DIFFERENCES IN THE INTERPRETATION AND EVALUATION OF THE BUILT ENVIRONMENT (DESIGNERS VERSUS NON-DESIGNERS)

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A review paper

Abstract

This study deals with factors contributing to differences in experts and non-experts' perception and interpretation of architectural meaning. A review of the results of seven research projects has revealed that the most important factors leading to different perceptions among people are experience, culture, social class, and environmental role: experts prefer more fashionable forms and styles and are more concerned with the aesthetic aspects of the visual stimuli; but the non-experts appreciate continuity in the design of buildings and physical components of the environment . It is suggested that , in future research, other factors which seem to have critical effects on the assessment of a building be considered including: smell, color, sound and actions.

Over the last thirty years there has been much research in environmental psychology to examine whether any differences exist between designers and non-designers about evaluating visual surrounding components. Most of these studies support the hypothesis that the individuals having and not having design training (urban design, architecture, landscape architecture, planning and product design) have different evaluations of their environment. Planners and architects with the association of other designers have the salient task of determining the formal aspects of the built environment while the lay people comprise the main users of those spaces. Exploring the perception and evaluation of the physical surrounding by people as the ultimate users could lead to the creation of a better design for the future.

Outline of the paper

The present review has mainly investigated seven individual research projects conducted during the 80s and 90s. Firstly, the concept of meaning communicated between people and the physical environment is set out through the words of some researchers. A table is compiled to show the basic parts of each study in order to give an overall view about the research projects.

A summary of each paper can be obtained from each separate row and a comparison between papers can be made through the columns. The essential points and results of the research projects are individually described in the next part. Lastly, the influential factors in the process of perception and interpretation of the built environment are summed up and the important points which should be considered for the future work are stated.

Environmental meaning

There has been much research into the question of meaning in architecture and how architects can introduce meaning which is understandable to the lay public into their design (Devlin, 1990). The question of meaning has been addressed by many commentators:

Meaning is a person's internal representation of the external physical setting, having perceptual, cognitive, and affective components (Groat, 1982). All buildings for better or worse carry meaning. They symbolise something to the viewer of the building (Broadbent, 1977). Architecture communicates at both a functional/utilitarian level and at a symbolic level (Eco, 1986). Our experienced environment is meaningful, people attribute meaning to places much as they do to words and the meaning of a place is not entirely determined by physical properties but also by a set of associations. Similarly people may give meaning to buildings. The minute a new form is invented it will acquire, inevitably, a meaning (Jencks, 1969). Meaning is an important mechanism linking environments and people (Rapoport, in press).

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Table 1. Important aspects of the research projects

