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Explaining the Physical Features Affecting Residents' Attachment to Their Homes and Their Persistence in New Cities (Case Study: Binalood New City)

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ABSTRACT

The present study aims to provide the basis for the persistence of city dwellers in their new cities by promoting their place attachment. It explains the relationship between physical criteria in residential complexes and place attachment in new cities. This research is fundamental-practical and relies on library studies and a mix-method research strategy. The practical part of the research uses a correlation strategy to discover the relationship between variables. To collect the required data in this section, 375 questionnaires (based on Cochran Formula) have been distributed using the random method. The Pearson correlation test and linear regression model have been used to determine the nature of the relationship between place attachment and physical criteria in residential complexes. SPSS software is used to rank these physical features. From the residents' point of view, 8 key criteria are important in place attachment in residential complexes. The results of the study, while confirming the significant correlation of these physical factors with place attachment, show that visual richness is the most effective physical factor in inducing resident's place attachment and the need to pay attention to high human needs, such as the need to the beauty. In cases where individuals do not find the physical factors of their residential place suitable, they show a greater tendency to leave their place. In this regard, people can be expected to stay longer by improving the physical criteria related to residential complexes.

***Keywords**: Place, Place Attachment, Residential Complex, Units, New Cities*

1. INTRODUCTION

New urbanism, or neotraditional planning, has been promoted as an answer to many of the problems created by sprawl. Despite providing the necessary facilities, new cities still face a significant problem, i.e., people's unwillingness to live and stay. This issue is especially true in case of residential complexes designed to provide affordable housing. There are lots of reasons for this, but Anon and Lawrence talk about lack of place attachment as one of the major factor. Increased mobility (Gustafson P., 2009a; gustafson, 2009b), commuting (Van der Klis & Karsten, 2009) or having more than one residence

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(Van Patten & Williams, 2008) lead to a lack of place attachment. In this part, the meaning of place attachment is investigated first. In particular, the term attachment is rooted in Bowlby's attachment theory (Bowlby, 1988) and relates to affective and emotional patterns that connect people to places. For example, for Shumaker and Taylor (1983), it is 'a positive affective bond or association between individuals and their residential environment' (p. 233). Hummon (1992) considers it 'emotional involvement with places' (p. 256), and Low (1992) defines it as 'an individual's cognitive or emotional connection to a particular setting or milieu' (p. 165). These definitions may be appropriate to describe this special feeling towards certain places, but they have the drawback of being too ambiguous and they do not allow us to differentiate attachment from other closely-related concepts, such as residential satisfaction, which has been defined as 'the positive or negative feeling that the occupants have for where they live' (Weidemann & Anderson, 1985, p. 156). That is why it is necessary to further delimit it. To this aim, the main characteristic of the concept of attachment, i.e. the desire to maintain closeness to the object of attachment, is employed (Ainsworth & Bell, 1970; Bowlby, 1973). This characteristic, although implicit in many definitions and operationalization of the concept, has rarely been explicitly emphasized. If we incorporate this specific property into the previous definition of place attachment, it could take the following form: a positive affective bond between an individual and a specific place, the main characteristic of which is the tendency of the individual to maintain closeness to such a place. Hidalgo and Hernandez could only find one description of place attachment in these terms, although under a different name. Sarbin (1983) speaks of the Spanish term querencia, which reflects the frequently observed tendency of people to prefer to stay near to specific places (Hidalgo & Hernandez, 2001). So, place attachment and durability in a place are interconnected concepts that cannot be study separately. Place attachment, the bonding that occurs between individuals and their meaningful environments, has gained much scientific attention in recent years (e.g., (Giuliani, 2003; Low & Altman, 1992). Part of this interest stems from the awareness that person-place bonds have become fragile as globalization, increased mobility, and encroaching environmental problems threaten the existence of, and our connections to, places (Sanders, Bowie, & Bowie, 2003; Sennett, 2000). Place attachment is also worthy of study because of its relevance to many important processes. For instance, the examination of place attachment as an emotional bond has shed light on the distress and grief expressed by those who are forced to relocate (Fried, 1963; Fullilove, 1996). Place attachment arises from a positive evaluation of a place on the basis that it meets an individual's need and allows him to achieve his goals (Shumaker & Taylor, 1983). If the current place is judged better than the alternative, the individual will have higher place attachment and will be more likely to stay there (Anton & Lawrence, 2014). The most parsimonious categorization of predictors of place attachment is presented in the form of three rough categories of socio- demographic, social, and physical-environment. Compared to socio-demographic variables, which are easy to operationalize, and social variables, which usually cover few well-defined measures (such as neighborhood ties or sense of security), the potential number of physical (natural, architectural or urban) features that may affect attachment is endless that has been rightly noted by Farnum, Hall, and Kruger (2005, p. 42). Another problem with this type of predictor concerns its measurement. Estimates of physical features may be obtained from objective measures (e.g., building size or density) or, alternatively, from independent estimates made by trained observers (e.g., rating of precinct cleanliness), and they also may be made by participants themselves. Another issue about place attachment that has not received much attention is specifying different places towards which attachment develops. Most studies carried out until now have focused their range of analysis on the neighborhood or community environment. That is, the study of place attachment has been reduced almost exclusively to studying neighborhood attachment. In general, all authors explicitly or implicitly recognized that people can develop feelings of attachment toward other places with a smaller range, like a house or street, and to places with a greater range, like a city or a nation, but not many have investigated these. An exception to this general trend is Altman and Low's book (1992). In various chapters, they describe examples of attachment to different places, such as house

