Identification Of Components Affecting Synomorphy And Utilization Of It In Planning Educational Spaces (Case: Faculties Of Art And Architecture Of Tehran)

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Abstract

Today, the lack of milieu- behavior synomorphy is the main problem in public spaces that prevents citizens and other people from using the designed spaces in the city. The problem is also found in the design of educational milieu. This research tries to solve this problem as much as possible using the synomorphy in the educational space, which means the milieu-behavior synomorphy leads to the creation of behaviors tailored to the purpose of design in space. As an applied, descriptive-analytical research, this study tries to identify the spaces affecting students' behavior and their relationship with surrounding milieu using a combination of quantitative and qualitative methods. To do so, College of Architecture and Urbanism of Shahid Beheshti University, the School of Architecture and Urbanism of University of Science and Technology and College of Fine Arts of University of Tehran were selected for case study and then, using analytical hierarchy process, seven common items between them were scored. In this analysis, six indicators associated with behavior and space were selected by the researcher and scored by two groups of experts and students. Using the map of behavioral patterns, the conformity of the mentioned groups' opinions with the model obtained from gatherings in space was obtained by the researcher. Accordingly, the results from the College of Fine Arts and the opinions of the mentioned groups were consistent. However, there was a slight difference in the ranking of spaces at Shahid Beheshti University. And, at the University of Science and Technology, the difference was found greater compared to the other two. According to the research information, it was concluded that the sense of place and the aesthetic concepts were essential indicators in synomorphy, and physical and cognitive elements can be effective in improvement and manner of behavioral patterns and use of space by people.

Keyword: Synomorphy, Educational Spaces Planning, College of Art and Architecture of Tehran, AHP Method

1. Introduction

How can the concept of synomorphy improve the quality of educational spaces? In response, it is suggested that, in cities, there are problems that result from the lack of behavior-milieu synomorphy (Torrington, 2009). In fact, a good city to visit is a city with good opportunities for three basic human activities: seeing, hearing and chatting (Gehl, 2010). As a meeting place, city is a matter of opportunity for democratic exchanges in which people can manifest their joy, sorrow, enthusiasm or anger in street celebrations, demonstrations, performances or meetings (Saghafi, 2016). In spite of the above, sometimes the urban spaces and architecture contain a desirable setting and landscape with visual aesthetic features, and various colors and vegetation and different colored lights are used there to create attractive spaces to a reasonable number. However, the reason for visitor's frustration is the lack of use of these spaces by citizens; so that such beautiful paintings seem to be failed (Torrington, 2009). The community may take various forms, it can be a gathering for a simple cooperation or for a religious cause, as well as a gathering within a tribe or within a city (Alimardani, 2004, 6). Also, in some cases, there are spaces that welcome different groups of citizens, but the behaviors within them are only the necessary ones and citizens avoid social and voluntary behaviors. So, those spaces do not encourage social interactions, and are considered insecure. In this regard, John Lang emphasizes that environmental design regardless of the needs of space users can cause great physiological and psychological damage to humans (Shariati, 2017). Hence, space perception is a major issue in cognitive psychology and there is considerable literature on the subject (Torrington, 2009). Barker (1968) uses the term *synomorphy* to properly describe the fit between a milieu and its users. Accordingly, the school milieu is important for children's development and theories of environmental psychology and various researches on the effect of physical milieu on the promotion of creativity show that some environmental factors

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effectively increase the development of creativity (Shafaei& Madani, 2010).

The fact that educational spaces affect students' learning and their creativity and curiosity (Mamykina, 2002) has been the subject of many decades of study in various fields of environmental psychology in educational spaces and it is believed that individuals' creativity flourishes in collaboration with each other due to the interaction of their ideas (Paulus, 2000). Therefore, new educational models require students' move and their teamwork. The relationship between milieu and behavior in educational milieux is considered as a major challenge in the design of these spaces (Shafaei& Madani, 2010). In higher education system, the point which is central to the definition of quality is the views and opinions of the audience, and quality is subject to the observer. Observers and audiences interpret quality themselves and define it according to their point of view (Bazargan, 2001). Therefore, in universities, it is possible to create and consider a flexible space capable of identifying and adapting to the demands of the user, so that, with the ability to change size, create open spaces and reduce private space without using and converting them into public space, it increases comfort and optimality of spaces and plays an important role in promoting social interactions (Mirzazadeh Niaragh, 2015, 1). The main problem is the lack of examined relationship between milieu and behavior in those spaces, and, as a result, a deterministic approach is implemented in their design. In other words, the use of new physical-spatial models in eliminating the contradictions between the physical milieu and the resulting behavior is an important principle in this field. So far, suitable ideas have been proposed in developed countries for the milieu- behavior synomorphy in the design of educational spaces, such as the idea of a *school without walls* or *school as a community*. Unfortunately, in Iran, such interactive view between behavior and physical context is not found in educational setting. In order to manage the issue, milieu-behavior synomorphy can be considered as a solution to reduce the mentioned conflicts so that body and behavior are considered in parallel in architecture. This article tries to examine the School of Architecture and Urbanism of the University of Tehran in order to discover the elements and spaces marked appropriate by the students, which are ignored by the authorities, in accordance with their needs.

