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Reconciling the architectural preferences of architects and the public: the ordered preference model

'You shall have the handsomest barn in England.' Inigo Jones to the Earl of Bedford, 1630.

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Abstract

The paper reports on a survey of visual preferences for suburban office buildings. The participants comprised members of the professions involved in the speculative development of these buildings, and building users. The survey method used paired comparisons of photographs representing eight different design types for suburban office buildings. The data was processed using a form of conjoint analysis. Differences in preferences between the participant groups were revealed, confirming previous surveys. Analysis of the preferences of architects and laymen showed a different weighting of design attributes. Despite these differences, a design type could be identified that would be acceptable to both architects and laymen. This finding is generalised in the proposal for an 'ordered preference model' to generate designs which reconcile the preferences of both professionals and laymen.

INTRODUCTION

Many previous studies have demonstrated that architects' judgments of the appearance of buildings differ from those of non-architects (eg. Hershberger, 1988; Devlin & Nasar, 1989; Brown & Gifford, 2001; the last of these papers gives references to other sources). However, there has been far less discussion about the policy implications of the difference. Nasar's *Design by Competition* (1999) took a hard line: he perceived a conflict between architects and the public, and sided wholeheartedly against architects. Architects, on the other hand, long for their values to be taken up by the wider community. For example, enthusiasts for then-new modern architecture said in 1939, 'If architects can bring home to the man in the street some sense of these great possibilities [of modern architecture], a popular demand will be created ... the demands of the people are certain to triumph in the end' (Yorke & Penn, 1939).

This paper reports on a survey of visual preferences for a particular building type, and suggests policy implications. The survey confirmed the familiar difference between the preferences of architects and laymen. It used a form of conjoint analysis, which revealed the underlying structure of preferences, and this suggested that, for the selected building type, the differences in preference between architects and laymen could be reconciled without conflict: there may be no necessity to take sides and no imperative to eliminate the differences. This finding is generalized in the proposal for an 'ordered preference model'.

The authors take it as self-evident that the buildings and environments produced by architects should be well-liked by their users, and should also be high quality design statements. These are distinct aspects of design and many buildings achieve one or the other but not both. The ordered preference model aims to generate designs that are successful with respect to both aspects.

CONTEXT: SPECULATIVE BUILDINGS

The research was stimulated by the differences of opinion that arise in the multi-disciplinary development teams for speculative buildings. The survey covered many aspects of the design and specification of a particular building type in the UK, the suburban office building. These buildings have become a familiar part of the everyday environment, as hundreds of thousands of square metres have been developed over the last twenty-five years. Other aspects of the survey were reported elsewhere (Fawcett, 1992). The data collected for one part of the survey, concerning visual preferences, has recently been re-analysed.

More than most other aspects of design, visual preferences are a matter of intuitive decision-making (Robbins & Langton, 1999, p.360): there is little objective data about what makes a 'good-looking' building – no-one

is likely to be able to prove (or convince others) that their favoured solution is best, but intuitive views may nevertheless be strongly held. Architects are often convinced that their favoured designs would be well-received by end-users, but their non-architect colleagues in the development teams are skeptical.

After completion, speculative buildings are offered to prospective tenants in a competitive marketplace. The practical pay-off from having a better building comes in higher rents or lower vacancy rates, which result from enhanced customer demand. Therefore, if appearance makes any contribution to value, it must be through increasing a building's appeal to prospective tenants. Few people involved in commercial development would disagree with this. What they disagree about is the kind of design that they think would appeal to prospective tenants. Development team deliberations are often resolved by a battle of wills (or purse-strings) rather than a rational understanding of customers, who are, of course, absent when speculative projects are being developed. The survey was commissioned by an architect involved in speculative development, who sought a more rational basis for design decisions.

SURVEY

Participants

For a speculative building the typical development team includes:

- the *architect*: designs the development in accordance with all relevant constraints (site, cost, regulations, market intelligence, etc);
- the *developer*: identifies the project and manages it through to completion;
- the *planning consultant*: advises on acceptability to local planning authorities in cases where planning consent is controversial;
- the *investor*: buys the development when a tenant is found, or, if a mortgage lender, may end up as owner if the project fails;
- the *estate agent*: advises on marketability and markets the development when it is completed.

All these professional groups were surveyed, together with users who worked in newly-completed suburban office buildings. The number of participants of each type is shown in Table 1.

Participant group	Number of participants
Architects	31
Developers	12
Planning consultants	11
Investors	7
Estate agents	15
Users	93
TOTAL	169

Table 1: Number of survey participants, by participant group.