AUTHOR	TITLE	YEAR PUBLICATION	HYPOTHESIS OR QUESTION	RESPONDENTS	METHOD	CASE STUDY	RESULT
Hurtmut Espe 1	Differences in the Perception of National Socialist and Classicist Architecture	1981 Journal of Environmental Psychology	How official Nazi architecture is evaluated, whether there are perceptual differences between Nazi and classicist style?	149 subjects all univ ersity students, architects and non-architects German and non-German	A format akin to the semantic differential techniques consisting of 20 six-point scales	18 facades in black and white slides, nine from National Socialist buildings and nine from classicist public buildings	a) A clear distinction between Nazi architecture and Classical architecture did exist. b) Non-architects tended to rate Nazi facades simple and uniform and Classical facades complicated and decorated, architects tended to give less extreme assessment on both styles.
Linda Groat 2	Meaning in Post-Modern Architecture: An examination using the multiple sorting task.	1982 Journal of Environmental Psychology	Are post-modern buildings perceived by the public as different from the building of the modern movement and do they convey more meaning?	20 architects and 20 accountants	Multiple sorting task	24 building photos including 8 Modern buildings 8 post-modern buildings 8 Transitional set	The architects seemed to draw deep distinction between Modern and post-modern buildings. For accountants Post Modern buildings did not serve a meaning for making distinctions among sets of buildings.
Joseph J. Valandez 3	Diverging Meanings of Development Among Architects and Three Other Professional Groups	1984 Journal of Environmental Psychology	Whether designers (a professional culture with specific behavioural attributes) should be compared with a general population which by definition has a greater distribution of attributes	4 groups: seven architects, seven psychotherapists, seven nutritionists, seven business administrators, all university advanced graduate students	Two qualitative and quantitative judgements about some house yards	29 slides of geographically distinct large backyards formulated and constructed by urban residents	The perception of architects, psychotherapists and business administrators were similar, but different from the nutritionists. In the quantitative judgements architects differed from all other professional groups.
Kimberly Devlin & Jack L. Nasar 4	The Beauty and the Best: Some preliminary comparisons of (high) versus (popular) residential architecture	1989 Journal of Environmental Psychology	Architects and non-architects would differ in their interpretative ratings of high and popular residential architecture	40 respondents, 20 architects and 20 non-architects (with a minimum of four years college education)	Data collection through eight seven-point bi-polar adjective scales.	20 high architecture residences and 20 popular residences	Architects preferred high style houses, non-architects preferred popular houses.
Kimberly Devlin 5	An Examination of Architectural Interpretation: Architects Versus Non-Architects	1990 Journal of Architecture and Planning Research	Architects and non-architects have different interpretations about buildings	For each of buildings 40 adult persons were interviewed 20 users 20 viewers	Two different methods: a) An on-site interview for non-architects b) Analysis of architectural review and criticism	2 office buildings 'The state of Illinois Centre' and '333 Wacker Drive building'	a) Most architects responded about aesthetic qualities non-architects used preference as a dominant category. b) Non-architects gave more descriptive responses to the physical features of the building. Architects commented more on ideas and concepts used to arrive at the physical form.
Philip Hubbard 6	Diverging Evaluation of the Built Environment: Planners Versus The Public	1994 The Urban Experience	An appreciation gap exists between planners and the public.	100 respondents including 20 local authority planning officers	Multiple sorting task	Evaluation of a number of commercial redevelopment within Birmingham city centre. (photographic stimuli)	Public tended to appreciate continuity in the townscape. Planners tended to appreciate more fashionable and up-to-date architectural style.
A. T. Purcell & Jack L. Naser 7	Experiencing other people's houses: A model of similarities and differences in environmental experience.	1995 Giving Places Meaning	Exploring the evaluation of the built environment in correlation with the knowledge structure	120 students 60 architecture students and 60 non-architecture students. Architecture students were tested again after 3 years	To use any number from 0 to 100 to indicate 4 different meanings to the buildings	20 high style and 20 popular style houses	Architecture students preferred high style, non-architecture students preferred popular style.

An overall view to the studies

All of these seven studies represent a common research theme which aims to find out whether there exists any differences between experts and non-experts in design field about the perception and evaluation of the built environment. Taken together, these studies utilise some common sets of stages to obtain their aims.

First, they rely on simulation of the physical environment. Only research 5 (according to Table 1) used an on-site interview for the evaluation of two office buildings. Four studies (1,3,4 and 7) used slides for their representation; in most cases colour slides were used. Two others (2and 6) employed photographs to simulate the built environment.

Second, the studies also share in employing educated respondents to collect data. Three studies (1,3 and 7) relied on university students where three others (2,3 and 4) preferred to employ experts to compare with the architects. In two studies of the latter group (2 and 4) the selected respondents represented a professional group and in study number 4 a minimum of four years college education was needed. Study number 5 is the only one which relied on the general public as the comparison group to the architects. This study also had a different approach to choose an on-site interview instead of simulation of the environment. Most of the studies selected the professional group versus architects in order to emphasise that any differences found in the study would be due to the professional role and as a result of demographic or intellectual differences.

Third, on the whole, most of the researchers used structured interviews and special psychological techniques to gather data. The bi-polar adjective scale and the multiple sorting task techniques were more frequently used. Again study number 5 employed unstructured interview and asked the respondents to freely express their ideas. At the end different methods of statistical data analysis were worked out to extract the results.

Individual review of the research projects

Valandez, in similar research in 1984 about professional culture, showed that an international sample of two professions (artists and militant politicians) were significantly different in their emotional symbol systems; and that each group, alone, was homogeneous irrespective of the citizenship of the individual. In this study (number 3 according to Table 1), the particular contribution of Valandez is his criticism of the intergroup variation in some studies which explore the differences between architects and non-architects. He also considered whether a general population, which by definition has a greater distribution of attributes, should be compared with designers (a professional culture with specific behavioural attributes). He suggested that non-designers may be less capable than architects and other designers of expressing what they see.

