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**The Role of Personal Characters on the
Residential Space List**

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The Role of Personal Characters on the Residential Space List

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Abstract

This study is applied with the objective of promoting the architects awareness of users' demands. Particularly, it is an effort for analyzing the probable relationships between personality characteristics (in terms of extroversion and introversion) and light desirability in general, as well as association between first factor and desirability of red and yellow lights.

Accordingly, 100 students in a simulated area as bedroom, responded a personality inventory, a light quantity inventory, a red light desirability test and a blue light desirability test. Eysenk personality inventory evaluated extroversion-introversion variables. Data was analyzed using SPSS. According to the results, there is a significant association between these two personality factors (introversion and extroversion) and light desirability.

Study questions:

Is there any significant difference between different characters in relation to light intensity?

Is there any significant difference between different characters in relation to light color?

Keywords: Light Intensity, Extroversion, Introversion, Favorable Space.

Introduction

Precise familiarity with users by architects has been ever under consideration and concern of architectural society. Plenty of buildings with aesthetic criteria that are accepted by wide range of professional society are assumed to be boring and inappropriate as the viewpoint of real users. This difference in evaluation is sometimes observed among the users, i.e. the audiences of architectural space have not equal perception of positive or negative characteristics of space. Ethnic, cultural and social differences may be reasons thereof. In this study, we intend to associate some psychological elements with space desirability characteristics for human, i.e. attempt to get aware of probable difference between different characters in ideals of architectural spaces. In case of proving this hypothesis, the architects must take the individuals characteristics into consideration, more than before, for design of architectural spaces and particularly design of house for known user.

On the other side, introversion and extroversion has been accepted by the people as an important categorization in psychology. introverts with characteristics such as interesting in emotions and personal thoughts, taciturnity, meditation, depression and concern and non-interesting in mass communication, comparing to extroverts with characteristics such as honesty, loquacity, interesting in communication with new people, motivation for exciting activities, high risk-taking and rapid decision-making are situated at the two ends of a spectrum (Hashemlou, 2007). Based on our hypothesis, the light desirability will not be equal for these two groups in architectural spaces and particularly residential spaces.

On the other side, color lights in various ways may have fundamental effects on the life. For instance the effect of light color on the human emotions has been accepted (Story, 2012, p. 30). Considering the different temperatures of colors, the human states are affected and even may create the sense of scaling (Story, 2012, p. 12). Therefore, second hypothesis has been expressed as below: There is a relationship between red light (hot) desirability and characteristics such as stimulation of neural system and intensification of emotions and attraction (Loscher, 1923, p. 78) and blue color (cold) with characteristics such as relaxing and harmony making (Loscher, 1923, p. 87) and personality of humans (introversion and extroversion).

On the other side, according to the theory of Gafman, peoples' behavior is different in clear and hidden areas and their real characteristics are revealed more in hidden areas such as bedroom and bathroom etc. (Altman, 2011, p. 46), therefore in this study the light desirability rate for the both groups has been evaluated in bedroom.

Methodology

The present study is a correlative study and applied based on questionnaire including three distinct inventories such as personality, light intensity

desirability and red and blue light (hot and cold) desirability. Upon raising simple but different questions, we attempt to identify the real demands of people and evaluate the probable correlation between these demands and their personality.

According to the instruction, 57-item questionnaire and answer sheet of Eysenck was provided to the candidates and to obtain the actual results, while collecting the statistical data of sample group, they are asked to cooperate with a researcher for applying a research work and requested to study the instructions before answering the questions and then answer them honestly and after filling, answer sheets related to research were collected.

At the final stage, answer sheets of Eysenck test were used. So, the score of sample group (N=100) was obtained for introversion-extroversion scales and experimental data was set for statistical operation. In continue, 30 persons were assumed as introverts with the score of 13 and lower, and 30 persons obtaining 17 and higher were evaluated as extroverts. The remained 40 persons obtained 14, 15 and 16 were omitted as people obtaining the extroversion score and were instable in mental emotions and were not evaluated in t-test. Ultimately, this data of two equal groups (group 1: N30 as introverts and group 2=N30 as extroverts was analyzed aiding SPSS.

