

Colour Studies in the Urban Environment: Reviews, Summaries and Challenges

Beichen Yu*

Architecture & Landscape Architecture, The University of Edinburgh, Edinburgh, UNITED KINGDOM

*s1319443@sms.ed.ac.uk

ABSTRACT

The colours from architectures are important components of colour palettes in an urban environment. However, it is not unobvious to notice that in almost every systematic study about environmental chromatic issues, the façades of architecture have been the major objects and sometimes the only resource of colours for discussions. In many studies that focus on colours in the urban environment, the concept of environmental colours has been displaced by colours from buildings by default.

By examining systematic studies that have distinct contributions to colour research in environments, this paper aims to explain why most studies merely focus on architectural colours and indicate other vital elements which have been ignored. This paper argues that architecture-orientated perspective of colour might not be able to allow a full exploration of the relationships between colour and urban environments. There are other components of colour in urban should be collected and analysed, which can provide new angles to understand the relationship between colour and the urban environment. Colour research in urban should not merely discuss about how to create harmony by colour planning of architectures, but also consider building further connections between colour and urban issues on the basis of colour's roles and functions.

KEYWORDS: colour studies, urban environment, environmental colour

INTRODUCTION

When talking about colour in urban environments, most people tend to refer to the colours from building façades or think about graffiti on the walls. Those associations of colour in urban context seem not to be exclusive for users, but also for most experts whose research and works concern the decisions of colour in city. In many studies that discuss colour in urban environments, colours from building façades are the major topic and sometimes the only resource of colours that is under consideration. Based on the architectural perspective of colour, studies approach chromatic issues in urban mostly from urban colour planning and colour policies for architectures. Despite of rich literatures and studies on colour and environments, the interactions between colour and urban spaces still remain vague apart from the knowledge of colour on architectural façades. By examining established studies on colour in man-made environments, this paper attempts to respond the following questions on colour research in urban:

1. Why most urban colour studies only focus on chromatic characters of architectures?
2. How the limited resources of colour and perspectives influence urban colour studies?
3. Why other colour components should be involved?
4. What are the potential connections between colour and urban issues?

STUDIES ON COLOUR AND MAN-MADE ENVIRONMENTS AND SUMMARIES

Environmental colour research as an important branch of colour study has not achieved enough attention until recent decades. Although colour has always been mentioned in architecture discussions, not many links have been built between colour and architectural environments before 20th century. However, with the development of colour science, colourists and designers started to recognise the roles of colour are more than just a way of decoration. Systematic studies that focus on colour in man-made environments have been developed since the second half of the last century. In 1982, a colour study group called 'Environmental Colour Design' was

established within the AIC as a platform for the rapid development of this branch (Schindler, 2004: 4). However, apart from the discussions of colour on architectures in cities, it is difficult to find further connections between colour and the urban environment, which is a complex and dynamic setting. This paper examines influential and systematic studies on colour in environments to understand the progress of environmental colour studies and how urban colour studies have been influenced and the potential research directions for colour in urban environments.

Representative researchers have been selected based on their systematic studies on colour in environments, which have been published as academic books in English language. Their works can be grouped into six major directions as showed in the following table. From Table 1, we can see diverse links between colour and environments have been built from the way we respond to environmental colour to colour application in environmental design. There are few key points that can be summarised from the established studies. Initially, environmental colour should not be considered just as a way of decoration. It can affect human physically and mentally, which can be used to satisfy specific requirements of a space. Secondly, the strong connections between the application of colour and culture, society, history and geographic settings have been acknowledged. As a final point, the context of using colour is becoming more specific during the progress of the research. The way we understand and apply environmental colour is not only supported and interpreted from heterogeneous responses to colour (e.g. Mahnke, 1996; Birren, 1978), but also the design intention and interactions of colour with other architectural features such as space, form and time (Fiona et al., 2015).

Table 1. Colour studies in environments

Research Focuses	Human Responses to Environmental Colour	Colour and spatial perception	Colour planning in Townscape
Content	Research on environmental colour's biological and psychological effects on human. Use colour to satisfy demands in architectural spaces	Understand how colour influences human perception on distance, location and other spatial relations.	Consider the town as an object for making colour decisions. Make colour planning of building façades for the entire area.
Representative Researchers	Faber Birren Byron Mikellides Gerhard Meerwein Frank Mahnke	Lois Swirnoff Antal Nemcsics	Werner Spillman

Geography of Colour in Different Regions	Relationships between Colour and Architectural Environments		Colour Decisions of Architecture
Study the relationships between colour from building façades and geographical settings. Find out how regional conditions such as light, climate, materials, culture and history influence architectural colour palettes. Connections between colour and regional identities.	Colour's effects, functions and applications on architectures	Colour's effects, functions and applications on man-made environments. Mainly discuss colour on buildings, but also involve colour on landscape.	How colour decisions of specific architectures have been made from the architects' perspective. Study the relationships between the context and architectural colour scheme.
Jean-Philippe Lenclos Lois Swirnoff	Antal Nemcsics Tom Porter	Michael Lancaster	Fiona McLachlan

Despite of the distinguished achievements of the current studies, this paper argues that there are obvious gaps in environmental colour studies. Only architectural colour has been collected and studied in most cases, while other resources of colour in environments such as vegetation, pavement and street furniture seem to be ignored. It is reasonable to exclude other colour sources if the research focuses on interior colour design or architecture itself. However, for studies that discuss about colour in cities or environmental design, they still merely concern colours from buildings and relationship between architectural colours within an area

(Swirnoff, 2003; Porter, 1982). The concept of environmental colour is ambiguous and sometimes has been replaced by architectural colour. This architecture-orientated perspective of colour has a great influence on urban colour studies and may response to some current limitations.