Valandez's paper has a methodological and a theoretical purpose related to the above discussions, but as he notes, the former is more important. Variation in the environmental evaluation of four professional groups (architects, psychotherapists, nutritionists and business administrators) was examined. He mentioned that this paper introduces an improvement in the methodology because the respondents are required to use categories in which architects were not more fluent.

The theoretical framework is an improvement because it investigates attributes of architects vis-a-vis other specialists rather than in comparison to a general population. He chose landscape architectural designs for large back yards which were initiated by residents rather than by professional landscape architects and reflected non-professional rather than professional norms and concepts of design.

The result of Valandez's research showed that the perceptions of architects, psychotherapists, and business administrators were strikingly similar, in qualitative aspects of judgement; whereas the variation between architects and nutritionists was equally striking since both are trained to visually examine physical structures, viz. architecture and cell structures. In their quantitative judgements, architects differed significantly from all other professional groups. Valandez suggests that as the number of subjects in the study was small, further research using larger samples is justified.

There are similar considerations in Groat's (1982) research. She chose accountants to represent the non-architects group because they have passed procedures similar to the architectural profession. In Groat's research two themes were examined.

The first one was assessing the claim that post-modern buildings are more meaningful to the general public than modern buildings because they have been designed by architects with the intention of conveying meanings consistent with popular values. The second one was the reasons for introducing the multiple

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sorting task as an appropriate device for revealing the meaning of environmental elements.

This study represents an empirical investigation of prevalent assumptions concerning the nature of meaning as it is conveyed by built form. She generates a set of two related hypotheses suitable for empirical testing:

a) there is an identifiable elite code for architects which is distinct from the popular code of non-architects in the context of both modern and post-modern buildings.

b) both architects and non-architects will distinguish between post-modern and modern buildings because they can recognise the dual existence of the elite and popular codes of the post-modern buildings.

Groat selected a broad range of twenty four buildings from modern to post-modern including an intermediate group which she called transitional. The multiple sorting task was employed and the respondents were asked to sort elements (building photos) into as many categories as they could find. One of the several advantages of this method allowed her to describe the differences between the two groups in terms of individual patterns of conceptualisation. Groat's conclusion showed:

a) the two expert and non-expert groups do in fact employ different sets of criteria for evaluating buildings.

b) contrary to the architects' intention, post-modern buildings were not interpreted as more meaningful or even distinct from modern buildings.

It was noticeable that non-architects typically used "preference" and "building type" in contrast to the architects, who typically used "form" , "style" , "history's significance" , "design approach" and "design quality" for their interpretation of buildings.

In a way similar to Groat who emphasised the different interpretation of physical environment consistent with variable codes employed by people, Hubbard emphasised that each individual potentially attributes a unique meaning to his environment. These meanings are constructed through established codes which are socially transmitted and thus, based on learning and culture. The idea of common perceptual codes shared by members of various groups also suggests why major differences in interpretation may exist between different socio-cultural groups (there are some investigations related to this field in Espe's research). Canter (1991) stated that "environmental role can be considered as an important factor for different evaluations of the built environment".

In this respect, the most frequently explored distinction is between the producers and consumers of the environment. Those who create the environment and those who live in it. Hubbard stated that apart from architects, planners have probably the best opportunity to influence the urban design process.

To investigate the hypothesis that "an appreciation gap exists between planners and the public" , a number of commercial redevelopments within Birmingham city center were selected and evaluated by over one hundred respondents including local authority planning officers. Respondents sorted 15 photographic stimuli according to the criteria of their own choice (multiple sorting task). The results showed that:

a) planners' sorts were mostly concerned with physical aspects of the redevelopment (materials, detailing, and context) or representational meanings; the public's sorts were based on (preferences, feelings and associations) or responsive meanings.

b) planners assessed the redevelopment according to similar criteria, while the distribution of the public group showed a fairly high level of scattering and little homogeneity.

c) not only did the planning group possess a sophisticated vocabulary for expressing their concerns, but their underlying conceptualisation of the redevelopment also possessed a more organised and coherent structure, clearly derived from their familiarity with architectural criticism.

d) while the public group had a more positive evaluation of the more derivative architectural style, the planning group preferred the more hi-tech and late modern style. This meant that while the public appreciated continuity in the townscape, planners tended to appreciate more fashionable and up-to-date architectural styles.

