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INVESTIGATING THE EFFECTS OF THE USER'S EGO STATE ON COLOR SELECTION IN RESIDENTIAL INTERIORS [1]

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Abstract

Objective
The present study aims at identifying a suitable color for space given the dominant ego state including inner child, adult, and parent within the user in order to set an applied guideline to establish an effective interaction between space and human being. The main objective of this research has been the presentation of the significance of color within the environment based on the principles ruling the human mental and ego states.

Methodology
This study relishes a correlational method to evaluate the relationship between two variables including the ego state – as an independent variable, and the type of selected color – as a dependent variable. The data collection for this study was done as a field survey through a questionnaire and library studies to become aware of the past literature and through a correlation analysis of data using Pearson Correlation Test and SPSS software.

Conclusions
Investigation of the results achieved from the field research showed that there is a high correlation between the inner child and interest in happy colors, and that, when in moderate ego state, people show higher tendency to bright colors which are included in the inner child's area of interest. On the contrary, a better color choice suitable for people may help them achieve a better feeling, i.e. a moderate ego state and autonomy. This is achieved when both identification of the user and discretion of the designer go together concurrently to provide the user with an inner peace and satisfaction and cause him to reach a mental health promotion.

Originality
In this paper, has been tried to investigate the relationship between the inner interests of human beings and one of the important elements of architecture, color, by using one of the

[1] This article is based on Ms. Taherysayah's class project at university of Tehran, which is written under the guidance of Prof. Okhovat. So the corresponding author of this article is Prof. Hanie Okhovat.

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psychological discussions known as Transactional Analysis, which has never been before, and can help in Immediate cognition of user by the designer. This paper can be useful for designers, architecture students, professors and specially researchers in the field of environmental psychology.

1. Introduction

The human surrounding environment possesses certain features which we may not perceive consciousnessly, but, they leave deep effects on our affairs and spirit. Our mood, work performance and even physical health are influenced by sensory input which we receive constantly from the abovementioned environment. Numerous works and studies have already been performed on meaning, environment, and local identity, but less have dealt with the issues such as how to make a place meaningful and establish a correct interaction between the environment and human being. Books and articles in environmental psychology emphasize mostly the idea that "shaping urban spaces and future buildings should be accomplished based on the effects of environmental psychology on making the future buildings enjoy a certain identity via the human approach (Jahanian & Talebian, 2013). This, however, has not been treated in detail and classified and "our present knowledge regarding the impact of the environment on human beings have little real basis" (Joines & Stewart, 2012a). This research aims at exploring a new way of presenting principles to offer an effective and convenient space, unique to the user. This study embarks later on reaching equilibrium and giving an architecture-driven treatment via adoption of appropriate spatial elements based on identification of the user and his interests and activities. Environmental psychology is an intricate study of people and their surrounding environment. According to Gifford (2014), environmental psychology is different from the main discipline of psychology since it deals with the daily physical environment. This science provides a framework which consisted of certain standpoints, researches and hypotheses that provide us with a better understanding of interaction between a man and his surrounding environment. Most of the previous relevant studies deal with those behavioral dimensions which are observable and measurable. Environment, as a set of stimuli, is investigated given the responses received from the entities.

In line with the extensive developments in psychology since 1970 which have made the recognition of human being to be easier, the environment in which a man is going to live is expected to present his convenient mode and desired concepts and senses. *Transactional Analysis* is a new and key theory which is related to personality development. The current study makes attempts to revive the unnoticed dimensions of personality in order to balance the ego state and enables a man to experience a moderate ego state[4] throughout his life using the elements and features of the environment, i. e. color herein. Based on transactional analysis theory, a man achieves a strong and healthy personality, autonomy and effective problem solving when all three dimensions of his ego state are alive, active and in a moderate status, and this could be considered as an environmental contribution to humans. Considering the hypothesis and testing the assumption that the child ego state is inclined more to happy and deep colors in his surrounding environment, this research is going to prove the capability of architecture in producing equilibrium in ego state of humans. This is possible by setting the stage to allow a specific ego state for each color within the environment to emerge.

[4] A pattern of emotions and experiences as a behaviour comprising three groups of child, parent and adult

It is possible to reach a deeper recognition of the users in environments in the near future by using the modern psychology as well as architecture science in order to achieve better and more satisfying results; otherwise architecture would stay away from its human contribution role and seen solely as a luxurious matter. Taking individual interests and behavioral dimensions into account via exploration of the ego state make it possible to reduce as much as likely the error risk and project failure probability to the extent of the controllable factors.

