

Beauty – Aesthetics – Senses Research of Attractiveness and Magic of the Built Environment

Katarzyna Ujma-Wasowicz^(✉) and Klaudiusz Fross

Faculty of Architecture, Silesian University of Technology, ul. Akademicka 7,
44-100 Gliwice, Poland

{katarzyna.ujma-wasowicz,klaudiusz.fross}@polsl.pl

Abstract. An objective of the taken discourse is cogitation over applicability of available research methods used to assess the built environment quality (i.e. architectural structures and urban interiors) in order to impartially and scientifically verify the beauty and appropriateness of the perception compared to subjective acceptability of a given place by its users. Methods that provide impartial data in architecture and urban solutions evaluation can be considered as quality characteristics. While the results closest to authors' expectations are obtained in the post-occupancy evaluation (POE) architecture research method, with studies in the field of environmental perception, and results of phenomenological research. Initial concept and assumptions were made for new methodology of design to be used by future architects and urbanists education, which gives more insight about the importance of *human factors* consideration in built environment.

Keywords: Human factors · Built environment · Aesthetics in architecture · Senses in architecture · Needs of users · Design quality · Design by research

1 Introduction

Aspiration and execution of a “place” where the people are willing to visit, identify with and care for by themselves, and often possessing the so called *genius loci*, is one of the biggest challenge and if successful, a source of incredible satisfaction for an architect and life creator in the built environment. A given space often “pulsates with life” since it is located for example at the intersection of transport routes, however, it does not mean the place is accepted. Users must use it having no other choice but in numerous situations, despite their monotony, depletion and untidiness, these “non-places” are life centres, spaces filled in with abundance of personal experience and memories. Another scene of the issue shows that regardless a given place potential and revitalisation efforts, the objectively beautiful/aesthetic space is deserted and unwillingly used. In the light of the foregoing, the following questions arise: why an ugly and dirty architectural space may possess “a *genius loci*” and assemble people, while an impartially beautiful and clean space will not? What is its reference to individual understanding of aesthetics and ergonomics (comfort and safety of use), to

getting used to a place or social relations predominating at that place? What methods can be used to check/verify the issue so as to drawing up relevant conclusions not to make design mistakes or make less of them? Do the research, design and education methods currently used and pertaining to the architectural space development respond to contemporary needs and challenges? Finally, does creating a new paradigm for the problem in question make sense and take a chance?

Research results that are closest to authors’ expectations may be brought by the expert groups’ criticism of architectural/urban space known from environmental psychology in terms of behavioural quality. The assessment, in most general terms, refers to recipient’s studying perception of a given place and observation of the place method of use and the user’s behaviour at the place. References to proxemics, a notion introduced into a dictionary a half age ago by E.T. Hall are also helpful in the research. According to its scientific argument, the space “talks” and it is done via behaviour and mutual human relations and relations between humans and their surroundings [1].

The aforementioned research spheres background originates from the border of sociology and psychology. Furthermore, the essence of the problem in question that refers to the sense of the surrounding *beauty* and *aesthetic* experience are issues from phenomenological research area. Phenomenology is a philosophical direction that rejects being guided by traditional assumptions and suppositions. The trend assumes that the world should be perceived as individually experienced phenomena. Everything may become a subject of phenomenological experience: an object, event, situation, experience that can be seen, heard, smelled, tasted, felt, felt by intuition, met or understood [2]. The final objective of phenomenological research is reaching a universal i.e. repetitive and available to put into certain framework “essence” of the said research object [3] (Fig. 1).

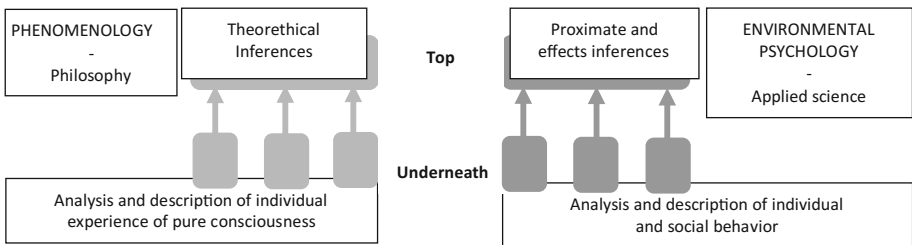


Fig. 1. Graphic overview of research methodology of phenomenologists and environmental psychologists (own study)

From methodological point of view both phenomenological and behavioural approach possess the status of qualitative studies, based on the one hand on radical empiricism assumption where critical intuition (enabling critical view) is a research tool, and on the other on the assumption that a given person and an object of cognition make upon indissoluble whole [3].