According to independent samples test tables, in case the significant relationship between evaluated elements is proved that Sig (2-tailed) obtained from t-test equals to 0.05 or higher.

Psychological Test of Individuals (Classification of People to Introverts and Extroverts)

Eysenck Questionnaire (Eysenck, 1964)

This test was made by Johns Eysenck and Cybil Eysenck and later was translated by Dr. Mohammadtaghi Baraheni to Persian and then normalized. This test includes three parts; first part emphasizes on the rate of lying. Second part deals with identification of extroversion and introversion variable and third part assesses the emotional stability or instability.

The above test is categorized in two-option objective tests and has a high validity and reliability. For interpretation, scoring and implementation of above test, we face equal conditions and know that we have tools with standard conditions (Taherkhani, 2006, p. 55).

Interpretation of Eysenck Questionnaire

This questionnaire has been made with the objective of measuring the introversion and extroversion and neuroticism and has a lie detecting scale that assesses the effort for good manifestation. This questionnaire comprised of 57 items and 3 scales including N, E and L (Taherkhani, 2006, p. 56). E scale (Introversion) and N scale (Neuroticism), our lie detector scale has 9 questions. If the individual's score in this scale is higher than 40, it is concluded that the

individual has not answered the questions honestly and manifested him/herself better than his real personality, therefore the individual's score in other scales may not be relied.

24 questions have been assumed for "introversion-extroversion" scale. In this scale, the score 13 to up include extroversion and score lower than 13 includes introversion. Neuroticism scale also contains 24 questions. If the individual's score in this scale is higher than 10, the individual emotionally is instable or so called is neurotic.

Light Intensity and Color Desirability

Technically, it is important to know to which extent a surface is exposed to light, because the human is willing to see the objects on this surface without exhausting the eyes by light radiation. "Human eye mechanism depending on the varied wavelength shows different sensitivity to the visible radiations" (Zieseniss, 2010, p. 5). In lighting calculations, the light is commonly measured by Foot-Candela unit (or lox in metric system) (Carlen, 2009, p.51). Light intensity unit in this paper has been assumed as lox. The light intensity of a lox includes the light arising out of radiation of a loman on a surface, 1 square meter in area (Zieseniss, 2010, p. 8). In the present study, whereas the eye may not determine the light intensity, loxmeter has been used for its measuring. Loxmeter is an instrument for measuring the light intensity according to lox unit. The respective instrument senses the light intensity on the sensor surface and shows the light intensity of sensor locating area, according to conversion factors allocated to digital instrument (Zieseniss, 2010, p. 8). In this research, this instrument has been used for measuring the light in five different points of room at 70 m height of floor. The average of these five points has been assumed as general light of room and controlled so that to fix this "average in the suggested standard of Iran means 100 lox for general space of bedroom" (Golmohammadi, 2010, p. 241). The light in this space is supplied only through windows, thus it is a natural light and the favorite light is controllable using the curtain.

The National Light Committee of Institute of Standards & Industrial Research of Iran has offered values for minimum light intensity for the most areas such as residential, commercial and industrial areas as following table: Observance of the minimum value is mandatory and it is recommended to use the proposed values. In the last column of this table, the light intensity recommended by American Light Engineers Society has been provided for comparison.

Table 1. *Light Intensity Table Recommended by Light Committee of Institute of Standards & Industrial Research of Iran for Residential Areas.*

Area	Minimum value of Iran (lox)	Proposed value of Iran (lox)	American Light Engineers Society (lox)
Living room and dining room	70	200	160
Study room	150	500	320
Kitchen	100	200	540
General light of bedroom	50	100	
Bed light in bedroom	200	500	
General light of bathroom	50	100	
Mirror (for shaving) in bathroom	200	500	
Stairways	100	150	
Corridor, portico and elevator	50	150	

(Golmohammadi, 2010, p. 241)

For supplying the blue lights in this study, color bulbs 20w in blue and red colors of LED type have been used. Use of artificial light for second part of study that focuses on assessment of light color attraction based on variety of personalities.