Design types

Many photographs were collected showing exterior views of suburban office buildings in the south-east of the UK. They were all of a generally similar scale and in similar settings. In comparing the buildings, it appeared that they were distinguished from each other by three main attributes, each of which could be ascribed two values:

Roof shape: *pitched* or *flat*

Wall material: *traditional* (brick) or *non-traditional* (metal or panels)

Architectural character: *weak* or *strong*.

The images were intuitively classified as 'weak' or 'strong' with respect to the attribute 'architectural character' by architecturally-trained researchers. The combination of the attributes and values generated 8 design types, shown in Figure 1. Specimen photos of the eight types are shown in Figure 2. The survey investigated visual preferences for these eight different suburban office design types.

The photographs of the buildings presented many other attributes which must have some influence on visual preferences, including, for example, the presence or absence of planting or parked cars in the landscape setting. By focusing on just three attributes for investigation, the impact of the others becomes 'noise' in the results.

Questionnaire format

In the survey, participants were presented with pairs of photographs of suburban office buildings, and asked whether they preferred the one on the left or the right; there was no 'don't know' or 'can't decide' option. Each design type was shown in a pair with the seven other design types. Each type was therefore presented in seven pairs, requiring seven photographs. Photographs were not reused, so 56 were needed (7 photos for 8 design types). The 56 photos were presented in 28 pairs; to minimize the impact of extraneous factors image pairs were selected so as to be approximately matched with respect to landscaping, visibility of parking, and sunny or overcast weather.

The use of photographs to ascertain responses to buildings and the environment is well established. Experiments demonstrating the validity of photographic testing were reviewed in detail by Hershberger & Cass (1988) and Stamps (1993 and 1999). Hershberger & Cass reported high correlations between judgments based on visits to buildings and photographic representations.

	ROOF SHAPE	WALL MATERIAL	ARCHITECTURAL CHARACTER
	pitched	traditional	strong
	pitched	traditional	weak
	pitched	non-traditional	strong
	pitched	non-traditional	weak
	flat	traditional	strong
	flat	traditional	weak
	flat	non-traditional	strong
	flat	non-traditional	weak

Figure 1 (above): The eight design types generated by three attributes, each with two values, and diagrams of the design types.

Figure 2 (right): Specimen photos showing the eight design types.



pitched | traditional | strong



pitched | traditional | weak



pitched | non-traditional | strong



pitched | non-traditional | weak



flat | traditional | strong



flat | traditional | weak



flat | non-traditional | strong



flat | non-traditional | weak

The survey was conducted interactively on a portable computer taken to participating firms' offices. One person at a time sat at the computer and worked through the survey. The paired images were displayed on the screen and the participant clicked on buttons to indicate which was preferred: there were buttons indicating 'preference' and 'strong preference' under each image, as shown in Figure 3. When a selection was made, another pair appeared. No guidance was given to participants about making preferences, and the typology of eight design types was not described. No time limit was imposed, although the survey database recorded the time taken by participants, as summarised in Table 2. In the database, each participant's preferences were recorded in a line of data in which the buttons selected for the 28 image pairs were indicated by entries of -2, -1, 1, or 2, corresponding to the four buttons running from left to right.

The interactive computer-based technique was successful. Participants happily engaged with the questionnaire, and all finished it. Participants seemed to be careful in making their selections. Because data was automatically logged for analysis, the risk of transcription errors was avoided.

The survey used the method of paired comparisons (Bock & Jones, 1968), a form of conjoint analysis. The attributes jointly through responses to experimental objects, rather than seeking direct responses to individual attributes (Louviere, 1988). Conjoint analysis using paired comparisons is not prominent in the environmental psychology literature, but other applications of conjoint analysis have been reported (eg. Katoshevski & Timmermans, 2001; Dijkstra et al, 2003 – in the latter, survey objects were presented in threes). The primary application area of conjoint analysis is market research.

Results 1: differences between participants

The first analysis dealt with similarities and differences in overall preference. This was done by comparing the preferences of survey participants. Each participant had a line of data with 28 entries indicating the buttons selected for the image pairs: if two participants chose the same button for a given pair, the difference between the numbers in the database was 0, regardless of which button was chosen. If their preferences were not the same, the difference between the numbers in the database could be 1, 2, 3 or 4 (the highest value arising if the database entries were 2 and -2 for an image pair). For two participants, the sum of differences in the database for all 28 image pairs gave a 'difference score' between their preferences. This is equivalent to the computer science concept of the 'Hamming distance' between the lines of data.