The text authors are convinced that the future of research in architecture and urban planning (in the field of aesthetics in particular), and the following support of education

and professional process owed to them, lies within the methodology area that links both spheres mentioned above.

2 Aesthetics in Architecture – I Use, so I Evaluate

It is commonly believed there is no accounting for taste, that aesthetics is hard to evaluate since it can be perceived differently by everyone. Each of us, however as a user of architectural and urban space (the internal one of the structure and external of the surroundings), everyday evaluates the place he or she currently remains, sees and perhaps feels with other senses. We similarly interpret own appearance, the appearance of people we meet or objects we use.

The assessment of functionality, safety and aesthetics of the built environment is often automatic and influences making innumerable decisions, e.g. I will sit down here because the view is beautiful, I will not go there because it is dark, unpleasant and maybe unsafe, this is such a nice place that I will visit it again with friends, etc. In a certain simplicity, the conclusion is obvious – the beauty of a place is most often linked with its ergonomic and technical quality which provide a final aesthetic impression.

In the above context, it is nevertheless worth thinking about the words of outstanding figures: Edward Hall, ethnologist or Juhani Pallasmaa, architect. As early as in the 60s of the 20th century, Hall ascertained: “Architects traditionally deal with visual patterns of structures – things that can be seen. They are completely unaware of the fact that people bear in themselves certain internalizations of permanent space they learned at the beginning of their lives”¹ [1]. Pallasmaa on the other hand wrote: “the partiality of vision has never been so clear than in the art. of architecture of the last half century, when the type of architecture fixed on production of spectacular and haunting pictures became predominant”² [4], and “the unhuman nature of contemporary architecture and cities may be perceived as a consequence of body and senses neglect and lack of balance in our sensory system”³ [4].

The problems of aesthetics in architecture are activities tended towards defining, understanding, and in consequence shaping such environmental features that would be a source of nice experience [5]. It is worth reminding that in terms of etymology, the word ‘aesthetics’ refers to sensual experience and not merely a visual one. Thus, in today’s reality it seems justifiable to ask the following question: how to promote and stress in creating and reading the architecture the themes of not only its visual beauty⁴, but also of opportunity to absorb the touch, read the sound, feel the smell and other experienced references. The issue becomes more complicated if we assume that there exist much more opportunities of the surrounding environment perception, just to mention the representation criteria, stimulating stimulus, phenomenal character or neural information. The question is the more justifiable when an insight at least into the

¹ E.T. Hall “Ukryty wymiar”, p. 165.

² J. Pallasmaa “Oczy skóry”, p. 38.

³ Ibidem, p. 26.

⁴ Read: spatial order, form, colour, texture, material, light, etc.

research of J.J. Gibson, psychologist is available, who recognizes senses as aggressive searching mechanism rather than passive receivers⁵ [4].

In the aesthetics of Berlyne, one of the first creators of general aesthetic model, complexity of the environment, its new elements, incoherence in the environment and astonishment (level of inconsistency of what we found with what we expected) play a crucial role. Berlyne proposed to formulate aesthetic judgements on two levels: uncertainty – excitation (excitation associated with specific exploration increases along with the uncertainty or conflict increase) and hedonic value (associated with pleasure). His studies proved that we feel the best in a situation of average stimulation or uncertainty level which means we prefer non-excessively surprising solutions. Another example of interesting studies may be seen in the S. Kaplan environmental preference where authors highlighted four equivalent perception levels accounting for a higher acceptance level of such and not the other place: coherence– organization of setting; legibility – setting elements suggestiveness to allow better understanding and its content categorization; complexity – number and diversity of the setting elements (especially in the case of natural landscapes); mystery – number of information hidden in the setting that the observer is willing to discover. In other words, the complexity and its various aspects support a place perception as an attractive one but also make an indispensable condition for the perception to occur. “Complexity determines change and only the change is the source of information”⁶ [3].

