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Kolektif Yaşamda Konutu Anlamak: Diyarbakır Çok Katlı Konutları Örneği

Araştırma Makalesi
Research Article

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ÖZ

Günümüz kentlerinde bir "yapılaşma kültürü" haline gelen çok katlı konut oluşumları gelişim dinamiklerinin etkisiyle yerele özgü bir kolektif yaşam desenini yansıtmaktadır. Bu bağlamda çok katlı konutta belirli bir süreçte mekânsal hiyerarşiyi ortaya çıkarmak, geçmiş ve gelecek arasındaki farkları ve güncel olanı okumaya/tanımlamaya imkân verebilir. Bu bağlamda çalışmanın amacı kolektif yaşam biçimini, hakim yapı kültürü olan çok katlı konut yapıları üzerinden değerlendirmektir. Bu amaç doğrultusunda kolektif yaşam tarzının bir unsuru olan modern çok katlı konutun değişimi ve geçmişten taşıdığı izlerin ortaya çıkarılması hedeflenmiştir. Önemli kırılma noktalarına sahip kentin makro ve mikro ölçekte değişimleri ve yansımalarının izi ile mekânsal örüntü ortaya konulmak istendiğinden çalışmada mekan dizimsel yöntemler ve alan dağılım tespiti yöntemi kullanılarak konut planları analiz edilmiştir. Yapılan çalışma sonucunda Diyarbakır kentinde çok katlı konutun değişimleri üç farklı periyodu işaret etmektedir. Bu periyotlar içerisinde ilk oluşan çok katlı konut planları ile geleneksel konut kurgusu arasında bir bağ olduğu, ikinci periyotta değişimin başladığı, son periyotta ise "türdeşleşmeye" doğru benzer değerler aldığı mahremiyet ve mekânsal kurgunun kaybolan ve ilave edilen işlev alanları ile farklılaştığı tespit edilmiştir.

MAKALE BİLGİSİ
Geliş 27 / 10 / 2022
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ANAHTAR KELİMELER
Diyarbakır kentsel gelişim
Çok katlı konut
Mekan dizim
Agraph
Depthmap

Understanding Housing in Collective Life: The Case of Multi-storeyed Houses of Diyarbakır

ABSTRACT

Multi-storey housing complexes, which have come to constitute a 'building culture' in today's cities, reflect local collective life patterns with the effects of development dynamics. In this context, revealing the spatial hierarchy in particular processes in multi-storey housing may make it possible to read or describe differences between the past and the future, and present forms. The aim of this study is to evaluate the collective lifestyle through multi-storey residential buildings, which is the dominant building culture in the area of interest. For that purpose, efforts are made to reveal traces of the past and changes in modern multi-storey housing as an element of the collective lifestyle. With the goal of identifying spatial patterns through traces of macro- and micro-scale changes and reflections of the city, which have some critical turning points, housing plans are analysed using space syntax methods and area distribution determinations in this study. As a result, it is seen that the changes in the multi-storey housing of the city of Diyarbakır indicate three different periods. A connection is determined between the first multi-storey housing plans and the traditional housing setup within these periods, while changes started in the second period. In the third period, privacy was emphasized and spatial setups were differentiated with lost and added functional areas, taking on similar values and moving towards homogenization.

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1. INTRODUCTION

The expansion of the multi-storey culture of collective life in cities in forms such as industrial housing units has become the dominant construction culture in Diyarbakır, Turkey, similarly to many other parts of the world. The first cores of multi-storey accommodation units built for disparate income groups across the four central districts of

the city (Kayapınar, Bağlar, Yenişehir, and Sur) bearing metropolitan status, in areas with both controlled and uncontrolled development, generally date back to the 1960s. The history emerging from the district centre of Sur and the administrative, social, and cultural public structuring that began developing around the city walls have their roots in the 1950s (Halifeoğlu and Dalkılıç, 2011; Şahin et al., 2019). In the Yenişehir area, which was the first residential area outside of Sur, the districts known today as Şehitlik and Kooperatif were established (Arslan, 1999; Beysanoğlu, 2001; Özer, 2010). Although the first concentrations of multi-storey houses were seen in İstanbul (Görgülü, 2017; Gür, 1989; Öncel, 2014), general production continued with lodging and cooperative activities through the 1950s (Tekeli, 1982).

After the 1930s, economic changes such as the mechanization of agriculture, employment problems, the establishment of Real Estate and Eytam Banks, and the granting of housing loans with the SGK, as well as political changes such as the transition to the multi-party system; It has caused an increase in the rate of migration and urbanization/construction to the city. Due to population growth and condominium regulations, the need for housing has come to the fore, and multi-story houses have started to become widespread and form the basic structure of housing architecture (Bozdoğan, 2008; Tekeli, 1996).

The same trends were observed in Diyarbakır, with some variation in the specific time periods. The housing needs of the city's population grew due to both incoming migration and high birth rates. Efforts were made to meet those housing needs through private enterprises and cooperatives, with licensed houses being built by cooperatives and unlicensed houses being built by private enterprises. Yenişehir, one such area of housing development, saw its first occurrences of multi-storey housing complexes between 1960 and 1973 (Arslan, 1999). Thanks to property ownership regulations and loan incentives, building cooperatives were effective in Yenişehir, whereas the areas around the city walls and the first neighbourhoods of the district known as Bağlar today were marked by the expansion of slums and less formal apartment units. As a result of the city's rapid population growth, zoning plans could not be properly implemented and the city was shaped by the parallel occurrence of uncontrolled housing and licensed multi-storey housing units.

In the 1970s, Bağlar acquired an urban texture consisting of several-storey, unplastered, brick or briquette, reinforced concrete terrace-roofed structures (Atlı, 2014); on the other hand, Yenişehir was shaped by blocks of cooperative housing built with credit support (Atlı, 2014; Beysanoğlu, 2001; Halifeoğlu and Dalkılıç, 2011). In those years, the railway line between Yenişehir as a planned area and Bağlar as a slum settlement was considered as a "buffer zone" (Atlı, 2014).

In these processes of development that continued until the mid-1980s, multi-storey houses were produced on a parcel basis. Multi-storey housing reflected characteristic features in terms of construction techniques, plan setups, flat sizes, settlement statuses, and residential areas in this period.