CHALLENGES OF COLOUR STUDIES IN URBAN ENVIRONMENTS

There are few discussions of colour can be found in urban literature. In the book, *Urbanisms of Color*, Dotherty (2010, 2) states that colour has always been neglected in urban design. From the colour study, the connections between colour and urban environments can simply be found in urban colour planning or policy on colour control in architecture. This paper argues that due to the influence from environmental colour study, the research directions of urban colour studies have been dominated by the architecture-orientated perspective, which means only architectural colour in urban has been considered important. There will be apparent limitations if we attempt to understand and apply colour in urban spaces through the architectural viewpoint only.

a. Visual Field and Colour Resources

Many studies regard façades of buildings as the major resources of colour in urban environments. However, it is worth noticing that dwellers of city view the urban spaces differently from the perspectives of architectural drawings. When making the decisions of colours, architects normally work on the elevations of the architecture's façades regardless its size and height. However, in reality, due to the habits of viewing and the street layouts, people normally will not confront a building directly and have the full view of the façade as architects do. Based on visual and urban theories, human vertical vision is much narrower than horizontal vision and pedestrians tend to look 10 degrees (see Figure 1) downwards while standing and walking (Gehl, 2011: 63; Gibson, 1950: 46), which means we see more objects horizontally on lower level and ground. Unlike architects, Gehl (2011: 63) suggests pedestrians pay more attention on ground floor of buildings, pavement and things in the street spaces, which implies colours from objects on eye level can be vital visual components in actual urban environments.

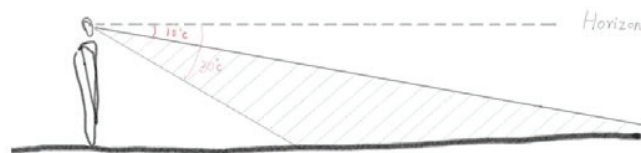


Figure 1: Normal lines of sight and visual field when standing (Redrawn from Higuchi, 1983)

Moreover, as Cullen (1971) describes the way we experience urban environments by serial vision of scenes, it is necessary to organise the relationships between colour components besides the colour design of individual architectures. In addition to the visual facts, the architecture-orientated perspective may also lead to the ignorance of other resources of colour in urban. Take the red telephone boxes in London as an example, the proportion of the red is minimal compared to colours from building façades, but they are significant in terms of the place identity and sense of place.

b. Colour Roles and Functions

Colour has always been a controversial topic in architectural debates. For many architects, colour was deemed secondary to form and considered as an intractable element to deal with (Braham, 2002: 2-4). Even considered as a way of decoration and ornament (Caivano, 2006), the choices of colours in architecture are limited. Influenced by the modern architecture movement since 1920s, colours like white or other natural and neutral colours have shared the privileges in architectural designs (Braham, 2002: 5). Even though architecture has changed significantly, most architects remain the preference of the 'safe' colour palettes and leave the decisions of colour to the last step (McLachlan, et al, 2015:16). Therefore, considering colour from architectural perspective may not only limit the range of colours but also the roles and functions of colour, which have been better understood by many artists and designers. Although research has revealed how environmental colour can affect us visually and psychologically, the roles of colour stay unclear except for aesthetic functions in urban colour studies. After Jean-Philippe Lenclos' research, studies on urban colour

planning have taken into account factors such as culture, traditions, climate, and other geographic features. However, unlike the historical city, Turin, colour planning of buildings possibly will not be able to meet the requirements in different urban contexts nowadays. In the dynamic urban environment, colour can be more interactive with urban issues when being used with clear intention and functional purposes.

CURRENT TREND AND NEW CONNECTIONS

Even though there has not been a systematic study that explores the relationships between colour and urban environments, colourists and designers start to look beyond architectural colour in urban context. In 2016 AIC interim meeting on Colour in Urban life, scholars have showed their interests in colour from different components, for example colour from vegetation, street art, and reflection from the water. The reasons to involve other resources of colour in urban environment are not only because of the visual habits of our viewing, but the new angles they can provide to urban colour studies. The urban colour decisions should not simply be the responsibility of architects, other designers (urban designers and landscape architects) and artists should use the materials that they are familiar with, such as plants, street furniture or art installations to engage colour as a tool for organisation and expression in urban. Colourist and designers will be able to use colour to tackle the challenges in urban environments from different scales and perspectives. For example, in many recent urban design projects, bright and highly saturated colours on pavement or installations have been used as parts of urban interventions. There are more attributes of colour should be introduced into the urban context. Furthermore, more studies that focus on how to provide colour design for specific context are required, which will produce better solutions in the dynamic urban environment.

CONCLUSION

This paper examines the current situation of environmental colour studies and explains why the architecture-orientated perspective of colour is not sufficient to provide a full understanding of colour in urban. Architectural colour is an important part of urban colour, however, it should not be used to represent environmental colour in urban colour study. More connections are expected to be built between colour and urban environments based on a holistic understanding of colour resources in urban and roles and functions which colour can play.

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