

Facade Colours not just a Matter of Personal Taste

– a psychological account of preferences for exterior building colours

Jan Janssens

The psychological importance of colours to humans has been the topic of scientific studies for over a century. Recent research has shown that environmental colours may increase or reduce brain activation and contribute to feelings of pleasantness, variation, spaciousness, social rank and originality in architectural spaces. Colours can also attain symbolic values and hereby increase the built environment's identity or cultural character. In a study, presented here and conducted by the author together with Rikard Küller at the Environmental Psychology Unit in Lund, a number of questions about urban colouration were investigated (Janssens & Küller, 1997). What colours are perceived as adequate for different kinds of buildings? Are there any general rules for this? Are there differences in colour preferences between different subject groups?

In a previous survey it was noticed that these questions frequently were asked by architects and that scientific information in these subjects was generally insufficient (Janssens, 1995; Janssens & Mikellides, 1998). As a matter of fact, many practitioners complained about

the lack of applicable knowledge about the psychological and perceptual effects of environmental colours. Besides the apparent gap of information exchange between academics and practitioners, most of the psychological facts about colour were considered to be rather abstract in nature. Much of the knowledge was out of contact with real life and therefore discarded by the colour designers and planners. Some architects even claimed it was not possible to take a scientific approach, because individual colour preferences were subjective and unique. Instead, they argued for the more intuitive or artistic approach, where colour design is founded on previous experience, professional touch and common sense.

The general public's discomfort with environmental colourations obviously corresponds to a decrease in knowledge about colours during the last decades. Colours are no longer inseparably connected with specific building materials, processes or styles. The constant urge for new architectural expressions demands the use of new forms and materials, sometimes provoking a less conscious colour use. On the whole,

the appearance of our urban spaces is determined not by devoted architects and skilful planners, but by ignorant decision makers and entrepreneurs.

Psychological studies of colour may be of interest to environmental planners for a number of reasons. One of the more interesting aspects of colours is their perceptual properties sometimes described as aesthetic qualities, which are closely related to people's preferences. Theories about colour preferences are numerous, from the simple assumption that some colours always are more preferred than others, to complicated models about styles, contexts and cultural determinators. The main purpose of the study reported below was to test three well defined hypotheses, based on different theories about colour preferences.

Colour preference theories

A common assumption is that our liking or disliking of colours is merely "a matter of personal taste" and that each individual would have his or her own and unique colour preference pattern. An extension of this assumption could be that a person's subjective liking of specific colours would influence his preferences for colours on all kinds of artefacts, such as clothes, cars and interiors. Even if everyday experience tells us that this is not so, a vast amount of scientific effort has been invested in trying to prove the existence of more general colour preference rules.

Our first hypothesis therefore stated that colours in the exterior environment are preferred in the same order as colour samples. By summarising the results of a large number of studies, Hans Eysenck (1941) found the colour blue to be the most preferred, followed by red, green, purple, orange and yellow. These results, however, were often founded on judgements of rather unspecified colour samples. More precise evaluations were reported by Lars Sivik (1974) by means of so called isosemantic mappings according to the NCS (Natural Colour System), thereby facilitating a more accurate preference ranking of different colour hues. It was thus hypothesised that the results from both Eysenck and Sivik would be good predictors for the appreciation of specific colours even on buildings.

Our second hypothesis was based on Daniel

Berlyne's investigations of abstract stimuli and art objects, defining aesthetic evaluations as basically determined by the arousal value of the object or stimulus. Berlyne (1971) described this process as a curvilinear pattern, involving an increasing positive evaluation when arousal increases, up to a certain optimal level. After that, additional arousal would lead to a decrease in evaluation and finally to a strong negative evaluation (Figure 1, page 34). Thus, this hypothesis proposes that the preference for a colour is determined by its arousal value.

Based on Allan Whitfield's and Philip Slatter's work (1978, 1979), our third hypothesis predicts that colour preferences are determined by people's expectations and previous experiences. Each artefact is judged according to its typicality, that is for buildings and furniture their style and function. This assumption lends support from a study by Masao Inui (1969), who found that specific room functions were emotionally connected with choices of specific room colours. Also geographical, cultural and historical linkages may be substantial in the evaluation of environmental colours. Since certain colours may be traditionally and/or regionally attributed to certain building types, this ought to be of importance in studies of architectural colour perception.

