

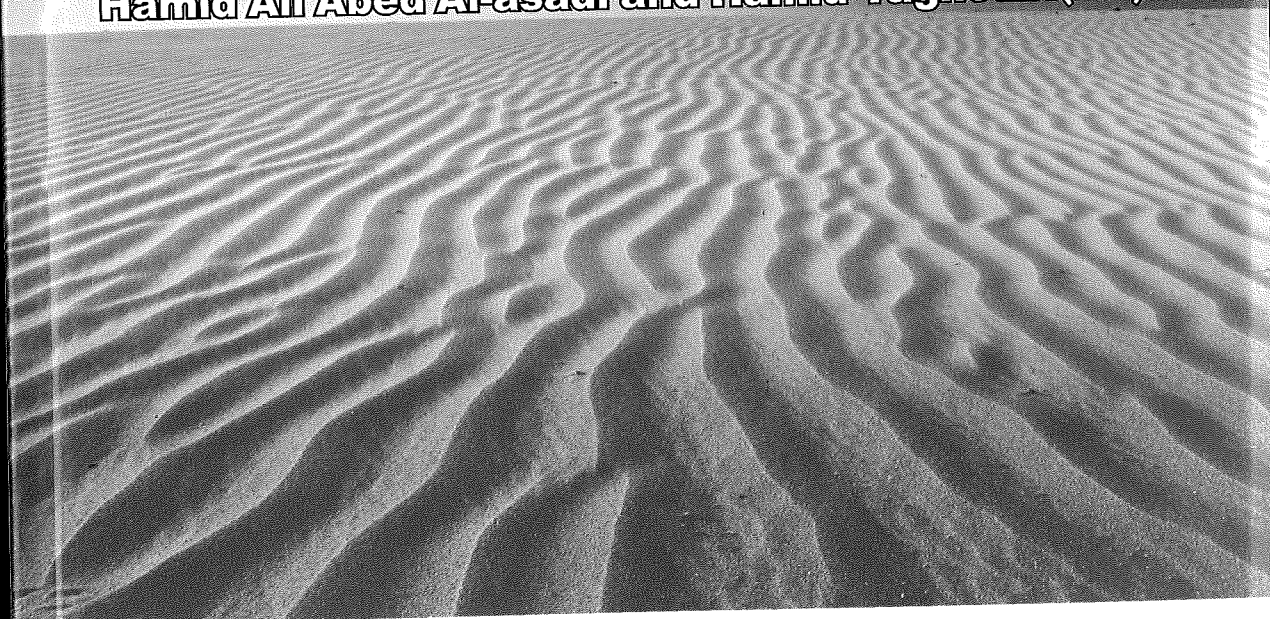
Social Science and Environment

2016 PPH International Conference on Social Science and Environment (PPH-SSE 2016).

January 23-24, 2016, Vancouver, Canada

Revised Selected Papers

Hamid Ali Abed Al-asadi and Hamid Yaghoubi(Ed.)



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**2016 PPH International Conference on Social Science and
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January 23-24, 2016, Vancouver, Canada

Edited by

Hamid Ali Abed Al-asadi and Hamid Yaghoubi

Singapore Management and Sports Science Institute

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PPH-SSE 2016 Preface

Warmly welcome to 2016 PPH International Conference on Social Science and Environment (PPH-SSE 2016). PPH-SSE 2016 will be held on January 23-24, 2016, in Vancouver, Canada. PPH-SSE 2016 is co-sponsored by Singapore Management and Sports Science Institute (SMSSI) and Academic Conference Institute, USA. PPH-SSE 2016 conference proceedings will be published by Singapore Management and Sports Science Institute, Singapore.

PPH-SSE 2016 will be one of the most comprehensive conferences, which focuses on the various aspects and levels of Social Science and Environment. The aim of this conference is to bring together the researchers and professionals from academia and industry background to share ideas, problems and solutions. It provides a great chance for academic and industry professionals to discuss and research recent progress in those areas of Environmental Science; Algorithm, Simulation and Modeling; Social Science.

