

9 Appraisals of built environments and approaches to building design that promote well-being and healthy behaviour

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9.1 INTRODUCTION

Interactions between people and buildings are complex. People vary; built structures vary. Ask ten people what they think of a particular building and you may hear ten different answers. However, ask the ten about another building and their answers may be quite uniform. The first part of this chapter is about the ways people evaluate, or **appraise**, built environments around them. The second part offers an overview of approaches that use insights and knowledge from environmental psychology to inform the design of the built environment to enhance human welfare.

9.2 AESTHETIC APPRAISALS OF ARCHITECTURE

When is a **building** beautiful? The answer is that beauty is partly in the eye of the beholder and partly in the building itself (see Chapters 4 and 7 for a similar argument pertaining to **natural stimuli** and settings). For example, architects and lay persons sometimes disagree about whether a building is beautiful, but other times almost everyone thinks a **building** is beautiful or ugly (see Box 9.1). Environmental psychologists aim to discover which human differences and which design differences account for such variation and uniformity in environmental appraisals so they can usefully contribute to the **design of buildings**, neighbourhoods and cities (e.g. Gifford, 1980; Gifford, Hine, Muller-Clemm, Reynolds, & Shaw, 2000; Gifford, Hine, Muller-Clemm, & Shaw, 2002). In this section, we first discuss uniformities in the appraisal of built settings that reflect the **influence of the physical qualities** of those settings. Next, we discuss variations in appraisals associated with differences in observers' personal characteristics.

Uniformities in the appraisal of built space

Environmental psychologists have spent much time identifying qualities of the built environment that lead to consistent **appraisals** across observers (Stamps & Nasar, 1997). One such attribute is a **building's exterior**, or **façade**. Many people prefer façades that express a sense of the past, that have detailed, decorated, grooved or three-dimensional surfaces that appear to provide shelter and invite touch and exploration (Frewald, 1990).

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BOX 9.1 DECODING MODERN ARCHITECTURE

A set of 42 large, modern buildings was evaluated by groups of architects and lay persons (Gifford et al., 2000). The findings showed that some of the buildings were appraised positively by architects and lay persons, some were appraised positively by one group, and negatively by the other group, and some were disliked by both groups. The Bank of China Tower in Hong Kong was the favourite of lay persons and the second choice of architects. This shows that it is possible to design a building that both experts and everyday people like. But the two groups can severely disagree too. Disney Headquarters in Los Angeles was hated by architects (#41) but loved by lay people (#3). Yet Stockley Park Building (1987–1989) in England was #4 for the architects but #33 for lay persons. Some buildings were complete aesthetic failures according to both groups (e.g. the Chicago Bar

Association building was #35 for architects and #34 for lay persons). Images of these buildings are easy to find using Google's images search engine, if you are curious.

However, environmental psychologists are not merely poll-takers. The study compared all 42 buildings on 57 different aspects of their facades to learn what is associated with positive and negative appraisals for each group of observers. The results are complex but, in part, the two groups tended to focus on different aspects of the façade to reach their appraisals and value aspects differently. For example, buildings with more railings, more metal cladding and fewer arches elicited more pleasure for architects than for lay persons, and architects were more psychologically aroused than lay persons by buildings with numerous rounded edges and corners, and more triangular elements.

In general, three types of abstract, aesthetic qualities that elicit particular appraisals have been distinguished: **formal**, **symbolic** and **schematic** (Nasar, 1994). Formal qualities include abstract concepts such as complexity, order and enclosure. Symbolic qualities are expressed through design style (e.g. art deco or postmodern). Schematic qualities refer to a design's goodness-of-example or typicality for its functional category (e.g. restaurants, shops). According to Nasar, combinations of these qualities evoke different appraisals. For example, buildings with a familiar design style that exhibit orderliness and moderate complexity are usually evaluated as 'pleasant', whereas buildings with a complex and atypical design style are usually evaluated as 'exciting'. The relation between complexity and preference usually takes an inverted U-shape: buildings with an intermediate level of complexity tend to be favoured over those with the most and least complexity (e.g. Imamoglu, 2000); this is different from nature, for which greater complexity is generally associated with greater preference (see Chapter 4).