For the 169 participants in the survey, there were 14,196 such difference scores between participant pairs (169 x 168 / 2 = 14196). The expected value of the difference score between two random selections would be 49; the average over all participant-pairs was 37.1, indicating overall agreement in visual preferences.



Figure 3: Mock-up of one of the 28 image-pairs in the survey. Participants indicated their preferences by clicking on one of the four buttons below the photographs.

Participant group	Average time taken per image pair (seconds)
Architects	11.3
Developers	15.3
Planning consultants	12.9
Investors	12.1
Estate agents	9.3
Users	8.9

Table 2: Average time taken to indicate preferences, by participant group.

Results 2: differences between participant groups

The average difference scores for participant pairs who belonged to the same participant group are shown in Table 3. In all cases the within-group average scores were lower than the average score for the aggregate of all participant-pairs (37.1). The planning consultants stand out as the group with the lowest average difference score (27.1); perhaps this reflected a shared stereotypical view of ‘what is acceptable to local authority planners’, rather than their own personal preferences which might have been more diverse. Users had the highest average difference score by a smaller margin (35.2); this suggests that there is no generic user that the development team for a speculative development can design for. Note that the difference score is insensitive to the design types that were actually preferred. Thus, two groups may have similar within-group difference scores, while having different preferences for design types.

The average difference scores for participant pairs who belonged to different participant groups are illustrated in Figure 4. The between-group difference scores were generally higher than within-group scores. The lowest difference score was between planning consultants and users (33.5); this was actually lower than the within-group score of users, suggesting that planning consultants’ preferences were approximately similar to the average of users’ preferences. The higher between-group difference scores were dominated by the architects, indicating that this group had a distinctive pattern of preferences for the design types.

Results 3: ranking of the eight design types

The ranking of the eight design types was established from the lines of data recording the participants’ 28 image-pair preferences. A given design type was represented in seven image-pairs, and in each image-pair it was strongly selected, weakly selected, weakly rejected, or strongly rejected. These cases were scored 2, 1, -1, -2 respectively, and the seven scores added for the given design type. The highest possible score was therefore 14 and the lowest -14. The scores for the eight design types were established in this way for all participants in the survey; the sum of the eight scores was always 0.

The scores of the eight design types were averaged for the participant groups; they are represented graphically on a ladder chart in Figure 5. On this chart a wide separation of high- and low-scoring design types indicates that the participant group had well-formed preferences between the types. The architects’ ranking had the greatest separation and the developers’ the least; the users’ ranking had low separation.

Participant group	Average within-group difference score
Architects	33.6
Developers	31.3
Planning consultants	27.1
Investors	32.7
Estate agents	33.9
Users	35.2

Table 3: Average within-group difference scores between pairs of participants, by participant groups.

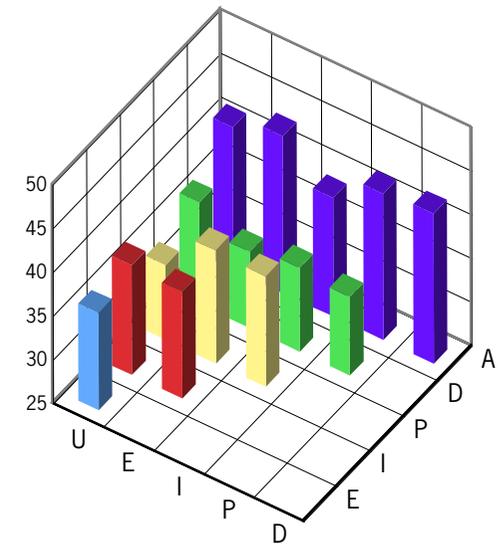


Figure 4: 3-D histogram showing average difference scores between participant groups.