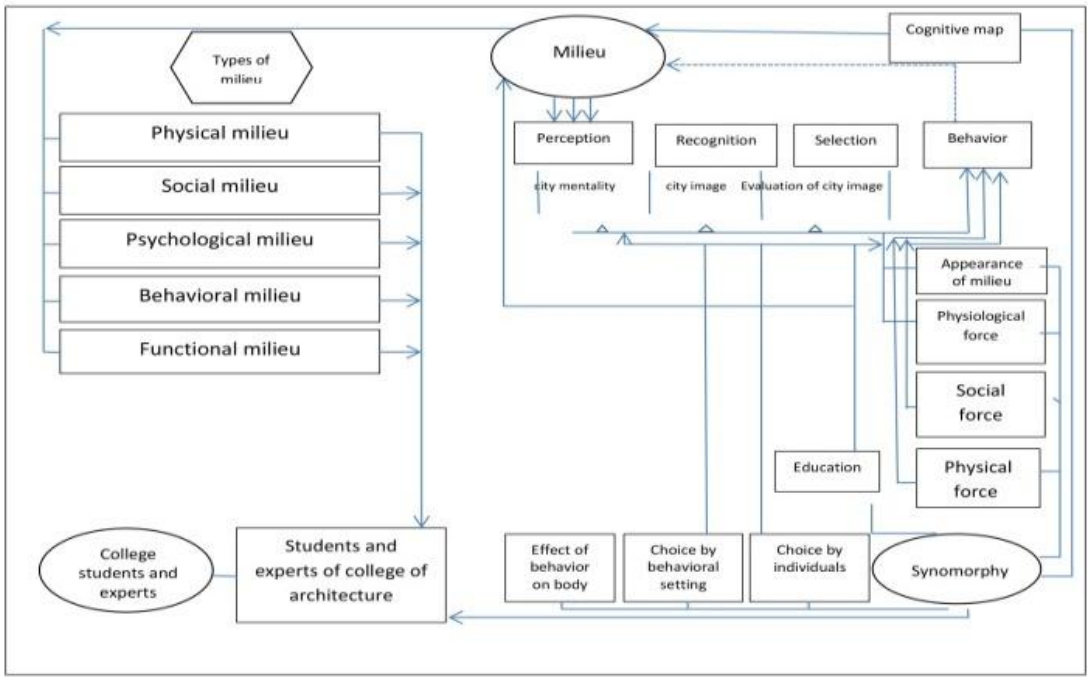

Fig 1. Theoretical Framework Of The Research

2. Theoretical Foundations

2.1.Milieu

Watson believes that milieu shapes human behavior, and human behavior can be changed by controlling the milieu (Farhad, 2009). Architects, psychologists, sociologists and geographers have different definitions and classifications of milieu according to their field, and it is difficult to find an exclusive definition (RahiqAghassan, 2018). Accordingly, spatial data, social, cultural, physical aspects, and symbolic, geographical, historical and biological architecture are considered as important dimensions of milieu (Mortazavi, 2001, 6).

In the research conducted by environmental or ecological psychologists so far, particular attention has been paid to the physical-architectural dimensions as well as symbolism and biology, because it was assumed that research on social and cultural dimensions included other specialties such as social psychology, cross-cultural psychology, anthropology and so

forth (Farhad, 2009). Koffka (1935) was the first to distinguish between geographical milieu (absolute space) and behavioral setting (relative space). He acknowledged that geographical milieu is not a stimulus or set of stimuli, but a stimulus provider, and mediators of behavioral setting (cognition, perception, attitude, etc.) clarify the relationship between geographical and behavioral settings (Downs & Stea, 1973, 5). In fact, the milieu of surrounding space is the main criterion of definition. Human milieux include land, living, social, and cultural content. Architects create potential milieu for human behavior, and individuals use and admire the milieu that affects them and influences the behavior and spiritual reactions of people consciously or unconsciously (Shariati, 2017, 15). The meaning of milieu is has recently been very popular among experts, especially since the 1970s, with the advent of humanistic tendencies in environmental design theories that emphasize the role of culture and cultural variables in urban space as a means for and an area of communication that allows information to be transmitted, so that environmental designers and urbanists can first consider the importance of the meaning of milieu in human lifestyle, taking into account the results of such studies, and then remain effective trying to achieve a more meaningful milieu (Rapoport, 2011).

Physical milieu includes land and geographical locations, social milieu includes institutions consisting of individuals and groups, psychological milieu refers to mental images of people, behavioral setting is a set of factors to which a person reacts, and functional milieu includes a set of various activities (Shokouei, 1996, 112-118).

2.2. The relationship between milieu and behavior

In fact, the relationship between milieu and behavior in an architectural process is considered using three theories of environmental determinism, environmental allowance and environmental probability, and all theorists realize that, depending on the subject of the design, one or even all three theories can be considered in the design process (Altman, 2003).

According to Rapoport, anthropology has an important effect on the milieu-behavior relationship and the role of culture as a factor influencing human behavior is very important (Rapoport, 2005). However, the unplanned urban development, increased workplace-home distance, increased urban traffic, lack of recognition of human needs, congestion and social conflicts, loss of sense of place and other effects can be considered as inappropriate urban conditions and qualities, that, by imposing psychological pressures on people, has adverse effects on their physical and mental health and causes disorders in the functioning of people in social, psychological and physical realms (Altman, 2003). Unlike traditional psychologists, who did not pay attention to the relationship between human behavior and physical milieu, in ecological psychology, the human relationship with milieu or surroundings was considered. Also, movements of modern architecture period played an essential role in the formation of this type of mutual relationship (Lang, 2002). Theories of environmental psychology show that the environment influences social attitudes and behaviors. Accordingly, there is some extent of relationship between physical outdoor milieu of the school and social behavior of students. In the design and planning of the school outdoor milieu more attention should be paid to creating a conducive learning milieu that can foster positive social behavior, especially for city schools (Johnson, 2009). Sonnenfeld introduces a hierarchical classification of behavior of human milieu into four levels: geographical, operational, perceptual, and behavioral. He went even further, proposing four levels in which the milieu should be studied. The four milieux supported by Sonnenfeld are as follows:

A- Geographical milieu (world), B- Operational milieu (parts of the world that affect human, whether they are aware or not), C- Perceptual milieu (parts of the world human is aware of, through direct and indirect experience), and D- Behavioral milieu (part of perceptual milieu that creates a behavioral response) (Rokhsari, 2017: 28).

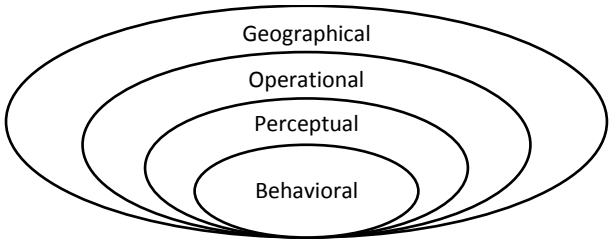

Fig. 2. Hierarchical classification of behavior from milieu (human milieu) (Rokhsari2017, p 28)

2.3. Milieu and behavior motivation

Human behavior has direction and purpose. Living things and human have needs. Basic human needs include need for water, food, oxygen and so on, and secondary needs include: security, peace, respect and so on. Needs create tension and direct human behavior to meet them (Alijani, 2017). Environmental conditions influence the advent, intensification and/or weakening of needs and direct human behavior in meeting them. Appropriate environmental factors and conditions help to meet the needs and inappropriate conditions prevent their repair and comfort. For example, for study or rest, a cozy calm atmosphere is needed. When space does not have necessary conditions to achieve the desired goal, meeting the need is postponed and finally, internal and social conflicts are encountered (Shahcheraghi& Bandarabad, 2015).