With the start of the 1980s, significant changes were experienced in Diyarbakır and Turkey as a whole. The need for housing across the country accelerated the construction of multi-storey housing units as a solution to issues such as the transition towards nuclear family households, transportation access, limited infrastructure services, the lack of family estates or inheritance, and the wish to reduce housing costs (Balamir, 1994; Görgülü, 2017; Tekeli, 2017; Ünal, 1979). The effects of these changes all emerged in the city of Diyarbakır.

The economic decisions made on 24 January 1980 reflected a sharp approach that marked major changes to Turkish policies (Boratav, 2012). At the same time, the construction industry gained momentum together with the increasing diversity of material supplies and the development of construction technologies. On top of these changes, forced migration and sudden population growth in Diyarbakır with the State of Emergency (OHAL) administration of the time led to more widespread construction of multi-storey housing in the city. That experience of forced migration constituted a threshold for this period in terms of urban and housing development. The development of the city, which assumed the position of a 'terminal city' (Keser, 2011) through migration and an identity as a 'mega village' (Bağlı and Binici, 2005), saw the increasing deepening of spatial separations with 'separate cities in the same city' (Özer, 2010).

Alongside the 'anonymization of reinforced concrete' (Tekin, 2013), the construction of cooperative housing blocks for middle-income residents in Yenişehir and the construction of less formal apartment houses in Bağlar, which were seen as a more economical and urgent solution, both increased. In this period, when zoning implementations were inadequate, the city received over 300,000 migrants between 1985 and 2005 and urgent housing needs were met by building multi-storey housing units very rapidly, despite the lack of infrastructure. Work was begun on a new zoning plan in 1983. Furthermore, according to 2002 data, about 50,000 of the 119,321 houses built were in violation of the existing zoning legislation and accommodated 300,000 people (Sevinç, 2001). Therefore, the multi-storey housing units built before and after 1984 can be classified as belonging to separate periods.

After the 1980s, another critical turning point in the general development of multi-storey housing and housing construction occurred with the zoning applications dated 2004-05. Zoning plans for the Kayapınar region were approved in 2001 and revised in 2005, and the population density of the Kayapınar region was intensified. Urban residents of the middle and upper classes who moved from the centre of Sur to Yenişehir continued to settle in the Kayapınar area, where spatial segregation was sharp and marked by urban mobility. Housing development areas were determined as 293.24 ha in 1960, 1277.23 ha in 1985,

and 3078.27 ha in 2005 (Gölcük, 2010). This situation was considered among the reasons for the development of multi-storey housing moving into the 2000s, with the spread of gated compounds with heightened security in the Kayapınar district and the Bağcılar ('New Bağlar') neighbourhood, as well as the general changes in the appearance of the city. Additionally, Kayapınar became the largest district, with its population exceeding 400,000 today.

In the 2000s, democratization and European Union accession efforts created social change by taming the chaotic environment that had appeared after the 1980s (Keyman and Koyuncu Lorasdağı, 2010; Samur, 2011; Yanmış, 2015). Another social change was the transition from a society that saved to a consumerist society (Odabaşı, 2013), with that transition impacting the former in terms of its production/consumption habits in conjunction with globalization and post-modernism. Consumption, defined based on symbolic systems of meaning, may be evaluated as a process managed by the interplay of symbols, wherein messages, images, or meanings are consumed with the aim of becoming noticeable and displayed (Baudrillard, 2013; Bocock, 2014; Miller, 2012).

With the overwhelming forces of globalization, this process exerted its effects throughout the whole world, not merely in Turkey. The production of multi-storey housing units and consumption-centred or public buildings that served to expand the consumption sectors of the economy developed in parallel with the changes in consumption habits. Hedonic habits led to preferences far removed from necessity. With the preferences of users/consumers who tend to prefer large, expensive, and luxurious residences rather than cost-efficient housing shaped to meet real needs, residences and multi-storey housing complexes with closed security systems are becoming more widespread today (Kılıç and Ayataç, 2019). From the 2000s, luxury dwellings and residences have been built as prestigious mixed-function, large-scale residential units by combining and transforming parts outside the city or within the city centre (Görgülü, 2017; Koca, 2012; Süer and Sayar, 2002).

In spite of the increasing number of residence complexes and mixed-function luxury housing estates in metropolitan areas, housing complexes with closed security systems that target the middle class have not become widespread. However, in Diyarbakır, multi-storey residential housing complexes with closed security systems can be found in most of the developed areas of the city.

In this context, the aim of this study is to evaluate the patterns of collective living through multi-storey residential buildings, which constitute a dominant building culture. For that purpose, efforts are made here to reveal traces of the past and changes in modern multi-storey housing as an element of the collective lifestyle. Therefore, in this study, the socio-economic, legal, and administrative factors affecting housing construction and spatial organization are addressed. For the analysis of housing planning, which has changed over time with the effects of cultural codes, licensed multi-storey housing structures, thought to reflect the preferences of residents with a certain 'plan,' are analysed here. The district municipality of Sur, having a unique pattern of historical settlement and TOKİ projects, was excluded.

Housing samples that reflected the imaginative or physical characteristics of the period in which they were built according to the processes of urban development and housing construction and the general characteristics of the residential blocks were selected and analysed. The changes experienced in these years were expressed concretely on the physical plane in this urban setting. Within the historical trajectory of the city of Diyarbakır, the construction of the first modern housing structures began in the 1950s. In this period, credit support and domestic migration flows shaped the patterns of residential construction. Legislative arrangements regarding property ownership were also effective in the emergence of multi-storey housing units in the city.

The first true multi-storey housing examples in Diyarbakır emerged in the 1960s. Therefore, the 1960s were accepted as the starting point for the research conducted in this study. On the other hand, the transition to a neoliberal economy in Turkey in the 1980s was an important turning point for the construction industry. In addition, the forced waves of migration to the city in the 1980s also affected the construction of multi-storey housing. These two important changes increased the rate of the construction of multi-storey houses in Diyarbakır both with and without licenses.

In 1984 and 1985, a master development planning study was carried out to increase the residential areas of the city. Multi-storey housing construction had become widespread, both suddenly and rapidly, with the effect of the changes described here. For this reason, 1985 was determined as the beginning of the second period considered in this study. In this period, unlicensed multi-storey housing units constituted a large part of the city's development. However, in the 2000s, this situation began to change again. The zoning implementation efforts carried out as of 2005 have changed the general appearance of the city. Licensed multi-storey residences have become widespread together with closed-system security complexes, shaping all of the new centres of development in the city. Thus, residential structures built in or after 2005 were evaluated for the third period of this study.