PPH-SSE 2016 received 46 paper submissions. All accepted papers have undergone a rigorous reviewing process, which are performed by the international conference committees. Each submission is peer reviewed by 3 PC members. The PC members consist of Professors, Doctors, and leading experts in PPH-SSE 2016 conference topics. The review process refers to the academic value, experiment procedure, method and results. What's more, the format and frequent expression as well as grammar may affect your paper. Thus, those factors should reflect and show in the paper. The paper is accepted or not, which depend on two members of PC. Both of the two PC passed the paper, this paper can be accepted. After the reviewing, 14 papers are finally accepted in the conference proceedings, representing 30.4% acceptance rate.

We would like to express our heartfelt gratitude to the members of the organizing committees of PPH-SSE 2016, for their hard and admirable work, which made this conference possible. Special thanks are extended to the support of publication chairs and organization chairs. Finally thank all of the authors who come from different countries all over the world, for their great contributions on PPH-SSE 2016 proceedings.

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Identifying Formal Color Variables that Characterize an Image in order to Evaluate the Visual Integration of Architecture

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Keywords: Color, Architecture, Urban landscape, Valencia, Integration

Abstract. The aim is to find color strategies to improve the visual integration of buildings with a high impact on the city landscape. With this in mind, a set of photomontages using different color concepts were created and these were used as the *stimuli framework* to be assessed by observers. Prior to the observer stage of the project, we first require a methodology to carry out an analysis of the composition of the sample images that are to be shown, and identify the *design attributes* that will impact on landscape integration. This paper describes the *design attributes* under consideration to ensure that the images are sufficiently dissimilar so as to be statistically significant. At a later stage, we will review the *design attributes* mentioned above for the composition of the images, together with perception variables that better favour landscape integration, following consultation with observers.

1. Introduction

The aim is to find color strategies to improve the visual integration of buildings with a high impact on the city landscape. With this in mind, a set of photomontages were created using different color concepts that are part of a "stimuli framework" to be assessed by observers. The subjective perception of the observers with regard to the visual integration will be associated with different design variables to determine how said variables can help to bring about a better integration of architecture. The ultimate aim is to have a set of specific guidelines to facilitate the work of architects and their involvement with these buildings.

Prior to the observer stage of the study, we first require a methodology to carry out an analysis of the composition of the images to be shown, and identify the *design attributes* that will impact on landscape integration, followed by an initial classification of the photomontages to ensure that they are sufficiently diverse.

2. Design attributes

We understand the term *design attributes* to refer to the set of variables that characterize the composition of an image and that can be identified and objectively analyzed, focusing on those that are important when successfully integrating an architectural design into an urban landscape.

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A comparison of the *design attributes* of the building we are working on with those from the urban environment allows us to initially classify the images into three levels, based on their level of integration: *mimetic, harmonious and contrasting* [1]. The first classification enables us to ensure that the *stimuli framework* is sufficiently varied to allow the study to be statistically consistent and, at a later stage of the project, to identify the *design attributes* better able to sway the perception of landscape integration, as expressed by the observers.

2.1 Design attributes as they relate to the composition of the forms

For each photomontage, we take into consideration a series of *design attributes* that relate to the composition of the architectural forms and we compare these to the immediate environment. More specifically, we relate them to five aspects: the *architectural typology*, the *aesthetic language*, the *local culture* and the distribution of the *essential elements* of the image.

If we first look at the *architectural typology*, we focus on the similarities, or not, with the surrounding buildings, specifically the height of building, the proportion of the façade, disposition and the balance of the openings, the use of ornamental elements, construction material used and textures. In the words of architect Rafael Moneo, the type of architecture is "a certain concept that describes a group of objects characterized as having the same formal structure. (...) The concept of the type is primarily based on the ability to group the objects together, making use of said structural similarities that are inherent to them"[2].