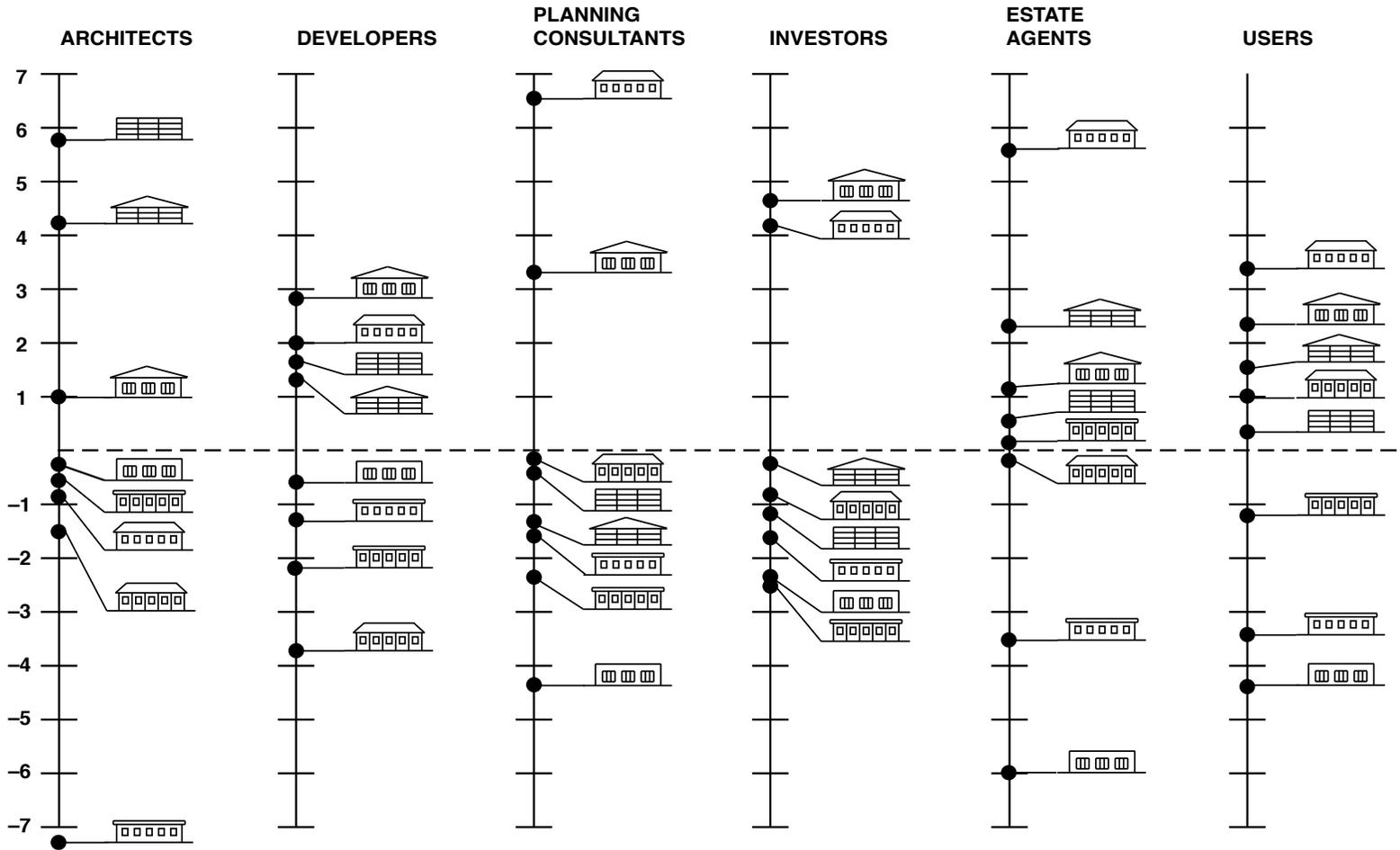


Figure 5: Ranking of the eight design types, by participant group.

When the rankings of design types are compared, the differences between the groups are pronounced:

- the two design types ranked highest by architects had lower rankings from all other groups;
- the types ranked highest by the other groups had lower rankings from architects.

Results 4: weighting of the three attributes

As well as ranking the eight design types, it was possible to identify which of the three design attributes (roof shape, wall type, architectural character) carried most weight. Of the 56 images used in the survey, half had pitched roofs and half had flat roofs; half had traditional walling and half had non-traditional walling; and half had a strong and half a weak architectural character. So each of the six attribute values appeared in 28 image-pairs, and in each image-pair it was strongly selected, weakly selected, weakly rejected, or strongly rejected. These cases were scored 2, 1, -1, -2 respectively, and the 28 scores added. The highest possible score was 56 and the lowest was -56. The numerical scores for the six attribute values were established for all participants in the survey; the sum of the six scores was always 0. The sum of the alternative values for a given attribute was also 0, and the magnitude of the difference between the alternative values indicates the weight that was given to that attribute in the individual's image-pair preferences. If, for example, an individual's results showed that one value for a particular attribute scored a high positive number and the other value a high negative number, then it was inferred that the attribute strongly influenced that individual's preferences.

