

Methodological challenges in assessing social quality of buildings

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Abstract. Although many of the rules for achieving a social adequacy of buildings are interwoven in the principles and standards of architectural design at a given historic period and place, architects do not have at their disposal an integral, reliable, and unified approach to predict whether, and to what extent, a building will fulfil the needs of the people who inhabit the building. Awareness of the need for such an approach does exist, but to date, there is no reliable algorithm for describing, measuring and assessing the social performance of buildings and urban spaces. This article analyses the basic methodological challenges in creating a system for assessing the social quality of build environment. The challenges concern defining the concept and a categorical paradigm for it, creating a conceptual model along with indicators for describing it, and a principle for intertwined indicators into a homogenous whole. The article proposes variants for their articulation.

Keywords: architecture, social quality, measurement, assessment system, environmental psychology

Preconditions

Social adequacy of spaces we inhabit has remained outside the focus of attention of the world of architecture. Entrepreneurs, investors, architects, designers, builders, local government, and managers who are responsible for the philosophy, design and management of buildings do not always evaluate critically how the newly erected buildings affect the most important client of all - the inhabitant. Architects do not possess the means to anticipate whether their designs will meet inhabitants' needs, whether a finished building provide comfortable and stimulating living and working conditions, whether architecture will be perceived as attractive. Yet, should it be considered a problem if architects and builders have worked for centuries without assessing social quality of architecture?

The first signs of a discrepancy between good intentions and actual results appeared in the 1960s (Fridman 1971; Venturi, Scott Brown, Izenour 1977) and reached a peak in 1972, when the housing complex Pruitt-Igoe, built according to the postulates of Modern Architecture, was demolished as it became obvious that living in it was impossible. The following decades have accumulated a record of dissatisfaction with “egocentric architecture [...] primarily aimed at satisfying the aesthetic self-affirmation needs of the architect/designer, who constructed ‘personal monuments’ rather than buildings centered on the needs of their users” (Bonnes, Secchiaroli 1995, 6). Often, factors and criteria guiding a design process do not take into account the needs of future inhabitants, but rather the ones, for instance, of the investor, for whom the important thing is the cost of construction and profit.

Why there are no systematic guidelines and standards for assessing the social performance of buildings? One of the key books discussing the evaluation of architectural products at the beginning of the current century, raises the question, “Why have architects talked about the assessment of building performance for so long and yet have been so slow to do anything about it?” (Preiser, Vischer (eds.) 2005, xi). According to Wolfgang Preiser, a leading expert in sustainability assessment, buildings and organizations using these buildings are complex phenomena charged with social values and motivations, where interaction with clients is dominated by the interests of the construction industry. The heavy daily workload does not permit designers to perceive life beyond the endless string of urgent tasks. Preiser calls it a “semi pathological condition” and “the curse of the project” (Preiser, Vischer (eds.) 2005, xi).

Causes of the lack of standards for assessing buildings’ social performance may also be found at an operational level - in the mechanisms by which social knowledge is interwoven in three interdependent spheres of creating a building: the design process, the evaluation of the completed building, and the training of future architects.

In the design process, some criteria of user comfort take place - but they act in a tacit manner, as a set of non-written, implicit professional principles. They are interwoven in the so-called ‘prototypes’ of the different building types (Rappaport 1983), but their updating lags behind social dynamics. The so-called ‘functional schemes’ of buildings, the backbone of every prototype, introduce ‘the social’ in buildings’ design but do not exhaust it. Functional schemes reflect the pattern of human flows throughout the building - but they put a stress on the technological behaviour of individuals in space, and not on people’s psychological and social-psychological needs. Some other aspects of human presence in a future building are regulated in the design process by explicit indicators, for instance the ‘anthropomorphism’ - by Noyfert’s manual (Noyfert 2007), ‘ergonomic aspects’ - by principles of ergonomics and the ISO’s Standard 159 [ISO 2015], ‘ecological compatibility’ - by multiple systems of sustainability evaluation. Nearly 70% of design activities concern the functional aspects of the building, while those related to users’ comfort hold a secondary place (Hamel 1990, quoted from: Durmisevic, Sariyildiz 2001).