(Marcus, 1995; Ahrentzen, 1992). Needless to say that positive bonds with places lead to willingness to stay in the place and to buy a home there. On the other hand, developing place attachment to home is beneficial. It has been linked with many positive health and community participation outcomes. People with higher place attachment report greater social and political involvement in their communities (Mesch & Manor, 1998), and communities comprised of highly attached people are more likely to work together to achieve a desired outcome, such as protecting the environment (Brown, Reed, & Harris, 2002) and protecting the social and physical features that characterize their neighborhoods (Mesch & Manor, 1998). Some of the advantages of place attachment for the individual include a better quality of life, better physical and psychological health, more satisfying social relationships, and greater satisfaction with physical environment (Tartaglia, 2012). As mentioned earlier, there is a lack of theory that would connect people's emotional bonds with the physical side of places. In an early journal issue devoted to place attachment, Kaplan (1984) postulated that in order to understand people's relations to places, one should go beyond economic factors and social relations because they explain a small portion of variance of place attachment. Attention should be focused on the "intangibles", i.e., physical features that make the environment easy to become attached to. Thus, the specific aim of this study is to understand and measure the relationship between physical dimensions of the place with place attachment to units in residential complexes in new cities.

Research questions

Attachment can obviously rest on physical features of a place, so the main question is:

- How do physical features come to affect the formation of place attachment and lead to stay in that place?

To answer this question, some basic questions should be answered first:

- Which physical features of a place are more likely to awaken attachment to that place? And what is the proper classification of these criteria?

1. Literature review

Contrary to the impression got from browsing titles of papers devoted to place attachment, there are not many systematic, psychometrically sound studies aimed at the identification of predictors or consequences of place attachment to residential places. This fact was noted by others, including Brown et al. (2003), Lewicka (2005) and McAndrew (1998) and the situation has not changed much since then. The majority of studies concern attachment to the neighborhood, few focus on attachment to home. house (Fornara, Bonaiuto, Bonnes, Carrus, & Passafaro, 2006; Gomez-Jacinto & Hombrados-Mendieta, 2002; Marans, 2003), very few on attachment to the city, and almost none reaches further than city-scale (region, country or continent). Although the most consistent predictor of attachment to residential place in the majority of studies is social factors (strength of local ties), the physical variables have value, too, sometimes collectively explaining a higher percent of variance of attachment than social factors. For instance, Fried (1982) found that residential satisfaction (a term used interchangeably with community and residential attachment) was better predicted by physical features than social factors. There are some studies on place attachment that support the need to take into account the physical component of the place (Riger & Lavarkas, 1981; Taylor, Gottfredson, & Brower, 1985). However, these results are not sufficiently conclusive as to break the excessive weight given to the social dimension of places in the formation of place attachment. Some of the examples of more comprehensive researches on physical factors are provided in the table below.

On the one hand, the concepts studied in these researches seem very different from place attachment. On the other hand, they studied those concepts in other types of places like dormitory. However, they are some of the main researches that the present study can rely on to extract the physical factors that are important to create and increase place attachment. But, as it can be seen, these factors are much diffused and need to be organized. So according to Canter (1977) theories, Table (2) was designed in the form of three formal, functional and conceptual-semantic domains and with an emphasis on physical criteria related to the areas that have been studied in this research.

