Architectural Design and Methods Inspired by Children's Culture and Creativity [Global Culture and Spatial Individualization]

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Abstract. The topic of children and adolescents in architecture was particularly explored in the modern era. This phenomenon was, among others, a result of contemporary social and demographic conditions as well as the development of social sciences and psychology. The 20th century, called a Century of the Child, was a period of specific 'childhood worship'. It was a time of tremendous hopes placed in the young generation and its potential to rebuild the world. The result was that the ubiquitous theme of the child and childhood also appeared in architectural theory and practice. The purpose of the research is to answer a question How the topic of 'child in architecture' may inspire in the times of aging societies? Principal results of the research are to distinguish three aspects of the phenomenon of 'child in architecture'.

1. A child was discovered as a user - special places were prepared for children – a zone of special characteristics at home and in the city, with design solutions inspired by the child's developmental needs.
2. Children's culture and creativity have become an inspiration for spatial solutions of the environment [designed for children and adults] and urban regeneration of the public space.
3. A child was asked to be a co-creator in the process of the participatory design, becoming an active user communicating needs, a partner inspiring future project activities.

The subject of the child in architecture, discovered and explored in the last century, generated a new typology of solutions [directed to children or inspired by the culture of childhood]. Over time, patterns from the world of adults and children began to intertwine, creating a new type of multi-generational solutions in the public space. The child's zone has been embedded in the architecture of the city in the concept of mixed use [which is a distinguishing feature of contemporary solutions]. Major conclusions of the paper: The homogenization, or the unification, of the culture is one of the effects of globalization. The individualization of design solutions [for example adaptation to the requirements of specific age groups of users] can be a way to resist unfavourable space unification processes. The paper is based on comparative studies of public utility buildings [serving in particular the purpose of out-of-school education] as well as observations and comparison of the work of practicing architects, students and children participating in workshop classes implemented at the Silesian University of Technology.

1. Introduction
Childhood – the first period of life between the birth and adulthood – associated with education, upbringing, fun, need for safety and love, is today perceived as a complex phenomenon. Childhood is a subject of multidisciplinary studies in the humanities and social sciences. Studies concerning childhood architecture can be found in scientific publications related to selected solutions of school and kindergarten buildings, the effect of the quality of the built environment on health, school marks
and behaviour, children’s creativity (spatial education, participatory design) and, in the urban planning context, the process of the ‘appropriation’ of the space by children, a concept of the city as a context of growing up. The subject of childhood ‘discovered’ in the architecture of the 20th century and intensively exploited then, is returning with respect to current phenomena of globalisation and ageing societies. The question that arises is what role in the shaping of contemporary architecture is played by its youngest users?

2. The origins of the phenomenon known as 'child in architecture'

Childhood as a separate category did not probably exist in the so-called traditional or pre-industrial societies (figure 1). The awareness concerning the first period of human life appeared in the industrial epoch, provoking the avalanche of changes throughout and following the 17th and 18th centuries (Aries) [1]. The aforesaid newly-born awareness became the foundation on which a modern family model was built and triggered the formulation of requirements concerning the architecture of dwellings and public buildings. The development of the middle and upper classes, benefiting from industrialisation, was accompanied by a rapid influx of proletariat into cities.

In the early 1900s, the living conditions of the poorest masses were harsh with the fate of children being extremely difficult, as the children were employed in factories, exposed to violence or affected by homelessness. Solidarity with the poor gave rise to various social and legislative initiatives. The late 1890s saw the establishment of organisations protecting children against violence. Measures which were taken aimed to organise personal, political, economic, social and cultural rights of children, thus providing them with freedom and safety (UNICEF) [2]. The aforesaid process lasted until the end of the 20th century when it was crowned with the World Summit for Children (1990) and the adoption of the European Convention on the Exercise of Children’s Rights (1996). These two events marked the end of the century named, after a book by Ellen Key [3], as the Century of the Child.

The aforesaid period was the time of the systematic research on growing up, which was performed using the then-developed experimental and statistical methods. New trends in pedagogy focused on providing children with versatile development and socialise individuals in the process of up-bringing as well as on the individualisation and promotion of education. The gradual introduction of compulsory education in Europe and the USA ended in 1950s and required the construction of modern facilities of both formal and non-formal education (centres of culture, people’s universities) serving the needs of working youth. The end of WW2 was followed by the period of an increased birth rate (1945 – 1965) with children becoming a large group in the society. It was necessary to provide new infrastructure to families meeting, among other things, special, i.e. protective and educational needs. The popularity of multi-family buildings in housing estates necessitated the creation of facilities enabling outdoor physical activity.

