



Colour and
Landscape

Proceedings of the International Colour Association (AIC) Conference 2019

Buenos Aires, Argentina
14-17 October 2019
Universidad de Belgrano

Organized by
Grupo Argentino del Color
(GAC)

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(AIC)

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grupo argentino del color
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The original website of the conference was <http://aic2019.org>.

The contents have been moved to a more permanent site: <https://aic2019color.wordpress.com>.

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Chromatic applications in interior spaces for the elderly in the P. Borja Geriatric Center of the Fontilles Foundation

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ABSTRACT

The interior space in architecture is one of the most important concepts throughout the history of architecture. There are many characteristics that define the three-dimensional aspects of space in order to obtain a more habitable place. This communication is focused on a particular chromatic study, carried out in three interior spaces at the P. Borja Geriatric Center of the Fontilles Foundation (Alicante), where the appropriate chromatic modifications have been made to achieve improvements in their habitability. This Geriatric Center is specialized in the care of elderly people with varying degrees of dependency. This study is part of a research project carried out by the UPV Architecture Color Group, approved by the Ministry of Industry and Competitiveness of the Spanish Government (2016-2019). The aim of this research project is to establish parameters and chromatic modifications in built interior spaces of the public centers of the Valencian Community, where older people live.

Keywords: *color in architecture, interior design, elderly, space*

INTRODUCTION

The facilities of the P. Borja Geriatric Center of the Fontilles Foundation (Alicante) present outstanding architectural features to be taken as a case study because it is a building located in a unique natural landscape, and it offers a climate especially suitable to accommodate people with certain dependency. It is a very different place from other centers that have been built in an urban area. This Foundation seeks to help the most vulnerable, it was created at the beginning of the 20th century, offering and carrying out various medical research projects. Thus, P. Borja Geriatric Center, that was constructed also at the beginning of the 20th century, is a benchmark of social compromise, where various studies on health and wellness are carried out. In this context, our study focuses, firstly, on an analysis of the original color of the most common rooms of this center; and, secondly, on the elaboration of new chromatic proposals that allow to improve the interiors spaces. The spaces

analyzed in this study are, today, the most used by residents in their daily lives: a multipurpose room where group activities are carried out, a corridor and its transit to other rooms, and a standard bedroom. All the chromatic modifications have been made in this pilot center.

THE P. BORJA GERIATRIC CENTER: CASE STUDY

The P. Borja Geriatric Center, that is located on the town of Fontilles (Alicante), is part of the Sanatorium of Fontilles, an autonomous complex for the integral treatment of leprosy. Currently, the Center works according to the new model of Integral Person-Centered Care (AICP) since 1998, improving the well-being and quality of life of people and achieving the recertification of ISO 9001 / 2015 in 2017 (fundacionfontilles.org). The building has been selected from about twenty of the public centers that have been analyzed in our color study of the Valencian Community because it is a historical building with particular characteristics that other centers in the region do not have; moreover, its architecture has undergone multiple modifications (Llopis 2017). Its presence, with a great volumetric impact, is characterized by the unique place where it is located, that is, its natural environment and landscape surrounding (Figure 1), as well as its wide interior spaces, that are not common compared with the rest of the residences analyzed.



Figure 1: Current state of the P. Borja Geriatric Center, in Fontilles, Alicante. Location and relationship with the natural environment.

The building was deeply modified in the second half of the 50s, with interventions such as the compartmentalization of rooms in smaller residential units to adapt the original project to modern hospital requirements.

Its natural environment of the Vall de Laguar (Alicante) allows to contemplate a landscape surrounded by large areas of Mediterranean woodland that offers a generous and quiet shading. At the same time, there are rest areas around the building that allow residents and family to walk. Therefore, the landscape and the climate generate a conducive environment with favorable conditions. The colors of the nature of the place: the blues of the sky, the greens of the vegetation and the ochres of the land, accentuate the feeling of well-being.

This set of conditions, such as its unique location and its great proportions, play an important role in the creative process of chromatic proposals that help to improve the perception of its spaces by offering a compositional design adapted to its architecture.

At the same time, in our Research Project on chromatic interventions in architecture for the elderly, color is considered as one of the elements that help to improve the visual comfort and mood of the residents, avoiding it being regarded merely as an element associated with the aesthetics of the building.

THE PILOT CENTER: CASE STUDY

It should be noted that, before the chromatic intervention, the interior of the center was characterized, in its entirety, by the typical uniform yellow color in all its walls, and a dark green color in the metallic details such as handrails, carpentry and other elements of design. These colors promoted a hospital image that did not follow any previous study neither any habitability condition. Thus, it has been necessary to carry out an exhaustive analysis to elaborate a color chart determined by the organization of the space, the type of activity that is carried out in each area, as well as the need to update the spaces design to bring the resident closer to society.

A final objective of this study, is to establish chromatic modifications that help the perceptual improvement of residents (Torres-Barchino et al. 2017). To do this, as a previous phase to the chromatic intervention in real spaces, two types of analysis are established: firstly, to determine the visual state of the elderly through a deep literature review (Delcampo-Carda et al. 2019) as well as objective tests carried out in small groups (focus group) of elderly people aged between 70 and 90 years (VV.AA. MODIFICA 2019) (Figure 2).