Coming back to practice – the architectural and urban space is co-created i.e. conceptualized, programmed and designed by architects, urban planners, constructors, interior and equipment designers, artists as designers of decor elements and investors themselves or their advisors. While designing targeted to a specific or anonymous user, they create aesthetics of a given work of art in accordance with their own sense of style, views and perspectives, possessed qualifications, investor’s expectations, current fashion inspirations, studies and consultations performed, etc. Every originator must be aware that his work will be exposed to constant assessment throughout its “lifespan” (operation). The assessment may vary: from praise and delight through minor remarks up to overwhelming criticism.

Many designers, still convinced of their infallibility and uniqueness, deem any slightest symptom of criticism unauthorised and unworthy of attention. However, understanding and taking into account the needs, restrictions or aesthetic preferences of users seems unquestionable nowadays and in the future. The question is how to combine different user tastes (they like the structure they have been once enthralled by or the one owned by their rich neighbour or a building that cannot be built at a plot because of the exciting context and/or legislative conditions, etc.) with intuitive sense of beauty and pragmatism preferred by the creator? Can the architect without taking the recipient into account, impose his “own” aesthetics? Is he entitled to do this? Maybe he should create a “compromise aesthetic” based on surveys and research performed? It seems that the most favourable solution providing the designer with an impartial reasoning in at least certain scope would be presentation of the combined architectural

⁵ J.J. Gibson after: Pallasmaa “Oczyskóry”, p. 51.

⁶ S.R. Maddi: after: Lewicka “Psychologi a miejsca”, p. 97.

research made within the scope of environmental perception and in accordance with the phenomenology method.

Two concurrent trends have functioned in Poland so far: artistic approach to architecture and research approach based on human needs analysis. The latter type of design called *Design by Research* is the state-of-the-art approach, targeted at satisfying the users' expectations. It does not exclude an interesting and fashionable form of a building or space between buildings. Whereas the first, traditional approach where an architect-creator imposes many aspects, including aesthetics, on the user, is exposed to numerous faults and problems during utilisation.

In order to avoid the future disappointments, non-fitting in the needs of a given space users, and in consequence creation of a place that is ineffective, unfunctional, and unaccepted in terms of aesthetics, one of successfully used methods is participation design i.e. with the co-participating user. Today, the simplest method of perceiving the aesthetic preferences, i.e. their articulation by user, is presenting ready models of existing places (e.g. photographs) to enable the user's easy defining by indication during a survey or interview his favourite and disliked architectonic solutions. The indicated photos depict the user's sense of aesthetics, expectations towards the place "climate" (preferred places in a historical part of city or modern "sterile" architecture, colourful facades, lots of greenery, etc.). There however, we repeatedly go back to the starting point: architects still perceive aesthetics within the scope of vision sensations with omitting the other senses. Hence the need to deal with the problem.

3 Designing and Research in Architecture and Urban Planning

There are numerous methods of searching for design solutions in general. These are proposals worked out by psychologists, educators, praxeologists or creators (i.e. designers) themselves. They are rarely used in a "clear", textbook form. Every experience-supported designer, with the time works out his own, many a time intuitive and therefore original method which being analysed appears a compilation (mixture) of various well-known methods. An intuitive search is for instance division, analogy, guessing, association, compilation of images and notions, recollection of similar problems and their transposition as well as improvement of solutions. The main task of all design methods is support of intellectual and creative effort.

The most common methods in scientific world are the ones whose objective is to find new problem solutions based on earlier-known methods that did not bring satisfactory effects. They for instance include the following methods:

- morphological (a new quality is received via a new breakdown of known elements – parts);
- solution trees (we must approach a theme in a summary way i.e. create a summary problem solution);
- system methods (abstract models, mathematical, graphic, analogue or digital model or simply a description are used). Here methodical design, providing (with a great probability) instant satisfying results, is of primacy.

In designing, the architect mainly uses all heuristic methods that allow new solutions discovery via advancing relevant hypotheses. The methods known from the respective literature are for instance: synergetics, brainstorm, morphological analysis, ideal solution method, and superposition method [6, 7]. The methods however, do not guarantee an anticipated result though obviously increase its probability. Moreover, they are not excessively formalised to remain a certain margin for human intuition. Neither strict obeying of activities sequence nor preciseness of their use are required in the said methods. The creator may fully use his knowledge and imagination. A certain downside of applying heuristic methods in design that they originally do not refer to opinions of the future solution user/users since the practical knowledge and expertise possessed by specialists i.e. designers constitute the foundation.