The six attribute value scores were averaged for the participant groups, as shown in Table 4. The magnitude and direction of preferences are clear. The sum of differences indicates the cumulative impact of the three attributes in the groups' image preference selections.

The differences between the alternative values for the three attributes were normalised for the participant groups and shown graphically in pie-charts in Figure 6. The contrast between the architects' and users' weighting of attributes is striking.

To quantify the relative importance attached to the three attributes by the participant groups, and the extent to which the attributes contributed to their overall preferences, a simple linear regression was conducted. The dependent variable was the score given by each participant to the eight design types. The independent variables were the three attributes. As each attribute had only two values, they could be set as single (0,1) dummy variables for the regressions. In this form, a regression was performed on the participants, based on their group membership.

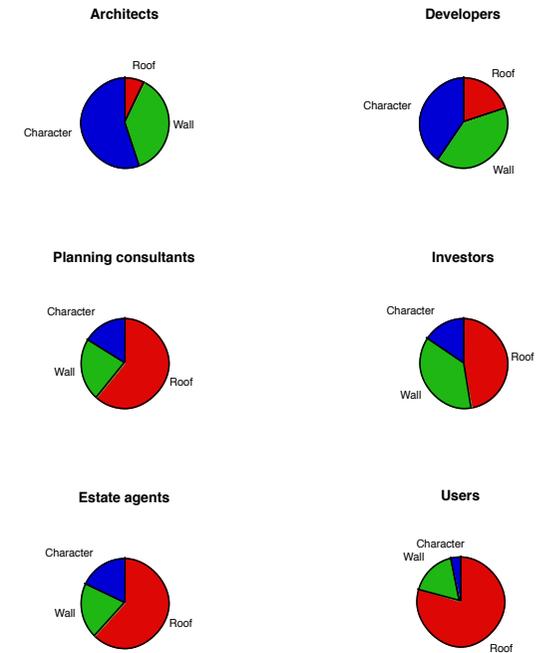


Figure 6: Pie charts showing the relative weighting of the three attributes, by participant group.

Participant group	Roof shape		Wall material		Character		Sum of differences
	pitched	flat	trad	non-trad	strong	weak	
Architects	2.54	-2.54	-7.54	7.54	10.68	-10.68	20.67
Developers	2.42	-2.42	3.08	-3.08	5.17	-5.17	10.67
Planning consultants	8.45	-8.45	4.09	-4.09	-2.63	2.63	15.17
Investors	7.71	-7.71	4.71	-4.71	0.86	-0.86	13.28
Estate agents	8.93	-8.93	-2.67	2.67	-2.00	2.00	13.60
Users	9.05	-9.05	-1.22	1.22	0.05	-0.05	10.32

Table 4: Scores of attribute values, and sum of differences, by participant group. The most important attribute for each participant group is highlighted.

R values are a measure of fit of a regression model to the data, indicating the amount of variance in preferences that is accounted for by the three attributes, shown in Table 5. The balance of the variance can be accounted for in various ways: response to other attributes of the buildings shown in the photographs, such as colour, proportion, style, or landscaping; variation between individuals in terms of ages and, to some extent, background, which has been demonstrated to influence environmental opinion (Bechtel and Korpela, 1995); and some measurement error may also be present. The Adjusted R^2 statistics show that the three attributes accounted for substantially different amounts of the variance in the participant groups. For the architects, over a third of the total variance relates to these attributes. The estate agents had the lowest value at 14.1%. The regression results are shown in Table 6 and the ‘t’ statistics in Table 7.

Participant group	R	R ²	Adjusted R ²
Architects	0.598	0.358	0.350
Developers	0.438	0.192	0.166
Planning consultants	0.535	0.286	0.261
Investors	0.526	0.277	0.235
Estate agents	0.402	0.161	0.141
Users	0.417	0.174	0.171

Table 5: Values of R, R² and Adjusted R², by participant group.

Participant group	constant	Roof shape	Wall material	Character
Architects	4.315	0.363	-2.008	<u>2.815</u>
Developers	2.813	0.771	1.104	<u>1.563</u>
Planning consultants	3.023	<u>2.136</u>	1.364	-0.455
Investors	2.607	<u>2.357</u>	1.857	0.500
Estate agents	4.656	<u>2.125</u>	-0.813	-0.050
Users	3.821	<u>2.177</u>	-0.318	0.126

Table 6: Regression coefficients, by participant group. Assignment of dummy variables: Roof shape pitched = 1, flat = 0; Wall material traditional = 1, non-traditional = 0; Character strong = 1, weak = 0. The most important attribute for each group is highlighted.