2.4 Behavior settings

Milieu consists of a set of behavior settings that are interconnected and share common aspects. These behavior settings consist of two basic elements: behavior indicative pattern and physical milieu (Golestani et al., 2015). In his

book, Ecological Psychology, Barker (1968) provides a definition of behavior settings provided in more detail in the book Behavior Setting. One way to provide activities through designing is the use of activity systems by environmental designers that are composed of behavioral circuits. "Behavior circuit is an anthropological ergonomics that examines people's daily behavior at the scale of rooms, houses, blocks of flats, neighborhood units, and cities in order to identify the physical and human resources needed", says Constance Perin. (Shariati, 2017). According to Barker (1968), the synomorphs of a given behavioral setting have a certain degree of dependence on each other than on parts of other behavioral settings.

This definition actually contains complete information about the recognition and study of behavioral settings, so that in the first five cases, the structural test of behavioral settings, and in the other two cases, the dynamic test of behavioral settings are described. The characteristics and subsequent explanations in the ecological psychology literature provide the basis for accurate identification of behavioral settings, but the great challenge is how to study and analyze behavioral settings. Barker et al. (1968) in the study of Midwest City, tried to provide a unique method for observing and recording behavioral settings in its ecological context (Rouhidehkordi, 2013).

2.4.1 Identification of behavioral settings

Although there are different important aspects in the study of behavioral settings, as emphasized in ecological psychology literature, in general, identification of behavioral settings remains a problem. In order to identify the behavioral settings, a process must be carried out, which includes two steps: 1. Identifying and preparing a list of all potential behavioral settings, 2. Excluding non-settings (Rouhidehkordi, 2013).

2.5. Synomorphy

Human is the product of milieu and biology and the interaction of the two. According to Gifford, "environmental psychology is different from psychology because it deals with everyday physical milieu, aiming to take a step toward adapting the living milieu as much as possible to individual, group and cultural needs of contemporary human" (Alijani, 2017). Milieu cannot be identified only by examining one of the two physical or behavioral aspects, but their synomorph determines the nature of milieu (Heft et al, 2014, 287-288). Synomorph is defined as a fit between the behavior and the milieu. Human behavior and the body it lies in are interwoven. This is a reminder that behavior and body are two components that become one at a time and place (Shahcheraghi & Bandarabad, 2013). Barker (1968) identified eight essential factors in the formation of synomorph (behavior-body). Physical forces: physical setting can encourage or discourage one from doing something, for example school corridor is a place with a few chairs where one can only move or stay. Social forces: managing a milieu can encourage or discourage behavior. A store manager or class teacher can impose a certain pattern of behavior. Physiological processes: the physiological response of individuals to the body is undeniable. In a zero-degree room, behaviors are cursory

and people move slowly accompanied by a feeling of discomfort. Milieu appearance: the appearance and setting of milieu demands a pattern of behavior. The flat surface of a grass field for children means that they can run and scream without any restrictions. But the appearance of a funeral imposes sadness on people. Learned reactions: learning what behavior is appropriate for a behavior/body synomorph is constantly done. This learning begins at an early age and is culturally appropriate. Individual's choice: individuals sometimes have the options to attend or miss a behavioral setting. Selection by behavior setting: some behavior settings have prerequisites to enter that prevent people whose behavior does not conform to the behavioral pattern of the physical setting, such as the age requirement for cinemas. The effect of behavior on physical setting: shortcuts between different parts of the city are formed by citizens' commute. In parks, footprints on the grass are seen. Therefore, behavior (citizens' footprints) forms a physical setting because the path is created following the behavior (Barker, 1968). Scott (2005) argues that those who work on Barker's theory (1968) fall into two categories: the classics who practice the theory as it is, and the developers who, while respecting it, believe that the theory needs to be modified (Scott, 2005, 303). Wicker redefined Barker's theory (1968) by examining the effect of size on it. In the Barker concept, the behavioral setting was assumed to be only in a state of continuity and stability. He refers to these time steps in the life cycles as *behavioral setting*. Thus, the behavioral setting does not have a fixed plan at first, but different events occur in each stage of its life (Wicker, 2002).

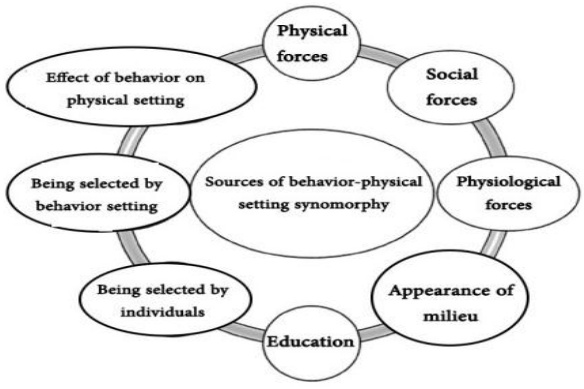

Fig 3. Sources for behavior/physical setting synomorph (Shahcheraghi& Bandarabad, cited Barker 1968)

2.6. Design of college with synomorphic place/behavior approach

The four main areas in the design of learning milieu are listed in Table 1

Table 1
Design areas of learning milieux (Alijani, 2017: 9)

No.	Areas	Characteristics
1	Spatial	Intimate, open, bright, closed, active, quiet, communicates with nature and more.
2	Emotional	Relaxing, safe, enjoyable and more
3	Physical	Heat, cold, cozy, visual pleasure and more
4	Behavioral	Individual studying, collaboration, teamwork, physical activities, writing, reading