In this study, first the spatial behavior of people in residential areas is identified, and the ego state, afterward is fully defined. Following elaboration of the fundamentals of color and its impacts, the purposes of change are presented; the next parts discuss the questionnaire and present analysis of the results. Given the different interests of people in different areas, the figures which resulted from the assessment of parent[5], adult[6], and child[7] would definitely be higher or lower than the total average; but, the total ratio of the state of child to interest in happy colors is the same. The present research is set out to achieve an applied model in order to access a human-driven place.

2. Research Methodology

This study uses a correlational method in which the dominant ego state within each statistical sample and their interests in happy colors are independent and dependent variables, respectively. The main hypothesis in this study is a positive correlation between the child ego state and his interest in happy colors. In order to collect the data, the library method was adopted to study the available resources on human spatial behavior, and fundamentals of colors and their effects on human beings, and also the relevant field studies were conducted by using an architectural and psychological questionnaires distributed among 30 statistical samples. It is worth noting that the ego state questionnaire was received from Delphi Institute which was translated and distributed, and the questionnaire on color within residential areas was developed by the researchers of this study in line with the fundamentals of architecture and color. The data analysis and determination of correlation degree among the variables were carried out using Pearson Correlation Test and the statistical data analysis software of SPSS. Ultimately, after the presentation of a table of the colors used in the bedroom, the colors appropriate for establishing equilibrium within ego state were modeled to dominate the parent, adult and child states, and finally a solution was also provided.

3. Research Literature

Environmental psychology has emerged and has been discussed in architecture and psychology since 1960. Eric Berne, a Canadian psychiatrist, set forth an issue in 1970 which is currently referred to as Transactional Analysis (TA). TA is a theory of personality and a psychotherapy regular method for personal change and development. This theory provides a representation of human psychology structure and is known to be prominent and significant within different perspectives of psychology in terms of the depth and extensive practical usage (Joines & Stewart, 2012b). As a result of its extensive usage in solving human emotional and

[5] Pattern of commands and forbiddances
[6] Pattern of thinking and ideas
[7] Pattern of feeling and emotions

behavioral problems, its lack of complexity and its simple concepts and practical means, the aforementioned theory succeeded in securing a recognized place as an applied scientific school in psychology and treating the conscious and unconscious problems of humans. Since one of the effective factors on human beings is environment and its elements, and "house is the world of human being or a representation of his interpretation of the world" (Barati, 2004, p. 53), this study is aimed at an unconscious transactional analysis of people within the residential interiors by combining these aspects of architecture and psychology.

4. Spatial behavior of people in residential space

Our surrounding physical environments play significant roles in making our lives meaningful and organized. Our sense to the place where we live is so much connected with our personal identity that makes us highly dependent upon this place and its related experiences, because "a physical environment is created by human beings, used by them, assessed by them and finally is destroyed or protected by them as well" (Namazian, 2001, p. 78). Thus, the concept of house is much beyond a sole shelter and indicates an emotional and significant relationship between people and their residential place. The emotional quality of the environment, including behaviors, physiological developments and mental experiences, is the most significant part within the relationship between a man and his environment, since it is the major factor affecting the mood and situational memories and is able to influence human health. The question that which is the true representation of the emotion has been a challenge in psychology for more than a century.

According to psychologists, the principal objective for designers in design process has been taking form and its aesthetic aspects into consideration. Hence, psychologists believe that designers sacrifice the real routine needs of users for their own abstract aesthetic desires, and they, as a result, have made people unaccustomed to the designed environments more than in the past (Motallebi, 2001). On the contrary, the environmental psychology may be best realized in houses since the habitation of human beings is highly connected with their psychological moods and "could be a potential threat or prosperity for their lives" (Motazedian, 2012, p. 60). The fact that the interior design of house is usually the symbol of residents' feeling about themselves is an old recognized reality. It is even said that "popularity of professional interior design in house demonstrates somehow the inability of people in the implementation of their decisions (in expressing themselves), because they do not know aptly their true self" (Cooper, 1995, p. 88). Therefore, architects today seek methods of presenting an environment for people to live in with their best human personality. Architecture is expected to be driven from and retrieve the context of human life. Furthermore, architecture is not a one-way flow and is not expected to impose a certain design and atmosphere; it is required to provide human beings with an environment where a man can grow freely from any unwanted mental pressure which is counted as a rational demand to every society.

A designer is always faced with numerous variables, rules and limitations; nevertheless, in order to achieve a suitable design, he should pay much attention to human behavior traits within both public and private living interior spaces because his activities are highly related to the human psychological characteristics. Thus "when implementing an interior design, the designer deals with two categories including the user of a space and his desired impact of the context upon the user." (Shaterian, 2010, p. 17) Human needs, ranging from biological needs to self-realization

and cognition consist of house as a shelter, house as a socio-cultural unit, house as a factor of identity, and also house as an environment for human intellectual, emotional, and psychological promotion, and meeting the aforementioned needs paves the way to touch a dynamic ascending trend of progress (Pourdeihimi *et al.,* 2011). In order to satisfy the most significant human needs and identify the effective factors on people's behavior in their surrounding spaces and also the influence of these factors, the following notes should be taken into account.

