Communicating urban development schemes through architectural representations

An investigation of perceptual responses

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This paper presents the findings of a research project that investigates peoples' perceptual responses to different forms of architectural representations as a means of communicating the proposed urban development schemes. By comparing traditional and computer-generated representations, the study aimed to establish whether some methods of architectural representation are perceived as more credible than others. Three concepts were used as the factors operating in credibility assessments, namely: accuracy, realism and abstraction. Analysis revealed significant differences in the assessed perceptions of representations' accuracy and realism as contrasted with the four different forms of representation. The results relating to the concept of abstraction were chaotic and show highly polarized reactions to abstract representations that collapses the semantic space about a dominant single dimension.

Keywords: *Architectural representations; mediated communication; perceived credibility; architects; professionals*

Introduction

At the beginning of the 21st century computer generated representations of urban developments became commonplace in communication of architectural design ideas. One factor that is appealed to in extolling the increasing use of computer representations is that such visualisations are widely believed to communicate architectural forms 'better' than traditional forms of representation (Pietsch, 2001). Yet, while their importance perhaps equals that of the introduction of paper (Ackerman, 2002) there is also a debate that indicates that computer representations can cause misinterpretations and disagreement about their credibility (Day, 2002).

Concerns over and debate about the credibility of architectural representations has had a long history with conflicting attitudes taken to representations. This is partly because credibility is a complex concept and a perceived quality that constitutes multiple aspects (Buller and Burgoon, 1996). As such, credibility does not reside in a representation. In addition, perceiving and understanding design through representations is a subjective process, which evokes cognitive and affective responses (Arnheim, 1974). Thus, in discussing the credibility of architectural

representations one is always discussing the perception of a particular form of representation.

The primary aim of this study was to investigate people's perceptual responses to the different forms of architectural representations of the proposed urban developments. By comparing traditional and computer generated representations the study aimed to establish whether some methods of architectural representation are regarded as more credible in communicating design than others and in what way and why. This approach is designed to inform about the impact of computer technologies on professional relationships across interest groups in architecture, planning and other built environment disciplines. This paper reports on the first stage of the study presents the results of the semantic analysis of visual representations.

Analytical framework for investigation

To apply the semantic differential technique effectively, it was necessary to establish the analytical framework and determine the major aspects underlying the concept of the perceived credibility. But, the body of literature concerned with the conceptualization of analytical framework for the assessment of architectural representations is limited (Appleyard, 1977; Radford et al. 1997; Pietsch, 2001; Sheppard, 2001) and there is an evident absence of the agreed criteria for the appraisal of representations (Pietsch, 2001, p533). However, from the existing research three key concepts emerged as relevant to this study, namely *accuracy, abstraction and realism*. *Accuracy* relates to the exactness of the method of representation, i.e. construction of perspective or chosen viewpoints. *Abstraction* is understood as a

low level of detail and refers to the overall amount of information provided. The term *realism* refers to the photorealistic style of representations. According to the research (Radford et al.1997) the interrelation of these concepts has crucial influence on visually mediated communication of architectural schemes.

Research design and method

The investigation utilized four static forms of representation: two traditional, hand made representations- freehand watercolour perspective and black and white perspective drawing (with a limited use of the primary colours) and two computer visualisations-CGI generated images and photomontage (Figure1). Printed, static format of all representations is chosen in order to avoid extraneous influences (such as computer screen factors and similar). The study was based on the four proposals for significant commercial urban developments with similar contextual attributes based in the UK.

Participants in this study were divided into three groups: a group of architects with a maximum of five years and a group of architects with a minimum of fifteen years of work experience. The third group consisted of the professionals from various fields of the built environment, i.e. planners, surveyors, engineers, planning inspectors and similar.

Method: Semantic analysis
The association and interrelation of the concepts of *accuracy, abstraction and realism* to the method and style of representation has been examined using the semantic differential scale. 18 bipolar Likert-like semantic differential questions have been answered by 22 respondents for each of four different architec-

Figure 1
Four case based analyses: architectural representations of significant commercial urban developments
Rep.1 Princesshay
Rep.2 Broadmead
Rep.3 Paradise St.
Rep. 4 New Swindon

tural representations. Responses to each question are obtained on a seven-point scale Adjective pairs were selected in a several ways: from thesaurus, from the literature in this field and from the spontaneous comments of the participants in the pilot testing.