When taking into account user needs, expectations and restrictions, the urban design in particular, but also the architectural one is dominated by the architects' need/inclination/obligation to implement: the research results elaborated by sociologists, quantitative and statistical studies where obtained results are presented in descriptive form or expressed in digits and percentage. This is the basis to work out conclusions on the phenomena frequency, intensity and dependences existing between them. User opinions on a given subject are examined within the above studies; the opinions for instance include: where and how they want to live, what do they expect in their working environment, where and how would they most preferably spend free time, in what situations they come across most spatial barriers, etc. In that spirit, though guided by own considerations, Christopher Alexander developed an individual design method based on the concept of matching human needs or demands to possible object forms rooted in the context. His "*A Pattern Language*" is, in a certain sense, a collection of models originated from different disciplines: theory of systems, natural science methodology, linguistics, cognitive psychology, biology, genetics and others. *Pattern language* is from philosophical point of view an expression of holistic attitude to the problem and as a design method a manifestation of participation. *Pattern language* derives from the beauty of culturally-denominated form and defines the process targeted at creating a type of this form found in tradition, but from the start afresh, with no imitation but taking into account current cultural considerations [8]. Though Alexander's approach is of humanistic nature, the fact that his concept faced criticism of the architects' environment, does not seem astounding. It was blamed for its characteristic feature – additivity that enables selection and adding models to each other as well as putting one model onto the other that leads to creating the architecture that is impartially friendly in use but lacking the strength characteristic for great architectonic works, where the form of structure adopts a dominant role.

In recent years, a noticeable trend has existed that shows a growing interest of architects – designers in qualitative studies they intend and are able to apply in their design output. The following are known research methods in architecture: POE (Post Occupancy Evaluation), ABSIC (Advanced Building Systems Integration Consortium), and BiU (Building-in-Use) [7].

With reference to the aspects dealt i.e. research of space attractiveness and magics, the POE method checking behavioural quality is the closest method for the paper authors. In 2012, two original quality research methods were developed: the first is used to perform the pre-conceptual design research and the second to evaluate the built

structure. However, according to this paper authors' opinion, the future of architects will also depend on skilful application of research results related to environmental perception and phenomenological expertise.

3.1 Quality Research Method (According to K. Fross 2012)

On the basis of 15-year experience, two original methods of built environment research have been developed. They involve schemes of procedure when doing research, that in sequence picture the required activities to be performed. The first "8-step" method is used to perform pre-design studies to formulate design guidelines. The second, "7-step" method is intended for evaluation of a structure accomplished by its designer, in order to verify decisions made at the design stage. The methods are of universal and open nature, may be modified, complemented and adjusted to specific research demands. Different tools have been applied, such as: observation of users' way of use and behaviour, quality assessment (e.g. behavioural quality), surveying, interviews, spontaneous and occasional talks, etc., that should be individually picked out according to needs and anticipated results.

The author's method to pre-design studies of facilities with similar functions as sources of knowledge useful in design. The method objective is to obtain knowledge from the existing built environment of a similar function, as the information basis for the author's own design. The research is conducted in pre-design stage before starting to build a programme and to create a concept. It focuses on making an assessment of architectonic and urban structures according to pre-set criteria and quality. The results obtained are analysed and grouped, conclusions are drawn to make the basis for formulation of the design guidelines. The assessments may be of general nature or be directed onto a specific problem e.g. aesthetics. The research preparation involves: defining the research objective and scope, make a list of properly selected buildings or fragments thereof, select relevant evaluation techniques and methods (e.g.: building round, making photos and films, interviews, occasional talks, surveys, graphic analyses, calculations etc.), make auxiliary tables of quality assessment (e.g. technical, functional, organizational, behavioural or economic assessment) specifying the assessment scope (exterior, interior, selected elements, functions, zones, rooms) that during assessment facilitate the recording, control and systematization of research, prepare graphic materials such as maps or site development plan, projections or schemes thereof, photos of solid (facade), etc. [9].

The author's method of evaluation of facilities implemented as verification of design decisions. It is the method of quality evaluation at the stage of the designed building utilization and make up a feedback tool for the designer or designer team to verify the design decisions that have been made and obtaining experience to be used in further tasks. The method is an important element of the designer's self-improvement. It is targeted at obtaining information from the implemented project. The research involves the facility quality assessment and observation of user behaviours. The research should be performed repeatedly: obligatorily in the first month of use, after 6 months, 12 months and e.g. 2 or 3 years. The research may be done in all quality categories or may be focused on a given problem. Occasional talks with users or

surveys are recommended. An interview with the facility administrator is obligatory. A talk to the investor and obtaining his opinion are also recommended. The scope of observation may be restricted to definite problems such as user behaviours, work comfort, safety, aesthetics, etc. [9].

