

## Does the individual's gender influence the perception of the built environment?

Ana Paula Bonini Penteadó<sup>1</sup>Ms, Alfredo Iarozinski Neto<sup>2</sup>D Sc, Ana Carolina Bonini Penteadó<sup>3</sup>Bach

R. Dep. Heitor Alencar Furtado, 5000 - Campo Comprido, Curitiba - PR, 81280-340

<sup>1</sup> anapaula\_bpenteadó@hotmail.com , <sup>2</sup>alfredo.iarozinski@gmail.com, <sup>3</sup> anacarolina\_penteadó@hotmail.com

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### 1 Context

The individual perceives the built environment through their experiences, expectations and preferences. Rheingantz (2000) states that the quality of the place, in addition to inducing the human well-being, designates preferences, expectations, land valuations and trade. Bergan (2005) points out that housing is able to move preferences, values and needs, leading to the user's satisfaction condition.

Norman (2008) states that emotion is an essential element of life, influencing the way people feel, behave and think. Simões (2005) points out that the perception and cognition studies, help to carry out interventions in an environment and vary according to the experience of its members.

This research has the objective to identify if the individual's gender can influence the perception of the built environment, through changes in design features. Thus, it aims to assist designers so that, from the perception of users in relation to project characteristics, can develop projects that address satisfactorily the users of these environments.

### 2 Method

The work was carried out using an inductive approach to research, with exploratory objective and quantitative bias. As the main procedure, the experimental method was chosen because it allows obtaining primary data systematically.

The first step in the experiment was the definition of design features to be analyzed. Then nine images of a living room were created in a 3D program and contemplate the

following design features: high ceilings and low ceilings; natural lighting (with higher and lower incidence); artificial lighting (with higher and lower incidence); warm color and cold color.

The scale PANAS (Positive and Negative Affect Schedule) was chosen according to Gendera et al. (2010) was developed by Watson, Clark and Tellegen (1988) for the evaluation of emotions due to its occurrence intensity, and in total were twenty emotions, where it is alternated positive and negative affects.

The first part of the experiment was a questionnaire which included information about the participant's profile. After completing the first part of the questionnaire, the next part was to show participants the nine pictures, each picture, presented a list of 20 emotions, to which the participant completed the intensity felt.

The intensity scale was based on the Likert model seven points ranging from -3 to 3 and -3 and 3 differed totally agreed completely. Thus, through the visual stimulus, participants should note the perceptions / emotions felt by observing the images.

Once prepared, the experiment was applied to 120 students of Architecture and Urban Planning courses and Civil Engineering in a University. Each image was designed in the classroom during the period in which the participant responded to the questionnaire, and changed the image to the questionnaire completing the termination referring to the image. The first to be shown is referred to a reference image. From the reference image changes in relation to the design features analyzed were made.

Of the total participants, 58% are female and 42% male. As for the age of the participants, 83% are under 25, 14% are between 25 and 40 years and only 3% are between 41 and 55 years. In relation to the profession, 57% are civil engineering course and 43% of the course of Architecture and Urbanism.

### **3 Results**

For the analysis of the images used in the experiment, the graphics with the medians of the responses of the participants were from the radar type. This graph model was chosen due to its shape being close to the model PANAS Feeling range, because that way, the graph display and model are nearby.

Feelings were grouped so that the top of the chart show the feelings associated with high positive affect, pleasure and strong commitment and the bottom of the chart show the feelings related to low positive affect, weak commitment and displeasure.

The aim of the experiment was to analyze the difference in perception of the participants of the experiment in relation to gender. The data were tabulated, separating the responses of participants by male and female.

According to the analyzes conducted and data obtained, it was noted that there is the perception of intensity differences, being more intense in some cases and the like in others.

Regarding the perception of the participants when they observed the image with high ceilings, the result was similar, varying only the intensity of some feelings.

For the image with low ceilings, the intensity of feelings also occurred differently among participants, but the perception was the same in both the feelings of negative affection genres had higher intensity.

In the analysis of the higher incidence of natural light, the results were similar because for both genders, the top of the chart where the feelings of affection positive intensity was higher.

For lower incidence of artificial lighting in the environment, the result was the opposite of that observed with the higher incidence of illumination. Both for participants females as the males, the intensity of the feelings was higher for the related negative affect.

After analyzing the incidence of natural light, it was verified the participants' perception of the experiment for the incidence of artificial lighting.

Male participants, observing the environment with higher incidence of artificial lighting, showed greater intensity the feelings related to positive affect. This shows that the highest incidence of light in an environment, creates feeling of comfort independent of the user's gender.

Next it was shown to the participant, the image whose incidence of artificial lighting is low and the environment is in the dark. The results showed that the intensity of feeling is different when compared to the gender of the participants.

Unlike the male, the female participants feel less comfortable in an environment with this feature.

The latest studies concern the color used in the environment. The characteristics were tested for the hot and cold colors. In assessing the warm color, the results are similar because in both groups the feelings of negative affect are more intense.

The use of color in hot environments, both the male and the female are not comfortable when exposed to this situation, and the feelings related to negative emotions are more intense in this situation.

After analyzing the warm color, the environment analysis using cold color was conducted. In this design feature we noticed a difference in intensity of feelings, but the perception of the environment was the same.

Thus, both the participants were male as female, they feel comfortable in cool colors environments. Compared with the previous feature, it is observed that users felt uncomfortable with the warm color image and comfortable with a cool color. This situation, the cool color is more evident in males.

## **4 Conclusions**

By analyzing the answers of the participants of the experiment, it was possible to realize that both participants males as females feel comfortable in rooms with high ceilings and uncomfortable with low-ceilinged.

It was also found that both genders are comfortable in environments where there is the incidence of natural lighting and uncomfortable in environments that have low incidence.

Environments with higher incidence of light in an environment generate the feeling of comfort independent of the user's gender.

For environments with warm colors, the discomfort is felt by both genders.

The individual's perception of aspects and gender influence the perception of the individual in relation to the built environment and design features. It was found that feelings related to the gender of the individual in relation to the design features, makes it feel more or less comfort.

Such aspects analyzed can help the process of design by providing greater well-being to the end user of a project, bringing the sensations of comfort and creating projects that can be more personalized, according to the genre in question.

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