As for design style, a study of architects and lay persons showed that both groups rated farm and Tudor-style buildings (houses with deeply pitched roofs and decorative timbering) as most desirable, Mediterranean and saltbox-style buildings (wooden houses with sloping roofs) as least desirable, farm-style as most friendly, colonial as

most unfriendly, colonial and Tudor as highest in status, and saltbox and Mediterranean as lowest in status (Nasar, 1989).

The influence of typicality on aesthetic appraisals of built structures depends on the desirability of the structure. More typicality may increase preference for desirable places such as urban parks, but lower preference for undesirable places, such as alleys (Herzog & Stark, 2004).

Observer differences

Despite these uniformities, appraisals also sometimes vary from person to person. Some prefer new buildings, others prefer traditional buildings. Some appreciate the action of busy streets, while others despise it. In general, individual differences in goals, intentions, knowledge, moods, culture and life experiences all interact with the physical characteristics of a built setting to determine appraisals of that setting (Canter, 1985; Gifford, 1980; Verderber & Moore, 1977; Ward, 1977). Individuals with various levels of education and income differ in the inferences they draw from architectural styles. For example, as educational level and income increase, preference for colonial-style houses decreases and preference for contemporary style houses increases (Nasar, 1989).

Training and occupation also influence environmental appraisal. For example, architects are socialised during their education to prefer certain designs over others (Wilson, 1996) and to use specific schemes to judge buildings (Devlin, 1990). This may be why architects are often unable to predict what non-architects will find desirable in a structure (Brown & Gifford, 2001; Nasar, 1989). In general, architects tend to prefer more unusual housing forms than non-architects, who tend to prefer conventional house styles (Nasar & Purcell, 1990). Non-architects also differ from architects in that they prefer square rooms over rectangular ones, with higher than average ceilings (Baird, Cassidy, & Kurr, 1978; Nasar, 1981).

Other role differences seem to influence preferences for the design or organisation of buildings. For example, when nursing home administrators, designers and residents were shown different nursing home design options, the administrators and designers favoured plans that supported social interaction for residents, while residents preferred plans that seemed to afford them the most privacy (Duffy, Bailey, Beck, & Barker, 1986).

Meaning in architecture

Given that research reveals marked differences in how people evaluate a setting, environmental psychologists search for reasons why. One idea is that architects and non-architects differ in their appraisals because they differ in their perception of **architectural meaning**, that is, what sorts of associations from a person's life does the visual image of the building evoke, in terms of, for example, historical events, styles, preferences and power relations. This idea is supported by Groat (1982), who found

that architects sorted a set of modern and postmodern buildings according to design, quality, style, form and possible historic significance, whereas lay persons (accountants) sorted the buildings mostly according to their preferences and building type (e.g. residence, office). Remarkably, the lay persons did not recognise postmodern buildings as being distinct from the other modern buildings, which suggests that some of the meanings that architects try to convey with their design styles do not exist for lay persons.

Generally, the goal of many architects is to design buildings that communicate meaning in the sense of typicality, or function: a library should look like a library and a hotel should look like a hotel, even if another goal is to accomplish this without making every building of a given type look the same (Genereux, Ward, & Russell, 1983). Being able to discern the purpose of a structure is important for community residents (Groat & Canter, 1979). In general, settings with multiple meanings (identities) are often disliked, whereas settings in which the general use is clearly defined are preferred (Nasar, 1983).

9.3 THREE DESIGN APPROACHES THAT PROMOTE WELL-BEING AND HEALTHY BEHAVIOUR IN BUILDINGS

Attempts to design buildings that promote human well-being and behaviour have been undertaken for many years (e.g. Dempsey, 1914). Three modern approaches to this are **social design** – designing buildings to best serve human needs and wants, **biophilic design** – the integration of natural shapes, forms, and processes in architecture – and **evidence-based design** – designing buildings based on the best available evidence on the effectiveness of design measures.