3.2 Problems of Environmental Perception and Phenomenology

Perception also named cognition or impression, like aesthetics, refers to human perception of certain phenomena or processes that occur due to specific stimuli affecting our sensory system. It covers not only a complex, subjective cognition process or experience and memory but introduction of one's activeness (i.e. expectations, values, objectives, ensuring safety, etc.) into the environment as well. Also, culture significantly influences the perception processes.

The said process takes place on two following levels: the sensory and motor level (of automatic nature, the stimuli are received by senses owing to whom people identify colours, sounds, roughness, smoothness, characteristic smell, etc.), and meaning and activity level (here stimuli are assigned with the meaning: perceiving and interpretation of a human smile, noticing the feelings of an observed person, etc.). While studying the perception issues, psychologists very soon (i.e. in 19th century) realized that people are sufficiently different so as each of us can perceive and describe own sensory experience in a various way. Today, in the scientific circle dealing with the problem, anyone doubts that solving the perception issues present an unusually complex task and it should be studied in different ways and aspects. In other words, there is no space in contemporary science for conventional perception approaches that often deal with the way the sensory mechanism records single aspects of an object in the surroundings. There, the problem is to be solved as a holistic i.e. overall process [5].

And here, in some measure, the phenomenological methodology comes as aid which "refers to "practicability" of subjective personal experience, contrary to external, impartial reality". The phenomenological experience, including the experience of a place still has sensual nature and its contents depends on the shape and position of our body. It is worth noticing that a new paradigm in cognitive psychology has introduced a notion of *embodied cognition* and for several decades has been a basic notion of phenomenological approaches⁷ [3].

When carrying out the above deliberations, one cannot omit in architecture and urban planning the issue of *Genus Loci* and its objective reality. It is an important theoretic notion in the works of phenomenologists of place who try to inquire what features of these places respond to the subjective sensation of their unique specifics. *Genius Loci* is recognized by humans but its source originates in the off-subject features of the place.

And the last issue absorbing the authors in the above discussion. A new theoretical category has recently appeared in the works of the complex systems theory representatives who seek biological references to the analysis of processes that govern the

⁷ M. Merleau-Ponty, Y.F. Tuan after: Lewicka "Psychologia Miejsca", p. 40.

organic development of cities. This category is a concept of urban and regional DNA which like biological DNA guarantees the identity of a place, despite various changes it undergoes⁸ [3].

4 Summary

Today, when critics deal with the problem of aesthetics and beauty (whether in a professional or amateur way), they undertake an evaluation of architectural and/or urban solutions, almost always use only their vision and based for example on photographs, historical memory. Generally, it can be noticed that people who have the ability to see rarely attach importance to the other senses. The perception applies especially to the situation of admiring the beauty (in popular opinion - aesthetics) of the surrounding landscape. And the second regularity, that does not require scientific evidence: the experience of other senses counts mainly in the moments when, for example, despite (theoretical or objective assessment) beautiful views reach other stimulants that are inappropriate for us, such as unbearable noise or odours or when we feel a complete lack of orientation in the field. On the other hand, the current activities of marketing specialists successfully use not only the vision but other senses as well. We feel good during the visit in the store that smells good, when someone or something subtly guides us to the goal, and therefore we are not lost when there is a lot of space for exploration of the goods or when the “soothing voice” tells us about the different promotions. In other words, in today’s world, supported by a marketing techniques, consumer goods are beginning to occupy a significant place in the consciousness and trivialize our ability to analyse and evaluate (Fig 2).