Table 1. Supporting research (Source: Authors)

Researches	Factors	Area of Study
(Evans & McCoy, 1998)	Simulation, Coherence, Affordance, Control, Restorative	Dormitory
(Bonaiuto, Fornara, & Bonnes, 2002)	Architectural. Urban planning features: building aesthetics, building density, volume, internal functionality Socio relational features: external connections, green areas, security Functional features: sport services, socio cultural services	Residential Complex
(Eshelman & Evans, 2002)	Aesthetics, Complexity, Simplicity, Flexibility, Attention to the disabled, Comfort, Identity	Retirement Residents
(Kamalipour, Jeddi Yeganeh, & Alalhesabi, 2012)	Physical Sustainability, Functional Sustainability, Unique characteristics, Accommodating activities, Comfort, Open spaces, Safety, Accessibility, Vitality, Diversity, Legibility	Residential Complex
(Khozaei, Ramayah, Sanusi Hassan, & Surienty, 2012)	Visual, Facilities, Location, Amenity, Personalization, Social Life, Security, Privacy	House
(Burris, 2014)	Aesthetics, Spatial Dimension, Order, Ambiance, Climatic conditions	Home
(shabak, Norouzi, Megat Abdullah, & Hayat Khan, 2015)	Site Features, Architectural Features, Natural Features, Accessibility, Facilities & Security, Cultural Features	Residential common open space
(Hamdy Mahmoud, 2017)	Aesthetics, Spatial Dimensions, Order, Environmental Conditions, Comfort Conditions (Sound, Lighting, Heat)	Interior design
(Yaghmaeian & Habib, 2019)	Accessibility, furniture, comfort, facilities, natural elements, aesthetic	Residential Environment

Table 2- Physical factors affecting the promotion of place attachment in residential complexes in new cities (Source: Authors)

Dimensions		Factors	Sub-Factors
Formal Dimensions		Stimulation Factors	Visual exposure
			Complexity
			Spatial Diversity
			Mystery
			Novelty
			Cohesion and Unity
			Visual Proportion
			Simplicity and Legibility
Functional Dimensions	Quantitative Features	Optimal Spatial Dimensions	
		Facilities	
		Comfort Conditions	Climatic (Thermal)
			Light (Natural and Artificial)
			Sound Control (noise)
	Qualitative Features	Responsiveness	Adaptability
			Functionality
			Flexibility
			Personalization
			Communication with nature
		Order	Spatial Hierarchy and Organization
			Readability
		Control	Crowding
			Territoriality
			Privacy
			Safety and Security
The Conceptual- Semantic Dimensions		Ability to make memory	
		Identity	Natural
			Artificial

As can be seen, there are too many factors that cannot be measured in one research. Furthermore, some of them may seem doubtful for ordinary people. So, after interview with some experts and designer, table (2) was summarized to table (3). For the purpose of clarity, factors were translated in Persian.

Table 3- Factors examined within the residential unit (Source: Authors)

Dimensions	Factors		Sub-Factors	Units
Formal Dimensions	Stimulation Factors		Visual exposure	The interior of the unit is beautifully designed. (1 question)
Functional Dimensions	Quantitative Features	Optimal Spatial Dimensions		The size of my room (rooms) is suitable. The size of the living and dining rooms in my unit is suitable. The size of the kitchen in my unit is suitable. The size of the balcony in my unit is suitable. (4 questions)
		Comfort Conditions	Climatic (Thermal)	I am satisfied with the cooling and heating systems of my unit. (1 question)
			Light (Natural and Artificial)	Most parts of my unit use the desired natural light. The artificial lighting system of my unit is suitable. (2 questions)
			Sound Control (noise)	No annoying sound can be heard from inside the unit. (1 question)
	Qualitative Features	Responsiveness	Adaptability	Most of the unit's interiors are tailored to my needs. (1 question)
			Functionality	The number and dimensions of my home cupboards are suitable for me. (1 question)
			Flexibility	In my house, there are no restrictions on the arrangement of living and dining rooms. (1 question)
			Personalization	It is possible to install signs on the walls of my house. (1 question)
			Communication with nature	From the windows of my unit, the green space outside can be seen. From the balcony of my house, the green space outside can be seen. (2 questions)
		Order	Spatial Hierarchy and Organization	The living room and bedrooms are designed separately from each other. (1 question)
		Control	Crowding	The number of bedrooms is proportional to the number of family members. The number of toilets per unit is proportional to the number of my family members. (2 questions)
			Territoriality	My room is my personal territory. (1 question)
			Privacy	The balcony of my unit is hidden from the eyes of strangers. When I open the front door of my unit, not all area of my unit is visible. (2 questions)
			Safety and Security	I feel safe in this unit. (1 question)
The Conceptual-Semantic Dimensions	Ability to make memory			I have many memories of this unit. (1 question)
	Identity		Artificial	My house is reminiscent of my childhood home. (1 question)
3 Dimensions	8 Factors		15 Sub-Factors	24 Questions