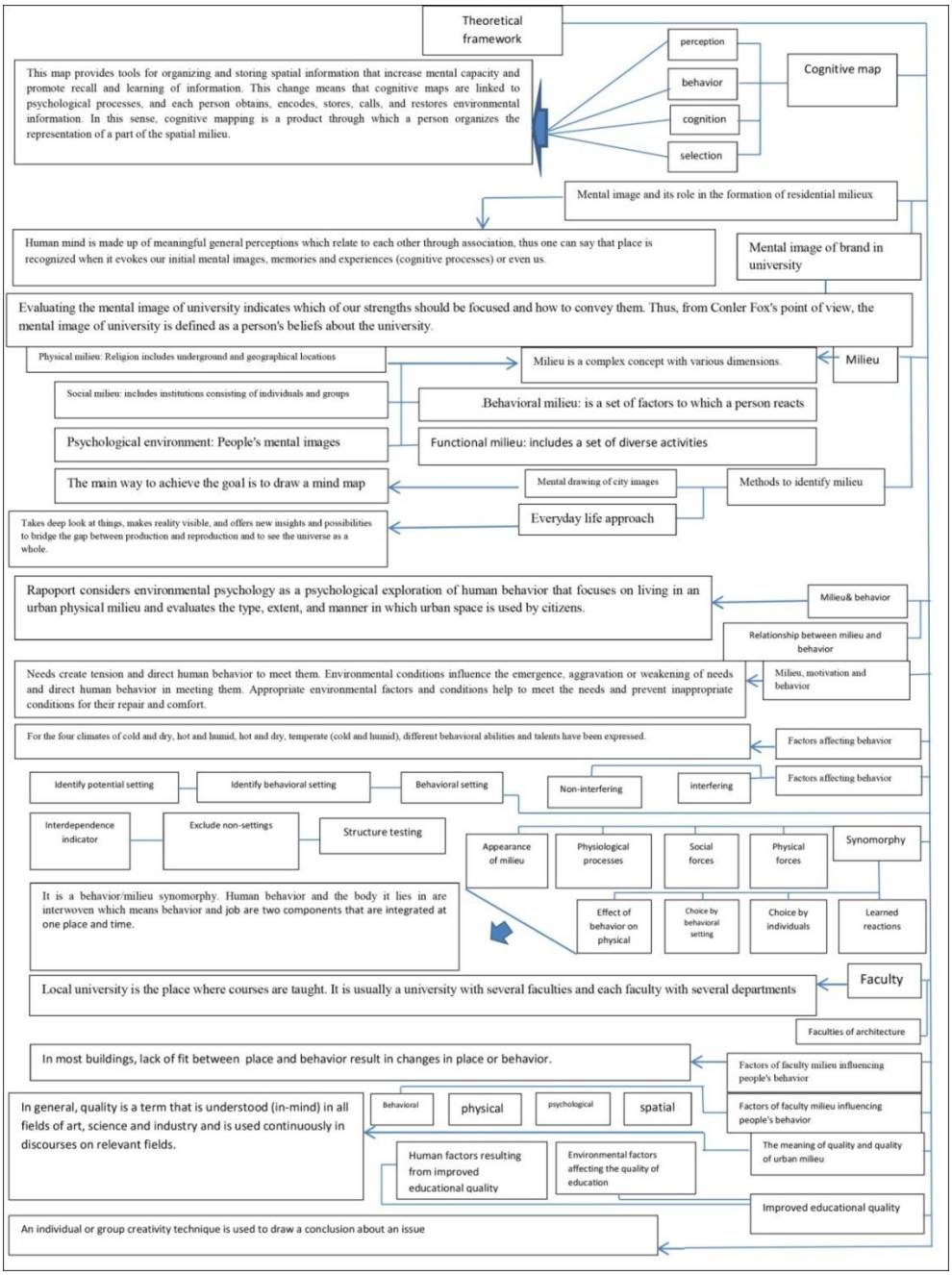

Fig. 4. Theoretical framework of the research

3. Research Background

Every research is based on previous research and works. Preparing, compiling and reviewing the articles and research background are the preliminary steps in Conducting Scientific Research. Research Background
Contains Everything Done In The Past On The Subject Of Research At Domestic And Foreign Levels.

Table 2
Studies on Synomorphism

Theorist and concept	Definition
Ecology and Development in Classroom Communication (Barowy & Smith, 2008)	Introduces a concept to explain a pattern for understanding content and meaning in relation to choices that occur in the context of space or for proximity to signs.
The Quality of Urban Open Space for Interaction with Children (Mansouri and Gharabiglou, 2011)	Researchers present three suggestions for child interaction in urban outdoor spaces, including: a naturalistic place for children to be free and spontaneous, paying attention to the concepts of collective architecture (children's involvement in the design process), and conformation to cultural themes and insights of every region.
Design of urban pergola with the aim of changing the behavioral patterns of street crossing (Zakerani, 2016)	Addresses path diagnosis and visual entrance for the milieu, using the urban pergola as central to the design of behavioral patterns. The results of the study show that pergola has a positive effect on forming the right behavior in citizens by creating a safe space on the side of the road, separating the crossing for drivers for greater safety, creating attractiveness for children, and sense of security for pedestrians to be seen by drivers
The effect of built environments on pedestrian behavior and pedestrian shopping (Hahm & etc. 2018)	This study identifies environmental components built in retail areas that affect pedestrian behaviors and their shopping behavior. The result of the research indicates that pedestrians prefer safe roads, high quality design, higher hierarchy, centrality, and rest areas or other street facilities provided.
A Comparative Study on the Architecture of the Historical Bazaar of Tajrish and Arg Shopping Center of Tehran based on Synomorphy Theory (Tafakar et al., 2019)	Trying to understand how the milieu and behavior interact, explaining the behavioral capabilities of the built environment, and how behaviors occur in accordance with the structures of the ecological environment, are among the objectives of the research. The result suggests that the milieu/ behavior synomorphy causes the continuous production of innovative relationships between the ecological environment and people in the study area.
Sociopetaloid of Architecture Space: Synthesis and Synomorphy of Human-Physical Factors(Salehnia & Memarian,2012)	This research experimentally analyzes the issue of Sociopetaloid of architecture space. Sociopetal represents spaces where people come together or stay away from each other, and when they stay away from each other it is also called sociofugal
Development of a combined theoretical framework of interaction between space syntax and behavioral settings (Hamedani, Golshan et al., 2019)	Provides a route to perceive behavioral-motion patterns in residential settings
The effect of social interactions on people's behavioral patterns in urban spaces (Askarizad & Safari, 2020)	The effect of social interactions on people's behavioral patterns on the sidewalk of Shahrdari Square of Rasht was studied. For this purpose, the space arrangement technique and four types of observation techniques were used and according to the result, the effective factors in urban fresh spaces in order to improve the quality in public spaces were introduced.
Space-choice behavior for individual study in a digital reading room (Hee Min & lee, 2020)	They used the concepts *personal space* from environmental psychology, and *evolutionary biology* to understand the priority of student seats in reading room of university library.