Social design

Unfortunately, in modern industrialised societies, a gap exists between building designers and building users. Architects generally do not discuss their project plans with those who will potentially use a space on a daily basis, except when they design a private residence. Instead, they communicate with boards of directors or facility managers who usually do not work or study in the space after it is complete.

This gap means that specific behavioural needs of building users are often not included in the building design and rationales for the architect's decisions are not explained to most users. Social design (Sommer, 1983; also see Box 9.2) aims to bridge the gap between building designers and users. It is distinguished from

BOX 9.2 SIX GOALS OF SOCIAL DESIGN

Social designers keep six goals in mind to facilitate communication between the principal players in the design process and remind them that the typical building user is a principal player (Gifford, 2007a).

- Goal 1: Create a setting that matches or fits the needs and behaviours of its occupants. This goal is also referred to as congruence, habitability or goodness of fit.
- Goal 2: Satisfy the needs of building users, because occupants spend much time living and working in designed spaces.
- Goal 3: Positively change behaviour in the setting. For example, increase productivity in an office building or enhance socialisation in a community centre.
- Goal 4: Enhance personal control of occupants. When users are able to change a setting to meet their needs, the setting tends to be less stressful.
- Goal 5: Facilitate social support and encourage cooperation in the setting.
- Goal 6: Employ imageability to help occupants and visitors find their way without the stress of becoming lost or confused.

traditional (formal) design because it does not focus on large-scale, corporate, high-cost approaches. Instead, it favours a small-scale, human-oriented, democratic approach. Information from and about a building's potential occupants, meaning and local context is used to make sure that the architecture will enhance well-being and health-promoting behaviour.

Social designers investigate the attitudes and behaviour of future building occupants – even on large-scale projects. This is accomplished by interviewing potential occupants about their expected needs in various areas of the building, how much time they might spend at certain points within the floor plan, and whether any special requirements exist among them (e.g. different levels of lighting for people of different ages). This approach almost guarantees success, because it combines the input of building users with the training and experience of an environmental psychologist, an architect and other relevant expertise to create the best possible built space within local contexts and constraints. Some examples of successful social design are in studies of hospital renovations (e.g. Becker & Poe, 1980) and other health facilities (e.g. Gifford & Martin, 1991).

Not every principal contributor in the design process understands the advantages of social design. Some architects assume that if a space is structurally beautiful, occupants will be so impressed with the aesthetics that functionality will take care of itself over time. Some architects question why they ought to match a building to

the needs and behaviours of a specific group of people when either the group or the needs of that group might change several times during the lifetime of the space. The response of environmental psychologists is that when a building's use changes, a new planning and design process can be undertaken.

Biophilic design

Humans evolved in natural environments for millennia and have lived in cities for only a short portion of our existence as a species. Therefore, some argue that modern people still have **biophilia**, or an innate tendency to affiliate with nature and natural elements (e.g. Wilson, 1984; see also Chapters 4, 6 and 7). If this tendency can be fulfilled, then positive and restorative experiences are believed to result. Thus, built settings that integrate representations of the natural world into facades and interiors, as well as healthy attributes such as natural ventilation and daylighting, would seem to benefit occupant well-being and behaviour. This design approach strives to integrate biophilic experiences with sustainable building and landscape practice (Kellert, Heerwagen, & Mador, 2008).

Biophilic design is closely related to **restorative design**, an approach that focuses on the promotion of **restoration** from stress or mental fatigue as a key component of biophilic experience (Hartig, Bringslimark, & Grindal Patil, 2008; see also Chapters 5 and 6). Restoration may stem from the presence of plants and other natural elements, but it can also occur in restful places, such as museums, that do not have obvious natural elements (see also Chapter 10). Thus, **restorative design** may be considered a more general form of biophilic design that aims to promote restful experiences characteristic of natural environments, but is not necessarily restricted to natural elements. After all, perhaps our most restorative activity is sleeping, which is almost always done indoors.