The relation between some of these singular explanatory assumptions has been the object of several studies lately, resulting in new and interesting approaches to aesthetic behaviour. For instance, Amos Tversky (1977) claims that both the arousing and prototypical potential are determinants of the affect for an object. He describes this quality as feature salience, comprising the two components; intensity (arousal) and diagnosticity (prototypicality). Other studies relate preference to specific subject attributes like gender, age and education. The present author found that architects as a group favour building exteriors with higher unity and coherence, whereas laymen prefer facades with higher complexity and variation (Janssens, 1984). It is worth noticing that the three hypotheses of our study represent different standpoints in the nature – nurture continuum. The second hypothesis takes its departure in our basic biological characteristics and

the third one in our refined capacities as social and cultural beings, whereas the first one includes both the subjective and general human aspects.

Experiments

The study started as a field survey in Malmö, where twelve urban environments of different age, scale and function were selected and assessed. Each environment was evaluated from a given spot in various respects, amongst others regarding colour preferences, arousal and prototypicality characteristics. Similar evaluations were made by different groups of subjects, both experts and laymen, both local inhabitants and passing people under different weather and seasonal conditions. In this way it was hoped that differences in experience would be elucidated. This field survey then formed the basis for two simulation studies intended to test the above hypotheses. Pictures had been taken of each environment and these pictures became the basis for the colour simulations. In the first experiment, slides of the urban environments were evaluated by groups of subjects and in the second one, judgements were made individually directly on a computer screen.

In order to test the hypotheses mentioned above, three consecutive experiments were carried out. For each hypothesis a specific test had been designed with that specific problem in mind. Also the assessment techniques had been adapted to each problem. A number of likely colour schemes had been applied on the different buildings. In two of the three experiments the same pictures were used. These represented the urban environments from the field study, with the focus on one centrally located building surrounded by other buildings. In the third experiment concerning prototypicality, only a black and white cut of each central building was presented together with various colour samples.

In each of the urban environments the building in the centre was coloured in nine different colours. The colour rendering was made with digital picture processing and then transferred to a normal colour slide film. In the colour manipulated facade, all details, as well as the other buildings and the fore- and backgrounds, were retained as in the original picture. The experi-

mental colours were chosen to represent four colour hues, each in one less and one more saturated rendering. The white colour was also included (Figure 2, page 34). It should be noted that the aim of the present study was to investigate the validity of the three colour preference theories and their possible interrelations, not to examine the particular colours.

The first experiment aimed at assessing the preferences for colours on specific buildings. These ratings were made under two conditions, one directed at the central building and one at the entire street environment. Under the first condition, the subjects had to express their likings for each colouration on a four point scale, ranging from "dislike very much" to "like very much". Under the second condition, the whole street environment was assessed by means of a seven step semantic rating scale ranging from "boring" to "pleasant". According to the first hypothesis these preferences were expected to correlate positively with the general colour preference rank order, as established by Eysenck or Sivik or, at least, by the subjects themselves.

In order to test the second hypothesis an experiment was designed to assess the perceived arousal value of the coloured exteriors in terms of how well they fitted into the environment. This was done by rating each building's relation to its surrounding on a four point scale, ranging from "anonymous/insignificant" to "conspicuous/stirs attention". According to Berlyne, the relationship of these assessments to the evaluative measures were expected to be curvilinear (Figure 1, page 34). A verification of the third hypothesis required a fit between the preference for exterior colours and the appropriateness of the colour schemes for a given type of building. For this purpose, each building was presented isolated in black and white together with samples of the nine colours. The subjects were asked to rank these samples according their appropriateness to each building type. All together more than 200 subjects were taking part in the study and assessed the simulated environments. In addition to the usual personal background questions, all subjects were also asked to rank the colours used on the central facades, according their subjective preferences for them, when presented as isolated colour samples.

Results

On the whole, our findings clearly showed the existence of a strong influence of exterior colours on the overall perception of the urban environment. It was also obvious that the simulation technique developed and used within the research project was superior to the presentation with overlays and filters used in earlier colour studies. The technique may therefore, within certain limits, be used as an efficient and reliable tool for colour planning of new and old environments.