2. Materials and methods

Although the nature of this research is qualitative, a combination of quantitative and qualitative strategies is employed to investigate the correlation between variables. The physical components of the place of residence are considered as the independent variable, and the degree of attachment as the dependent variable. The impact of physical components of residential complexes (flats) on residents' sense of attachment is investigated through causal-comparative strategy. Different steps of the research require a different method of study. The study of the related literature and its conclusions lead to the formation of a conceptual research framework that defines key assumptions and their relationship and identifies the issues that need to be addressed in future research. At the second step, quantitative method was used and the data collection of the existing samples carried out and evaluated to create a comprehensive and logical conceptual framework. In this respect, questionnaires had been designed according to the research objectives as well as the expected output for analysis purposes. The research instruments included a self-report questionnaire encompassing 20 scales (70 items) and place attachment scale. Responses were on the bases of a 5-point Likert-type scale for each item (from *totally disagree* to *totally agree*). Trained interviewers (i.e., architectural students) contacted potential participants in different residential complexes in Binalood new city. In addition, participants were asked to answer (on a 0-6 response scale) an additional question about how attached they are to their place of residence, and to declare whether they would remain there for their rest of life or not. Because the whole society is similar and homogeneous, simple possible samples have been selected through systematic random sampling method (based on Cochran formula). In this method, assuming that all members of the community are homogeneous, each of them is given a number or code from 1 to N, and then the sample individuals are selected in a specific order. Finally, 375 participants completed a short demographic form. The analysis of questions, reliability and validity calculations and initial tests were performed in SPSS software. Cronbach's alpha coefficient was used as a common method for multi-value Likert questionnaires' validity. According to this method, if the value of this index for the questionnaire questions is more than 0.7, the questionnaire has an acceptable reliability. In this study, Cronbach's alpha is 0.932. Therefore, the designed questionnaire was simultaneously used in 8 residential complexes to compare the results with each other and calculate their correlation coefficient. Demographic information showed that 62% of the respondents were women, 42% had a diploma, and 44.5% were in the age group of 31-49 years. Also, 61% of the interviewees owned their place of residence and had lived there for more than 3 years.

Similar results and high correlation coefficient (more than 90%) indicate the validity and reliability of the research instruments. Parametric tests (correlation test) have been used to analyze the results. Multivariate regression was used to analyze the obtained information and the relationship between place attachment with 18 factors and sub-factors, and the criteria were prioritized using EXEL and SPSS software. In the last stage, conclusions were made based on the analysis of the literature and the collected data. In connection with the identification of effective physical factors, the significance of the correlation between individual factors and the idea of place attachment has been investigated through Pearson correlation coefficient.

The mean, median, skewness and kurtosis of the criteria presented in questionnaires are presented in Table 4.

According to Pearson correlation coefficient, the minimum correlation coefficient is 0.157. Examining the results obtained from Table 5, it can be said that there is almost a high correlation between all factors and criteria with place attachment. The standard β numerical value was employed to prioritize the results of regression. Regarding the results obtained from physical criteria related to residential units, the component of visual richness (beauty) with a β coefficient of 0.492 is the most important criterion in the formation of place attachment. It shows that if this physical factor changes by 1 unit, the degree of place attachment will change by about 0.4. Also, the sub-factor of noise in residential units with a β coefficient of 0.001 has the lowest coefficient.

Table 4: General specifications of the Factors (Source: Authors)

Factors	Sub-Factors	Mean	Median	skewness	kurtosis
Stimulation Factors	Visual exposure	7.0000	7.0000	0.386	1.147
Optimal Spatial Dimensions	-	6.6907	7.0000	0.904	0.296
Comfort Conditions	Climatic (Thermal)	5.8053	7.0000	0.585	1.066
	Light (Natural)	8.1200	9.0000	2.173	5.105
	Light (Artificial)	7.5707	9.0000	1.500	1.904
	Sound Control (noise)	4.8453	3.0000	0.165	1.363
Responsiveness	Adaptability	5.5547	7.0000	0.402	0.962
	Functionality	5.6240	7.0000	0.233	1.287
	Flexibility	5.1013	5.0000	0.101	1.342
	Personalization	7.4053	7.0000	1.792	3.056
	Communication with nature	6.2160	7.0000	0.647	0.957
Order	Spatial Hierarchy and Organization	6.9787	7.0000	1.068	0.150
Control	Crowding	6.3707	7.0000	0.568	0.975
	Territoriality	6.6240	7.0000	0.620	0.621
	Privacy	5.8373	7.0000	0.510	1.184
	Safety and Security	7.3253	7.0000	1.288	0.251
Ability to make memory		5.6240	5.0000	0.331	0.814
Identity	Artificial	3.3147	3.0000	0.827	0.364