4.1 Impact of the physical environment on human behavior

Four theoretical viewpoints of Libertarianism, Possibilism, Determinism and Probabilism have been proposed in this connection:

- Libertarianism maintains that the environment leaves no impact on human behavior. This approach is untenable, given that there are serious limitations against the human behavior.
- Possibilism sees the environment as a providing factor of human behavior and even beyond this. This approach introduces the environment as a set of behavior opportunities based on which an act may take place. The physical environment potentials provide people with facilities as well as limitations in which each person is able to make a choice in line with cultural interests, value system, beliefs and attitudes of people.
- Determinism considers the environment as a determining factor of human behavior and puts that the environment-behavior relationship is causal (Lang, 2004).
- Probabilism maintains that although the physical environment provides required facilities for a certain behavior to emerge as desired to an individual, the former investigations indicate that the probability of choosing a number of phenomena in a physical context or a behavioral setting[8] by people is higher than that of other choices.

In a general categorization, libertarianism tries to prove low environmental impact on behavior while the approaches of possibilism, probabilism and determinism maintain higher effects of environment on behavior, respectively (Noghrehkar *et al,* 2010). In addition, probabilism has been a base for most of the recent studies on the relationship between behaviour and environment (Lang, 2004).

4.2 Moods affected by the surrounding environment

The surrounding environment refers to hidden aspects of the physical environment including weather, height, temperature, light, color and noise which have strong and predictable impacts on human behavior and emotion. It could be claimed that the moods and emotions which people experience arise mostly from their surrounding environments. Mehrabian & Russell have proposed three dimensions of Pleasure, Arousal, and Dominance for predicting mood states of reaction to the environment; their model is referred to as Three-Factor Theory of Emotion (Bakker *et al,* 2014). Emotion evaluation refers to the capability of an object or environment in changing the mood state. However, the mood in every situation is associated with an internal state within each individual and the emotion evaluation is related to an object or place in the physical world. Guilford showed that there is a two-way relationship between emotion evaluation and moods. He reported that people with previous state of complacency enjoy more favorable

[8] Behavioral setting or a "place-behavior" is an element of environment analysis which is used to represent the main functions of architectural and urban spaces or their designs. Behavior setting is a concept proposed for the first time by Roger Barker and his colleagues in a study on "psychology of growth" to analyze the social environment and psychological context of children.

ratings than those with previous state of dissatisfaction (McAndrew, 1993). This demonstrates that everything affecting the mood is also capable of affecting the mood reactions to the environment. From an evolutionary perspective, our adaptive system with environment is due to natural selections over time. Our psychological reactions to external stimuli are counted as an adaption to recurring stimuli which have been witnessed throughout the evolutionary history. As a result, the correct adaptation manner between man and his environment eliminates many imbalances.

5. Ego state

Incompatibility of the psychological demand of the space user with the plan is a serious challenge in design. This occurs even in those situations where the user has expressed all his expectations which are realized by the designer; though, the final result fails to satisfy the user. From time to time, we are faced with some situations in which the user finds no justified reason for his dissatisfaction, the design is complete in every aspect, but the fact is that the internal demand of the user has been covered by some normative do's and don'ts internalized within him. The above demand seems unconsciously only in immediate judgements and creates a feeling of dissatisfaction. It goes also without saying that unfamiliarity of architects with identification of the user in using suitable architectural elements plays a vital role in creating such a discontent. Should the designer identifies the user's dominant ego state and internal feelings, he may succeed in obtaining the user's satisfaction, and this realizes more knowledge on the ego state and personality type of each user is achieved. Eric Berne defines "ego state" as "a similar pattern of emotions and experiences which is directly associated with a similar and homogeneous pattern of behavior" (Berne, 1961, p. 13).

Ego State Pattern: "Parent" means do's and don'ts; those behaviors, thoughts, and emotions that have already been removed from the parents, like when we think as our parents do. "Child" means emotions, like our behavior in childhood and the feelings of that period which have been recollected. "Adult" means thinking and reflection, i.e. those behaviors, thoughts, and feelings that are direct reactions to the present time and place, like when we are reasonable (Hargaden & Sills, 2010).