The bipolar pairs used were: for *accuracy*: (vague-precise), (incorrect-correct), (dishonest-honest), (deceptive-truthful), (ambiguous-clear), (arbitrary-well considered); for *realism*: (imitation-authentic), (looking artificial-looking natural), (illusion-lifelike), (not convincing-plausible), (dull-vivid), (intuitive-rational); for *abstraction*: (symbolic-descriptive), (abbreviated-extended), (simple-ornate), (expanded-dense), (loose-compact), (ordered-chaotic). The questionnaire based semantic analysis asked the participants to rate their evaluative responses to representations in a similar manner as conducted by Hershberger (1988) for architecture. The data analyses followed procedures described by Osgood et al (1957) and Palmer (2000).

Results

The analysis is conducted using one-way and two-way mixed ANOVA to indicate statistical interactions between group and representation on accuracy, realism and abstraction scores. A post hoc application of Tukey's multiple comparison (HSD) test has been applied to locate the significant differences between groups in each representation.

As seen in Table 1 the ANOVA revealed significant differences between perceptions by different groups. A post hoc application of Tukey's multiple

comparison test procedure indicates that architects with 15 years of more experience gave a significantly higher mean accuracy (4.39) and realism (3.81) rating on Representation 4 than professionals (2.33) and 2.08). Application of Pearson's test of linear correlation showed that realism scores in all four representations are significantly correlated with accuracy scores in the same representations. The responses to the six semantic pairs relating to abstraction does not form a consistent set of information. Because of a low value of Cronbach's alpha responses on each of the pairs were analysed descriptively using simple cross-tabulations.

Discussion and conclusions

A potential limitation with this research was that technical drawings and written text that usually accompanies architectural design proposals were not used in this study. This, potentially, has limited the amount information professionals are accustomed to receive. Yet, it was important to consider images only as a visual means of mediating communication of design proposals.

The architects' and professionals' perceptual responses were analysed over all four forms of representation in relation to the three aspects relating to the concept of credibility. The findings show that perceptions of accuracy and realism among different groups vary significantly. Yet, they show a strong relationship between the high level of detail provided by 'realism' and trust that the information provided is accurate. While the patterns of ratings were similar
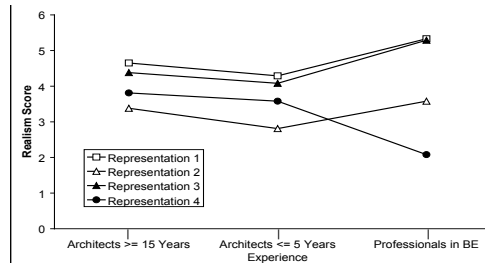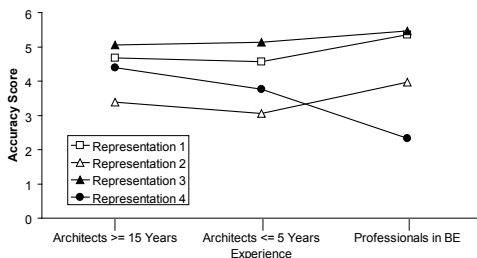

Table 1
The profile plots suggest different behavior between the groups that arises when architects and professionals in the built environment rate perceived accuracy and realism

for the two groups of architects, professionals' ratings show much lower degree of the perceived accuracy and realism of traditional forms of representation. However, all three groups regarded computer generated representations as more accurate and realistic than traditional forms of representations.

The analysis of the differences between the groups' responses to the method of representation have demonstrated a high level of inconsistency in preference judgments among architects and professionals that is customarily suggested in much of the literature on picture perception. These findings also comply with some recent studies examining the relationship between architects and other professionals (Wyatt, 2004). Finally, abstraction as a concept appears to be a complex and difficult to assess. The participants judgments show little structuring– as there was no frame of reference for the concept or a lack of understanding of the concept itself. This finding tends to substantiate the findings of the research by Tucker (1955) who studied the semantic factors structures apparent in the judgments of artists and non-artists.

The primary aim of this investigation, the perceived credibility of architectural representations based on the three concepts, have been elaborated, for the most part, through the substantive aspects of the investigation. However, to what extent each concept affects perception of credibility and how they interrelate remains to be answered in the next stage of this study. These questions will be further investigated through the focus group meetings and individual interviews.

Acknowledgement

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