2. Material and Method

In this study, the area sizes of particular spaces and the frequency of their occurrence in the plan setup of the considered units were determined from housing plans. Furthermore, the space syntax and visual space analysis methods were used for the analysis of the floor plans of the selected samples (Figure 1).

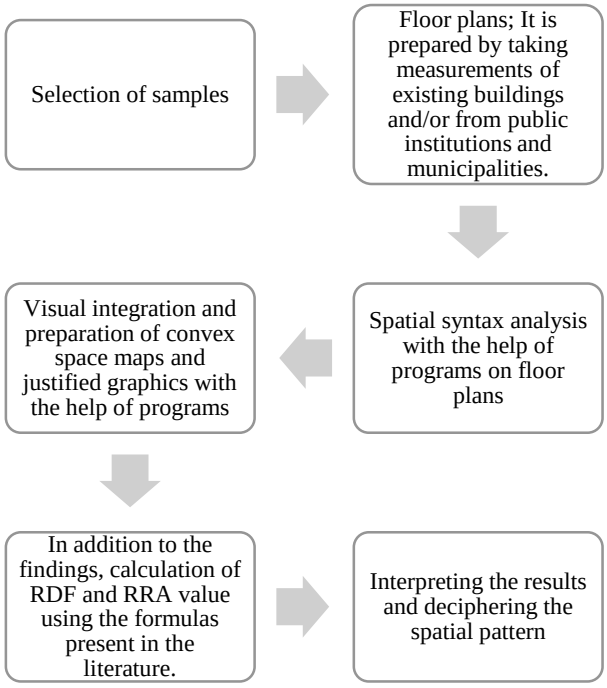


Figure 1. Method of study

Spatial syntax is a set of theories and methods used to define spatial organization with measurable expressions in a mathematical language. This method was developed by Hillier et al. at University College of London in the 1970s and further described by Hillier and Hanson (2001) in a study titled 'Social Logic of Space'. Hillier and Hanson described the existence of a common language in the clustering of spaces; accordingly, the order and hierarchy between spaces and between individuals are related. The bonds between spatial organization and social structure create a pattern (Hillier and Hanson, 2001). Thus, this method defines systems, revealing the characteristics that will provide a systematic framework for evidence-based analysis (Peponis, 2005). Bafna (2003) stated that the meanings represented by the cells of a space include the behavioural patterns of different human groups and that these patterns can be derived from the spatial organization in the basic logic of the space syntax. With a method based on permeability analysis, comparisons can also be made by revealing genotypes. In the present study, visual graph analyses were carried out to expand the permeability analysis. The visual space approach developed by Benedikt can be used to describe the relationships between the geometry of space and the perceptions of observers who are moving. Visibility, which expresses the image information at the point where an observer is located, is related to the geometry of the space (İnce Güney, 2007).

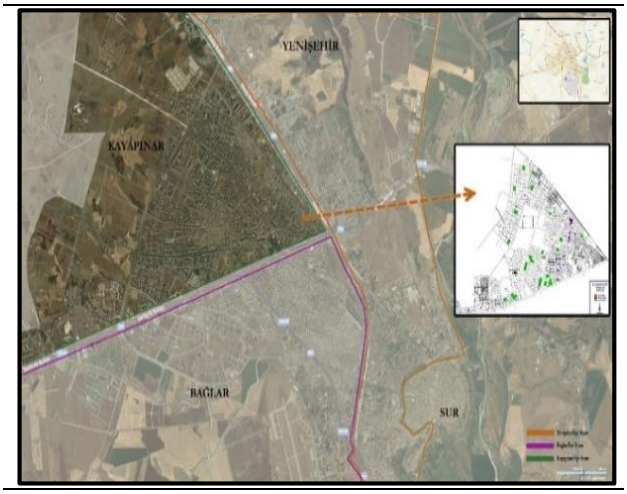
With these methods, selected to reveal the underlying information by explaining the hierarchical structure of spatial organization and to express intangible information concretely, permeability visibility analyses were conducted and convex space maps, visual space maps, and justified graphs were created. The Agraph (Manum, 2006) and Depthmap (Turner et al., 2001; Turner, 2007) programs were used. Connectivity, integration (HH), relative asymmetry (RA), total depth (TD), and main depth (MD) values were calculated separately for a system that comprised plans and parts. Visual integration (VHH) values were calculated on the visual space maps and the control value (CV) was computed on justified graphs based on neighbourhood relations. Because systems of different sizes were being assessed, real relative asymmetry (RRA) and relative difference factor (RDF) values were also determined. The integration (HH) value, which is inversely proportional to the RA value, can be obtained using the Depthmap program and makes hierarchical readings easier. Moreover, the average distribution of the spaces of the houses according to the total area of the houses, their percentages, and their frequencies of occurrence were calculated.

When selecting 105 exemplary buildings in the study, the fact that they were built in different years with different production styles of the period and that they were licensed housing applications were the bases for the selection. Twenty-two residences selected for the period 1960-1984 are in the Yenişehir and Kaynartepe cadastral neighborhoods of today's Yenişehir and Bağlar districts, which are referred to as the Surdışı district, 7 of the 45 residences selected for the 1985-2004 period are in Yenişehir District, 14 are in Bağlar District, 24 are in Huzurevleri and Peyas neighborhoods which are the borders of today's Kayapınar District. Of the 38 residences chosen for the period 2005 and later, 5 of them are in Yenişehir District, 10 are in Bağlar District, and 23 are within the boundaries of today's Kayapınar district (Figure 2).