An important difference between biophilic design and **social design** is that in biophilic design, building users are not directly questioned or observed. Instead, proponents of biophilic and restorative design make use of research evidence on the impacts of buildings on users. For example, some research suggests that a lack of exposure to nature leads to long-term stress and negative feelings about the built environment (Joye, 2007; Parsons, 1991; Ulrich, 1984). However, if this is true, one may ask why buildings do not include more natural content. One reason is that buildings are often planned with cost efficiency in mind, instead of integrating natural forms (Salingaros, 2004). Another reason might be rooted in the finding that productivity on a simple task decreased when many plants were in the office (Larsen, Adams, Deal, Kweon, & Tyler, 1998). Perhaps biophilic elements are good for workers' mental health, but less beneficial for their productivity.

Evidence-based design

According to this approach, all building design should be informed by the best available evidence on the effectiveness of each design decision. Proponents of this

approach argue that designing by intuition, fashion or solely on the basis of theory, precedent or aesthetics is less likely to produce a positively habitable built setting than if design is solidly based on research.

Recently, increased calls for evidence-based design have been made (e.g. Zimring & Bosch, 2008), although the need has been recognised for decades (e.g. Zeisel, 1975). Research by environmental psychologists has documented the positive impact of a range of design characteristics, such as reduced noise, enhanced lighting and ventilation, better ergonomic designs, supportive workplaces, the provision of personal control and improved layouts on well-being and functioning of building users (Gifford, 2007a; Sommer, 1983; Ulrich, Quan, Zimring, Joseph, & Choudhary, 2004, see also Chapter 3). Especially in healthcare architecture, these findings are increasingly used in an effort to improve patient and staff well-being, patient healing, stress reduction and safety.

9.4 SUMMARY

Even the most outdoors-oriented people spend most of their lives in one building or another, and the rest of us spend the vast majority of our time indoors. These structures are, therefore, of great importance to our well-being. In this chapter we have discussed some important similarities and differences in people's appraisal of built settings in relation to physical qualities of those settings and observer characteristics. We have also discussed social design, biophilic design and evidence-based design as three recent approaches that aim to translate insights from environmental psychology into building designs that satisfy users' needs and improve their well-being. In sum, this chapter shows that when empirical research successfully interfaces with architecture, spaces are built that mirror occupants' behavioural tendencies and enhance their daily experience. This will not only reduce stress and prolong satisfaction of occupants, but also stimulate procedural improvements and save undue criticism and time in future projects.

GLOSSARY

appraisal One person's personal impression of a place or structure.

architectural meaning Associations from a person's life evoked by the visual image of a building, in terms of, for example, historical events, styles, preferences and power relations.

biophilia People's innate tendency to seek connections with nature and other forms of life.

biophilic design A design approach that promotes the integration of natural shapes, forms and processes in building design with the assumption that bringing nature indoors is restorative because it emulates our species' long time spent in natural surroundings.

evidence-based design An approach to designing buildings based on the best available evidence on the effectiveness of design measures.

formal quality In Nasar's system, there are three formal qualities (or combinations of them): perceived enclosure, complexity and order of a building.

restoration The physiological and psychological process of recovery from stress and mental fatigue.

schematic quality A building design's typicality for a certain category (e.g. restaurants, shops).

social design A small-scale, human-oriented, democratic approach to building design in which information about, and the views of, a building's potential occupants, local context, and meaning take precedence over formal design criteria.

symbolic quality A type of abstract quality expressed through design style.

SUGGESTIONS FOR FURTHER READING

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Kellert, S. R., Heerwagen, J. H., & Mador, M. L. (Eds.). (2008). *Biophilic design*. Hoboken, NJ: Wiley.

Sommer, R. (1983). *Social design: Creating buildings with people in mind*. Englewood Cliffs, NJ: Prentice-Hall.

REVIEW QUESTIONS

1. Describe two physical attributes and two observer characteristics that have consistently been found to influence the aesthetic appraisal of built settings.
2. Describe at least three differences between architects and lay persons in their appraisal of built settings.
3. How can differences in the appraisal of built settings between architects and lay persons be explained?
4. Describe the six goals of social design.
5. Besides social design, which other modern design approaches have strived for the promotion of human well-being and behaviour in buildings?