4. Methodology

As an applied, descriptive-analytical research, this study tries to identify the spaces affecting students' behavior and their relationship with surrounding milieu using a combination of quantitative and qualitative methods. Due to the fact that the content of the research is related to the educational and architectural environment, as a result, the three faculties of art and architecture of the University of Tehran were selected as the best case studies. Therefore, the three colleges of art and architecture of the state universities of Tehran were selected for a case study to identify the

spaces and to be applied by correlation method in terms of effectiveness on synomorph. In this study, among the types of descriptive research, the correlation method is used. This type of research seeks to find out the relationship between variables, not necessarily a cause-and-effect relationship. The researcher tries to know, for example, whether there is a relationship between the two variables in the target community. The correlation between the two variables is either positive or negative. Positive correlation means the direction of change in one variable is consistent with the direction of change in another variable. Negative correlation occurs when the direction of change of one variable is inconsistent with the direction of change of another variable, that is, it decreases with the increase of another (Mustakhdemin Hosseini, 2015). Regression analysis is used among the correlation research methods which are divided into three categories: bivariate correlation, regression analysis and correlation matrix analysis. In this method, according to the number of variables, multiple regression model and multivariate regression model can be used to analyze the data. In regression analyses, predictor variables can be analyzed in three ways: simultaneous, stepwise, and hierarchical. According to each of the concepts, hierarchical analysis is used to achieve the results. To use this method, two groups were selected for test, a group of 30 students from the colleges of art and architecture of the University of Tehran and a group of 30 specialists in the relevant field of research including department heads, educational assistants, deans, educational management experts and academic advisors. In this study, experts were selected non-randomly to make the most of the information of selected individuals. According to each of the concepts, hierarchical analysis is used to achieve the results. To use this method, two groups were selected for the question. A 30-member group of students from the Faculty of Architecture and Art of Tehran State Universities and a 30-member group of specialists in the relevant field of research including department heads, educational assistants, deans, educational management experts, and academic advisors were used. In this study, experts were selected non-randomly to make the most of the information of selected individuals.

Basically, hierarchical analysis is a general theory of measurement based on a set of psychological and mathematical principles that can solve complicated problems in various quantitative and qualitative fields. In general, each problem deals with three general levels: first, the objective of the problem, second, the evaluation criteria, and third, the possible choices. Components at each level of the hierarchy are compared in pairs to determine the relative preference of each in terms of alternatives (Taleghani et al., 2012, 84).

Using the hierarchical analysis, the indicators, developed by the researcher from the study of previous researches on the subject of the present study, were ranked from the point of view of the two groups in order to identify the differences in the views of each group. Then 30 experts and students were asked about the characteristics of the selected spaces in the college of art and architecture of the respective university, which was used in hierarchical analysis. In the next step, the attendance of students in each of the spaces in all three case samples were observed and measured to examine the degree of similarity or difference of opinions of experts in designing the educational space of the college, and opinions of students in using the designed space. Indicators obtained from previous studies include physical elements (light, sound, temperature), spatial-architectural factors (elements, stairs, water), aesthetic concepts (fit between content and current activity), access, cognition (sense of experience and revelation, etc.) and sense of place. Common spaces between the colleges of art and architecture of the universities in question include exhibition, library, computer lab and Internet center, the amphitheater, the outside and the entrance of the college, the middle void (central space of the building), and the stairwell.

Table 3
Scoring (Ghaemi et al., 2016, 36).

No.	Definition	Details
1	Equal preference	Two activities with same partnership for the goal.
3	Medium preference	Experiences and judgments moderately prefer one activity to another.
5	Strong preference	Experiences and judgments strongly or specifically prefer one activity to another.
7	Very strong preference	One activity is strongly preferred to other activities.
9	Infinite preference	One activity is preferred to another as much as possible.
2،4،6،8	Intermediate values	To address preferences between high values.
Inverse	-	The inverse of each is used to address inverse comparisons.

5. Study Area

In this study, according to the purpose and subject of the research, the non-probability sampling method and the type of sampling have been used to achieve representativeness or comparability. Has been investigated; Also, according to the methods used in the research, an appropriate number of samples were identified and used for review. In this section, 30 experts and 30 students in the mentioned faculties of art and architecture were examined, and an equal number of samples were examined in all 3 faculties and universities. According to the study area, the scope of research corresponds to the faculties of art and architecture of public universities affiliated to the Ministry of Science, including the University of Tehran, University of Science and Technology, Shahid Beheshti University. Also, according to the research conducted between 1399-1399, the time domain corresponds to these years.

Table 4
The study area

Location of the studied universities in Tehran		
University of Tehran		
Number of students of University of Tehran	53488	
School of Visual Arts, College of Fine Arts		
Number of students of College of Fine Arts	2590	
Number of fields of study in College of Fine Arts	46	
Departments of the College of Fine Arts	Number	Faculty groups
	4	Department of Architecture, Department of Landscape Architecture, Department of Restoration of Historic Buildings and Textures (Conservation and Development) and Department of Architectural Sciences
Shahid Beheshti University		
Number of students of Shahid Beheshti University	19153	
School of Architecture and Urbanism, Shahid Beheshti University		
Number of students of the School of Architecture and Urbanism, Shahid Beheshti University	727	
Departments of the School of Architecture and Urbanism, Shahid Beheshti University	Number	Faculty groups
	6	Reconstruction Research Group, Department of Architectural History and Restoration of Buildings and Textures, Architecture Department, Urbanism and Design Department, Building Department and Landscape Architecture Department
University of Science and Technology		
Number of students of University of Science and Technology	10837	
School of Architecture and Urbanism, University of Science and Technology		
Number of students of the School of Architecture and Urbansim, University of Science and Technology	750 people, no associate, about 150 master's degree and 37 Ph.D. students	
Departments of School of Architecture and Urbanism, University of Science and Technology	Number	Faculty groups
	4	Architecture, Urbanism, Restoration, Industrial Design -Architecture: Bachelor of Architecture Master of Architecture, Majors: Technology, Housing, Sustainable Architecture, Educational-Cultural, Health -Urbanism: Urban Planning, Regional Planning, Urban Design -Restoration: Protection and Restoration of Urban Heritage, Protection and Restoration of Architectural Heritage -Industrial Design

6. Research findings

According to the subject, the purpose and the method of research were considered hierarchically, which are displayed in Figure 3.