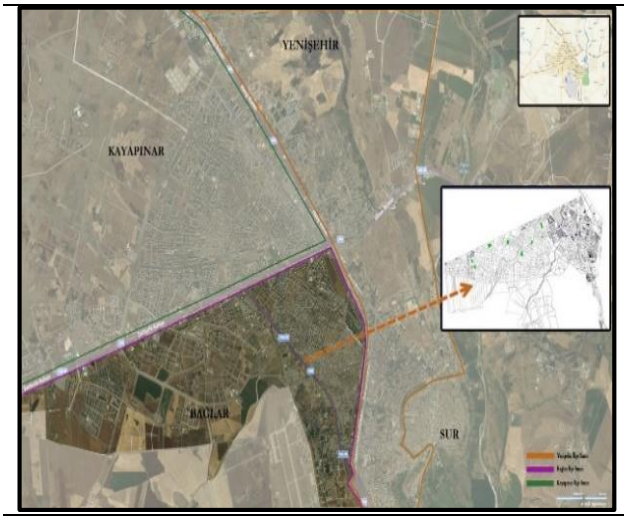
Among the houses determined for the first period 7 were produced between 1960-1969, 13 between 1970-1979, and 2 between 1980-1984. 14 of these houses were produced by private enterprises, whereas 7 of them were built by cooperatives and one by a construction company. Among the residences selected for the second period, 12 of them were built between 1985 and 1990, 21 of them were built between 1991 and 1999, and 12 of them were built between 2000 and 2004. Fourteen were produced by private enterprises with a build-sell approach, 26 by cooperatives, and 5 by construction companies. Twelve of them have 4-6 storeys, 29 of them have 7-9 storeys, and the remaining 4 have 11-13 storeys. They consist of multiple blocks and there are 38 open and 7 closed residential units. Two of these selected units were built as mixed buildings and 43 were built with reinforced concrete cores. In terms of numbers of rooms, 4 of them are 4+1, 4 of them are 2+1, and 37 of them are 3+1.

Among the housing units selected for the third period, 12 were built between 2005 and 2009, 20 were built between 2010 and 2014, and 6 were built after 2015. Two were built by private enterprises with a build-sell approach, 7 by cooperatives, 3 by foundations, and 26 by construction companies, all with reinforced concrete cores. Thirteen of them have 7-9 storeys and 25 of them have 10-15 storeys; they are multi-block structures, including 1 open and 37 closed residential units. In terms of numbers of rooms, 14 of these units are 4+1, 23 are 3+1, and 1 is 5+1. These

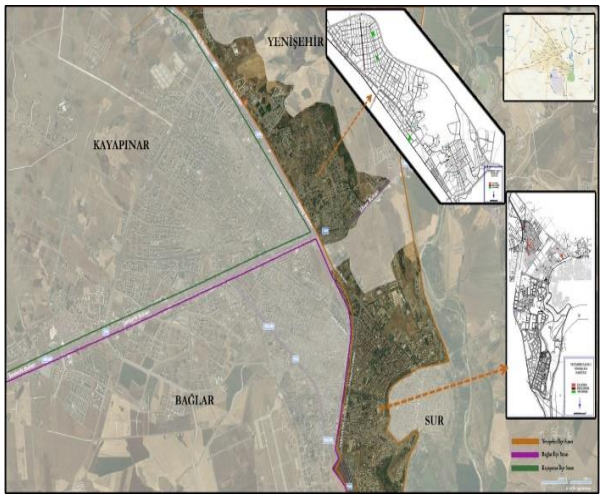
housing units were selected by random and criterion sampling; they are all structures that could be reached and for which research permission was granted.



Kayapınar District Sampling Area



Bağlar District Sampling Area



Yenişehir District Sampling Area

Figure 2. Distribution of study area according to districts and building units chosen from the sampling are

3. Findings

When the housing sizes of the three periods are examined, it was confirmed that the area of houses was an average of 100 m² in the first period at the time that houses was widespread by parcel-based production, but it was 125 m² in the second period when single blocks built by private initiatives and multiple blocks built through cooperatives were common; also, it was 167 m² in the third period when closed security site blocks were common. It could be seen that the number of floors and blocks as well as the residential and total construction areas have increased in the process (Figure 3).

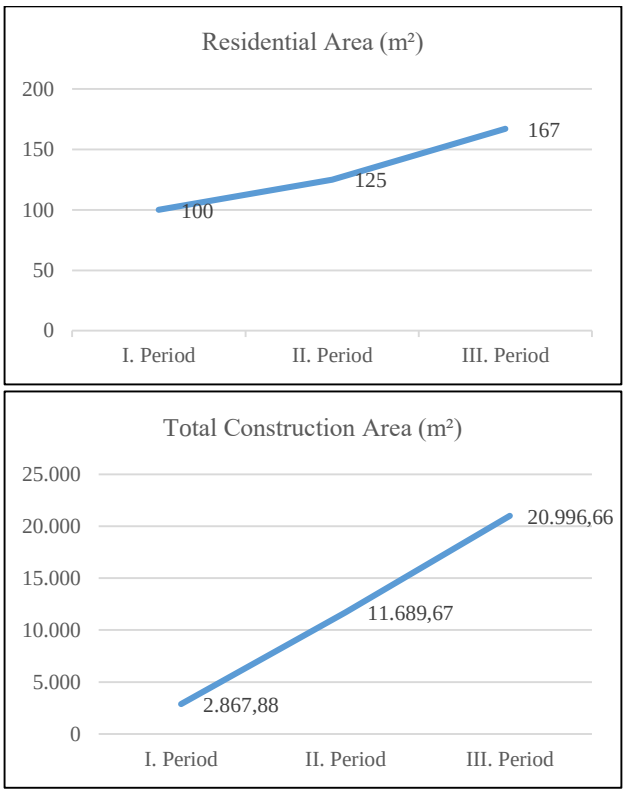


Figure 3. Average housing and total construction area changes (m²)

When the area distributions inside the individual housing units were considered, it was observed that the areas of the living rooms were particularly emphasized in the building designs (Figures 4 and 5). The areas dedicated to guest rooms and living rooms initially increased, accounting for 35% of the housing area in the first and second periods, but despite the overall increase in housing areas in the third period, the space of these particular rooms decreased to 31%.

In the first period, the living room was central to housing units, signifying connectivity and impacting the geometric form of the house. With these features, the living room can also be described as a transition area.