The examinees individually entered into this space that had a 100 lox light and answered the questions related to light intensity desirability means light adequacy. Then, upon lightening the red and blue bulbs, questions were asked about respective color desirability separately to specify the desirability of their favorite light color. This process is implemented before questions related to Eysenck personality test.

Inferential Analysis

First Hypothesis

The light intensity desirability is different in introverts and extroverts.

In order to examine if the light intensity desirability is different in introverts and extroverts or not, t-test (mean of two independent populations test) is used.

Table 2. *Evaluation of Light Intensity Desirability in Two Introverts (1) and Extroverts (2)Ggroup*

➔ **T-Test**

grup	N	Mean	Std. Deviation	Std. Error Mean
nor 1	30	8.3333	2.70801	.49441
2	30	6.7667	2.50080	.45658

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
nor	Equal variances assumed	.658	.421	2.328	58	.023	1.56667	.67299	.21954	2.91380
	Equal variances not assumed			2.328	57.636	.023	1.56667	.67299	.21936	2.91398

According to independent samples test table, assuming the equal variances, statistic of t test and p (significance level of test-sig) respectively equaled to 2.328 and 0.023, and because p value is lower than 0.05 (error level), H0 concerning equality of the effects of light intensity desirability in introverts and extroverts is rejected. It is concluded that this desirability differs in introverts and extroverts and there is a significant difference between light intensity desirability between these two groups.

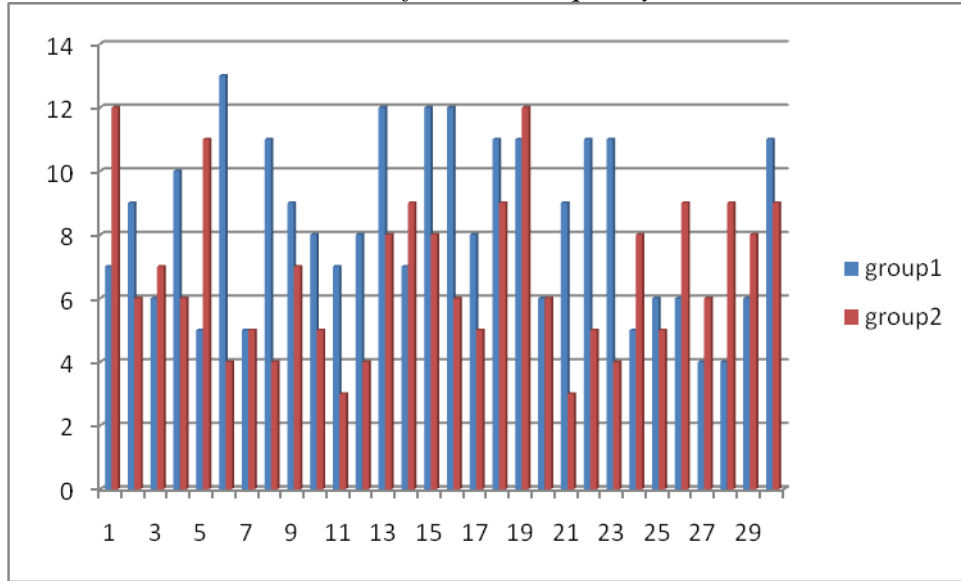
In this test, hypotheses 0 and 1 are explained as below:

H0: Light intensity desirability in introverts = light intensity desirability in extroverts

H1: Light intensity desirability in introverts ≠ light intensity desirability in extroverts

According to group statistics table that shows the descriptive statistics related to light intensity in introverts and extroverts, whereas the average of light intensity desirability in first group (8.33) is more than second group (6.76), intuitively it is concluded that light intensity desirability differs in introverts and extroverts and first group people express more reaction thereto.

Diagram 1. *The Histogram of Light Intensity Desirability as the Viewpoint of Introverts and Extroverts in Lieu for their Frequency*



Second Hypothesis

There is a significant relationship between introverts and extroverts in relation to blue light desirability (representative of cold color).