Participant group	Roof shape	Wall material	Character
Architects	0.224	<u><0.001</u>	<u><0.001</u>
Developers	0.084	<u>0.014</u>	<u><0.001</u>
Planning consultants	<u><0.001</u>	<u>0.003</u>	0.309
Investors	<u>0.001</u>	0.009	0.467
Estate agents	<u>0.001</u>	0.091	0.296
Users	<u><0.001</u>	0.043	0.423

Table 7: Results of the t statistic, by participant group. Relationships significant at the 0.05 level are highlighted.

DISCUSSION

Methodology: conjoint analysis

The use of image pairs to investigate visual preferences was straightforward and effective. The survey method could be applied in many situations (Fawcett, 1998). David (1988) noted that ‘The method of paired comparisons is used primarily in cases when the objects to be compared can only be judged subjectively; that is to say, when it is impossible or impractical to make relevant measurements to decide which of the objects is preferable.’ One benefit of the use of images is that it avoided reliance on verbal descriptions of buildings, or the verbal expression of responses. ‘Architects and non-architects use words differently and the differences may be indicative of potential communication problems between the architect and client’ (Devlin & Nasar, 1989).

The method of exhaustive paired comparisons used in the survey is only suitable for a small number of distinct design types. It was found that eight design types and 28 image pairs were fairly demanding for the participants, and exhaustive comparisons would be inconceivable for more than a maximum of about 10 design types, as shown in Table 8. When there are more design types, sample comparisons can be used instead of exhaustive comparisons. With exhaustive comparisons, data analysis can be carried out by simply counting the recorded survey scores; with sample surveys the underlying structure of preferences can still be inferred with a lower level of confidence, as can the expected responses to permutations of attribute values defining objects that were not actually presented in the sample survey.

The restriction to a small number of design alternatives has advantages. With too many variables, interacting in complex way, survey results can be hard to interpret.

Connoisseurs and laymen

The following discussion concentrates on the differences between the responses of the architect and user participants in the survey. The responses of the other professional groups are of interest, but are not pursued here. The headline finding that the visual preferences of architects differ from those of laymen confirms the findings of many previous studies, as noted in the Introduction. The distinctive preferences of architects are sustained by a specialised education (Wilson, 1996), exposure to the same professional literature, and frequent interaction between colleagues. Laymen, on the other hand, presumably give much less, if any, attention to architectural design and rarely, if ever, engage in discussions with others on the topic.

In the survey, the preferences of architects were dominated by the enigmatic attribute of architectural character and were much less affected by roof shape; whereas laymen's preferences were dominated by roof shape and were almost completely unaffected by architectural character. Either laymen were unable to recognize architectural character, as defined by architects, or they recognized it but were indifferent to it; the former seems more likely. Architects, on the other hand, must have been able to recognize roof shape, but gave greater weight to architectural character – they regarded it as a more important attribute.

This situation corresponds to the difference between regular consumers and 'connoisseurs' (Earl, 1986, p.195). As consumers develop into connoisseurs they take account of new attributes in product evaluation, thereby changing their overall preferences; for example, a wine connoisseur will detect and attach importance to attributes of a wine that are not apparent to non-connoisseurs. This model suggests that non-connoisseurs have a simpler decision model, such as 'pitched roof = good, flat roof = bad'. The short time taken by users to complete the visual preferences survey may support this hypothesis.

Number of design types	Number of image pairs
4	6
6	15
8	28
10	45
15	105
25	300
50	1225
100	4950

Table 8: Number of image pairs required for an exhaustive survey, by the number of design types.

The survey findings are consistent with the proposition that the three attributes used for the definition of design types can be ranked from ‘basic’ (roof shape) to ‘complex’ (architectural character), with the basic attribute being most important in the preferences of laymen, and the complex attribute most important to the architects. This pattern can be represented diagrammatically, in Figure 7. The same pattern is evident in a chart showing the relative weighting of the three attributes by the participant groups in the survey, in Figure 8.

Architectural character

The survey images were intuitively classified as ‘weak’ and ‘strong’ with respect to the attribute ‘architectural character’ by architecturally-trained researchers. Although the survey results show that architectural character was very important to the preferences of architects, they offered no explanation of what gives a building a strong architectural character. Explanation may be unnecessary: *de facto* it is whatever is esteemed at a point in time by the architectural profession. However, the lack of an explicit definition creates a barrier between architectural ‘insiders’ and the rest of the world. It isolates architects, whereas mutual understanding would be more desirable.