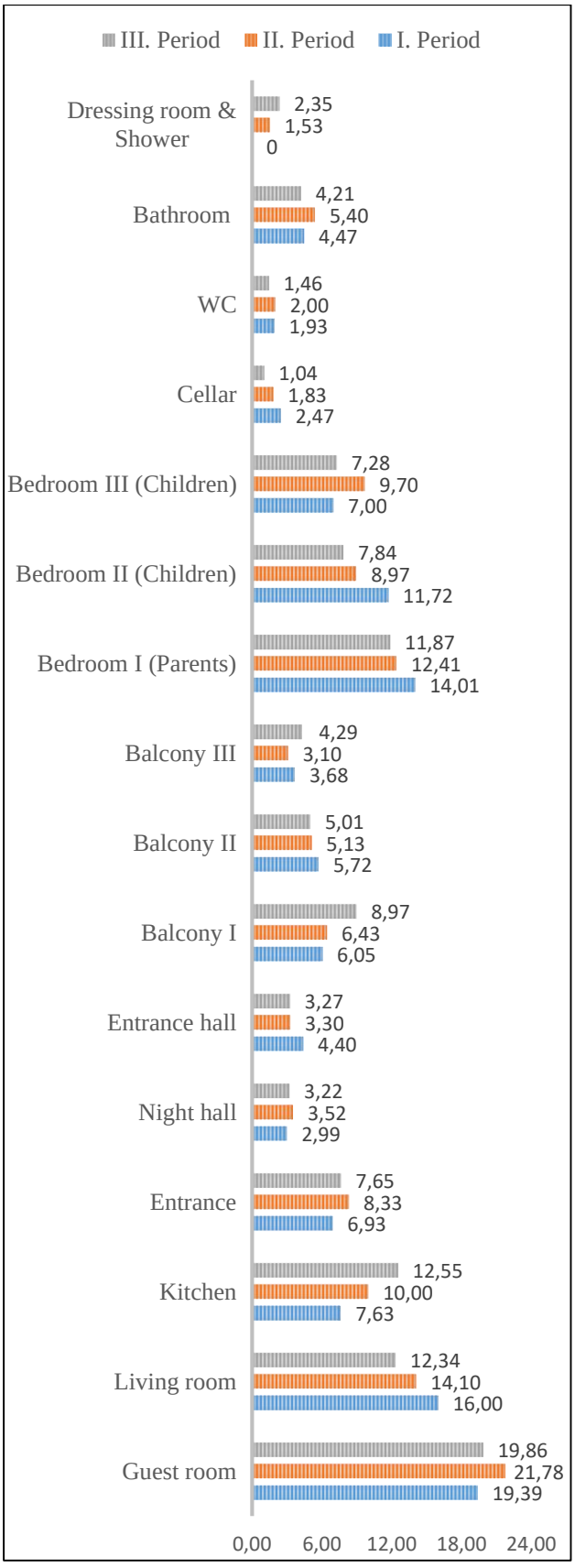


Figure 4. Average distribution of residential areas according to the period by total residential area (%)

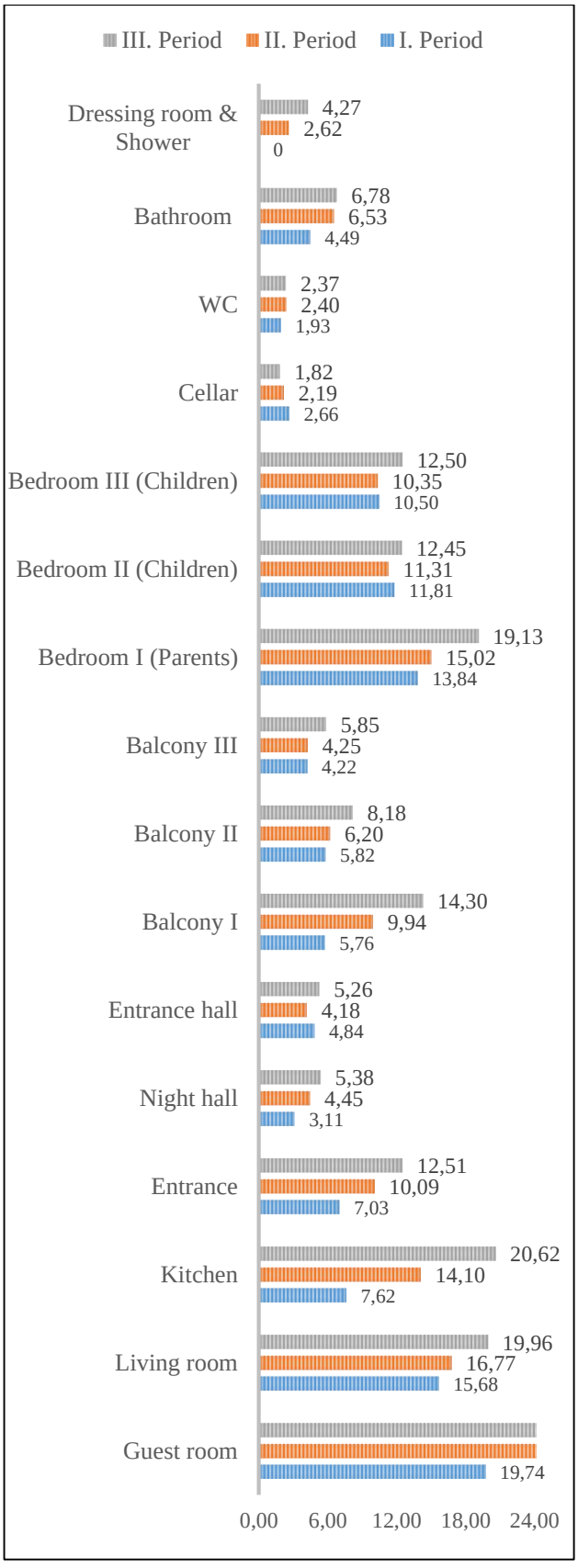


Figure 5. Average distribution of residential areas according to the total residential areas by periods (m²)

In the other periods, the living room was arranged separately within the general living area and lost its feature of being a central or transitional space. Furthermore, in the housing units from the first period, there are examples of the guest room/living room having a direct connection to the bedrooms and other areas, suggesting that privacy boundaries remained more ambiguous in the first period.

The kitchen is the area that underwent the most changes across these three periods in terms of its location, functionality, and increases in space. The kitchen is connected with the hallway and planned with more economical dimensions compared to the extent of cooking-food preparation actions in the first period; its average area is 7.62 m² and its ratio to the residential area is 7.63%.

In the following periods, the location of the kitchen changes with its attachment to the living area, its area is increased by nearly 3 times, and sections for socializing, spending time with family members, and eating are included. In the selected housing units from these periods, kitchens of over 30 m² are common.