The Century of the Child was characterised by a demand for a new type of architecture which could address the needs of growing-up users where this form of design was recognised as the manifestation of new progressive thinking. The creators of modern architecture undertook to redefine it in the spirit of, so to speak, the ‘cult’ of childhood. Past centuries were marked by the search for patterns which could help shape the space in a manner corresponding to the contemporary image of growing-up. New social sensitivity resulted in a new approach to issues concerning the healthy environment of development. New methods which aimed to regenerate the tissue of the city were inspired by the dynamics of children’s play. This avant-garde approach was to mark the start of building a new better world (Kinchin) [4].
3. Child as a user

The subject of the ‘child in architecture’ came into being during modernism, in the context of functional requirements of the space designed for growing-up users, and was determined by the research results in psychology, pedagogy, social sciences, medicine and interdisciplinary collaboration of architects and specialists in pedagogy. The recognised children’s needs included both physical needs as well as the need for safety, belonging, respect, self-acceptance, self-fulfilment and the possibility of satisfying the aforesaid wants through play and education. A new pursuit included the providing of children with appropriate hygienic and sanitary conditions as well as the adjustment of dimensions, layout and the programme of a designed space to children’s developmental needs. The space-related objectives included flexibility and individualisation. That space was inspired by the figure of its user, perceived as a ‘star’ or ‘hope’, i.e. a growing-up person surrounded by care and provided with safety and versatile development (Smolińska-Theiss) [5]. The user was also equipped with a special children’s zone – a laboratory of growing up both at home and school (child’s bedroom, school classroom), which also became the area of observation. The characteristics of the ‘zone’ corresponded to contemporary technical conditions concerned with related architecture. The dimensions and accessibility/availability of the space were adjusted to developmental needs (minimum functional standards had been shaped until the 1950s) [6]. The neighbouring adult zone made it possible to exercise necessary control. The area, constituting an enclave, was characterised by the spatial and functional autonomy.

4. Inspiration behind the shaping of the ‘children’s zone’

In the periods of modernism and late modernism, the children’s zone was like the adults’ world in miniature (‘schools like cities’ by Hans Scharoun / Darmstadt (designed in 1951), Lünen (1962), Marl (1968)). The layout of historical designs of schools, kindergartens and people’s houses referred to the...
archetype of a house or a residence being home to public life. The 20th century saw the creation of children’s zones inspired by systems used in the shaping of production spaces (‘process lines’ - Munkegårdsskolen, Gentofte, Arne Jacobsen (1957); modernist projection of the Palace of the Youth - Pałac Młodzieży in Katowice by Zygmunt Majerski, Julian Duchowicz, (1951), (figure 3)). Designs of the children’s zone also started to contain solutions inspired by the forms of contemporary educational toys such as Fröbel's Gifts blocks in the equipment of a children’s room designed by Alma Siedhoff-Buscher and located in Haus am Horn (architect Georg Muche). As the toy industry developed, children’s zones drew inspirations from more modern blocks such as LEGO® - the museum of blocks in Billund / BIG – Bjarke Ingels Group, or Chuon Chuon Kim 2 Kindergarten / KIENTRUC O. The 1950s and 1960s saw the “children’s zone” include references to science fiction (Zdenek Nemecek) (figure 4) and new mass media. Present-day ideas concerned with the shaping of form are inspired by IT (welcomed by the youngest generation of clever recipients and users), computer games – a board, maze, chart, tessellation or territory [7] [8] (Ørestad College / 3XN Architects Swedish Vittra Schools / Rosan Bosch Studio) and, afterwards, the world of nature - an important element of contemporary upbringing in the spirit of sustainable development (WeGrow, Montessori micro school, New York / BIG – Bjarke Ingels Group; Kindergarten in Guastalla / Mario Cucinella Architects). By utilising recycled materials, new designs reclaimed the ‘wastes’ of the contemporary civilisation for children to play with (Kindergarten in Guastalla). The ways of the changing world of adults were successively reflected in the objects surrounding children and the buildings designed for them. The location of the ‘children’s zone’ in the public space changed as well (figure 5, 6).

5. Child as an inspiration

Presently, it is possible to observe the multiplication of spaces for children in public buildings. Following educational policy requirements and social expectations concerning the shaping of the habits of permanent education, the children’s zone should be arranged in a manner favouring education through play in any place and at any time. The location of children’s zones in various public places are characterised by high accessibility and this makes such zones also available for adults. The second half of the 20th century saw a change in perception, where the child was viewed as a subject (Smolinska-Theiss), [5] and treated as an “active person, a participant (...), capable of having rights and obligations“ [9]. The approach to design following later modernism was characterised by the expansion of children’s zones outside previously designated enclaves. New concepts of cities as ‘schools on the macroscale’ came into existence (Van Eyck, Hertzberger), [10], new ideals advocated the filling of municipal voids with children’s activities (playgrounds in Amsterdam / Aldo Van Eyck, 1947-55), recovering the continuity of the public space by utilising the potential of playing (Urban Re-Identification / Smithsons & Henderson, 1953) and a similar approach to shaping the architecture of leisure in the city (New Babylon / Constant Nieuwenhuys, 1959-74; Fun Palace / Cedric Price & Joan Littlewood, 1964). The 1970s were the years of publications inspired by public spaces being “reclaimed” by children and cities being interpreted through the context of growing-up (Kevin Lynch, 1977 – mapping processes attended by children, e.g. in Cracow and Warsaw [11]; Colin Ward,1978 [12]). The specific nature of the growing-up time inspired new concepts related to the reconstruction of the adults’ world (figure 7). Presently, it is possible to observe the process of improving solutions in the public space, the availability of which is tantamount to being open for all age groups (figure 8).