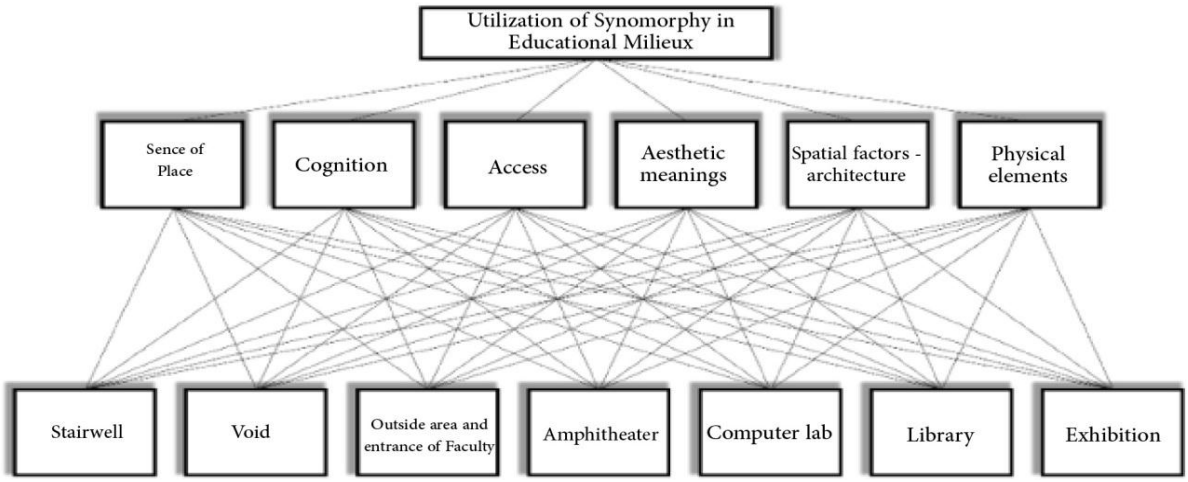

Fig 5. Hierarchy tree

According to Figure 5, the purpose of the research is to apply synomorphy in educational milieu, therefore, based on 6-criteria prioritization, seven spaces were ranked.

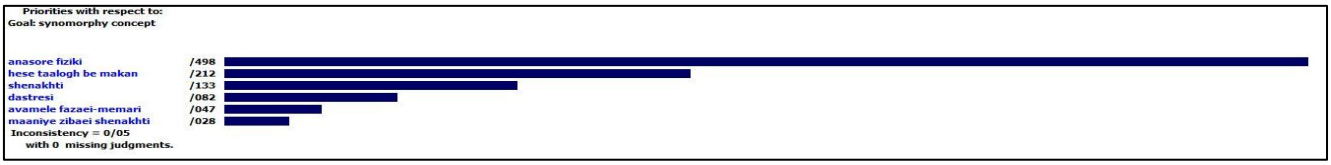

Fig 6. Ranking of criteria by specialists

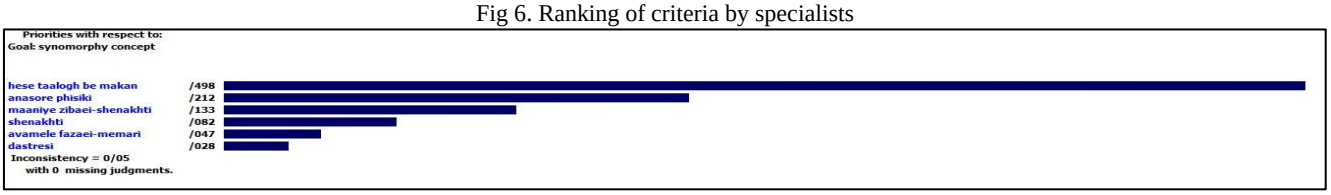

Fig 7. Ranking of criteria by students

According to the results obtained from the specialists' viewpoints, physical elements and aesthetic concepts were ranked highest and lowest, respectively. While, in the sample students' point of view, sense of place had the highest value and was ranked first, and access had the lowest value among the criteria. However, access, which was ranked last in the eyes of students, was in the third rank by the specialists, and the aesthetic concepts that took the last place by the specialists, had the third rank in the scoring by the students. Figures 6 to 13 display the scoring of spaces according to the ranking of criteria by the students and specialists in the samples.

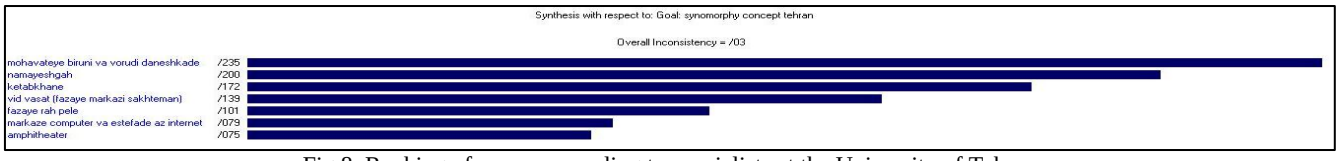

Fig 8. Ranking of spaces according to specialists at the University of Tehran

According to specialists at the University of Tehran, the outdoor area of the College of Fine Arts and the amphitheater should have the largest and the smallest number of visitors, respectively.