He used the multiple sorting technique for collecting data. The non-verbal nature of the multiple sorting technique (suggested by Groat) meant that the differences observed did not merely result from differences in vocabulary (as suggested by Valandez), but resulted from fundamental differences in the way that groups conceptualised redevelopment. It brought up an important question: the extent to which planners are able to identify aesthetic dimensions of buildings and urban forms, assess symbolic and cultural values in specific situations and evaluate impacts of

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development and change on the built forms. His results lend support to the view that there should be greater integration of public interests within the planning process.

The importance of Espe's study is that he explored the interpretation of two different architectural styles among architects and non-architects with two different nationalities. In fact, in his study, he wanted to investigate the relationship between nationality and expert role in aesthetic evaluation. To do that, eighteen facades were selected; nine from National Socialist (Nazi) buildings and nine from classicist public buildings. A format akin to the semantic differential was employed consisting of twenty six-point scales. Many of the adjectives had a metaphorical character to establish a control on the influence of nationality. 149 university students both German and non-German, were questioned. Both architects and non-architects were employed to determine the influence of specialised training. The result of the research showed that:

a) a clear distinction between Nazi architecture and classical architecture did exist.
b) there was a definite cultural difference in evaluating facades regardless of style.
c) non-architects tended to rate Nazi facades as simpler and more uniform and classicist facades more complicated and decorated than architects did.
d) architects tended to give less extreme assessment on both styles.

The comparison of the results in this research indicated greater similarities among architects of different nationalities than among the public of those nations. The similarities between architects of different nationalities may be considered as the result of their training. The effects of training in architecture was also investigated in research conducted by Purcell and Nasar.

Devlin and Nasar (1989) examined the differences of architects' and non-architects' environmental perceptions through research which compared the responses of the two groups to popular and high architecture. High architecture was defined as that designed by architects and published in professional architectural magazines, whereas popular architecture was represented in non-professional magazines and newspapers.

The most valuable contribution of their study was their measurement of the building categories. The findings confirmed the presence of physical elements which may define the character of high and popular buildings. To obtain their aims, they utilised the following stages:

Twenty high architecture residences and twenty popular residences were selected and were represented through color slides to forty respondents. These consisted of twenty architects and twenty non-architects, the latter group being composed of persons who had had a minimum of four years of college education. Six attributes were rated on the seven point bi-polar scales, namely complexity/simplicity, novelty/commonplace, clarity/ambiguity, coherent/chaotic, exciting/boring, and relaxing/distressing. The results of the study showed:

a) architects preferred higher levels of complexity and novelty than the public.
b) architects rated high residential architecture as more meaningful, clear, coherent, pleasant and relaxing than the popular residential architecture; non-architects rated popular residential architecture as more meaningful, clear, coherent, pleasant and relaxing than the high residential architecture.
c) for both architects and non-architects preference related to novelty within coherent (or organizable) forms. Both groups preferred a discrepancy from their norms.

Purcell and Nasar (1995) in a similar study investigated the similarities and differences in environmental experience and the physical attributes of a particular building type. Moreover, they explored the effects of architectural training through examining a group of students twice, first, when they were half way through their first year and second, at the end of their third year. Groat and Hubbard expressed the role of different codes in evaluating the environment, while in this study Purcell and Nasar demonstrated the role of knowledge structures in explaining similarities and differences in affective experience. They argued that "through repeated encounters over time with different examples, a predominantly non-conscious learning process takes place". On the basis of this process the individual constructs a mental representation of these regularities together with the ranges of values typically associated with the attributes and relationships. These structures have been variously referred to as: schema, frames, scripts or , more generally, knowledge structures. The affective experiences can occur under two different conditions:

a) degree of fit to an existing knowledge structure

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b) discrepancies from a knowledge structure

This research was conducted to explore the evaluation of the built environment in correlation with knowledge structure. Similarities and differences in experience can occur between groups in two ways:

In one case, groups that live in different geographic locations may have different experiences in terms of attributes, relationships and ranges of values:

In the second case, through education or other circumstances one group could experience a different range of examples from those normally presented in the environment. So the respondents for this study were selected in such a way that they:

a) represent a different nationality in relation to the location of the buildings (American houses were shown to Australian students).

b) represent two different professional groups.