- A person within his child ego state experiences different emotions such as passion, enthusiasm, joy, happiness, aspiration, sadness, crying, etc. at present and he cannot have access to these states without placing himself in the aforesaid ego state. These feelings appear in different circumstances in which one is related to color. The question that what colors cause the child ego state to experience joy and aspiration is the subject which this research is going to deal with.
- A person within his adult ego state demonstrates appropriate reactions in immediate situations of which the thinking and intellection is the main feature. A person at the time of thinking is often placed on neutral ground (even in terms of color) and an unbiased environment so that the decision making process is not affected and the variables effective on thinking are controlled.
- A person within his parent ego state follows rules, do's and don'ts, dominance, power and authority. A senior military officer certainly requires conditions in workplace in which his feeling of power and authority is strengthened where those colors that represent power suit. This person definitely needs to create equilibrium in his ego state by experiencing other

states in diverse situation preferably private spaces. This is possible through environmental encouragements which show the significance of the role of a well-informed designer.

If a circumstance in which a man experiences his desired atmosphere and delight is realized, less changes to achieve a peace would be required more than present. Also in the construction of public buildings, it is very important to note which of the human ego state is preferred and encouraged under the usage of this building, a matter based on which the project planning, designing, and implementation are executed. In this manner, people can recognize buildings without any sign and title solely by exploring the ego state of the buildings provided that the design and implementation processes are performed correctly. In other words, maybe it is true that what is referred to as sense of space is our behavior similar pattern which is directly associated with our emotions and experiences.

Today, through certain approved methods of psychology, it is possible to measure each ego state in a person, to become aware of these states, strengthen some dimensions and reduce some vigilantly. Providing a behavior chart[9] for each person, i.e. every specific user of the space, facilitates shaping and space creation closer to his dominant ego state. If an environment is created and equipped in a way that it is able to conduct the user to a balanced ego state and avoid dominance of a specific state, it provides an environment suitable for the development of states and access equilibrium. Obtaining a balanced state is important since we need “adult” ego state to resolve the immediate problems and cope better with life difficulties; we need principles within our “parent” ego state to be able to adapt to a healthy society; and we need “child” ego state so that we could have access to our childhood spontaneity, creativity, and intuitive ability. Consequently, a healthy and balanced personality needs to see equilibrium among all its three ego states. We make every attempt to provide an environment which makes a balanced ego state to appear, in order to reach this, first the current dominant ego state of the user should be identified, then we need to provide a model using architectural elements to conduct the current state toward an equilibrium, this could be fulfilled using color, form, light, etc.

6. Color and its effects

Observing a color is a psychological reality which is different from its chemical material and this is experienced as a fundamental quality in visual perception. Generally speaking, the eye receives the information of aesthetics, features of materials and benefits of an object. Since color selection affects much the human perception from the internal environment, it contributes to the mental and physical welfare of the users of a specific space (Kwallek, 2009). “The psychological perspective to color reveals our emotional and mental reactions to colors” (Feisner, 2006, p. 3). It is worth mentioning that the development of Psychology of Art have been together with the development of History of Art over the recent decades where the role of art in the treatment of mental disorders is noticeable (Kamali & Javdan, 2012). We require color not only in art and design, but also in medical applications where the color of hospital rooms influences much the improvement of patients (Kumarasamy *et al,* 2014).

[9] A diagram of the amount of Each of the Ego-states; child, adult and parent per person

Therefore, various studies have been conducted on color perception of which each has tried to prove a type of perception, inherent or acquired. Vining (2006) indicated that " it is true that we are all born with same mechanism of perception to see colors, though, reactions to colors from increase of heart rate to feel excited is an acquired communication". Scaruffi (2006), on the contrary, maintains that when a stimulus arises (e.g. a dangerous situation), an area in the brain creates a feeling (e.g. fear) which is conducted through the brain and body to the nervous system, causing a change in the state of the person, and this change is considered somehow a confrontation against the stimulus.

Furthermore, an important persuasive paradigm which acknowledges the inherent perception of color is called Chromotherapy or Color Therapy, and this is an old successful treatment for diseases used by ancient Egyptians, Greeks, Arabs and Indians. In the theory of color therapy, every color is used to treat a specific disease based on its constantly inherent relationship with the endocrine system and metabolism in body. "Color therapy would be impossible without such all-inclusive inherent consequences" (Hettiarachchi, 2012, p. 23). Colors, also, have physiological impacts on the body and health. For instance, red color causes hypertension and a rise in skin temperature (Bleicher, 2012).