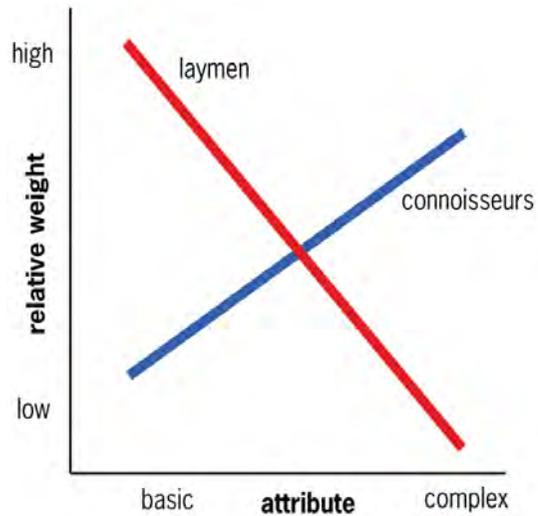
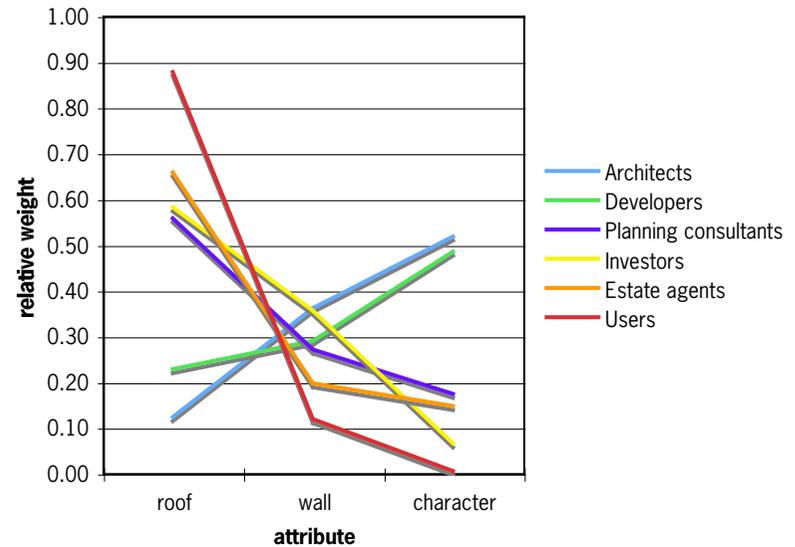


Figure 7 (left): Diagram showing expected pattern of weighting of low- and high-level attributes by laymen and connoisseurs.

Figure 8 (right): Chart of survey data showing relative weighting of attributes, by participant group.



Pragmatic response

When speculative buildings are designed by connoisseurs/architects for non-connoisseurs/laymen, there is a near-certainty that the visual preferences of the two groups will differ. There is a risk that designs produced by architects in accordance with their visual preferences will be disliked by laymen/users whose preferences are different. Can this conflict be avoided?

In the present study of suburban offices, laymen preferred pitched roofs and somewhat preferred traditional walling, but were indifferent to architectural character; whereas architects preferred strong architectural character but were largely indifferent to roof shape and walling. Therefore a design with a pitched roof, traditional walling and a strong architectural character would satisfy the dominant values of both architects and laymen. It would avoid the conflict resulting from the adoption of a design with attributes that were favoured by any one group but violated the preferences of another group. In the context of the building type and participant groups surveyed, the case for pursuing the pitched roof/traditional walling/strong architectural character design strategy seems overwhelming.

In this instance, there appears to be a straightforward way of reconciling the values of architects and laymen, and avoiding conflict.

ORDERED PREFERENCE MODEL

The model

Generalising from the survey, we can put forward a model for architectural design, which we call the ordered preference model. It is based on the following assumptions:

1. The attributes of buildings can be ranked from 'basic' to 'complex' attributes.
2. The preferences of laymen ('non-connoisseurs') are dominated by the basic attributes, using simple decision rules; they are indifferent to complex attributes.
3. The preferences of architects ('connoisseurs') are dominated by the complex attributes; they recognize but attach little weight to basic attributes.

The ordered preference model proposes that designs should be developed in which the values of the basic attributes correspond to the preferences of laymen, and the values of the complex attributes correspond to the preferences of architects.

Applying the model

To apply the ordered preference model, the basic preferences of users or clients must be identified in the briefing or pre-design stage of a project, before architectural designs are produced. It is inefficient to produce designs and have them rejected when presented to clients or users, or to make modifications at a late stage.

