

## Teaching Color

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### ABSTRACT

Architects inherently want to make the world better place and therefore they need to know about the world. Since color plays an important (albeit underrated) role in our world, it is critical for students of architecture to understand the fundamentals of color and its application. Teaching Color under the umbrella of architectural design, I am interested in establishing a design culture where color plays a key role, both formally and in terms of sustainability. From a pedagogical perspective my understanding of teaching sustainability is not only a question of optimization or building performance metrics, but also an important dimension related to social discourses, addressing how we live now and in the future.

Architecture may derive through design principles, but ultimately spaces are perceived from a vantage point of a person moving through space. Spaces are determined by geometries, but are experienced as sequences of light and color, haptic and acoustic. Designing spaces is of course an act of making spaces, but it is important that we leave room for interpretation. An integrated approach, for instance, that allows light and color to transform space and at the same time is transformed through space.

**KEYWORDS:** *Architectural Color Design, Interior Design, Environmental Color Design*

### INTRODUCTION

How does color influence us? Do we actually stop and think about the effect of color in our daily and professional lives? Does color change the way we act, think, proceed through the day—the choices we make? How much do we know about color? How does color matter?

Seeing and perceiving color is a sensory experience that depends on different conditions and one's own awareness. It is a complex process involving physics, psychology, and culture. In this proposal on teaching color the objective is students will learn about theories of color and examine how these theories have changed over time as a result of scientific discoveries and cultural shifts. By the end of the course students will not only have a knowledge of the history of color, but also will have developed a personal theory of color and their student work will demonstrate knowledge and understanding of color application, related to important sustainable question, based on what they learn in the course and on their own experience.

### THEORY

This research studies theories of color and examine how these theories have changed over time as a result of scientific discoveries and cultural shifts. The topic of color is frequently taught in the fields of design and architecture, but rarely in the humanities. Yet its importance extends to many humanistic fields. The topic of color is frequently taught in the fields of design and architecture, but rarely in the humanities. Yet its importance extends to many humanistic fields and to collaborate with various fields. This research builds on and is inspired by my research on color reflectivity with respect to designing interior spaces, as well as teaching at the University of Oregon, in the College of Architecture and Allied Arts, now College of Design. It offers perspectives on the question of color that go beyond the technical aspects.

Every historical period has produced new understandings and formulations about color and new systems of visual representation. Linear, circular and three-dimensional diagrams have over the ages helped shape our understanding of the harmonies and laws that govern color. The vast spectrum of colors made possible by modern technologies is relatively new. Today, we have seemingly endless choices among colors and color schemes, but what do we really know about them?

## EXPERIMENTAL

This paper is structured by a historical timeline that was developed to show the evolution of thinking about color and how art and science have interacted over time to change our understanding of it. The timeline provides a framework to think about how perceptions of color change and what this evolution may tell us about our own values. The paper will trace changes in cultural perception that followed or accompanied scientific developments such as those in optics and mechanical reproduction (including digital printing, screen-based technologies, the evolution of the computer, mass media, and so forth), and changing socio-economic conditions.

As part of the investigations, the research will look at color in art—including installations, painting, and sculpture—and in literature and film as well. A major focus will be color used in architecture and how this informs our daily life.

Architects inherently want to make the world better place and therefore they need to know about the world. Since color plays an important (albeit underrated) role in our world, it is critical for students of architecture to understand the fundamentals of color and its application. Teaching Color Theory under the umbrella of architectural design, I am interested in establishing a design culture where color plays a key role, both formally and in terms of sustainability. From a pedagogical perspective my understanding of teaching sustainability is not only a question of optimization or building performance metrics, but also an important dimension related to social discourses, addressing how we live now and in the future. How we live is subject to constant change. Decisive for our doing are sensory experiences and perceptions.