In order to analyze the significant relationship between introverts and extroverts in desirability for selecting blue light, t-test (mean of two independent populations test) was used.

Table 3. *Evaluation of Blue Light Desirability in two Introverts (1) and Extroverts (2) Group*

➔ **T-Test**

grup	N	Mean	Std. Deviation	Std. Error Mean
abi 1	30	3.1333	1.54771	.28257
abi 2	30	3.2667	1.63861	.29917

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower		Upper
abi	Equal variances assumed	.081	.776	-.324	58	.747	-.13333	.41152	-.95708	.69041
	Equal variances not assumed			-.324	57.812	.747	-.13333	.41152	-.95714	.69047

According to independent samples test table, assuming the equal variances, statistic of t test and p (significance level of test-sig) respectively equaled to -0.324 and 0.747, and because p value is higher than 0.05, H0 concerning equality of blue light (as a cold color) selection desirability in introverts and extroverts is accepted. It is concluded that in the sample of this study, introverts and extroverts have equal tendency to select the blue light.

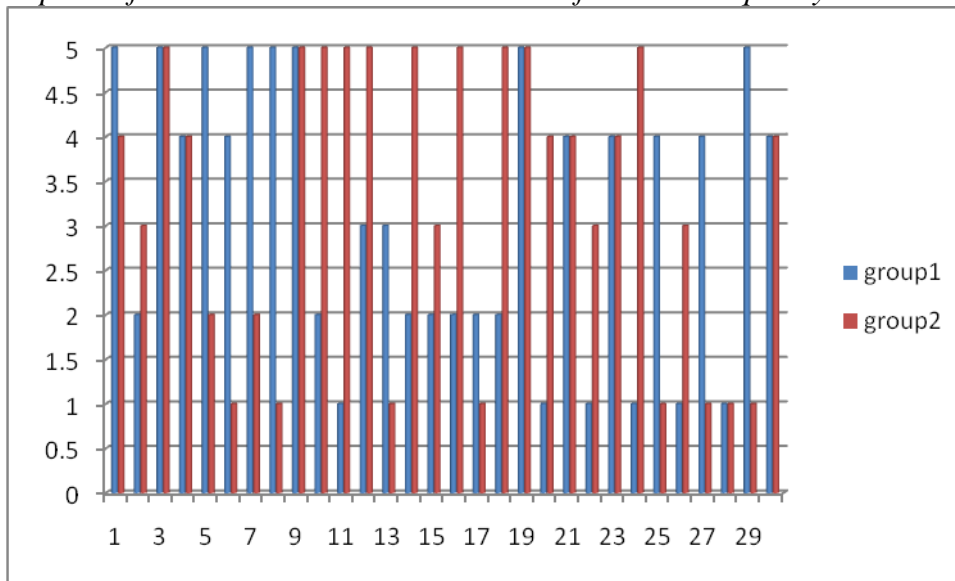
In this test, hypotheses 0 and 1 are explained as below:

H0: Desirability of blue light selection in extroverts = Desirability of blue light selection in introverts

H1: Desirability of blue light selection in extroverts ≠ Desirability of blue light selection in introverts

According to group statistics table that shows the descriptive statistics related to introverts and extroverts' reaction to blue light, whereas the average of blue light selection desirability in first group (3.13) is almost equal to the average of second group (3.26), intuitively it is concluded that blue light selection desirability indicates no significant difference between introverts and extroverts.

Diagram 2. *The Histogram of Blue Light Selection Desirability as the Viewpoint of Introverts and Extroverts in Lieu for their Frequency*



Third Hypothesis

There is a significant relationship between introverts and extroverts in relation to red light desirability (representative of hot color).