Sixty architecture students and sixty non-architecture students participated in the research. They were asked to use any number from 0 to 100 to indicate four different meanings of the buildings, which represented the two different styles : high and popular dwellings (architecture students were examined twice).

Results of the study showed that architecture students preferred the high styles and non-architecture students preferred the popular styles. When the students were tested at the end of their third year, the popular style houses were significantly less preferred (resulting from the students' architectural education process). These findings indicated that the differences did not result from differences in knowledge structure between the groups but rather from differences in response to the discrepancies from the same knowledge structure. The finding that Australians judged American style houses familiar, could be due to experiences through secondary sources (movies, T.V, and magazines). Moreover, both countries share a common British/western European heritage which may be reflected in similarities in houses.

In summary, it seems that artists favour more uncertainty than do lay persons, and the results for the non-architects supported Whitfield's (1983) hypothesis that people prefer a fit to prototypes.

Devlin (1990) investigated whether architects can introduce meaning into their designs which is understandable to lay people. Devlin argued that since a representation of the buildings, by means of photographs and slides, may not sufficiently simulate what can be captured by direct experience, two different methods of collecting data were chosen: for non-architects an on-site interview was employed and for architects, a content analysis of architectural review and criticism was used. The latter data was obtained from publications of professional architecture.

The study concentrates on one building type, the office building. In this way, the differences due to building type were eliminated. Two selected office buildings were 'the State of Illinois Center' and '333 Walker Drive Building' for which, numerous articles were written.

For each of these two buildings, forty adult persons were interviewed of whom twenty were users and twenty were viewers. The participants could freely talk about the buildings selected and led the conversation in the direction they desired. To sum up the results, it was noticeable that most architects responded to what Groat termed 'aesthetic qualities'. Architects discussed issues of form, style, historical significance, design approach and design quality. As Groat (1982) suggested non-architects used 'preference' as a dominant category. The next most frequently used categories included building details and size, energy and ventilation. In other words, non-architects gave more affective and responsive responses to the physical features of the buildings, whereas architects commented more on ideas and concepts used to arrive at the physical form.

Conclusion

All the studies discussed explored the idea that each physical environment consists of various features that convey meaning for people. There are different ideas about the factors that may have an influence on the perception and interpretation of architectural meaning. This meaning is perceived and interpreted by individuals according to their knowledge structure, which has been shaped through their experiences over time. Therefore, experience influences how one perceives his or her surroundings and consequently people of different backgrounds may differ in their environmental perception.

The socio-cultural context of people affects the meaning they perceive. The prediction that people of different environmental roles will have differing conceptualisations and evaluations of their environments has proved to be a remarkably consistent research finding (Canter, 1991).

Accordingly, all members of a group have a fairly common perception, cognition and action structure (Pennartz, 1989). The environmental meanings are

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constructed through established codes which are socially transmitted and thus based on learning and culture.

To sum up, the most important factors contributing to different perceptions among people are experience, culture, social class and environmental role.

The rate of fitting between the environmental stimuli and the knowledge structure of an individual affects the latter's evaluation. If this fitting is high the evaluation is associated with familiarity and as the fitting decreases the feeling changes from preference to excitement. With large differences from knowledge structure the experience becomes strongly negative.

The results of the studies show considerable differences between the design experts and other people. The former, preferring more fashionable forms and styles, are more concerned with the aesthetic aspects of the visual stimuli. For non-experts, preference and familiarity is considered important and they appreciate continuity in the design of buildings and physical components of the environment.

Because of the simulation of the physical stimuli by means of slides and photographs, the studies reviewed have eliminated some factors which inhibit the evaluation process. Those contextual factors such as smell, colour, sound and actions have critical effects on the assessment of a place. On the whole, this is a new era of research and one has to address a number of questions in order to achieve a reliable result. Scientific investigation of the assessment and interpretation of the built environment will help to discover the reasons why certain architectural features are liked or disliked and may provide insight towards better design in the future.

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