If we look at the *aesthetic language*, we refer to the links between the design and a particular style. The style can be defined as the set of formal features, whose constant appearance together are considered to be characteristic of the work of an artist, a school or a specific period in the history of art. The *aesthetic language* employed might be contemporary or reminiscent of a period from the history of architecture. As it is a chromatic intervention, we can also talk about ties to the *aesthetic language* as it relates to the history of painting or to a renowned painter. Thus, the term *aesthetic language* allows us to distinguish chromatic interventions dominated by a certain degree of abstraction, with more figurative representations, or elements typically associated with Pop Art, or with Surrealism, etc.

The formal attributes that relate to *local culture*, refer to any aspects of the intervention that make reference to locally-based historical events, famous local celebrities, or the presence of any iconic element with a major significance for the local inhabitants, whether for their religious or political connotations, or connotations of any kind. These are formal aspects that carry with them a certain message with a very specific meaning within the visual culture of the observers. It is an architectural integration that is not so much based on the similarities between the building and its immediate surroundings, but rather the citizen identifying with the architecture, as if it were something of "their own".

Lastly, we believe that what is required is an evaluation of the formal attributes related to the *essential elements* of an image. In other words, beyond the simple ties to local architecture, using a specific aesthetic language, or with a specific meaning within the context of the local culture, whereby the form can be evaluated as a purely perceptive phenomenon, in keeping with the theories of iconological critique and pure visuality [3,4,5]. We therefore carry out a comprehensive study of the essential elements that enable us to describe and construct the form of an image: *points, directions, geometry, rhythm and hierarchy*.

2.2 Design attributes as they relate to the color composition

For each image shown to the observer, we carry out a prior analysis of the color composition. We would like to make a number of versions of the same formal solution using different colors for the strict separation between the composition of form and colour.

We want to know if the specific colors used in the intervention colorimetrically coincide with those of the immediate environment as far as the *tone, saturation and luminosity* are concerned. Here we refer to the colors of the immediate surroundings at this precise moment and from the chosen vantage point. We carry out an analysis to see if the colors coincide with the color of the surrounding

architecture. For example, it is generally accepted that the presence of saturated grey, violet and green tones are wholly inappropriate for certain traditional historic centers [6].

In addition to studying the specific colors, we would like to study the overall composition. We acknowledge the existence of color harmonies and contrasts based on each of the three perception variables. Also under analysis is the *number of colors* used in the intervention, the *size* of the building, and the *transitions* from one color to the next.

With regard to the *number of colors* used, we refer to the variety of tonal families that appear: a single tonal family (monochromic), two tones (bichromic) or more (polychromic). Generally speaking, monochromic interventions boast a greater visual impact [7].

With regard to the *size of the surface area* with colour, it should be pointed out that distance of the observation point can also influence the observation. The closer one gets to the object, the greater the sense of visual impact due to the increased area that it occupies within the frame. Certain authors believe that the elliptical area immediately around the element to be integrated is sufficient [8,9].

And lastly, we would like to know how the *transition* occurs between some colors and others, whether it be a gradually transition using color gradients or a sudden transition, underlining, should this be the case, with a clear borderline edge between both colors.

3. Formulating the design attributes onto a summary sheet

To facilitate the analysis of the design attributes under study, the information has been included as part of a summary sheet to be used for an initial evaluation of the degree of similarity or difference between the architectural intervention and its surroundings. This information, which we can define as *objective*, given that it is based on verifiable and measurable criteria, will be compared to the opinions of observers and their *subjective* perception as to the degree of *landscape integration* of each color concept.

4. Implementation

We chose three sample chromatic interventions on buildings with a visual impact on the landscape to validate the use of the summary sheet. The first of these is a dividing wall with a trompe-d'oeil effect, which complements an adjoining architectural design, in the form of a street. It is an intervention that we would categorize *a priori* as *mimetic*. The second one is a chromatic intervention by Friedrich Ernst von Garnier on an industrial building located against the backdrop of a natural environment. We consider this to be a harmonious intervention, as it has certain ties with its surroundings but by no means has been conceived to be invisible. The third is a *contrasting* intervention, carried out by Dutch artist Florentijn Hofman right in the centre of Rotterdam.