The last generation of systems for *building sustainability assessment* includes indicators for user comfort. However, these indicators are limited in range and leave the impression of incompleteness and inconsistency, as the objective quantifiable indicators for building assessment do not take into account the psycho-

logical and socio-psychological dimension of buildings' performance (Vischer 1989). The lack of objective, tested and uniformly applied criteria entails inadequate building assessments by both architects and other related parties. Random and even inessential criteria often prevail, different for the different projects, imposed at times by the powerful presence of some assessors.

The curricula for students of architecture also fail to present in a systematic way the basic requirements for the social adequacy of buildings, neither distinct criteria for assessing buildings' social quality. Courses 'Architecture and sociology' are taught at the Bulgarian faculties of architecture, but they usually present concepts of sociology and related disciplines and neglect their practical application for the development of designer skills (Penevska 2013). Social knowledge is transmitted on an apprenticeship principle - "do what I'm doing" - and is translated in a fragmentary, inconsistent set of skills that do not ensure that the student will be able to design socially adequate, comfortable buildings.

An integral methodology for the description, measurement, and assessment of the social quality of architectural designs and buildings would contribute to an architecture of a higher quality, to a more comfortable habitation and a greater user satisfaction. Creating such a methodology faces a number of challenges. The major one is to articulate and define the concept of *social quality of buildings*. To develop a conceptual model of the object of assessment is related to the need to construct a system of indicators for its description and assessment, organized around a cogent unifying principle. Deriving the necessary indicators is also a multivariant task for which at present there is no reliable prototype. It is also necessary to coordinate and specify a set of categories, aiming at homogeneity as the current terminology comes from various disciplines. Another challenge is that the social performance of buildings - unlike their construction-related and economic aspects, which can be measured quantitatively - is described primarily by qualitative indicators that defy objective measurement.

The purpose of this article is to suggest a *possible* solution to the basic challenges of creating a methodology for assessing social quality of buildings. Different initial assumptions could lead to a different conceptual perspective to social building performance evaluation.

Synchronizing conceptual tools

To clarify and coordinate the terminological tools by which the notion of "social quality of buildings" is structured entails from the multidisciplinary quality of the sphere in question. The variety of ways that authors of different disciplines interpret the same concept creates a terminological chaos. An added difficulty for the Bulgarian architectural science is the fact that the majority of terms related to social dimensions of architecture come from foreign sources whose categorical apparatus is little known or has been introduced imprecisely.

In order to structure the field of "social quality of buildings", a selection and interpretation of terms from three semantic groups is suggested here: environment and its derivatives; the human being and social quality; indicator and social indicator.

The notion of “environment” and its derivatives

The first semantic group gravitates around the notion of *environment* and its synonyms and derivatives in Bulgarian: surroundings, space, place, spatial environment, physical environment, social environment, social-spatial environment. In mass media, *environment* is usually used in the sense of natural environment, nature. For architects and urban planners, *environment* is the architectural context understood as the dimensions of physical space without the people inhabiting it - it is usually referred to as *space* or *spatial environment*. Social sciences by the term *environment* usually refer to social surroundings of the individual and disregard the concrete physical configurations in which people's interactions unfold. In English, space in its physical dimension is indicated by the terms *physical environment*, *spatio-physical environment*, *physical-objective environment*, *physical space*, *physical-geographical space*, *physical setting*. The expression *built environment* is also used to distinguish the man-made environment from the natural one.

Disciplines that study man-environment interrelations interpret the concept of *environment* as a unity and interaction of physical and social components. The term *social-physical environment* includes three components: the material context (physical space, built environment), the human presence in that space (the behaviour of the individual and the social group) and the interaction between these two (the psychological processes, the actions connected to these, and the arising results and products) (Bonnes, Secchiaroli 1995). In order to distinguish the general term *environment* from the specific empirical object of study, the concept of *place* has been introduced (Canter 1977; Stokols 1978; Russel, Ward 1982). It designates “a complex unit of analysis that emerges from the interaction between three main components of a specific human-environmental setting; these include its physical attributes, the activities persons carry out there and the cognitive representations individuals make of both of the preceding components” (Bonnes, Secchiaroli 1995, 129).

