

Architectural representation: the image and the sign

Gaia Leandri^{1,2}, Jackie Campbell³, Susana Iñarra Abad¹, Francisco Juan Vidal¹

¹Departamento de Expresión Gráfica Arquitectónica, Universitat Politècnica de València, Spain, ²Dipartimento di Neuroscienze, Riabilitazione, Oftalmologia, Genetica e Scienze Materno Infantili (DINOEMI), Università degli Studi di Genova, Italy, ³Faculty of Health, Education and Society, University of Northampton, Northampton, UK.

Abstract

The final aspect of architectural projects is nowadays illustrated by computer generated images of photographic quality (photorealistic renders), mostly replacing the old fashioned hand drawn images. Several authors feel that their realism may not convey the desired message to onlookers. We proposed a Web based questionnaire containing 3 tests to assess whether communication, recognisability and engagement were better conveyed by hand drawn images or photorealistic renders. 154 responders took the test, 74% of them were professionals in the architectural field and 26% general public. In both groups, the answers indicated that communication and recognizability were much better perceived in hand drawn images than in photorealistic renders. Engagement was aimed at assessing personal preference towards render or hand drawn images, with an even outcome. It is concluded that architect's idea and spirit are better conveyed by hand drawn images which are a sort of "sign". Such feature should be properly taken into account in academic curricula. Photorealistic renders should be used complementarily to show a virtual reality of the project's outcome.

Keywords: Image; Architecture; Render; Hand drawn; Communication; Recognisability.

1. Introduction

This paper focuses on the issue of images illustrating architectural projects. They are now almost exclusively digitally created, though handmade drawings are still in use. After a brief review of pros and cons of the two styles, the results of an original online survey about choices by architects and general public are reported, with potential consequences on educational methods.

1.1. Architectural imagery in the 21st century

Since the first introduction of Computer Aided Design (CAD) in mid 60s of the last century, its undeniable advantages have brought forward a growing enthusiasm to the point that nowadays no architect can present a project that has not been CAD processed. Evolution of software allows now accurate 3D photo simulations of new architectural projects so that virtual postcards, or “postcards from the future” can be produced to allure onlookers (Jacob 2017). Realism through digital images seems to be the ultimate goal of the presentation process. The old traditional hand drawn images, though still in some use, seem to be forgotten, particularly in the educational field. Working preferences for students are strongly biased towards an entirely computerized world (Şenyapılı and Basa 2006). Dichotomy between digital and hand drawn images has been the object of several studies inquiring whether digital images are perceived as a more comprehensible and effective tool of communication than the hand made representations (Bates-Brkljac 2009, 2011; Iñarra Abad, Juan Vidal, and Llinares Millan 2013). The results were partially dependent on the background of the audience, mainly whether they were architects or other professionals. Computer generated images were generally perceived as more accurate and realistic than traditional illustrations, a characteristic that mainly appraised the non architects (Bates-Brkljac 2009). All in all, architects prefer artistic images and pay attention mainly to attributes as innovation and functionality, whereas non-architects prefer photoidealistic images and pay attention mainly to the wellbeing feeling conveyed by the digital image (Bates-Brkljac 2011). One more important issue is represented by meeting the consumer’s preferences and needs, as already occurs in the field of industrial design (Iñarra Abad et al. 2013; Llinares Millan and Iñarra Abad 2014).

1.2. A tale of two views: visual information and architectural representation

Imagery representing architecture may be split in two categories. On one side there is the “*visual information*” which may be defined as “*documentary act deprived of any inherent significance*” (Maller 1991); in this category may fall the technical working drawings, the survey drawings and the photographic images. Photorealistic renders also fall in this category. On the other side lies the “*architectural representation*”, which is the visual synthesis that embraces the critical thinking of the architect (Maller 1991). We may then

assimilate the “*architectural representation*” to an imagery, possibly handcrafted, that enables the communication process between architects and the general public, and conveys the creative spirit of the architect or, in a way, his signature. Such dichotomy could be revealed by the onlooker reactions to our tests. Whilst previous surveys were meant to assess some qualitative and semi-quantitative features of image perceptions by recording choice of adjectives and grading of preference, our questionnaire was mainly addressed at identification of predetermined characteristics of images, thus providing comparatively objective data even on the assessment of authorship. The main objective of the survey was to explore if digital photo quality images could convey the designer message and personality better or worse than hand drawn images.