To facilitate the evaluation of the design attributes as they relate to the color composition, we digitally processed the images to discover the colours they were composed of, on one side the color composition of the form, on the other, the color composition of the backdrop (Fig.1). For each one (*mimetic, harmonious and contrasting*), we reduced the chromatic information to just 256 pixels, generating what is known as a *predominant chromatic inventory* [10] or *color palette*, in order of their tonal family, their luminance (light intensity) and their repetition or popularity.

Fig. 1. Study of

5. Discussion

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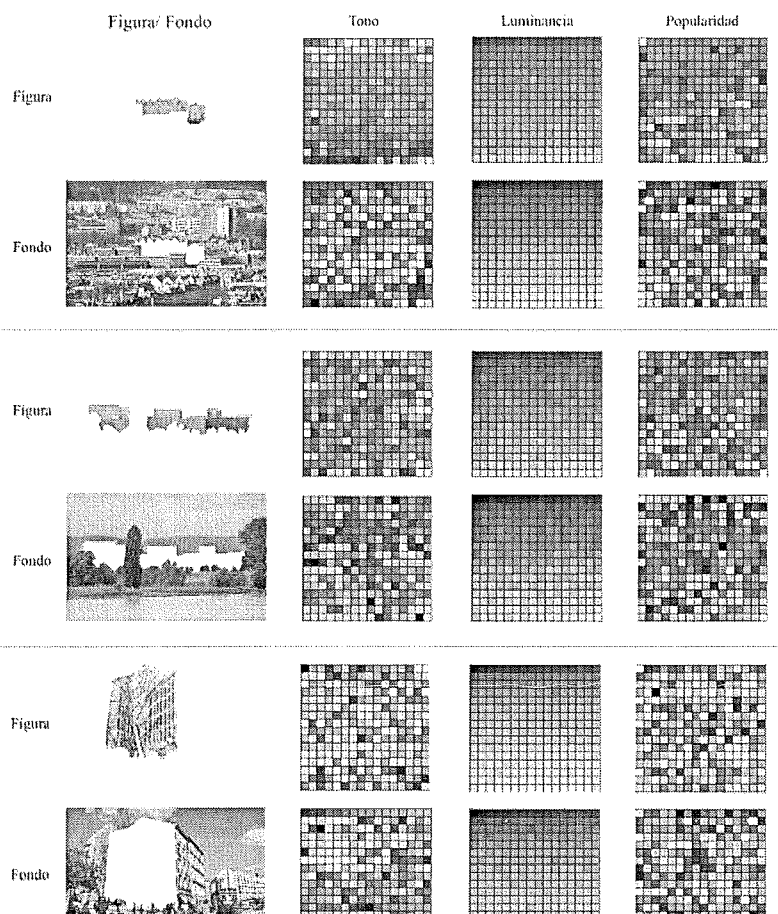


Fig. 1. Study of the colors contained in the forms and the backdrops for each of the selected sample images, with an indication of the tone, the luminance and the repetition of each color.

5. Discussion of the results

Figure 2 contains the results of the study on design attributes for each image, allocating a score from 1 to 5. The higher the score, the greater the similarity between the intervention and its immediate environment for said design attribute, whereas the lower scores are indicative of major differences between the form and the backdrop, and therefore a greater level of contrast *a priori*. The scores stem from an objective analysis by two color and architectural design specialists, and very little divergence of opinion between their respective analyses was noted.

Upon analysis of the results, it can be seen that the highest scores for each of the attributes were allocated to the more mimetic intervention, whereas the lowest scores were allocated to the contrasting one. The harmonious intervention received an intermediate score, higher in some attributes than others. This is also the case for the average results for each of the attribute groups (*type of architecture, aesthetic language, local culture, essential elements, colorimetry, color composition and proportion of colors*), as well as for the overall average.