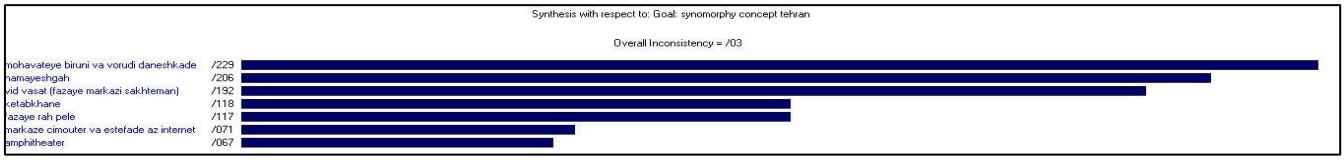

Fig 9. Ranking of spaces from the perspective of students at the University of Tehran

According to Figure 9, the students' opinions were in line with those of the specialists and similar space ranking was obtained.

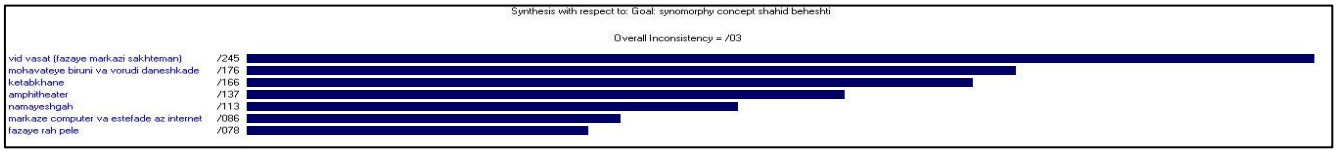

Fig 10. Ranking of spaces according to specialists in Shahid Beheshti University

According to specialists at Shahid Beheshti University, the middle void or the center of the building and the stairwell had the highest and lowest scores, respectively.

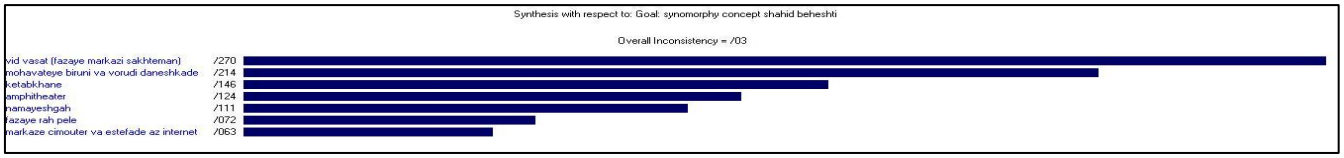

Fig 11. Ranking of spaces according to students in Shahid Beheshti University

According to the students, the middle void had the highest score, similar to the specialists, but the computer lab was assumed to have the lowest number of visits.

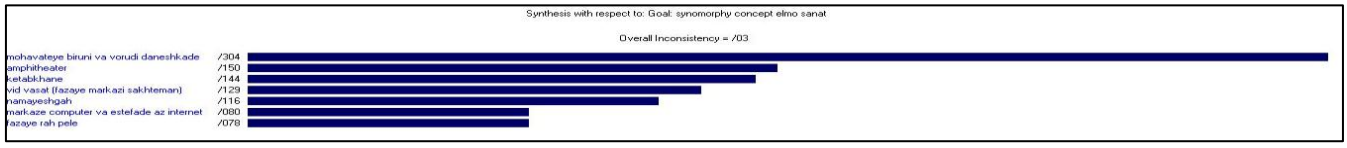

Fig 12. Ranking of spaces according to specialists in the University of Science and Technology

The outside area and the entrance of the School of Architecture and Urbanism of the University of Science and Technology had the highest score and the stairwell space had the lowest score according to the specialists.

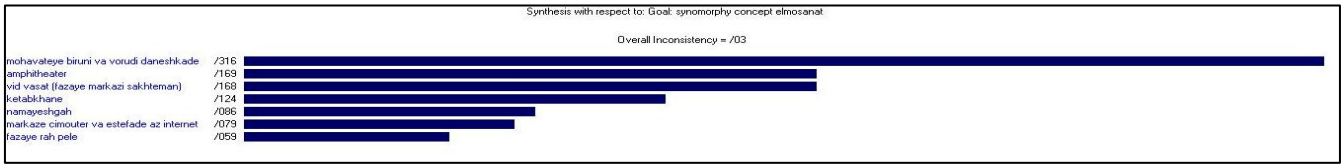

Fig 13. Ranking of spaces according to students in the University of Science and Technology

The first and the last rankings of the spaces according to the students corresponded to the opinion of the specialists and difference was found in the middle spaces.

Then, the behavioral pattern of 30 students in each of the relevant case studies was examined from 12 to 13:30 to determine the amount of accumulation and behavior in each of the faculties; Also, the full circle symbol indicates the origin of the harvested, the multiplication symbol symbolizes the destination of the interviewee and the straight line symbolizes the movement of the harvested people in all three maps.