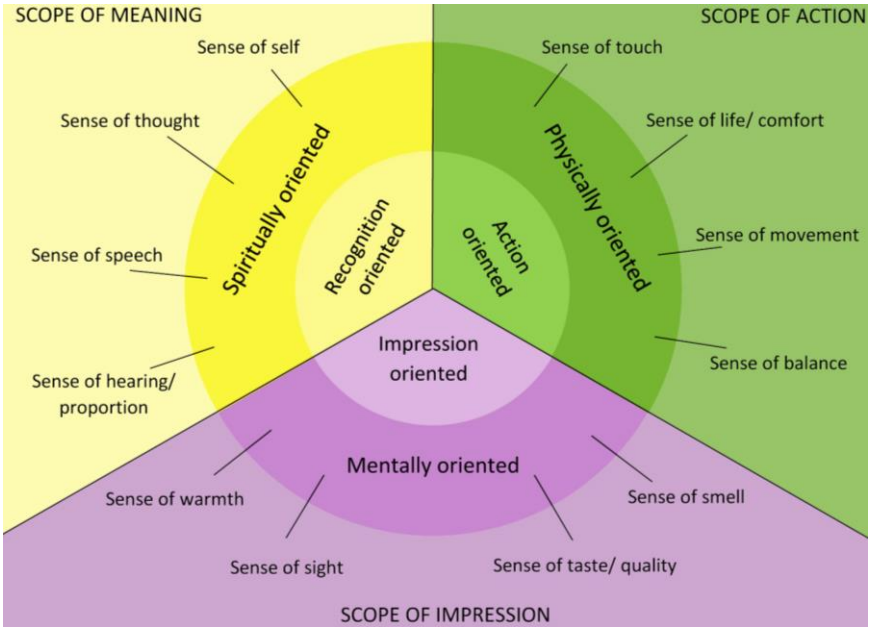
According to Hari (2003), a color therapist, "the modern physics has proved that each color has its own wavelength, specific frequency and energy. Thus, the color we absorb affects the nervous systems and endocrine glands, and as a result, hormone secretion and other organic materials inside the human body. The therapeutic effect of color is effectively used even in Western medicine; as "the blue color'' has been used for decades to treat the Hyperbilirubinemia of babies" (Mahnke, 1996). It sounds generally that color-related feelings may appear as an elegant and sophisticated process comprised of continuous acquired, inherent and congenital reactions in a living organism (Hettiarachchi, 2012).

Given the intricate factors affecting the appearance of feelings caused by color stimuli, consciously and unconsciously, the color experience cannot be systematically classified certainly (Hettiarachchi, 2012). Nevertheless, the color experience pyramid, as described below by Mahnke (1996), demonstrates the reactions to colors in several basic layers:

1. Biological inherent uncontrollable reactions
2. Unconscious reactions of human experience – involuntarily, and thinking-free
3. Conscious symbols
4. Cultural influences, mannerisms, environment, fashion and styles
5. Personal relationship with color affected by other levels

The present research is aimed at inherently unconscious reactions, since the ego state, including parent, adult and child, act within this human dimension. In a fundamental investigation of color and human perception, a study titled "Color: Communication in Architectural Space (2007)" introduced colors as fundamental factors of visual perception and environmental experience. They are the concept and essence of our environmental experience quality" (Meerwein *et al,* 2007, p. 16). This perception and the full spectrum of sensual impression, meaning, and action as experienced in the environment are illustrated in figure1.

Figure 1. **Spectrum of the Senses, based on scopes of impression, action, and meaning**



Source: Meerwein *et al*., 2007. p. 12.

It should be noted that cultural influences in color selection require intercultural studies which make it possible to shed light on color-feeling relationship in different cultures (Kaya, 2004). According to Rapoport, a pioneer in culture-based housing studies, the factor of culture and perception of the world plays an important role in human selections (Rapoport, 1969). However, Mahnke (1996) maintains that although there are open cultural differences, we are well aware that many reactions to color are universal and are beyond the cultural boundaries. This sounds natural that we pay attention often to differences instead of similarities, however, the basic similarities are important in order to perceive human reaction to color particularly when it comes to design of a human space (Hettiarachchi, 2012). The factor of culture was not considered as an effective variable in the present research as a result of the identical cultural items among the statistical population.

Color has a direct emotional impact on people. Warm colors such as red, orange, and yellow are associated with active emotions while cold colors such as blue, green, and purple are associated with calm emotions (Kwallek, 2009). Numerous studies have been conducted on the effects of color on emotions and performance including those conducted by Junko *et al*. (2006), and Wardono *et al.* (2010). Kaya (2004) investigated the relationship between color and emotions referring to color samples in Munsell Color System and exploring the reasons of emotional reactions of students to each color. According to the aforesaid study, color is associated with emotions and moods, and different emotions and moods appear by using different colors or when specific colors are preferred. The results of studying some colors revealed green for calm, joy, peace and hope; blue for calm, peace, and less negative responses such as grief, sorrow and depression; red for joy, happiness, excitement, love and less negative responses such as blood and evil; yellow for joy; and black for authority and grief.