In other words, we have stumbled across a procedure that enables us to study the similarity or difference between an architectural design with visual impact and its surrounding landscape, by means of the identification of a series of design attributes, indicating the level of similarity on a scale from 1 to 5, the score of 5 being allocated to an architecture that perfectly blends in with its immediate

environment. This scale is in keeping with the classification *a priori* that had been allocated to each of the images, taking into account three levels of visual impact: mimicry, harmony and contrast.

The summary sheet enables us to carry out an initial objective analysis of the degree of contrast between the form and its backdrop. When, at a later stage of the research process, the input from the observers is included, it can be modulated to allocate a weighting that each of the design attributes has on the perception of the visual integration.

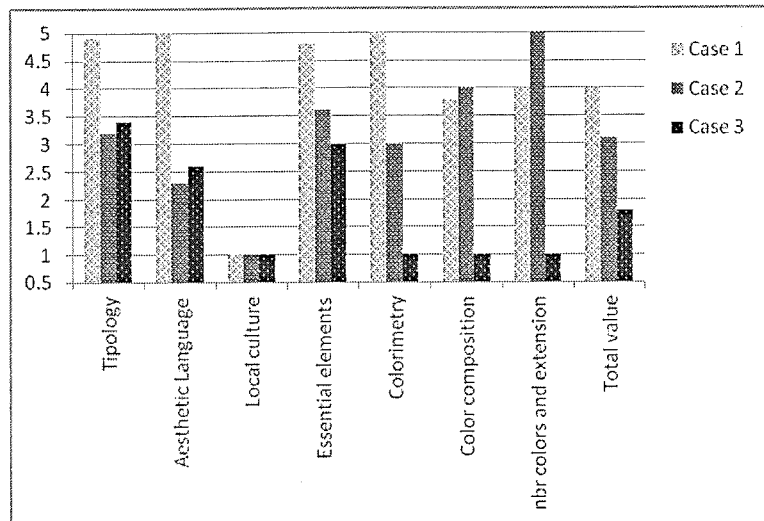


Fig. 2. Level of compliance between form and backdrop for each of the design attributes in each case, 1 being the lowest, and 5 the highest.

6. Conclusions

A methodology was proposed to analyze the design attributes that are going to be significant in the landscape integration of architectural designs with visual impact. To achieve this, a set of attributes was compiled that relates to the composition of the *forms* and another series that relates to the *color* composition.

Attributes that refer to the composition of the forms are the *type of architecture*, the *aesthetic language*, ties to the *local culture*, and the *essential elements* of an image. Attributes that refer to the color composition are the *colorimetry*, the *color composition*, and the *number and extension of colors*.

For each design attribute, one can assess the similarity or difference between the architecture and its integration with its surroundings, with an initial objective evaluation of the degree of differentiation between the *form* and the backdrop. Said analysis provides a reference score, from 1 to 5, which indicates the degree of integration between an architectural design and its environment. This value is useful as it provides an initial classification of the stimuli, broken into three categories: mimetic, harmonious and contrasting interventions.

At a later stage of the study, once we receive feedback from the user upon seeing the images, a weighting can be modulated for each of the design attributes as to the perception of the visual integration.