During the creation of architectural scenery in the public space, the use of a metaphor like the garden, playground, multifunctional agora, box, natural scenery, forest, etc., resembles the arrangement of a role-playing game (Superkilen, Copenhagen / BIG BjarkIngels Group, Superflex, Topotek 1, 2012) [8].
Figure 3. Palace of the Youth - Pałac Młodzieży in Katowice, exhibition room with a sculpture depicting working socialist youth, representing hope for creating the better world; architects Z. Majerski and J. Duchowicz, art. Tadeusz Gierula; 1951, Photo by M.Balcer-Zgraja, 2019

Figure 4. Playground ‘Sputnik’ in a private garden, housing estate of Baba, Prague, 1959, Photo by M.Balcer-Zgraja, 2019

Figure 5. Children’s zone in the basement of Kunsthaus Bregenz, architect Peter Zumthor, 1997; Photo by M.Balcer-Zgraja, 2019
Figure 6. Children’s zone in the multipurpose exhibition centre BMW Welt – München; architects of Coop Himmelb(l)au, 2007; Photo by M.Balcer-Zgraja, 2019

Figures 7. YAC (Young Architects Competitions), Urban Up | Unipol Projects Cities, 2019. Kid's Factory in Laveno Mombellois a concept assuming the regeneration of the postindustrial space through its conversion into the space of education and play. The objective of the competition was to come up with an idea for the most innovative educational and recreational complex dedicated to children. Presented works were developed at the Faculty of Architecture of the Silesian University of Technology in the Department of Housing and Public Architecture Design within the subject of the Design of the Architecture of Multifunctional Public Complexes: (left) M.Smuleżyńska, D.Milewski, tutor: M.Balcer-Zgraja; (right) N.Mielańczyk, S.Waluda, tutor: M.Balcer-Zgraja

Figures 8. Interactive play at the Museum of Transport, Luzern / Gigon & Guyer, 2009, façade and educational space for participants of various ages; Photo by M.Balcer-Zgraja, 2019
6. Child as a co-creator

The ageing of the society combined with negative birth rates have resulted in the shifting of priorities towards the building of the environment for the elderly. Children are perceived as partners and citizens (Smolińska-Theiss), [5] who are increasingly often invited to participate in the design process (Henry Sanoff [13]; Susan Hofmann & Die BaupilotenArchitektur [14], e.g. in participatory workshops involving the use of the Negotiating Game for School Development). Children Culture Center Ama'r in Copenhagen (Dorte Mandrup Arkitekter) exemplifies a successful design process attended by children at its early stage and affecting the formulation of the programme and the manner of space shaping (collaboration with the artist - Kerstin Bergendal). Knowledge about children’s needs and ideas is usually sourced from focus interviews, mapping as well as artistic and modelling workshops attended by children and their guardians. The support of the inter-generation dialogue constitutes an element of educational programmes run by universities within their third mission, i.e. collaboration with the socio-economic environment (figure 9). The children’s zones often neighbour areas dedicated to the elderly within the programme of Anti-Loneliness Mission (competition concept of Alpha Boom Co-Housing, i.e. a multi-generation hybrid solution combining a residence for the elderly with a children’s care centre, Pragmatic Award w 2019 HOME Competition / Jeff Jordan Architects).

Figure 9. Children’s zone neighbouring the elderly’s zone in models made by children participating in the Children’s University of Architecture (DWA – Dziecięca Wszechnica Architektury); the project is co-financed by the European Union within the European Social Fund from the resources of the Young Inventor’s University (Uniwersytet Młodego Odkrywcy), Axis III Higher Education for Economy and Development (Oś III Szkołnictwo wyższe dla gospodarki i rozwoju), Operational Programme Knowledge Education Development (Program Operacyjny Wiedza Edukacja Rozwój) 2014-2020, Measure 3.1 Competence in Higher Education (Działanie 3.1 Kompetencje w szkolnictwie wyższym); Project implemented at the Faculty of Architecture of the Silesian University of Technology in the years 2018-2020, Head of the Project: Beata Majerska-Pałubicka, PhD (DSc) Habilitated Eng. Architect, Professor at the Silesian University of Technology; Task performed in the group supervised by M.Balcer-Zgraja; Photo by M.Balcer-Zgraja, 2020

