (in fact, the upcoming APA Diagnostic and Statistical Manual of Mental Disorders, DSM-5, which is hoped to be published in 2013, considers this denomination).

3. Design criteria

We will go on to present, fleetingly and not in great depth, some aspects of people with ASD to whom a solution can be given using architectural project and design mechanisms. We will group them, in order to make their presentation more systematic, according to the different areas that may be affected in said people.

3.1. Imagination

Resistance to change and a limited capacity of imagination are one of the essential characteristics of autistic spectrum, and these are reflected in aspects such as difficulty or extreme nervousness when changing activity, and even when moving from one space to another (because people with ASD are incapable of "imagining", in the sense of creating a mental image of what there might be at the other side of a door or wall, for example). From an educational point of view (and even in family life) this aspect is faced by "anticipating" the activities that are going to be carried out next, and avoiding or lessening, as far as possible, unexpected changes in the planned routines.

From the point of view of an architectural project, the inability to construct a mental image of the environment, as well as to integrate parts into a whole, may be faced by

3 Which would correspond with the so-called "classic autism" or "Kanner's autism"

4 This is known as "Wing's triad" (L. Wing and Gould, 1979)

looking for a clear structure in the building, as well as by providing elements that give it a certain order and unity, in such a way that the building can be easily read, predictable, *imaginable*. Referring to the transition between spaces, the anxiety suffered by people with ASD can be reduced for example, by using colours on the doors (depending on the spaces behind them), as well as pictographs and photographs which “advance” what we are going to find, or by creating transitional environments in between, where the change of space can be anticipated.

3.2. Communication

Difficulties in verbal and non-verbal communication, together with difficulties processing information, make it necessary to “remove certain psychological “barriers” and adapt the environment with codes which [...] are characterised by being specific and easily perceivable (as opposed to subtle), simple, that is, containing few elements (as opposed to complex) and permanent (as opposed to temporary)” (Tamarit, De Dios, Domínguez, and Escribano, 1990).

The person with ASD needs visual support for communicating and pictographs or photographs of objects, people, etc. are usually used. The built environment should be able to “welcome” these forms of communication, foreseeing their correct location and integration. Colour coding, for example, of different elements may also help to improve communication.

3.3. Social interaction

Difficulties in social interaction are taken into account, by definition, although to varying degrees, in people with ASD. For this reason, different educational strategies try to influence this aspect. Therefore, it will be necessary to provide the spaces in which to allow and even encourage social interaction, although always taking into account that people with ASD may show particular proxemics⁵, needing wide, open spaces, in which said interaction may take place without getting too close. A combination of larger areas and others, in which interaction can take place more closely, if required, would be advisable. Moreover, at certain times a person with ASD may feel overwhelmed by a demanding social situation (in the sense that they are forced to participate in several interactions) and need a space to which they can retreat in search of privacy or a “simpler” interaction (less people, or people with whom they are more familiar).

3.4. Sensory difficulties

In the case of ASD sufferers, it is also common for malfunctions to exist in the reception (or the processing) of stimuli, which is demonstrated by a visual, acoustic, vestibular or tactile (although also often related to smell or taste) hypersensitivity (or sometimes hyposensitivity). The proprioceptive sense is also altered at times. A consideration of this aspect should lead us to be careful when designing with colours (which do not clash excessively, are not

⁵ Proxemics refers to the space that exists between people in different social interactions. Proximity may be perceived as a threat by a person with autism.

too strong or too bright), textures or patterns, with acoustic properties in these spaces and the construction elements separating one from another, with lighting (soft lighting is recommended, preferably sunlight, and in all cases avoiding fluorescent strip lights, as the flickering and buzzing may upset a person with visual or auditory hypersensitivity), as well as with the fittings, etc. Another example of sensory alteration is a different perception of the sensation of pain, which may mean that a person with ASD could suffer serious burns on their hands, due to not moving them in time when water from a tap, for example, comes out at a very high temperature, or they may have a serious cut or injury and barely notice.

Multi-sensory stimulation rooms ("Snoezelen" rooms) allow people with ASD to adjust their sensory perceptions and also reduce anxiety at specific moments.

3.5. Behaviour and safety

Behavioural problems are also frequent in people with ASD, and may lead to aggressive conduct, meaning that the elements in the built environment have to be designed, chosen and implemented taking into account these potential bouts of aggression. Examples of these elements that are to be paid special attention to are bathroom fittings, electrical devices, metal door fittings, banisters and railings, exterior carpentry, tiles, etc.

4. Conclusion

It has been proven that existing scientific literature regarding built environments in relation to people with ASD and vice versa is scarce, and this is in spite of significant research activity carried out in relation with autism in recent years. This interest is due to the significant increase in the number of cases diagnosed, meaning that prevalence studies produce much greater ratios than the figures of 1 to 3 people in every 10,000 that were handled at the beginning of the 1990s and which were previously even lower. Recently it has been affirmed that there is one child with ASD in every 110 born (CDC – Center for Disease Control and Prevention, 2009). It is clear that the increase in numbers does not reflect (at least not exclusively) a real increase in the number of cases, but the expansion that the concept of autism has undergone, stretching to that of autistic spectrum, and to health care and education which allow for early diagnosis, with a greater awareness of the existence of the disorder (Ahrentzen and Steele, 2009). In spite of this, figures reveal that it is a significant group of the population, which requires attention from society. In our area of discipline this should also be the case. In just a few years, architects have been made aware of how to draw up plans without the so-called "architectural barriers" that limit accessibility for people with a disability. However, under this concept of a barrier, we do not usually include those which limit the use of the built environment for people with cognitive or mental disabilities. As Baumers and Heylighten (2009, 2010) state, these people perceive space in a unique, different way, with the "mind's eye".

It is necessary to progress in research in this sense, analysing the architectural achievements designed and built for people with ASD, checking how suitable they are for the particular

characteristics of this part of the population, even studying any defects they may have and verifying the new contributions that can be made in them.

It would also be interesting to encourage field studies with specific interventions in the built environment, even on a smaller scale, such as that of Magda Mostafa (2008), which allows us to extract results that can be checked and verified on how certain activities improve, and to what extent, the experience of the person with ASD in their built environment.

If, in general, the constant reflection upon the relationship between the person and space, between the individual and their environment (built), is important for the discipline of architecture, we believe that the particularisation of this reflection for the *dweller* with autism may be an interesting contribution for the discipline itself. In fact, researching about this adjustment and this link, between the architectural object and its aim - the person, is to reflect upon architecture itself, which, like other arts and other disciplines such as Philosophy, grows upon *rethinking*.

Finally, we will conclude with a quote from Luis Fernández-Galiano, which allows us to situate the role of the architect, especially in the case of people who are to be found “within the spectrum”:

“Dwelling is a difficult job. Like the profession of living, that of dwelling requires continual learning and attention, demands meticulous, systematic effort, and claims an immeasurable investment of time and energy. The nature with which the majority of people manage to carry out the complicated rituals of the dwelling space is surprising. Just as happens in the case of language, expertise in use is acquired along with habit, which provides guidelines and domesticates gestures and voices via daily reiteration of movement and words. So, this tiring and habitual profession has both an obstacle and an accomplice in the architect” (quoted in Oyarzun, 2005)

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