Architecture may derive through design principles, but ultimately spaces are perceived from a vantage point of a person moving through space. Spaces are determined by geometries, but are experienced as sequences of light and color, haptic and acoustic. Through material and its surface characteristics a series of atmospheres are created. Designing spaces is of course an act of making spaces, but it is important that we leave room for interpretation. An integrated approach, for instance, that allows light and color to transform space and at the same time is transformed through space. In a room color is perceived, turns itself into different a colors and changes how other colors and surfaces are perceived through interaction. For example, marking the bounce of a room and perhaps its function, shaping ancillary areas or demarcating other spaces — in any case color allows for a enriched sense of time and place.

## RESULTS AND DISCUSSION

The idea of the proposal of teaching color application in the build environment maps core findings related to color theory around the parametric application of color from ancient period to today. It represents color theories both from science and art and their application in various fields. The concept traces these separate but interconnected histories in parallel. Historically color theories have had two themes: (Figure 1) First, the search for comprehensive Color-Order-Systems, along with their visual representations or diagrams (called Color solids), which have taken various forms, including linear, circular, or three-dimensional. Second, the search for laws of Color Harmony, which are the laws of color perception as a basis for color ordering.

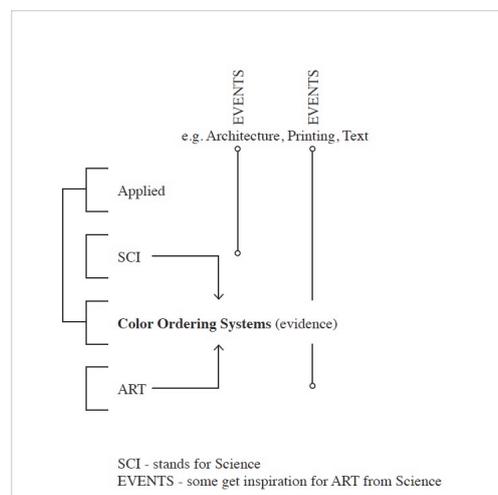


Figure 1: Scheme of Color Timeline

This concept represents the theoretical development, including Color-Order-Systems and Color Solids, the evidence in science and art, and its applications. Looking at both causes (the physics of color - Isaac Newton) and effects (color viewed not as light, but as an entity of its own, the psychology of color - Johann Wolfgang von Goethe) these theories are valid and lead to others. In the hope of developing a better understanding of colors' perceived, the question is whether a law for color in the build environment could be formulated to explain this. The Interaction of Color and its application as a dimension in color science, in its Colorreflectivity it is valuable architecturally and aesthetically and in terms of performance. The effect of color can be increased without changing people's perceptions of the color in the space, by applying the interaction of color with the larger built environment in nature or within larger fields.

The relationship of science and art and evidence of new knowledge that comes out of these interactions, reveal numerous possible topics for teaching color all under the umbrella of environmental. The topic of the interaction of color reveals many relationships and interconnections between science and art related to color theory and the application of color. And it raises questions or topics for further research. Of the many topics. I could have selected I have chosen to teach Color Reflectivity within the context of the evolution of color theory. Buildings consume 70% of all U.S. electrical energy production, most of it for electrical light. Therefore daylighting is an important strategy both to save energy and reduce greenhouse gases.

Color reflectivity is valuable not only architecturally and aesthetically but also in terms of performance. Given the benefits of color, why does nobody teach about color reflectivity as a key area where arts and science, perception and performance interconnect?

### **CONCLUSION**

The color reflectivity experiments I have conducted support my hypothesis that there is little knowledge on color interaction and reflectivity, and I will continue working on the application of color to develop this topic. This focus relates directly to issues of central importance to the University of Oregon, including sustainability and socioeconomic diversity. Designing with color enables unique sensory experiences and generates situations that heighten attention and open new ways of seeing. My approach seeks to encourage a transformation of how one thinks about color in architecture. I see this as it is presented as both an ongoing research and teaching as a broader more general project on the theme of color and form in architecture.

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### **REFERENCES**

- [1] Albers, Josef. 1963. Interaction of Color. New Haven: Yale.
- [2] Behnisch, Guenter. 1993. Ueber das Farbliche/On Color Stuttgart: Hatje.
- [3] Brown, G.Z., De Kay, Mark. 2001. Sun, Wind & Light. New York: John Wiley and Sons, Inc.