7. Children and creative thinking

The social emancipation of children was accompanied by a gradual expansion of their culture in architecture, which is manifested by the functional programming of a building and the formation of spatial solutions utilising childhood attributes ("its important features and characteristics as well as specific and symbolic objects, distinctive elements" [9]). The process was first identified and analysed. This resulted in the creation of typology of solutions, which in the form of hybrid systems were later built into the space of the contemporary city. This specific manner of “childhood reception” in architecture was also incorporated in the design method. The above-named pre-design studies attended by children constitute its important aspect. The processing of conclusions from the analysis of input data in the form of the synthesis of spatial solutions and involving unrealistic thinking (fantasizing), autistic perception, incompetence, a ludic approach (manifested by playing with the form) as well as concentration on HERE and NOW – all these aspects support creative thinking (Nęcka), [15] and
arouse associations with children’s activities. The comparison of works by young amateurs and “iconic” creators of architecture reveals similarities in the form-shaping manner. Works made by children lack rational reflection, are not burdened with the necessary processing of the input material, constitute pure playing with the form and material, yet the ultimate result of space modelling by mature architects often proves surprisingly similar (figure 10).

8. Childhood vs globalisation
‘Childhood’ as a product of culture (Aries), [1] is affected by contemporary civilisation transformations. One of the most vivid indicators of the present is globalisation and its consequences – “tendencies in the global economy, politics, demography, social life and culture, consisting in the propagation of analogous phenomena regardless of the geographical context and the economic development of a given region” [16]. The process results in the mixing and unification of patterns as well as in the homogenisation of culture. Rem Koolhaas (1993) [17] refers to globalisation as a “return to the Tower of Babel” pointing out to the mixing of languages – “maximum of possibilities collected in any place, taken out of any context, stolen from any ideology” [17]. Phenomena which compose today's context of growing-up include the hyper-availability of resources and information chaos, availability of new media, IT, popularity of social media sites, globalised production of toys drawing patterns from the mainstream culture. For young people, the virtual world seems more attractive than the actual one, which can be seen as a negative effect of progress. Today, the shaping of the children’s zone is inspired by the world of new technologies. Spatial solutions imitate the operating principle of ‘interactive devices’ (i.e. “software programmes, electronic hardware responding to information received from the user” [8]). Such solutions are embedded in architecture (façade of the Kekec kindergarten, Ljubljana / Jure Kotnik, 2010). When they are used, they develop motor activity, creativity and visual-spatial intelligence.

9. Conclusions
Spatial education has become an integral part of contemporary education (constituting, in Poland, an element of the core curriculum for primary schools within the subjects of arts). Architecture is taught to children, who are also invited to participate in the process of its creation. To a significant extent, the mission of such education is implemented outside school, which affects the programme of buildings which may become places of out-of-school education. Since its definition, the children’s zone has become an integral element of contemporary architecture. The approach to young users has changed with time. The subject grew up along with the post-war generation of baby-boomers. The reception of the individual phases of this subject in architecture resulted in the increasingly closer interaction and removal of barriers between the children’s zone and the adult user’s zone. Such interaction took place through mutual and bi-directional space-shaping inspirations and the transfer of patterns. In multigeneration solutions available to general public the inter-generation border is increasingly blurred. In architecture, the child-partner lost its identity. In “Architectures of Regionalism in the Age of Globalization: Peaks and Valleys in the Flat World” Liane Lefaivre, Alexander Tzonis [18] portray the model of today’s world as ‘flat’, where diversity has been lost by the levelling of all barriers to interaction and by the elimination of all naturally formed barriers acting as borders. Regionalism, as a grass-root response to culture unification processes, restores geographical diversity. Similarly, maintaining the autonomy of the children’s zone does not impede the inter-generation dialogue but favours the preservation of generations’ heterogeneity and protects childhood’s individuality in the physical space of growing-up.

Inspiration: “someone or something that gives you ideas for doing something; a sudden good idea; someone that people admire and want to be like; the act of breathing in, or a single breath in” [19]. Childhood with its specific characteristics as an inspiration can become an impulse to reconstruct the world after periods of crisis (Great Depression, WW2, 1973 oil crisis, Covid-19 crisis -?). The topic may be up-to-date in coming years.
Figure 10. Works made during workshops POWER UMO DWA – Children’s University of Architecture (Dziecięca Wszechnica Architektury); participants did not see the buildings presented on the right (from top: Schröder House/ Gerrit Rietveld; Photo by Basvb [20]; Bavinger House/ Bruce Goff; Photo by Jones2jy [21]; The Netherlands Expo Pavilion/MVRDV; Photo by bjdica [22]; Rudin House/ Herzog de Meuron; Photo by Axel Hindemith [23])
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