Although cellar/pantry spaces were limited in number in the first period, the cellar can be thought of as an important place when evaluated across the periods in terms of its incidence rate (67%). The size and location of the cellar space is shaped in accordance with the space of the kitchen. It has the feature of being close to the kitchen or having a direct connection to the kitchen.

The cellar space, which covers 2.47% of the housing area in units from the first period, loses its importance and decreases to an area of 1.83% in the second period and 1.04% in the third period. Regarding its rate of occurrence, it is present in 14 (67%) of 21 samples in the first period, 15 (34%) of 45 samples in the second period, and 6 (15%) of 38 samples in the third period. Thus, a decreasing trend can be observed.

With regard to the area size of the balconies and their ratios to the total residential area, the area of the main balcony, which was associated with living spaces and employed frequently in the first period, ranged from 5 m² to 14.3 m² on average. Among the analysed housing units, the balcony was placed along the front line of the building entirely or to the extent that the structure would allow in the first period and partially so in the second period. In the third period, balconies have areas similar to the living room units, reaching up to 30 m². These balconies were designed while keeping the aspect ratio closer to allow functions such as sitting and sleeping. Balcony space is significant for city residents as it allows for adaptation to climatic conditions, the preparation of winter supplies such as tomato paste and dried foods, the completion of chores such as washing the carpets, and the fulfilment of traditional habits such as sleeping in open spaces. In the third period, the concept of orientation towards a view can be seen, with balconies shifted from the road to the garden with increases in the areas for social reinforcement in these housing units. It can be said that this criterion was also effective in the construction of the main balconies in the planning process. Looking at the ratio of circulation areas in terms of size and total housing areas, there are no sharp distinctions. Nevertheless, the transformation of the entrance hall, which is an area that could be judged in terms of the concept of privacy, was also observed. In 3 examples from the first period, the entrance hall is situated in such a way that the boundaries of in-house privacy are more ambiguous. In the following periods, the space is broadened as the boundaries of privacy become more evident. The frequency of the occurrence of this space in the second period is 45% in 20 units, while it is 50% in 19 units in the third period.

As a consequence of the spatial increase in bedrooms, privacy was also increased. There is no clear distinction between bedrooms of similar sizes in the floor plans of the first period and there are units directly attached to the bedrooms. Bedrooms averaged 11-13 m² in size in the first period and they were segregated between the parents' and children's bedrooms in the following periods, with the difference in area between the parents' and children's bedrooms being enhanced.

A shower unit was added in some units in the second period; on the other hand, a dressing room and shower unit were both added in the third period. Areas with water access also increased with the increase in the residential area. Sink units situated between such areas in an open manner can be seen in units in the first period, but that style is not encountered in the following periods.

A total of 105 housing samples spanning three periods were analysed in a holistic manner. When the values obtained from the considered systems were correlated, differences were identified (Table 1). When the connectivity value, which reflects the relationship of units with each other, and the integration value, which signifies the centrality of the units in the system, were considered, decreases were identified. The units that make up the system were found to be partially separated and their relations were weakened. The average integration value increased in the second period and decreased in the third period. This could be taken as an indication of a transition from a more accessible and shallow system to a more detached and deeper system.

Table 1. The average of the syntactic measurement values of 105 houses as to the periods

	Period I	Period II	Period III
CV	2,03	1,97	1,98
HH	1,10	1,16	1,06
MD	2,54	2,47	2,64
RA	0,30	0,29	0,29
TD	28,50	27,81	32,58
VHH	8,50	7,22	6,38
TFF	0,70	0,66	0,72
RRA	1,07	1,02	1,06

Together with the enlargement of the areas and the increase in the number of spaces, it is noticed that the total depth and average depths broaden especially in systems in which entrance halls exist. It indicates that the most homogeneous structure with values approaching 1 with respect to the TFF value of the systems, and a structure with a tendency to segregate with values above 1 according to the RRA value. Although the houses have a homogeneous and systematically segregated structure, these values are the most homogeneous structure in the third period, and the systems with the least segregation tendency are in the second period. The visual integration value (VHH) of the system was calculated by preparing the visual integration maps. In reference to these values, the visual integration value tends to decrease. The calculated values are between 6.66-12.35 in the first period, 5.32-9.55 in the second period, and 5.20-7.96 in the third period. It can be disclosed that controllability in movement and orientation has diverted, and the boundaries of privacy have begun to become obvious.

Convex space maps, visual integration maps and justified graphs for syntactic measurements of the spaces that compose the system are given in figures 6, 7, 8 and 9. According to the numerical size of the calculated values, the places are coloured from red to blue on the maps. According to the colour scale between red and blue; values are higher towards red and lower towards blue. On the other hand, the situation is opposite in the justified graphics created according to the depth parameter. By the maps, graphics and calculations prepared, the syntactic values of the houses were computed in accordance with the spaces**.** The results of the computations with the most integrated and most disjointed spaces and the spaces with the highest and lowest connectivity, depth and control values are demonstrated in Table 2.

Table 2. Locations according to the values obtained through syntactic calculations

		Period I	Period II	Period III
HH	The most integrated spaces	Living room Night hall (inner hall) Entrance	Night hall (inner hall) Entrance	Entrance Night hall (inner hall) Parents' bedroom
	The most seperated places	Balconies Cellar	Balconies Dressing room +Shower	Balconies Dressing room +Shower
VHH	The most integrated point density	Living room Night hall (inner hall) Entrance	Night hall (inner hall) Entrance	Entrance Night hall (inner hall) Guest room Kitchen
	Most seperated point density	Balconies Cellar WC-Bathroom	Balconies WC-Bathroom	Balconies WC-Bathroom
MD	Deepest places	Balconies Cellar Bedrooms	Balconies Dressing room +Shower	Balconies Dressing room +Shower
	The shallowest/surface places	Living room Night hall (inner hall) Entrance	Night hall (inner hall) Entrance Kitchen	Entrance Night hall (inner hall)
TD	Private areas of use where privacy is desired	Balconies Cellar	Balconies Dressing room +Shower	Balconies Dressing room +Shower
	Public areas with low privacy demands	Living room Night hall (inner hall) Entrance	Night hall (inner hall) Entrance Kitchen	Entrance Night hall (inner hall)
CV	High accessibility in the system, strong control	Night hall (inner hall) Entrance Living room	Night hall (inner hall) Entrance Kitchen	Entrance Night hall (inner hall) Parents' bedroom
	Weak control in the system	Cellar WC-Bathroom Bedrooms	Cellar Bathroom Dressing room +Shower	Cellar Bathroom Children's Bedrooms
Connectivity	Strong inter-spatial relationship	Entrance Hall Living room	Night hall (inner hall) Entrance Kitchen	Entrance Night hall (inner hall) Parents' bedroom
	Weak Relationship between places	Cellar WC-Bathroom	Cellar WC-Bathroom Dressing room +Shower	Cellar WC-Bathroom