Table 4. *Evaluation of Red Light Desirability in two Introverts (1) and Extroverts (2) Group*

➔ **T-Test**

grup	N	Mean	Std. Deviation	Std. Error Mean
germez 1	30	2.8667	1.40770	.25701
2	30	2.8667	1.25212	.22861

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
germez	Equal variances assumed	.741	.393	.000	58	1.000	.00000	.34397	-.68853	.68853
	Equal variances not assumed			.000	57.222	1.000	.00000	.34397	-.68873	.68873

According to independent samples test table, assuming the equal variances, statistic of t test and p (significance level of test-sig) respectively equaled to 0.00 and 1.00, and because p value is higher than 0.05, H₀ concerning equality of red light (as a hot color) selection desirability in introverts and extroverts is accepted. It is concluded that in the sample of this study, introverts and extroverts have equal tendency to select the red light.

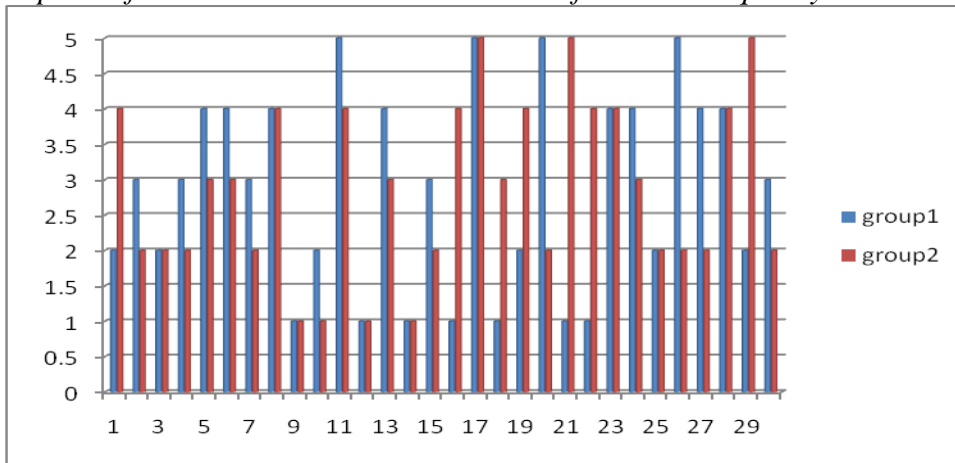
In this test, hypotheses 0 and 1 are explained as below:

H₀: Desirability of red light selection in introverts = Desirability of red light selection in extroverts

H₁: Desirability of red light selection in introverts = Desirability of red light selection in introverts

According to group statistics table that shows the descriptive statistics related to introverts and extroverts' reaction to red light, whereas the average of red light selection desirability in first group as introverts (2.866) is almost equal to the average of second group as extroverts (2.866), intuitively it is concluded that blue light selection desirability indicates no significant difference between introverts and extroverts.

Diagram 3. *The Histogram of Red Light Selection Desirability as the Viewpoint of Introverts and Extroverts in Lieu for their Frequency*



Conclusion

In this study, after requesting the students for honestly answering to questions, they were avoided to get aware of standards of simulated room light and were asked to imagine the available light required for their personal bedroom, where needs a great calmness. In continue, they were asked to answer the questions that indirectly specified the light quantity desirability, based on standard range, in introverts and extroverts. Considering the analysis of statistical data, introverts demand for higher light in their bedrooms than the extroverts.¹ Desirability of more light as the viewpoint of introverts comparing to extroverts demonstrates that attitude to individuals' personality is an important and necessary factor in design. Accordingly, it is concluded that suitable space for each person will be varied depending on his/her personality characteristics. Consequently, it is required the architects to design, at least for spaces that have known and specified user, based on their characterization.

The results of this study indicated no significant relationship between selection of blue light for creating a space with cold color and selection of red light for creation of a space with hot color, proportional to personality of introverts and extroverts. In relation to second and third hypotheses, if statistical data was evaluated based on preferring lighter colors such as yellow and green (instead of red and blue dark colors), probably exacter results were obtained. Moreover, if more people were tested as population or they were evaluated in a residential house so that the samples felt more relatedness to the room simulated in dormitory environment, then probably the accuracy of second and third hypotheses was proved more precisely and the findings had more validity.

¹It may be construed by tendency of introverts to escape from loneliness and depression. As if the extroverts after interaction and frequent communication with people demand for less light in their bedrooms for reaching to a desirable solitude and calmness.

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