For the purposes of assessing social quality of architectural designs and buildings, regarding *environment* as an integral spatial-behavioural-psychological amalgam holds a significant methodological potential. It enables the introduction of conceptualizations and sets of social-physical indicators for describing and measuring architectural spaces. It may also inform the definition of the object of assessment. As people interact directly only with their immediate environment, and not simultaneously with the whole building, neighbourhood or city, an object of assessment can only include those configurations with which a person has a direct visual or tactile contact. The possibility for such a direct contact determines the physical scope of the architectural environment that is to be assessed.

The concept of “human being” in the context of architectural design

Human beings have multiple projections in architecture; this fact has not been theoretically analysed in specialized literature in our country. When assessing a building's social quality, it is essential to define what we understand

by an *individual* in this context. The object of assessment will be defined by the possible projections of the person into the built environment - i.e. projections that enter into direct contact and interact with the environment.

Individuals ‘enter’ architectural designs through several of their projections - as a human body, as a biological organism, as a moving being, as a psychological structure, as a member of a social group. “Human being” as a composite abstract term, influences architecture indirectly - as a part of society, an ethnic group, a culture, or, for instance, by a human economic or legislative activity. Since these projections are not directly integrated into the tissue of architectural designs, they need not be considered in buildings’ social quality assessment.

Some of the projections are regulated and quantified by the theory and practice of architecture; others are rather cursorily sketched and require a more precise and systematic interpretation (Table 1).

Table 1. Projections of a human being in architectural design

Projections of a human being in architectural design	Degree of relevance and regulation of the projection as a determinant of design
As a physical body	Human anthropomorphic parameters are incorporated in a design by benchmarks for sizes and distances of building components, interior space and furnishings
As a biological organism	The boundaries in which human senses are effective taken into account in the norms for the acceptable limits of microclimate (light, temperature, noise, humidity, etc.)
As a moving and acting unit	The activities of individuals and groups are reflected in functional schemes. Accelerated social dynamics requires regular updating of schemes and creating new ones for the new types of social interaction. However, updating usually lags behind in time
As a mental structure	Only a limited number of fragmentary rules regulating the conditions of psychological comfort are present in architectural design
As a member of a social group	Social groups, as ‘social individuals’, have specific requirements for the organization of environment and impose common norms on their members: both are factors in architecture, but are not taken into account systematically in design process

The concept of “social quality of buildings”

In architecture, the concept of “quality” is associated with the degree to which a building or space satisfy the needs and expectations of their users (Nelson 2006). If human beings in an architectural environment are viewed as the projections listed above, then the concept of *social quality of a building* may be defined as the degree to which the parameters of the socio-spatial environment provide comfort for each of these projections - i.e. provide a biological, functional, psychological and social-psychological comfort of the individuals and social groups that inhabit and use that environment.

The concepts “indicator” and “social indicator”

“Pokazatel” [in Bulgarian] and “indicator” are synonymous, stemming respectively from a Slavic and Latin linguistic root; yet there are some nuances in their use in professional publications in Bulgaria. Empirical social research uses “indicator”, “primary/composite indicator” (Mihaylov 1973), “classification indicator”, and “nomenclature indicator” (Oshavkov 1983; Oshavkov (ed.) 1983) as a unifying term for a group of indicators. In social-economic literature and publications on sustainable development, the term “pokazatel” is usually used (Obreshkov 2010; Evropeyska komisiya; NOI 2016).

In assessing architecture, these two groups of terms can be used for the description of units on various levels of hierarchy. In order to provide relevance to the adopted terminology in empirical research in Bulgaria, “indicator” might be used to denote a specific aspect of the object that is measured and assessed. “Pokazatel” may be used as a more general category encompassing a series of indicators. Pokazatel may also be used to describe objects on a higher hierarchical level.