7. Acknowledgement

This research was made possible thanks to the financial support of the Community of Valencia Regional Ministry of Education, Culture and Sport (GV/2015)

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Identifying the Perception Variables to be Taken into Consideration When Evaluating the Integration of Architectures with Visual Impact in the City

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Keywords: Perception, Color, Architecture, Visual integration

Abstract. This study is part of a research project whose goal is to define improvement strategies, using color as a criterion, for the visual integration of architecture that impacts on the urban landscape. To evaluate urban landscape integration, most studies use concepts from experts or from other geo-demographic contexts. The potential shortcoming is that this approach might not correspond to the conceptual schematics of the users who are the subject of the study, which supposes a considerable risk to its legitimacy. The aim of this particular study, therefore, is to define a comprehensive methodology to identify these variables and to then apply them in the specific case of Valencia. For this reason we have used the focus-group approach. The sessions that were attended by expert and non-expert profiles were aimed at saturating the semantic use of the informants and to evaluate the main expressions used in earlier landscape integration projects. For this reason we used visual stimulations consisting of a sample of chromatic intervention approaches, which, due to their incompatibility with the urban fabric, were designated "non-compliant"; to these, we then applied a series of chromatic intervention approaches in order to reduce the aesthetic impact and improve their valuation scores. The methodology employed allowed us to identify the criteria, impressions and attitudes of two different profiles (expert/non-expert), structured around the concept of landscape integration, condensing them down to 34 expressions. In this way, we are able to ensure that for this particular study, the questionnaires that use them will be easily recognized. The precise definition of variables is essential for later correlation with the final assessment of the intervention and with the design variables.

1. Introduction

The integration of buildings into their existing surroundings has been the focus of a number of papers, but all within a rural setting [1, 2, 3]. These authors conclude that color is one of the essential variables in the relation between the building and its environment.

In the case of an urban setting, town-planning rules and regulations stipulate the protection of the visual heritage, calling for landscape integration studies that include the active participation of citizens. However, there are in fact very few research papers that deal with the landscape integration of architectural designs within an urban setting.

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Tab.1.Characteristics

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Expert 2	
Expert 3	
Expert 4	
Non-expert 1	
Non-expert 2	
Non-expert 3	
Non-expert 4	

Without a framework of scientific literature that tackles the question of landscape integration in an urban setting, we are able to question the rigor with which the processes of citizen participation are carried out and therefore in their effectiveness at improving the design of our cities.

Within the field of landscape integration, of particular note is the work by O'Connor [4]. Said author breaks the aesthetics of buildings down to the dimensions developed by Mehrabian and Russell [5] but then incorporates two additional dimensions. Firstly, she analyzes the preference of the building with regard to its surroundings, assuming that it is an aspect different to that of the aesthetic response [6, 7]. Secondly, she assesses the integration, congruence and the fit of the building with regard to its immediate surroundings, based on variables such as sympathy or harmony, terms used in earlier research [8, 9, 10].

To be able to assess a given situation, it is essential that the evaluation variables adapt themselves to the mindset of the respondent. And this is precisely the aim of this paper, to identify a set of user-perception variables used to evaluate the visual integration of architectural designs that impact on the city of Valencia.

For this, we chose a qualitative approach for the research [11] as it is considered to be a suitable methodology for the interpretation of data and the drawing of conclusions [12]. The focus group approach was the chosen qualitative technique. It consists of carrying out carefully structured and facilitated group discussions that aim to acquire information about the subject of a study using the experiences and opinions of the participants [13].

The main advantage of the focus-group approach compared to other qualitative techniques is that it takes advantage of the social interaction or collective synergy to generate information and to recall certain aspects that would not be feasible with individual interviews [14]. Furthermore, as the role of the interviewer is not that important [15], it is less intimidating [16] and generates a friendly atmosphere [17], which makes it especially effective when examining the relation between user and product [18].

2. Material & methods

2.1 Overview

The study comprises two focus-group sessions aimed at compiling and approving expressions that are commonly used by observers to describe landscape integration. One session exclusively involves experts in the subject matter, and the other, non-experts. In both, the same structure is used. All sessions were held at the Department of Graphic Expression in Architecture at the Polytechnic University of Valencia towards the end of the 2013-2014 academic year.

2.2 Participants

The participant selection process carried out was in compliance with the guidelines provided by Krueger. Four experts and four non-experts, whose characteristics appear below in Table 1. The focus groups were facilitated by two interviewers: an experienced member acting as the facilitator, the other, as their assistant. The role of the first was to run the session, the second to take down key notes and to oversee the sound recording (for which the participants signed an informed consent slip) and the subsequent verbatim transcription.