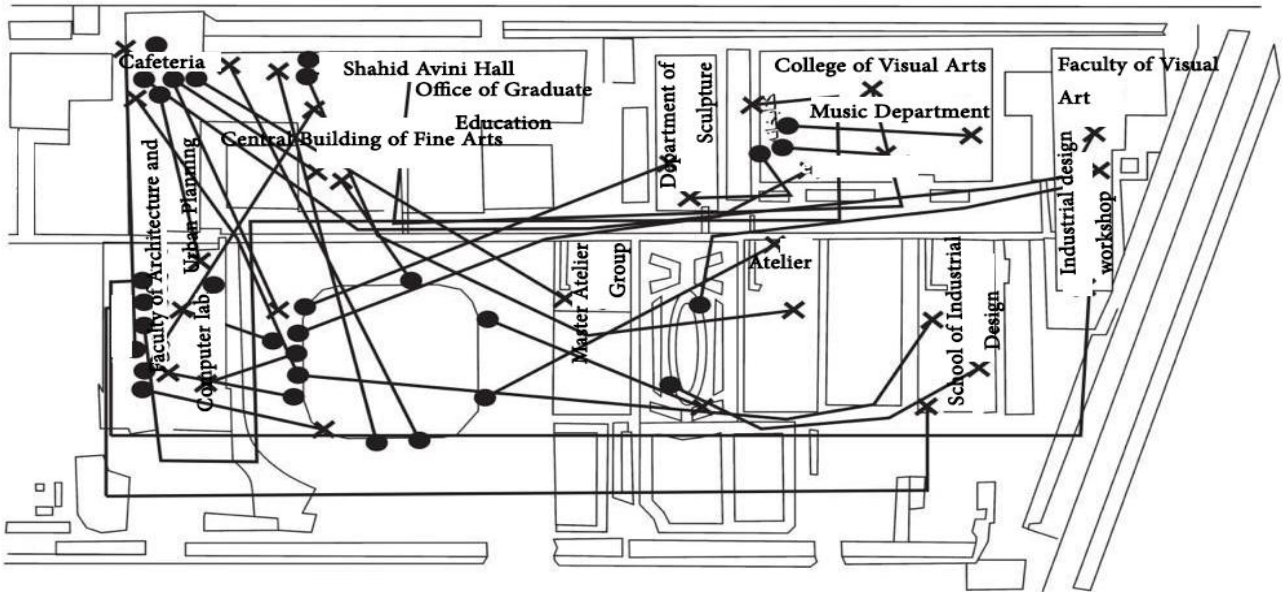

Fig 14. Behavioral pattern map of the College of Fine Arts, University of Tehran

According to Figure 14, the largest gathering occurred in the central courtyard of the Fine Arts College, then at the exhibition, and finally at the cafeteria.

Fig 15. Behavioral pattern map of Shahid Beheshti University, College of Urbanism and Architecture

According to the study, the largest gathering occurred in the main lobby of the college, the outdoor area and some stairwell spaces, respectively.

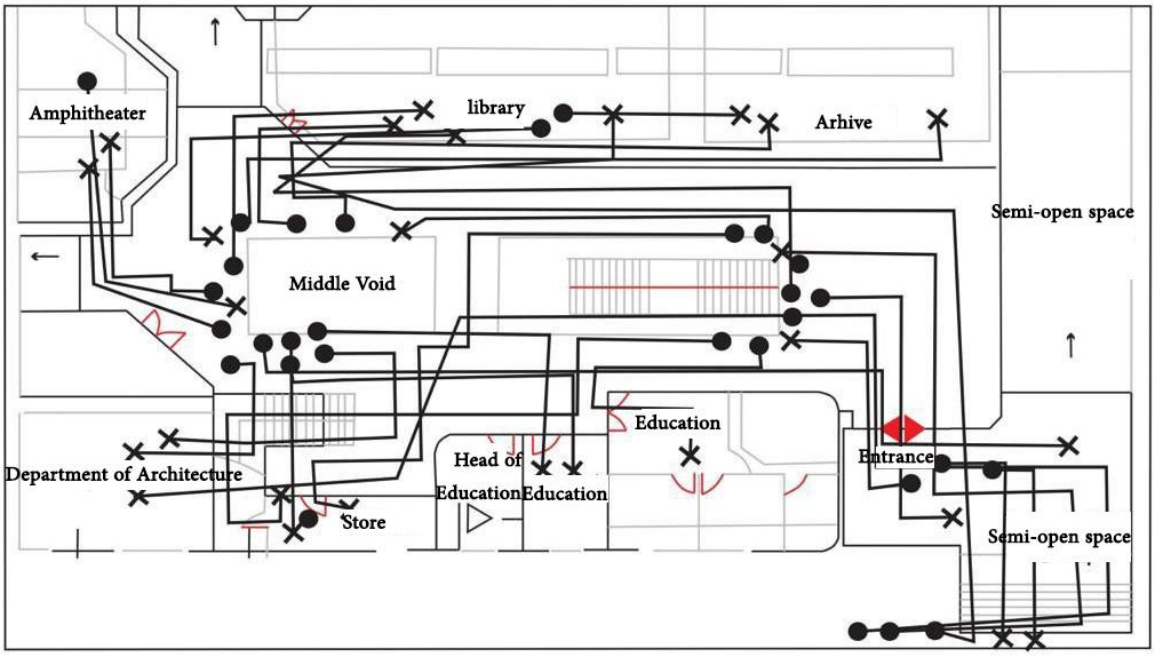

Fig 16. Behavioral pattern map of the School of Urbanism and Architecture, University of Science and Technology

Most gatherings found in the middle void, in the stairwell, and finally in the outer courtyard and the entrance of the school.

7. Discussion And Conclusion

According to the studies on the utilization of synomorphy in the educational milieu during the research, it was found out that in the College of Fine Arts of the University of Tehran, the opinions of specialists and students corresponded to the researcher's observations i.e., most of gatherings were held in the outer area, the entrance of the college and then the exhibition. Based on the observations, synomorphy was observed in the college and the characteristics of the mentioned spaces corresponded to the students' behavior and the college was consciously designed with respect to students' needs. In addition to an educational milieu, the college was known as a public space.

In Shahid Beheshti University, certain differences were found in the opinions of specialists and students with observations in such a way that in specialists' and students' opinions, the middle void and the stairwell gained highest and lowest scores, respectively. In the School of Architecture and Urbanism, Shahid Beheshti University, the most behavior pattern, as stated by users and space officials, was observed in the middle void or lobby and then in the outer area of the college. However, the stairwell ranked third in observations, but last in hierarchical analysis.

In the School of Architecture and Urbanism, University of Science and Technology, the behavior pattern was most seen in the middle void, stairwell, the outside and entrance of the school, respectively, and the least gathering and behavior pattern occurred in the amphitheater. While, based on the hierarchical analysis, the highest scores were for the outside area, the amphitheater and the library and the lowest score went to the stairwell. Observations indicated that there was less agreement between opinions and behavior patterns.

According to the present study, the characteristics of the space with the most behavior pattern include: 1. The central courtyard or outside area of the College of Fine Arts of the University of Tehran with desirable physical elements, appropriate aesthetic concepts, and sense of place 2. The lobby or central space of the School of Architecture and Urbanism of Shahid Beheshti University has all the characteristics selected by the researcher at a higher place than average level, which include: sense of place, access, physical elements, spatial factors aesthetic concepts and cognition 3. The middle void of School of Architecture and Urbanism, University of Science and Technology, with sense of place, access, cognition, and aesthetic concepts.

Therefore, according to the facts mentioned above, it is concluded that sense of place and aesthetic concepts are observed in all three samples and are the essential items in the utilization of synomorphy. Therefore, physical and cognitive elements can help increase the quality of space for students to use.

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