For a speculative development, user preferences have to be derived from a well-matched surrogate group; this paper shows that relatively simple surveys can provide the required information. In the case of a commissioned building with a known client or user group, the difficulty of identifying users disappears, but not the need for investigation of their preferences. In some cases a sophisticated client might have preferences for complex attributes, and here the independence of architects' and users' preferences will not apply. To ensure client satisfaction, with user values reflected in the design, there should be shared values regarding complex attributes between the client and architect.

In effect, the ordered preference model proposes that the architect should follow user or client preferences to the level of competence of the user or client group. In many situations the level of competence is self-evident from the users' or clients' expressed views: they are unlikely to express views where they have none. The architect assumes responsibility for the aspects of design where users do not have clear preferences, normally the complex attributes. For a commissioned building, the architect can provide information about alternatives to the client's or users' expressed views, which may modify preferences; but this is not possible for speculative developments.

Architectural competitions

Architectural competitions were the focus of Nasar's analysis of the conflict between architects' and lay values (1999). In architectural competitions, completed designs are assessed, so there is no opportunity to take account of feedback in design development. The competing designs are produced by architects whose main concern is with complex attributes – the more prestigious the competition and architects, the more strongly this applies. If the competition entries are judged by laymen, considerable weight is likely to be attached to basic attributes that are regarded as marginal by the competitors. If judged by architects on the basis of complex attributes, the results are likely to be baffling to laymen. Both outcomes are unsatisfactory.

It is desirable that the preferences of the user or client group should be specified in the competition's design brief. This would normally leave scope for architects to focus on other, more complex attributes. However, it makes sense for the competitors' designs to be judged by architects who can identify and respond to the

complex attributes that differentiate the designs. Here, as in many other situations, the brief is crucially important for the success of a design enterprise.

Acceptability to architects

Architects have anxiety about any situation where complex attributes might be devalued. This leads to resentment of any restriction on their control over architectural design. For example, Bennetts, an eminent British architect, argued that ‘... a system of lay-evaluation and consultation ... would inevitably favour the large and grey over the dynamic and colourful’ (1999, reviewing Nasar, 1999). There is therefore a risk that the ordered preference model would be resented by architects. However, the model is precisely intended to give architects control over the complex attributes that promote high architectural quality, whilst respecting user preferences for basic attributes that promote user satisfaction.

In everyday practice, most architects willingly develop designs that match their clients’ expectations, using their professional expertise to do so in a skilful way. Those architects who are unwilling to accept a brief in which basic attributes (or, in the case of a sophisticated client, complex attributes) are specified, believing that total control is necessary to achieve their architectural vision, should only be appointed by clients or users who share their vision. Few architects would intentionally impose their values on an unsympathetic audience: most architects want their work to be liked and the ordered preference model should contribute to the achievement of this desirable outcome.

CONCLUSIONS AND FURTHER RESEARCH

The findings of the survey of visual preferences for suburban office buildings are striking, and are consistent with the proposed ordered preference model, but further surveys would have to be carried out to establish whether the findings are typical, and therefore whether the ordered preference model would have general applicability.

In the form of conjoint analysis that was used, it is necessary to specify the attributes of interest before a survey takes place: the omission of important attributes at this stage would greatly weaken the survey findings. In the case of the survey of suburban office buildings, it has been suggested that an attribute representing external landscape might have been important.

Even if the ordered preference model were validated by other survey evidence, it is not certain that it would

easily win acceptance in practice. Deep-seated prejudices within the architectural profession would have to be overcome.

A less ambitious but perhaps more widely applicable lesson from the survey is that the preferences of users can be established by relatively simple survey techniques, generating valuable information for architects who wish to provide designs that satisfy end-users (as proposed in Fawcett, 1998). The survey technique could be valuable in the pre-design stage of many projects. In the absence of such information, designers are likely to follow their own preferences, leading to a risk of conflict with user values.

Finally, an inspirational precedent for the ordered preference model. The great English classical architect Inigo Jones (1573-1652) was commissioned to design a new church in Covent Garden, London, in 1630. The client, the Earl of Bedford, said he wanted little more than a barn. Jones replied, 'You shall have the handsomest barn in England' (Summerson, 1966). Inigo Jones' outstanding design, shown in Figure 9, performed equally well with respect to both basic and complex attributes.



Figure 9: St Paul's Church, Covent Garden, London – 'the handsomest barn in England'.

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