Tab.1.Characteristics of the informants. The assigned number simply corresponds to the order of their first session.

Informant	Transcription code	Session	Sex	Age	Years of experience (expert profile only)
Expert 1	E-1	1	Male	45	21
Expert 2	E-2	1	Male	41	15
Expert 3	E-3	1	Female	37	13
Expert 4	E-4	1	Female	55	31
Non-expert 1	N-1	2	Male	53	-
Non-expert 2	N-2	2	Female	37	-
Non-expert 3	N-3	2	Female	48	-
Non-expert 4	N-4	2	Male	41	-

2.3 Process

The focus group comprised two sessions: the first, with experts in landscape, the other, with the non-experts. Both were structured in the same way, three consecutive stages of progressively increasing analytical complexity in order to saturate participants with expressions used to describe chromatic interventions in landscape integration:

a. Stage 1: an open, joint deliberation session about visual stimuli. Comprising 9 sample images of buildings categorized as "non-compliant" due to their incompatibility with the urban fabric, which were then subjected to a chromatic intervention in order to improve their integration into the immediate surroundings. In order to provide a sufficiently wide spectrum of samples of this type of intervention, the 9 images underwent different levels of integration, classified as mimetic, harmonic and contrasting, with three images per category. All were color copies, printed onto A4 paper with a 600 dpi resolution, with a randomly generated code at the foot of the page to act as a name, but with no additional information.

b. Stage 2: a guided joint discussion with an evaluation, using general consensus, of the aforementioned images: (1) satisfaction with the building and its surroundings, (2) satisfaction with the integration of the building with its surroundings (3) the degree to which the color of the building adds to the visual value of the setting as a whole. A Likert scale was used, from -2 (totally disagree) to 2 (totally agree).

c. Stage 3: a guided joint discussion to evaluate the images based on expressions commonly used in the assessment of landscape interventions. These were compiled using the landscape integration regulations (Landscape Regulation (Reglamento de Paisaje) contained in Decree 120/2006, of 11 August, of the Valencia Regional Council) and from the doctoral thesis by O'Connor [4]. During this stage, in addition to encouraging semantic expression, feedback was received about the selected expressions. The questionnaire was carried out using the same approach.

2.4 Data analysis

2.4.1 Structure of the analysis

Given the aim of the paper and the fact that the specialized literature is scarce, it was decided to break down the analysis into three stages: (1) review and selection of expressions used by the informants; (2) critique of the expressions used in the questionnaire; and (3) grouping and filtering.

2.4.2. Analysis method for stage 1.

The first stage was carried out for each session of the focus group. Two members of the research team carried out the analysis separately, and afterwards they pooled their results to present a summary to the rest of the team over the course of a number of sessions until consensus was reached. The reason for involving more than a single researcher [19] and for the cross analysis is that it provides a greater reliability of the results [20]. Table 2 contains the results.

Tab.2.Results of the 1st stage of the analysis; summary of the expressions used by experts and non-experts.

Expression	Session (Experts / non-experts)
Abstract	Experts
Artistic	Non-experts
Blends into its surroundings	Experts
Blurred	Experts
Brusque	Non-experts
Camouflaged	Experts
Complex	Experts
Concealed	Experts
Contrasting	Experts
Diffuse	Experts
Distinguished	Experts
Eye-catching	Experts and Non-experts
Formal	Experts
Fun	Non-experts

2.4.3. Analysis method

In the second stage, keeping those that rec themselves came up v was shared by the maj

Tab.3.Results of the 2.