Assessment indicators usually used by architects target physical characteristics of buildings. In order to assess building’s social quality, one should take into account the interaction between physical parameters and users, and how this interaction affects inhabitants’ comfort and satisfaction. It could be achieved by adding social indicators that could measure quality of life and well-being of individuals and social groups (Noll 2004). In their systemic unity the indicators for the three components of the context - physical attributes, actions of individuals, and the outcomes of their interaction - can be used as indicators for the social performance of buildings and, hence, for their social quality.

Indicators used for a building performance assessment can be viewed as social, if - in accordance with the guidelines of the United Nations Environment Programme (UNEP) - social consequences of a building performance are considered as an influence on people’s well-being. If users are regarded as ‘consumers of the building-as-an-end-product’, then user health and safety can be categorized as social sub-categories of the building (Häkkinen 2012). Thus, social effects of a building can be regarded as a product or service, provided by the building.

The conceptual and informational context

The next methodological challenge is to devise indicators for describing, measuring and assessing social quality of buildings. One could decide to bring together the principles applied in architectural design and to consolidate the indicators those principles encompass. However, it is not a valid solution as there is no guarantee that the list of indicators is exhaustive and organized in a systemic manner. Other two spheres can be used as potential sources of reliable indicators - the disciplines that study man-environment interaction and the systems for building sustainability assessment. Combined, these two disciplines provide mutually complementary information and can outline a full picture of a building that is to be assessed.

Building performance evaluation systems

The systems for building sustainability assessment are a natural source of indicators and criteria for measuring and assessing social performance of buildings. Along with traditional material, technological and economic indicators, some of the leading systems include indicators that relate to the social quality of buildings (Essig 2012): the EN 16309 (common to the EU), the British BREEAM, the German DGNB, the American LEED, the Belgian Valideo, the South African SBAT, the Australian Green Star, and Abu Dhabi's. Estidama.

They are based on two conceptual approaches that are functional for the purposes of the present work: Social Building Performance Evaluation (SBPE) and Social Life Cycle Assessment (SLCA). The first one is a part of the larger Building Performance Evaluation (BPE) system, that evaluates whether buildings achieve their goals and also, how well they fulfil their tasks (BSRIA 2015). The second one, SLCA, "is a method that can be used to assess the social and sociological aspects of products, their actual and potential positive as well as negative impacts along the life cycle" (Life Cycle Initiative). As both architectural designs and finished buildings belong to the 'product' category, SLCA is a suitable framework for describing and evaluating their social effect. In both approaches, the sections related to the material aspects of buildings are elaborated in detail conceptually and methodologically, but social sections - that should assess how well a building provides conditions for users' psychological and socio-psychological comfort, satisfaction, and well-being - are still in the early stages of conceptualizing and development.

Indicators of the different systems are selected by different logic and principles, are grouped by different criteria, and penetrate to different depths. This makes it impossible to mechanically combine them into an integral set for building assessment. Most of the indicators are quantitative ones (energy efficiency, harmful emissions, etc.) and do not depict an adequate image of environment's user quality. The indicators relevant to social aspects of buildings do not leave an impression of cogent ones.

An additional reference sphere is necessary - one that might suggest both reliable social indicators for building performance and conceptual approaches for interlinking these indicators into a system. The disciplines that study man-environment interrelations are one such sphere: architectural and urban sociology, cultural and urban anthropology, proxemics, architectural psychology, visual sociology, urban geography, etc.

Environmental psychology

Out of the vast thematic range of the above disciplines, only these that reveal the specificity of face-to-face contacts between people and their immediate environment are of practical value for assessing social quality of buildings. This would exclude large segments of the disciplines that are potential sources of indicators for description and assessment of social quality, as these segments interpret the general indirect relations between society and the physical environment and have no direct applied value for architectural design. It is essential for architects to be able to foresee the reactions, behavioural and emotional, of people who will inhabit and use the spaces they design. It will also help architects to choose between multiple design solutions and to evaluate social performance of future buildings.