Table 5: The degree of correlation between the measured criteria and the concept of place attachment and regression ranking (Source: Authors)

Factors	Sub-Factors	Pearson Correlation Coefficient	Order of correlation (descending)	Regression results		
				Std. Error	Standardized Coefficient β	Rank based on regression
Stimulation Factors	Visual exposure	0.650	1	0.517	0.492	1
Optimal Spatial Dimensions	-	0.496	3	0.547	0.147	6
Comfort Conditions	Climatic (Thermal)	0.407	9	0.368	0.004	17
	Light (Natural)	0.286	16	0.701	0.029	13
	Light (Artificial)	0.157	18	0.573	0.135	7
	Sound Control (noise)	0.307	15	0.391	0.001	18
Responsiveness	Adaptability	0.492	4	0.532	0.045	12
	Functionality	0.370	10	0.496	0.029	14
	Flexibility	0.355	12	0.508	0.025	15
	Personalization	0.221	17	0.488	0.071	9
	Communication with nature	0.369	11	0.591	0.351	2
Order	Spatial Hierarchy and Organization	0.425	8	0.440	0.055	10
Control	Crowding	0.582	2	0.525	0.193	4
	Territoriality	0.483	5	0.430	0.183	5
	Privacy	0.315	14	0.370	0.086	8
	Safety and Security	0.443	7	0.520	0.258	3
Ability to make memory		0.462	6	0.507	0.052	11
Identity	Artificial	0.339	13	0.419	0.008	16

3. Results and discussion

Unlike the studies of Gillis (1977), Mesh (1998), Kim (2004), Gifford (2007), and Lewica (2005), which merely examine physical criteria related to the functional dimension, and research that emphasizes the effect of physical criteria related to the semantic dimension in promoting a sense of place attachment, this study is in line with the foregoing researches, emphasizing the need to pay attention to the formal and semantic dimensions along with the functional dimension. Despite the differences in the subject under study (the effect of dormitory physical factors on residents' stress), the results of Ivan and McCoy research are confirmed by the present study and it can be said that it is more comprehensive than other researches. Also, the results of the researches of Eshlman (2002), Khozai (2012), Jiboy (2014), Shabak (2015), Kamalipour (2012), who studied place attachment in residential complexes and houses, and especially Yaghmaeian (2019), are in line with the results of this study. However, the physical criteria studied in the mentioned researches are more limited than the present article and there is no classification among them. In general, the following results are obtained in this study:

- Physical criteria related to the units showed a stronger correlation with the sense of place attachment and staying in this new city.
- Visual exposure in the residential units showed strong correlation among the other criteria, and ranked first in affecting place attachment.
- Communication with nature is in the second place from the resident’s point of view and the importance of paying attention to this issue in designing the units is proved.

4. Conclusion

The present study investigated the concept of place attachment and the factors influencing its creation and promotion from the perspective of physical criteria, and explored the residential complexes of Binalood new city as an example of modern urban development. Finally, eight significant criteria [visual exposure (aesthetic) related to the formal domain, optimal spatial dimensions, comfort conditions, communication with nature, order, control related to the functional domain, ability to make a memory, and identity related to the semantic field] were presented. According to the obtained results, there is a significant relationship between the physical factors studied in this paper and place attachment. Furthermore, the most important and positive correlation was found between the criterion of visual exposure (beauty) and place attachment in the area of residential unit spaces in residential complexes from the perspective of residents. The effectiveness of these factors on place attachment was also examined in the studied samples. From the viewpoint of residents of residential complexes of new cities, the most important criteria for inducing place attachment include visual exposure, communication with nature, safety and security, congestion, providing personalization, paying attention to optimal spatial dimensions, providing appropriate artificial light, privacy, the possibility of personalization, proper design of access hierarchy and spatial organization, attention to the ability to make a memory, adaptability, the reception of adequate natural light, the functionality and flexibility of the unit, the provision of artificial identity, thermal comfort, and attention to noise pollution, respectively. It was also concluded that the desirability of designing and planning the physical factors of residential units in addition to its positive effect on promoting residents' attachment are directly related to their desire to stay in the residential complex, which is the basis for their stay in new city.