2. Materials and methods

2.1. The questionnaire

A simple questionnaire was constructed and named “*Architectural Drawing 3.0*”. It was an online web questionnaire created on Typeform, an interactive platform which allows to combine images and text. It was run on Instagram and LinkedIn throughout a duration of two months, during which random people were targeted, with no limitation in number. It was conceived for a wide range of different users that could represent the heterogeneous public usually reached by architectural imagery. The questionnaire had been designed according to recent overviews (Mittal and Mittal 2011); the questions were of the following typologies:

- 1- Text questions which assessed the user background, interests or attitudes towards drawing tools and renders;
- 2- Multimedia test which provided textual and multimedia contents (images) with a true or false type of answer;
- 3- Multimedia test with a single preference type of answer, for which the general impression of the user was the parameter we were seeking.

The two multimedia tests were conventional one-stem multiple-choice type with correct answer scored 1 and wrong answer scored 0 (Ng and Chan 2009). The position of correct answer in each question was randomized by the Typeform platform. The whole questionnaire was divided into six sections.

2.1.1. First section on status information

The first section just asked questions #1) age, #2) gender and #3) occupation. All questions were of the close ended type, so the answers could be precisely categorised. Age groups were a) 19 and under, b) 20-29 c) 30-39, d) 40-49, e) 50-59, f) 60 and over; gender a) male, b) female; occupation a) architect, b) student, c) civil/construction engineer, d) architectural

assistant, e) architectural illustrator, f) 3D artist, g) academic (in the architectural field), h) interior/product designer, i) developer, j) real estate agent, k) other.

2.1.2. Second section on “Communication”

The second section, containing questions #4, #5, #6, #7, was named “*Communication*”, meaning that it was aimed at assessing how much the visual message (vignette) would communicate to the observer its meaning as novelty and originality of a newly designed project, to be recognized among others already existent. The comparison was between hand drawn illustrations versus photorealistic renders: which of the two would best communicate to the onlooker. Question #4 showed a vignette with a hand drawn image which illustrated a new project among other already existing city buildings. Four vignettes with already marked different buildings were offered as possible solutions. Only one marked the correct new project. Question #5 showed a similar hand drawn project, but with only two vignettes as a choice. Question #6 was analogous to #4 but the illustrations were photorealistic renders. Question #7 was analogous to #5 but now photorealistic renders showed the project.

2.1.3. Third section on “Recognisability”

The goal was to assess how much the “*sign*” of the project’s author could be recognised in hand drawn illustrations compared to photorealistic renders. The test takers were first shown 3 hand drawn images authored by as many famous architectural companies, and 3 photorealistic renders from the same, in order to familiarise themselves with each company style. In question #8 a set of 3 new images by the same companies was shown, unlabelled: the test takers had to pick up the correct combination of authorship just recognizing the style of the illustrations among 6 possibilities. Question #9 was analogous to #8, but this time the images were photorealistic renders.

2.1.4. Fourth section on “Engagement”

These two questions were just about personal preference between hand drawn or photographic render representation of interior design. Question #10 showed two similar living room projects, one as a hand drawn illustration and another as photorealistic render. The test taker had to choose which one preferred. Question #11 was analogous, but showed a bedroom project.

2.1.5. Fifth section on preferences in the use of images by architects

This section aimed at collecting data about professional use of images according to preferences of architects, and their desiderata about freehand digital drawing.

2.1.6. Sixth section on contacts and comments

This was mainly aimed at collecting comments on architectural imagery in general and suggestions for future questionnaires.

2.2. Data handling and statistical analysis

The web platform provided detailed data on a spreadsheet and some preliminary descriptive statistics and proportions with correct answers per each group of test takers. Differences in the proportions of right and wrong answers were tested by using the chi-squared (χ^2) test. Fishers exact test was used if any of the cells had expected counts less than 5. All tests were conducted with $\alpha=0.05$ (5% level) and a null hypothesis of no difference between the two groups (reject null hypothesis/accept evidence of a difference if $p<0.05$ i.e. chance of wrongly saying there is no difference (false negative) was less than 5%).