The main hypotheses were tested by means of a statistical technique, where all assessments were incorporated in multiple regression analyses. The analyses revealed similar patterns, irrespective of whether the dependent variable was the evaluation of the whole street or of the central building. In both cases the strongest relationship was between the evaluation on one hand and the arousing property of the building colour on the other. When the whole street environment was assessed, a small part of the evaluation could be ascribed to the buildings' prototypicality and an equally small portion to the subjects' individual colour preferences. When each particular building was assessed, the prototypicality was the second most important whereas the subjective colour preferences were almost negligible. The results also indicate some variation in the importance of the main explanatory factors between different types of urban scenes, which implies that an individual approach is demanded for each particular colour project.

Thus the existence of a general order of colour preferences as suggested by Eysenck's and Sivik's results, could be rejected. The assumption that the appreciation of a particular colour is valid also when this colour is applied on a building obviously is not true. Even if a colour's inherent beauty may not be trivial, in this context it is clearly of less importance. Also the characteristics of the spectator, such as age and gender, and external factors such as weather and lighting conditions, had only minor influences on the assessments. Differences between experts and laymen however need to be examined more in detail.

Conclusions

Our results emphasise the importance of the relation between the coloured facade and its surroundings, rather than of the colour itself. The foremost finding was the existence of a curvilinear relationship between arousal and evaluation in accordance with Berlyne's theory. A colour has to fit in to its surrounding, not disappearing all together and becoming indifferent, nor becoming too conspicuous, which might make it appear badly chosen.

Almost equally strong support was obtained for the importance of prototypicality as proposed by Whitfield and Slatter. When it comes to preferences for facade colours, it appears to be more a question of which colours do fit with in than which colours are beautiful. In fact, the ranking of the colours' fitness was based more on conventions than on aesthetic considerations.

Thus, the results of the study point to a dual explanation for facade colour preferences, as suggested by Tversky (1977). Both the specific facade colour's arousal potential and its prototypical quality are important for the appreciation. We also found indications of a variation in the relative importance of these two factors. For instance, in old environments with small scale dwellings, the prototypicality became very important. In modern, large scale industrial settings, the arousing properties came more to the front. In the first case we are obviously more bound by our previous experiences and expectations, whereas in the latter, we may not yet have developed any specific expectancies but are inclined to rely more on basic perceptual rules.

The results support the conclusion that the evaluation of environmental colours might be both biologically and culturally determined. The urban scene ought to please and satisfy the needs of most people. Since our results are based on the experiences of the general public, they might help professional planners to avoid colour solutions that are either too insignificant or too "outstanding", or are completely in conflict with the expectations of the general public. (The research project was supported by the Swedish Council for Building Research and the Colour Science Foundation.)

Jan Janssens, associate professor,
Environmental psychology, School of architecture
Lund institute of Technology Jan.Janssens@mpe.lth.se

References

- Berlyne, D.E., 1971. *Aesthetics and Psychobiology*. Appleton-Century-Crofts, New York.
- Eysenck, H.J., 1941. "A critical and experimental study of color preferences" in *American Journal of Psychology*, 54, 385–391.
- Inui, M., 1969. "Colour in the interior environment" in *Lighting Research and Technology*, 1, 86–94.
- Janssens, J., 1984. *Looking at buildings – Individual variations in the perception of building exteriors*. Lunds Tekniska Högskola, Lund.
- Janssens, J., 1995. "Färgforskning och miljögestaltning" in *Miljöpsykologiska Monografier*, Nr 11, Lunds Tekniska Högskola, Lund.
- Janssens, J. & Küller, R., 1997. "Färgsättningens betydelse för upplevelsen av stadsbilden" in *Miljöpsykologiska Monografier*, Nr 15, Lunds Tekniska Högskola, Lund.
- Janssens, J. & Mikellides, B., 1998. "Color research in architectural education – A cross-cultural explorative study" in *Color Research and Application*, 23, 328–334.
- Sivik, L., 1974. "Color meaning and perceptual color dimensions: A study of color samples" in *Göteborg Psychological Reports*, Volume 4, Nr 1, Göteborg.
- Tversky, A., 1977. "Features of similarity" in *Psychological Review*, 84, 327–350.
- Whitfield, T.W.A. & Slatter, P.E., 1978. "The evaluation of architectural interior colour as a function of style of furnishings: Categorization effects" in *Scandinavian Journal of Psychology*, 19, 251–255.
- Whitfield, T.W.A. & Slatter, P.E., 1979. "The effects of categorization and prototypicality on aesthetic choice in a furniture selection task" in *British Journal of Psychology*, 70, 65–76.