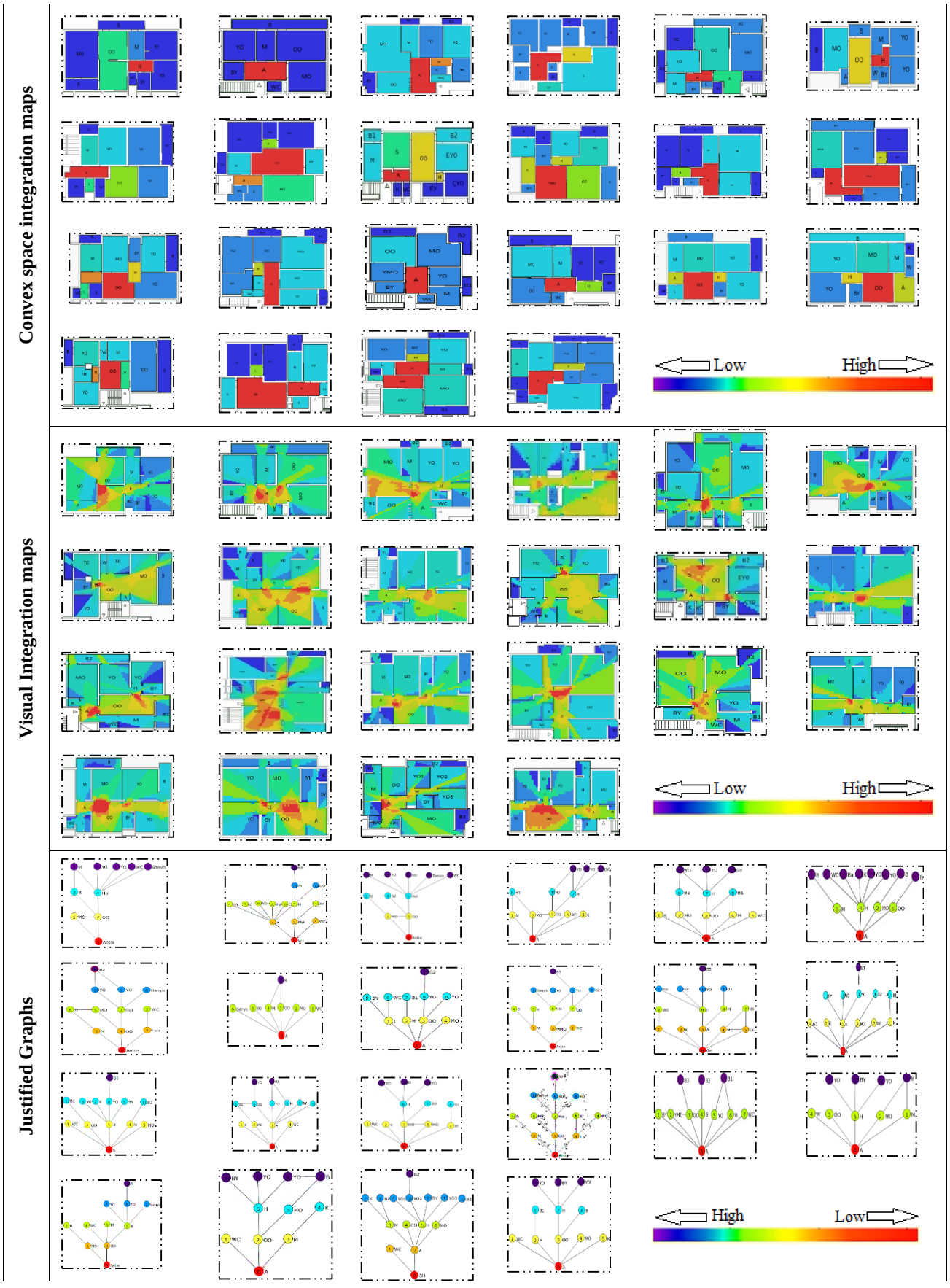


Figure 6. Convex space integration maps, visual integration maps and justified graphs for the first period