Therefore, the color mental composition is a tool for the recognition of thinking style, emotions and performance. Assisting an individual to uncover his mental state and colors is a contribution

which allows him to recognize himself better. Difficulties may appear unsolvable at first but it is better to trust in the innate talent of people. Irrespective of personal taste, there is a strong recognition flair within human beings to which if any reference is made, it is accounted for a public feeling that dominates the emotional and personal judgements. A combination of the results achieved from the aforementioned investigation as well as the transactional analysis makes it possible to identify the ego state causing these feedbacks, and also the conscious adoption of the aforesaid tacts creates a space to reflect a specific sense and the desired ego state to emerge.

7. Purposes of Change

A reason for adopting the psychological approach in terms of behavior dimension in designing a residential space is to provide a convenient situation for following the autonomy. When a person, actually, experiences an equilibrium in his three ego states, each state acts timely and properly. “Child”, “parent”, and “adult” attain joy, support and reality, respectively, and this sets the stage to touch the autonomy. Autonomy was the ideal and ultimate aim of Eric Berne in transactional analysis. He never defined this concept but described it by saying that “autonomy is achieved once three abilities of awareness, spontaneity and intimacy are released and developed” (Joines & Stewart, 2012b, p. 531). By autonomy he meant that in order to explore his full capabilities, every person as an adult needs to make new decisions on the methods of confronting the life he used to adopt in his childhood. When a person discovers his old methods inappropriate, he has to replace them by other applied new ones. On the one hand, “Contemporary design is primarily the product of complex interactions between teams of people from diverse disciplines. Commercial demands and time pressures often leave little space for innovation” (Burry, 2017, p. 296). However, as transactional analysis puts, each individual is expected to go beyond his old selections and reach what is called independence; since only this allows all the three ego states, i.e. child, parent and adult, to set free from scripts, superstitions and prejudices, to make attempts to find a real cause for events, and to react and present effective solutions according to an accurate perception of reality.

7.1 Awareness

Awareness is defined as an ability to see, hear, feel, taste and smell things as pure perceptions like what a newly born baby experiences. An aware person does not filter his experiences by his “adult” interpretations, but he relates with his own pure physical feelings as well as the external stimuli. This is discussed here because as we grow older, we learn to hide our awareness and criticize the way we and others act. This is reflected in our choices on the surrounding environment elements like color, form and desired emotions.

7.2 Spontaneity

“Spontaneity is the ability to choose from among a wide range of emotions, thoughts, and behaviors. As an aware person experiences the world, a spontaneous person reacts to the world directly without hiding a part of reality or reinterpreting it” (Joines & Stewart, 2012b, p. 533). In addition, “privacy is never supposed to limit the activities of the family members and each family member has the autonomy to engage in various activities in complete freedom” (Hosseini *et al,* 2014, p. 27). Providing proper conditions for spontaneity at the time of design,

and using the direct and overt demands of the user would bring about satisfying circumstances on design.

7.3 Intimacy

Intimacy implies the sharing of emotions and demands openly within a relationship between you and your surrounding setting. The person may touch his “natural child” when experiencing his intimacy. The concept of space intimacy versus strangeness is set forth here.

These three concepts result in the same desirability to which Eric Berne referred, and this is so much difficult to realize. However, it is possible to take steps toward autonomy fulfillment by analyzing the effectiveness and control of architectural concepts which affect, intentionally or unintentionally, the user or audience. Now a question arises here as:

Are all people with dominant child ego state interested more in bright and shiny colors within their surrounding environment?

It appears that every person with any ego state shows positive reaction to colors of the same state. It should be noted that color in more private spaces arise from the personal interests of the user, because like other issues such as dress style, color selection in public places is subject to certain other issues including social norms, pollution degree, and social interactions which prevent people from achieving their desired conditions, as the common dressing colors in megalopolises are grey, dark-blue and black while in tourist attractions like coast cities or entertainment islands the dominant colors are closer to ego state of people. The current researchers see these differences as being resulted from change in social norms from performance-driven environments to those of entertainment and approach of people to their personal ego state. In the cities of the first group, the personal interests are more likely to appear in private places. In order to investigate these cases, this study examines here the private places in houses such as bedroom, living room and kitchen.