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2.4.4. Analysis method

The basis of the expres order to avoid redunda and then used to organ

Harmonious	Non-experts
Integrated	Experts and Non-experts
Interesting	Non-experts
Mimetic	Experts
Nice	Non-experts
Outstanding	Experts
Permeable	Experts
Rotund	Experts and Non-experts
Singular	Experts
Spectacular	Non-experts
Strange	Non-experts
Subtle	Experts
Suggestive	Experts
Tidy	Experts
Traditional	Experts and Non-experts
Ugly	Non-experts
Uniform	Non-experts
Unnatural	Non-experts
Volumetric	Experts
Wearisome	Non-experts

2.4.3. Analysis method for stage 2.

In the second stage, the pairs of expressions dealt with in stage 3 of the sessions were screened, keeping those that received no negative comments and eliminating or modifying (if the informants themselves came up with alternatives) those that were criticized, on the condition that this opinion was shared by the majority of the informants. Table 3 contains the results:

Tab.3. Results of the 2nd stage of the analysis; expressions kept, modified or eliminated from the questionnaire.

Expression	Informers not in agreement	Kept / Modified / Eliminated
Bad – Good	6	Eliminated
Bold – Discrete		Kept
Calm – Frenetic, hectic	6	Eliminated
Compatible – Incompatible	6	Eliminated
Complicated – Simple		Kept
Congruent – Incongruent		Kept
Contextualized – Non-contextualized		Kept
Empathic – Non-empathic	7	Eliminated
Fascinating, exciting – Boring, monotonous	5	Attractive – Unattractive
Impressive – Unimpressive		Kept
Integrated – Disintegrated		Kept
Large – Small		Kept
Monotonous, Boring – Vibrant, lively	5	Boring – Fun
Orderly – Unorderly		Kept
Pleasant – Unpleasant		Kept
Relaxing – Unsettling		Kept
Suitable – Unsuitable		Kept
Ugly – Gorgeous		Ugly – Pretty
Unorganized – Organized, unified	6	Eliminated
		Which contrasts – Which does not contrast
Which contrasts – In harmony	5	
Which disfigures – Which does not disfigure	6	Eliminated
Which distorts – Which does not distort		Kept

2.4.4. Analysis method for stage 3.

The basis of the expressions compiled and selected in stages 1 and 2 were then grouped together in order to avoid redundancy. An Affinity Diagram [21], a method used to arrange ideas, was created and then used to organize them into groups with each one being allocated a title that expressed the

essential idea. Two members of the research team and experts in landscape and the two non -experts took part in this stage. Of the 66 initial expressions (34 from stage 1, and 32 from stage 2) the definitive list of expressions came to 44. Table 4 contains the results:

Tab.4.Definitive list of expressions.

Expressions		
Abstract	Integrated	Striking
Artistic	Interesting	Subtle
Attractive	Large	Suggestive
Blends into the background	Mimetic	Traditional
Boring	Neat	Tremendous
Camouflaged	Nice	Ugly
Complicated	Orderly	Uniform
Diffuse	Original	Unnatural
Discrete	Pleasant	Unorderly
Distinguished	Relaxing	Unpleasant
Formal	Simple	Unsettling
Fun	Singular	Untidy
Harmonious	Spectacular	Volumetric
Impressive	Strange	Which adapts

3. Conclusions

In the field of landscape integration of architectural designs in an urban setting, hardly any research papers have taken into account citizen participation. This paper attempts to provide a qualitative approach (using focus groups) so as to incorporate the opinion of citizens into the definition of the semantic lexicon to be used to evaluate the urban setting.

From the focus-group sessions carried out, we were able to establish a set of semantic variables that will form the foundations of surveys to analyze the efficacy of the different color strategies used for the visual integration of architectural designs that impact on the landscape.

The advantage of this technique is that it allows one to introduce a set of variables into the questionnaire that can be easily recognized by the observer. The suitable definition of these variables is essential for its later correlation with the final evaluation of the intervention or with the design variables.

Although the semantic lexicon arrived at is particular to a population and the specific setting under study, the methodology itself can be easily extrapolated to other fields of study or other sectors of society.

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