3. Results

3.1. Grouping responders

There were 154 full responders. 75% of them were in the age range of 20-39 and 9% 19 or under. So 84% could be defined young adults; 58% were males and 42% females. Architects represented 28%, students in the architectural field were 21%, civil or construction engineer 6%, architectural assistant 4%, architectural illustrator 3%, 3D artist 2%, academic 2%, interior designer 2%, developer 1%. The “*other*” category scored 26%. So we decided to group all “*professionals*” altogether, scoring a total of 74% of test takers, to be compared to the “*others*” group.

3.2. Communication section: questions #4, #5, #6, #7

Responses to Question #4 (locate hand drawn project image in urban environment, 4 choices) yielded 89.6% of correct answers by “*professionals*” and 87.2% by “*others*”. There was no significant difference between the two groups. A similar result turned out for question #5, where correct answers were 93% in the case of “*professionals*” and 82% for “*others*”. No significant difference between groups. Questions #6 and #7 concerned photorealistic renders, again there was no significant difference between “*professionals*” and “*others*” in each of the two questions: professionals were 23.5% correct in question #6 and 32% in question #7, while the “*others*” proportions for correct answers were 12.8% (question #6) and 47% (question #7). When comparing the scores of the same group in recognising the project in hand drawn images (questions #4 and #5) and in photorealistic renders (questions #6 and #7), it came out a difference of 66.10% for “*professionals*” and 74.40% for “*others*”, with a very high significance level ($p<0.0001$) in both cases.

3.3. Recognisability section: Questions #8 and #9

The images were hand drawn and the test takers, after having familiarised with each company's style, had to spot the answer with the correct labelling combination among 6 possible choices. The 3 styles were correctly recognised by 70,4% of "professionals" and 56.4% of "others". The difference between the two groups was not significant. For question #9, the same procedure as question #8 was applied, but the images were photorealistic renders. The "professionals" scored 20.9% of correct answers, whilst the "others" scored 23.1%. No significant difference between groups was demonstrated. Comparing the same group responding to the two questions, it came out that the "professionals" showed a 49.50% score difference between the correct answers to question #8 and question #9, which was highly significant ($p < 0.0001$). The "others" also showed a significant difference of 23.1% ($p = 0.0028$) between the two questions. So, both "professionals" and "others" scored more correctly in the case of hand drawn images than photorealistic renders.

3.4. Engagement section

Questions in this section simply asked the observer for a personal preference between hand drawn illustration and photorealistic render. The two options were presented in a different order for each participant, randomly organized by the Typeform platform. The perceptive "engagement" was sought, with an answer presumably based upon the general impression and instinctive reaction by the onlooker. We did not perform statistics to compare these results as the choice was strictly based not on performance but on personal taste, and could be dependent on the quality of image. Two images, one hand drawn and one a photorealistic render of two very similar living rooms and two bedrooms were presented. The "professionals" group expressed a slight preference for the hand drawn living room (56%) against the photorealistic render (44%), but showed a reversed preference for the photorealistic bedroom (56%) against the hand drawn version (44%). The "others" group expressed an almost perfectly even opinion, with 51% preference on the hand drawn living room against the photorealistic render (49%), with identical proportion as to the bedroom. We could approximate these results to a 50/50 preference for both groups and for both representations.

4. Discussion and conclusions

4.1 The test takers

The participants to the questionnaire responded to publicisation on some of the Web channels; their recruitment could of course be biased by the chosen channels, but we deem that they represented an audience generally interested in architecture and images. The "other" group can be assimilated to the general public, without specific education on

architecture or image crafting and processing; they were expected to respond more instinctively to the tests, without looking for technical assessments. The “professionals”, many of them architects, would look at the images from a more educated point of view, and, in theory, spotting better than the “others” the correct answers to the proposed questions. We shall see that, eventually, the educated “professionals” and the more naïve “others” behaved very similarly.

4.2 The tests

The two main tests on communication and recognisability were addressed at assessing the ability of images to convey the correct message. We may consider them as “objective” tests, in the sense that they require answers independent from the opinion of the onlooker. They are contraposed to “subjective” tests, like our “engagement” section or other tests proposed in the literature, where the answers are dependent on the opinion of the onlooker (see figure 1).