Figure 2: Focus groups conducted in small groups of older people, to know their visual status and color preferences.

The conclusions drawn in this first theoretical-practical analysis determined the second phase of the analysis, that is, a survey consisting of a test based on images, of the best known rooms by the residents, visualized by virtual reality glasses in their original chromatic state and the same images modified in other color schemes previously selected by residents.

In these images, 4 different color schemes (mainly based on value and hue contrast modifications) of the three specific rooms were shown. Subsequently, the test aimed to collect the responses about the best perception of the spaces and the particular chromatic preference before carrying out the painting process in the center's facilities. For this, a questionnaire was prepared for each participant, consisting of 3 different parts, based on the evaluation of the three main real spaces existing in the Geriatric Center. Each of these spaces was presented individually. The participants needed to assess each space from 0 to 5 (Table 1), and provide a word that suggested that space, to know their most specific opinion (Figure 3).

0	1	2	3	4	5
Indifferent	Unsatisfactory	Average	Good	Very Good	Excellent

Table 1: Rating scale.

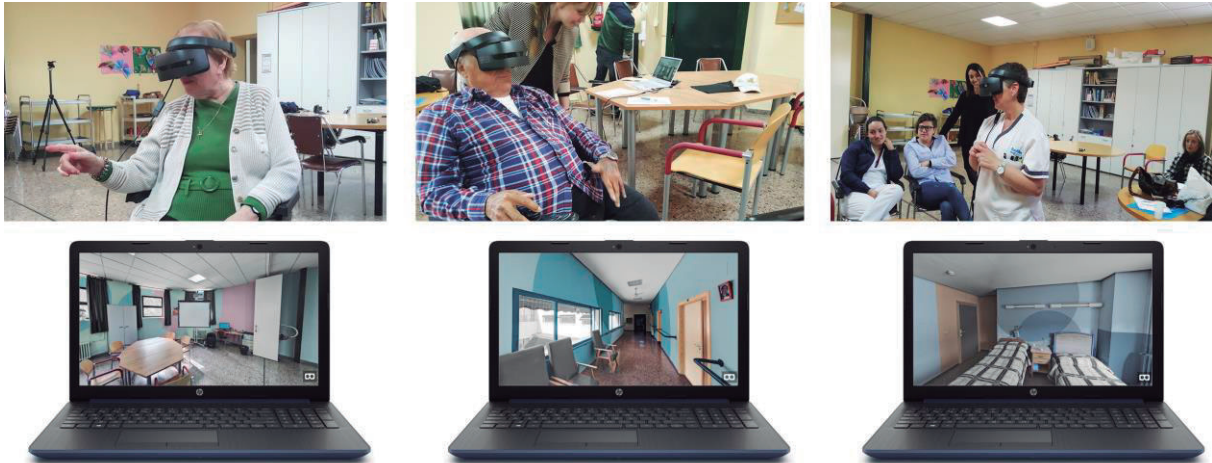


Figure 3: Test conducted to residents and staff of the P. Borja Geriatric Center. Visualization by virtual reality glasses of the images of the best known rooms by the resident: multipurpose room, corridor and bedroom.

It should be noted that spaces with color were better rated than white spaces, practically unanimously (Torres-Barchino et al. 2017). This result is coherent with previous scientific studies that analyze the disadvantages of spaces with a predominantly white use, since they promote monotony and lack of stimulation in the user (Dalke et al. 2006), prevent the orientation process as spaces lack of visual information (Delcampo-Carda et al. 2016), being able to cause anxiety and depression (Ainsworth 1989) and even visual fatigue due to the high levels of light reflectance (Mahnke and Mahnke 1987).

The chromatic proposals offered in our study for these spaces by using the new technologies of virtual reality, have given the possibility to visualize and select chromatic compositions before painting them. The combinations have been defined as a result of the previous study through geometric patterns that suggest harmony and dynamism, as well as the unquestionable participation of the older residents and the staff. Finally, the color compositions best valued by residents have been chosen for their intervention in each of the indicated rooms of the center. In addition, the natural lighting, orientation of the rooms or size, have been, among other spatial characteristics, the basic factors to define the set of chromatic interventions.

RESULTS

As a result, various compositions were designed with geometric patterns and color variations between warm and cold shades (Figure 4). The difference of each one of the spaces studied, does not depend only on its dimensions, but on the lighting (natural light entrances and artificial light spots). Furthermore, the route that the resident makes during the day, has been a fundamental characteristic to determine any variation or color approach in the whole space. Depending on the activity to be developed in each room, we seek three different types of perceptions:

To perceive and generate an *attention space for transit time*: corridors.

To perceive a *balanced space for resting time*: bedroom.

To perceive a *dynamic space for action time*: activity or multipurpose room.