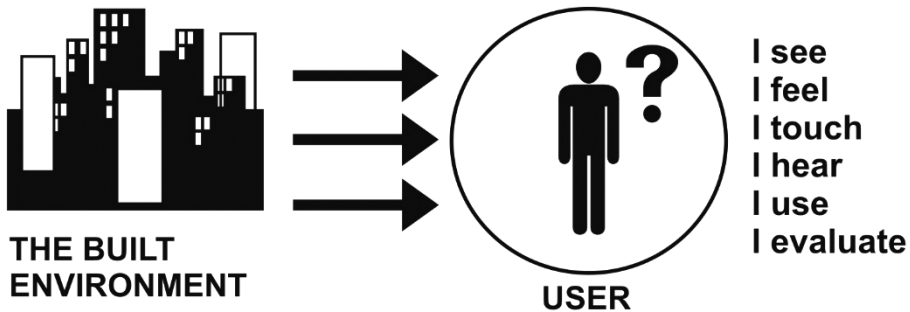


Fig. 2. Modern understanding of the role of the architect in the designing of the built environment (own study)

In a natural way, for the inquisitive researcher of architectural space, the following question arises: why in the European realities designers of individual buildings or space “between the buildings” extremely rarely encourage customers to use other senses than

⁸ E.A. Silva, N. Wu after: Lewicka, “Psychologia miejsca”, p. 61.

sight to admire the beauty, and the implied aesthetics? Where is the problem? Whether in public education, or even in education of professionals?

Reading the above arguments and considering them to be right, it is worth asking why this is happening? Is the reason for this that modern architecture assimilated psychological strategy to promote the work, its advertising and insistent persuasion? Maybe the problem lies in healthy (based on hygiene) lifestyle as a priority? Is that why we do not want to or even cannot use other senses than sight? An alternative for the search for the causes of cherished sense of vision can also be delving into the historical theses of theory of architecture, which consisted mainly standard - visual proportions of the human body in relation to the building under construction, according to the Vitruvius “measure of all things is the man,” the search of ideal proportions of the human body, or the use of modernist “Modulor” of Le Corbusier to shape the immediate human environment [10].

It should be emphasized that the article tried to look at the problem of the scientific search for the principles of aesthetics from the architect’s point of view, not only in professional way but also from a university teacher and researcher’s point of view, the authors are both representatives of. It is not their ambition to independently create a new methodology of design and learning because they believe that today this task is interdisciplinary, where a much greater extent than in environmental psychology permeates the knowledge of psychologists, sociologists, anthropologists, architects and other scientists. The task, which was set, is primarily an indication of the issue that directly affected and now extremely trouble architects and urban planners.

The basic problem noticed by the paper authors still lies in the fact that scientists, especially those in the first two mentioned areas, are not able to communicate – they are using different methods and techniques of research and they are recognizing its methodology for more appropriate. Such cooperation, which aims to identify new formula of approach to the development of environment, that is friendly for human, is extremely desirable. The combination of “strength”, the interdisciplinary nature of the research, the expected development of the methodology will serve architects and city planners in the process of taking into account the human factor, and consequently also the aesthetic attitudes. Apparently, most of us feel that the border between everyday usual life and science seems thicker.

References

1. Hall, E.T.: Ukryty wymiar (oryg. The Hidden Dimension). MUZA S.A., Warszawa (1964)
2. Heidegger, M.: Odczyty i rozprawy (Lectures and discourses). Aletheia, Warszawa (2007)
3. Lewicka, M.: Psychologia miejsca (Psychology of the place). Wydawnictwo Naukowe SCHOLAR, Warszawa (2012)
4. Pallasmaa, J.: Oczy skóry – Architektura i zmysły (oryg. The Eyes of the Skin: Architecture and the Senses). Instytut Architektury, Kraków (2012)
5. Bell, P.A., Greene, T.C., Fisher, J.D., Baum, A.: Psychologia środowiskowa (oryg. Environmental Psychology). Gdańskie Wydawnictwo Psychologiczne, Gdańsk (2004)
6. Tarnowski W.: Metody poszukiwania rozwiązań projektowych (Search Methods of Design Solutions), Katowice (1980)

7. Niezabitowska, E.: *Metody i techniki badawcze w architekturze* (Research methods and techniques in architecture). Wydawnictwo Politechniki Śląskiej, Gliwice (2014)
8. Alexander, C.: *Język wzorców. Miasta, budynki, konstrukcja* (oryg. A Pattern Language. Towns – Buildings – Construction), GWP (2008)
9. Fross K.: *Badania jakościowe w projektowaniu architektonicznym na wybranych przykładach* (Qualitative research in architectural design on selected examples). Politechnika Śląska (2012)
10. Juzwa, N., Ujma-Wasowicz, K., Gil, A.: Almost human architecture. Examples of polish architecture where the human factor co-creates the concept of the buildings In: *Proceedings of the 6th International Conference on Applied Human Factors and Ergonomics*, pp. 1660–1667. Elsevier (2015)