8. Questionnaire development purposes and investigation of responses

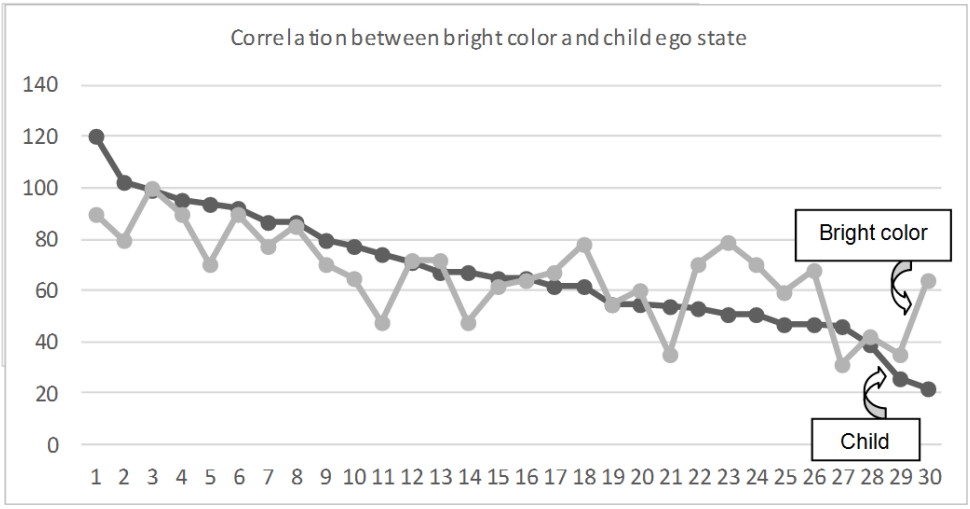
The researchers prepared two questionnaires in psychology and architecture in order to test the proposed hypothesis. The psychological questionnaire helps to recognize it by focusing on the dominant ego state of the respondent, i.e. independent variable (behavior chart). In the questionnaire of “color in residential space” driven by identification of personal interests, the dependent variable of this research was detected. Finally, the results of the questionnaires were examined by Pearson Correlation Test using SPSS software, and the results of data correlation were demonstrated in figure 5. It is worth noting that in our society (Iran) with deep religious beliefs, many behaviors that are known to be appropriate for children are banned or criticized for adults, on account of this, the adult and parent related behaviors appear more in such societies. The results were examined based on the assumption that each person enjoys equilibrium when he experiences all his three ego states equally.

The completed questionnaires signified that from among the total of 30 respondents, 5 (16%) enjoyed child as the dominant ego state, 2 (7%) possessed parent as the dominant ego state, and 23 (77%) had adult as the dominant ego state. Investigation of the achieved figures from the responses (figures 2, 3 & 4) revealed the following results.

According to figure 5, the correlation coefficient between inner child and bright color is closer to 1, more than other ego states. It should be noted that in Pearson test, when the correlation is closer to 1 and the value of significance is less than 0.05, the correlation between the two variables is more significant and the hypothesis is accordingly verified.

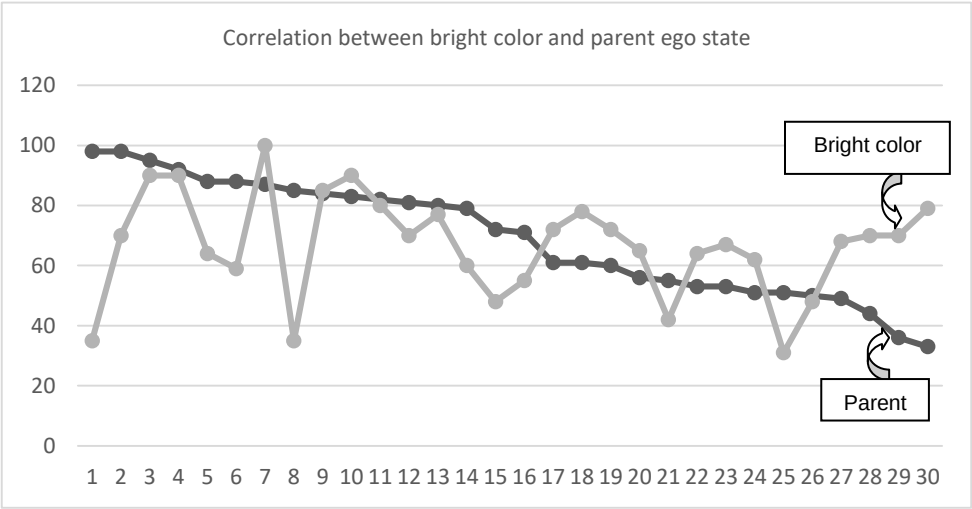
As the results of the questionnaire indicates, taking into consideration the achieved results and given the ratio between ego state and interest in bright colors, it can be said that the proposed hypothesis is verified and interest in bright colors relates directly not only with the inner child, but also with the equilibrium within an individual in terms of balance between all three ego states of parent, adult and child as well.