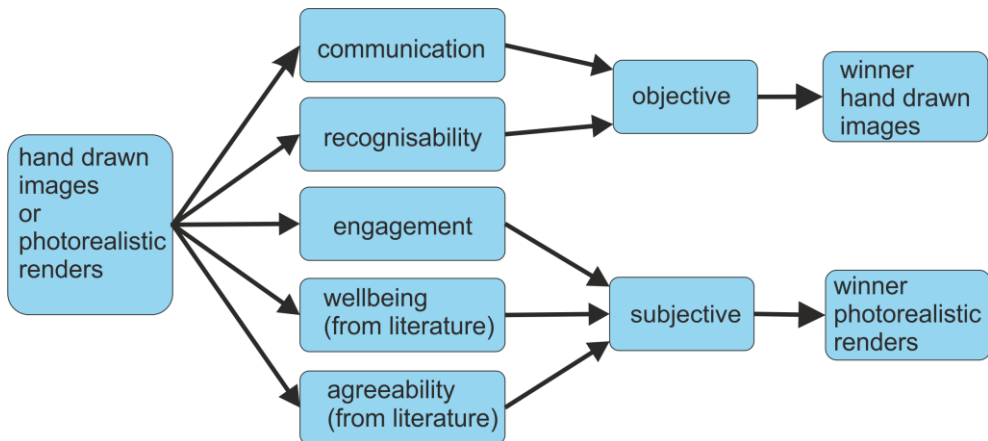


Fig. 1. The flowchart summarises the dichotomy between objective tests, like those on communication and recognizability, and subjective tests on architectural imagery. Hand drawn images score better in the former, whilst photorealistic renders achieve best results in subjectively based judgments. Data on wellbeing and agreeability have been inferred by published literature, as these qualities had not been explored in our tests.

All professionals and students in the architectural field do not only design buildings, they also need to sell their projects to clients, juries, public commissioners. The importance of images is paramount to such an end. When the observer looks at an image portraying more than one building, for example a bird’s eye view or simply a view of the neighbourhood contextualizing the proposed design, he/she may experience difficulty in spotting the project in a photorealistic render. In some cases the aim of the image may be how the still non existent building will perfectly blend with the surroundings, but at the same time, such type of imagery limits the very scope of the architectural representation, which is to tackle the

reaction of the observer to the project, to introduce critical concepts, to communicate the architect's emotions to the customer (Maller 1991). Recognisability is obviously linked with the style in the design and presentation of the project. It is the “*sign*” of the maker. On day, G.L. was at her desk in her office, when her boss came in and asked: “*I need you to create a new style for the Company. Like Renzo Piano drawings, you know. Something recognizable*”. Her thought went straight to the thin lines and the blue/yellow washed colours that are Piano's visual signature. As in every other industry, architecture is nothing less than a product behind which there is the name of the designer. Whether the object comes to life or remains unbuilt, whether it gets published on a magazine or presented at a competition, it is important for the architect, the “*seller*” of the idea, to leave a personal trademark.

4.3 The answers

It may be surprising to find that architects and the general public had very similar reactions to the images presented. In both cases, the hand drawn images conveyed more correctly the information that we thought should be transmitted to the onlooker; a sure token of the greater efficacy by the hand drawn images to express the ideas and personality of the author. The photorealistic render, though needed in some circumstances in order to provide detailed information about the future results, may not have such important qualities. It is remarkable that whereas the objective qualities of communication and recognisability were assessed as belonging more to hand drawn images than to photorealistic renders, the subjective opinion on aesthetics a propos of the living room and bedroom was a perfectly balanced response by “professionals” and “others”.

4.4 Impact on architectural education

The dichotomy between the “*objective*” and the “*subjective*” test suggests that the perception mechanisms of a pleasurable image are disjointed from the meaning that the image should convey (see figure 1). Both factors, on one side the personal feeling elicited by the image and arising inside the observer, and on the other the “*sign*” and “*communication*” of the architect (a more objective quality of the image) should be given attention. In architectural education there is now a preponderance of computerised activity, which may lead towards easier work and sometimes to onlooker's preference (Iñarra Abad et al. 2013; Llinares Millan and Iñarra Abad 2014), but does not accomplish the other fundamental scope of the image, to show the critical idea of the architect (Maller 1991). So, the academic world should emphasise the importance of both styles of images pursuing each one a different but complementary aim.

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