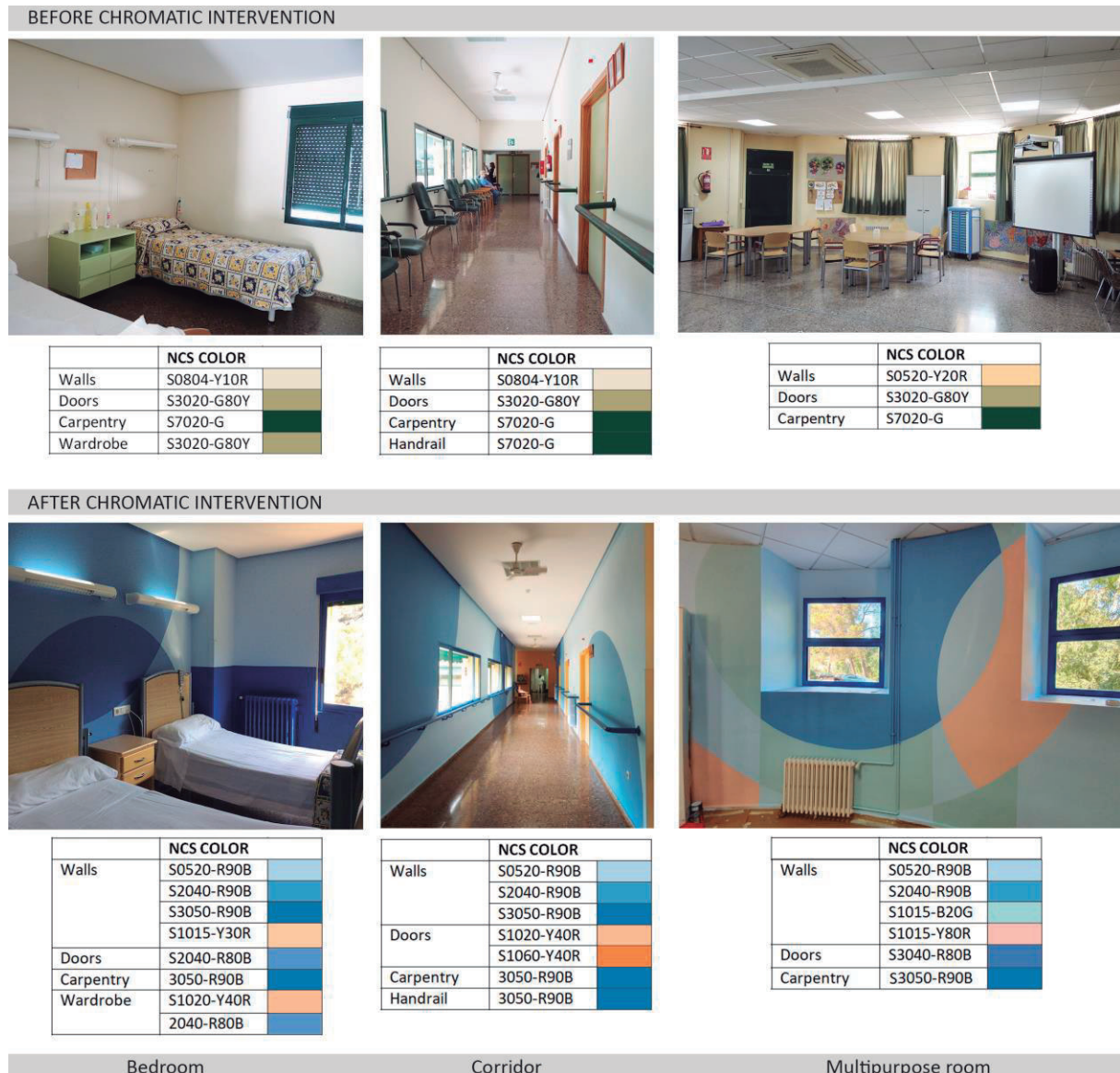


Figure 4: Before and after the chromatic intervention. Final result.

The result of this work has been carried out in the facilities of the P. Borja Geriatric Center for three years and culminates during this year 2019. The implementation of the color chart and its application in the indicated spaces, has demonstrated a new perception of them in the case study center, in which both residents and staff participated in the process in the different compositional designs intended for this place.

This research project, leads to the reflection of the study and application of color, as well as the idea of generating designs that help to improve the original built spaces whose modifications allow to improve the quality of life of older people with certain degrees of dependency.

Likewise, we believe that a common color chart cannot be established for all buildings of this type. The particular study for each type of center must be considered based on its own characteristics, as well as knowing the people who inhabit them.

CONCLUSION

Currently, the residents of the center show a more positive mood after the color intervention in the inhabited spaces. The activity-multipurpose room as a group room and game room, has managed to improve the attitude of the resident. It is still too early to draw definitive conclusions. These conclusions should be determined throughout the rest of this year to assess the satisfaction results of resident users.

In short, our study is a pioneer in this type of experience in the Valencian Community, so a theoretical-graphic document is being prepared with the results of the tests based on the organization of color in residential spaces that will soon be revealed in a "White Paper", especially indicated to designers and architects.

ACKNOWLEDGEMENTS

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Note: This research was presented in poster format at the AIC 2019 Conference in Buenos Aires, and won one of the Robert W. G. Hunt Poster Awards (see Appendix, in this book).