So, table 2 is transformed to diagram 1, which has determined the relationship between physical features of the residential complexes, place attachment, and stay in place. On the other hand, this diagram defines main features that influence resident’s place attachment in three dimensions.

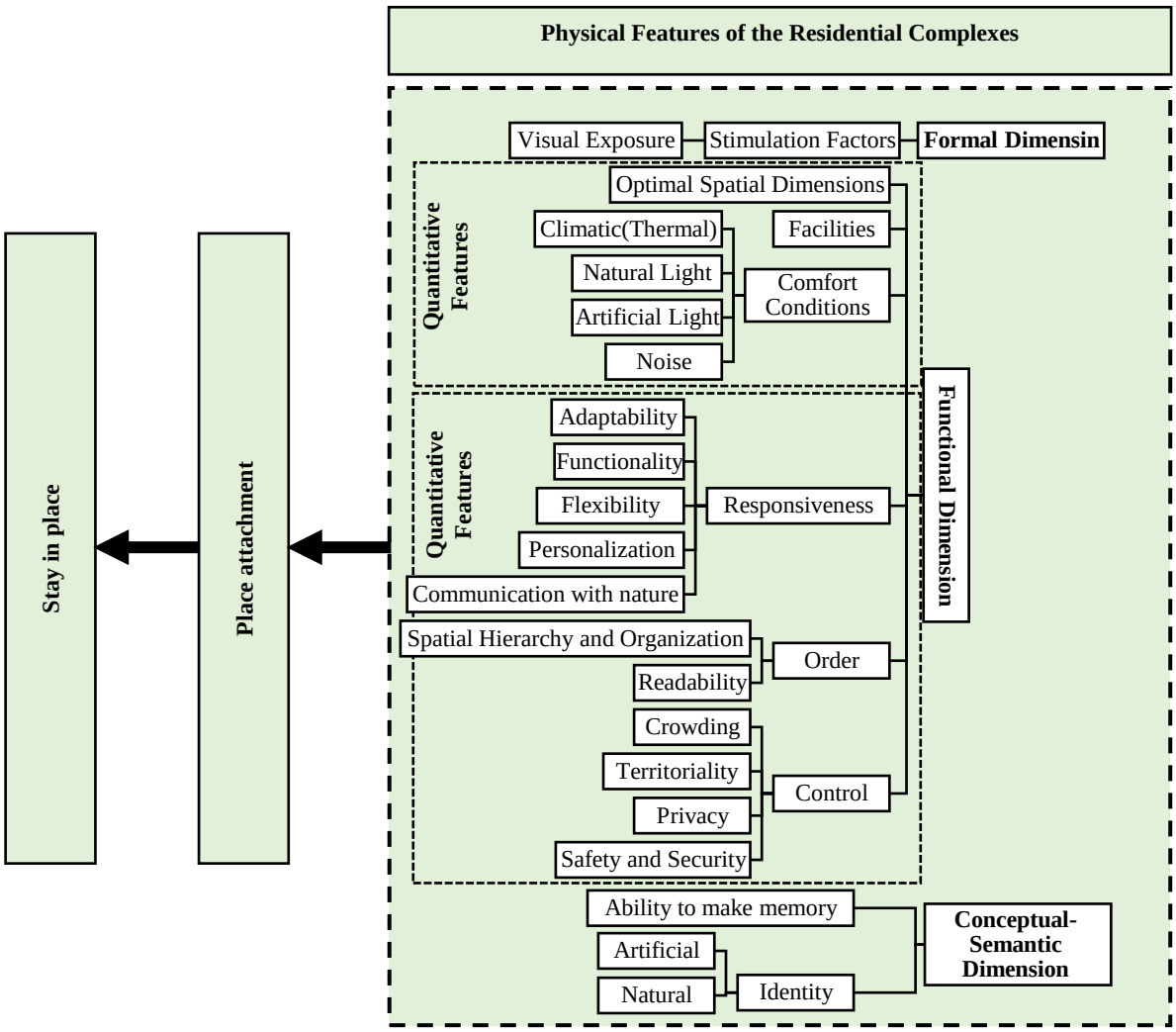

Figure 1- Physical Features of the Residential Complexes that influence resident's place attachmen (Source: Authors)

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