Hence, it is necessary for this work to outline research field that encompass fragments of disciplines that study and interpret the *empirical* contact between individuals and buildings. Such an eclectic approach is typical for applied research projects that do not look for a theoretical purity but aim at a final product that meets specific requirements. Such research publications are necessary pluralistic and 'omnivorous', as the effectiveness of possible solutions depends on the size and variety of sources and information used (Akoff 1985; Bickman, Rog 1998).

A similar hybrid field has already been established by environmental psychology. It is interdisciplinary and approaches its research objects from different perspectives, encompassing and combining a wide range of research results obtained by psychology, anthropology, sociology, political science, geography, design, architecture, urban and regional planning, engineering, landscape architecture, management, organization theory (Craik 1973, 403). Environmental psychology can be the needed source of social indicators for building social assessment as it is an integral "attempt to establish an empirical and theoretical relationship between behavior and experience of the person and its built environment" (Ittelson et al. 1974, 303).

The challenge here is to select out of environmental psychology research findings the content that has an operational value for assessing social quality of architecture. A structured approach is necessary in order to establish a foundation for making two choices: *first*, how to localize the units that would help construct a conceptual model of the social quality of architecture; *second*, how to extract those units out of the 'alloy' in which they are entangled.

Each one of the two basic theoretical perspectives in environmental psychology - transactional and phenomenological - may be used as a 'mine' for digging out indicators for the social quality of buildings, and for principles for their interlinking into a system. Transactional perspective offers the needed holistic and systemic approach that studies the dynamic interactions between the individual and environment, regarded not as autonomous entities but as aspects of a single whole (Stokols, Altman (eds.) 1987). Its emphasis on the active nature of human activities in space - based on a purpose, guided by goals, planned - is consistent with the way architects see people in their designs - as entities performing "functions". The central role which transactional perspective assigns

to the processes of perceiving and familiarizing environment, complement the functional interpretation with emotional and axiological dimensions that are essential to the assessment of the social quality of architectural space.

The second tradition in environmental psychology is conceived within the context of the phenomenological approach to the environment (Canter 1977; Canter 1986; Proshansky, Fabian, Kaminoff 1983; Altman 1986) and aims to create a theory of place, because “people always situate their actions in a specific place [...] the nature of the place, so specified, is an important ingredient in understanding human action and experience” (Canter 1986, 208). This perspective is also attractive for architects as their basic task is to design concrete places - homes, schools, offices - not the environment as a whole. However, it is problematic for designers and theorists to get into cooperation as they have different units for analysis as reference points: “place” for architects and “psycho-environmental processes” for social researchers (Altman 1973). This, in addition to the smaller number of studies produced so far, makes the phenomenological tradition harder to use as a source of conceptual insights and indicators for building social quality assessment.

The transactional perspective offers a more suitable theoretical context for constructing (as a first attempt) a conceptual model for assessing the social quality of buildings. An alternative version, situated in the phenomenological perspective and within the “theory of the place”, could produce a different model of the social quality of buildings, and to a different system of indicators for measuring and assessing it.

Prospects

Together, environmental psychology and building performance assessment systems offer a large and varied set of indicators for assessing social quality of buildings. Both perspectives - the theoretical, scientific, research one and the applied, practical, business-oriented one - yield mutually complementary picture of the assessed architectural spaces.

Sustainability assessment systems construct their object by transforming building's goals into material means for achieving them. This movement from the abstract to the concrete carries out the risk of overlooking essential elements; besides, the necessary systemic quality of the description of a building can be discredited by the limitations of the available instruments for measurement and assessment. Environmental psychology, by moving in the opposite direction - from 'living' reality towards theoretical abstraction - may compensate for the shortcomings of building performance assessment systems by proposing both a different set of social indicators, and also an integral, reliable principle for their mutual binding into a system. Thus, the two disciplines in cooperation are able to provide all that is necessary for the development of a conceptual model of social quality of buildings, together with a system of indicators for measuring and assessing this model.

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