Figure 2. **Assessment of correlation between bright color and child ego state**



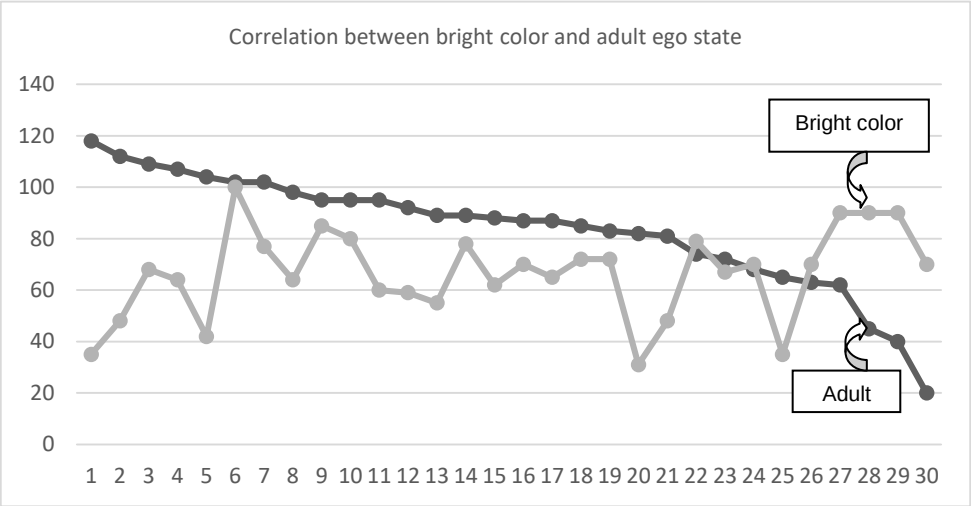
Source: By authors

Figure 3. **Assessment of correlation between bright color and parent ego state**



Source: By authors

Figure 4. **Assessment of correlation between bright color and adult ego state**



Source: By authors

Figure 5. **Pearson Test result; correlation between bright color and ego state in SPSS**

Correlations

		Child	Bright color
Child	Pearson Correlation	1	.639**
	Sig. (2-tailed)		.000
	N	30	30
Bright color	Pearson Correlation	.639**	1
	Sig. (2-tailed)	.000	
	N	30	30

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations

		Parent	Bright color
Parent	Pearson Correlation	1	.136
	Sig. (2-tailed)		.475
	N	30	30
Bright color	Pearson Correlation	.136	1
	Sig. (2-tailed)	.475	
	N	30	30

		Adult	Bright color
Adult	Pearson Correlation	1	-.304
	Sig. (2-tailed)		.103
	N	30	30
Bright color	Pearson Correlation	-.304	1
	Sig. (2-tailed)	.103	
	N	30	30

Source: By authors

Conclusions

Drawing guidelines for a conscious design is always a mental concern to a designer. The present attempt was made and presented as a small sample for paying psychological attention in terms of transactional analysis to space design. Investigation of the obtained results from field study showed that a person enjoying equilibrium in his ego state is more interested in bright

colors which are also an area of interest to the inner child. It could also be mentioned that choosing a suitable color helps a person to reach a better sense, i.e. his ego state equilibrium, and this is realized once we touch a correct understanding of the space user. Following a successful recognition as the first step, the designer takes turn to show tact in the selection of a color combination that suits the ego state of the user and provides him with an inner peace and satisfaction. The notes below should be taken into consideration for the establishment of equilibrium in people.

1. In the event of dominance of "child" ego state and higher interest of the person in bright and sharp colors, in order to balance this and produce an equilibrium in all three ego states, the colors with lower degrees of saturation and brightness could be used in the background of the environment specifically separating elements such as wall, floor and ceiling. Nevertheless, the objects existing within the space could be chosen for the colors desired to "child" state with the possibility of replacement.
2. The dominance of "parent" ego state entails interest in dark and opaque colors. In order to create a balance in this state, the designer can use colors with moderate saturation[10] and brightness[11] in fixed elements of the space in a way far from causing defensive state within the user.
3. In order to produce equilibrium in "adult" ego state with interest in soft and neutral colors, the designer may use traces of colors with high saturation and brightness.

An important note in this connection is that excessiveness would cause rejection and denial of the user. Following the introduction of colors associated with each ego state in table 1, the researcher made efforts in table 2 to represent suitable color of bedroom for each ego state in line with the abovementioned notes.

Table 1. **Colors associated with dominant human ego state**

	Adult
	Parent
	Child

Source: Authors

[10] The amount of white light in color
[11] Intensity of light emitted from the color stimulus

Table 2. **Bedroom color combination for each ego state**

Child	Parent	Adult	
			Dominance of Ego states
			Balance of Ego states

Source: Authors

Definitely in the future, only the architects will be successful and acquainted with the psychology and the real spirit of people, so one of the basic requirements for planning and design will be this epistemological aspect; as if great architects in the past achieved this task with their intuitive sense, but in the age of speed and technology, attainment of a set of almost unit guidelines can be beneficial. Still, some limitations including personality shadows would probably prevent full recognition of users, but the act and will of the designer takes him to new paths.

Hopefully, conducting further studies in all fields of designing would provide us with flexible guidelines and solutions for making the environments and spaces more human-driven and behavior-based.

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