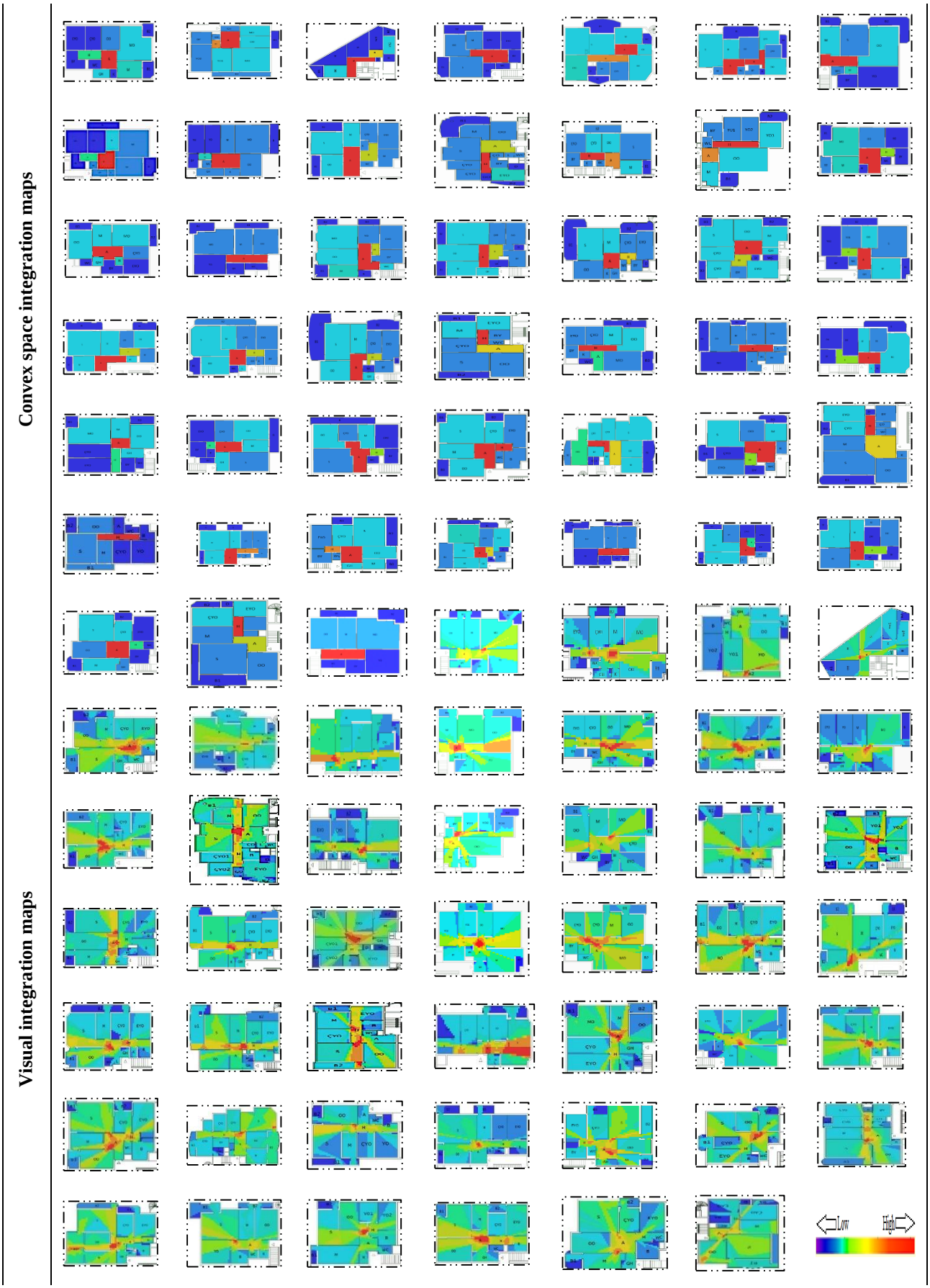


Figure 7. Convex space and visual integration maps of the second period

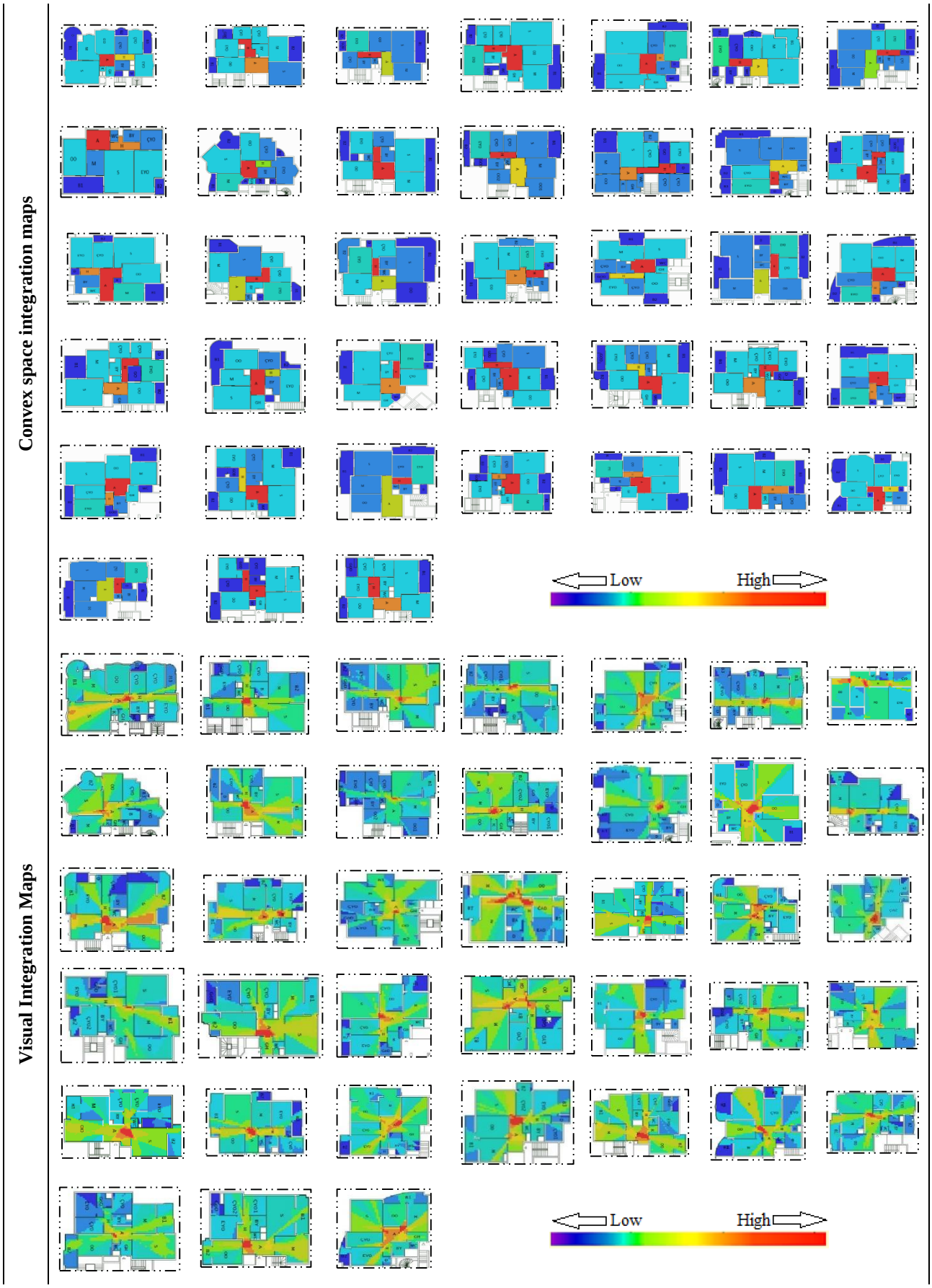


Figure 8. Convex space and visual integration maps of the third period

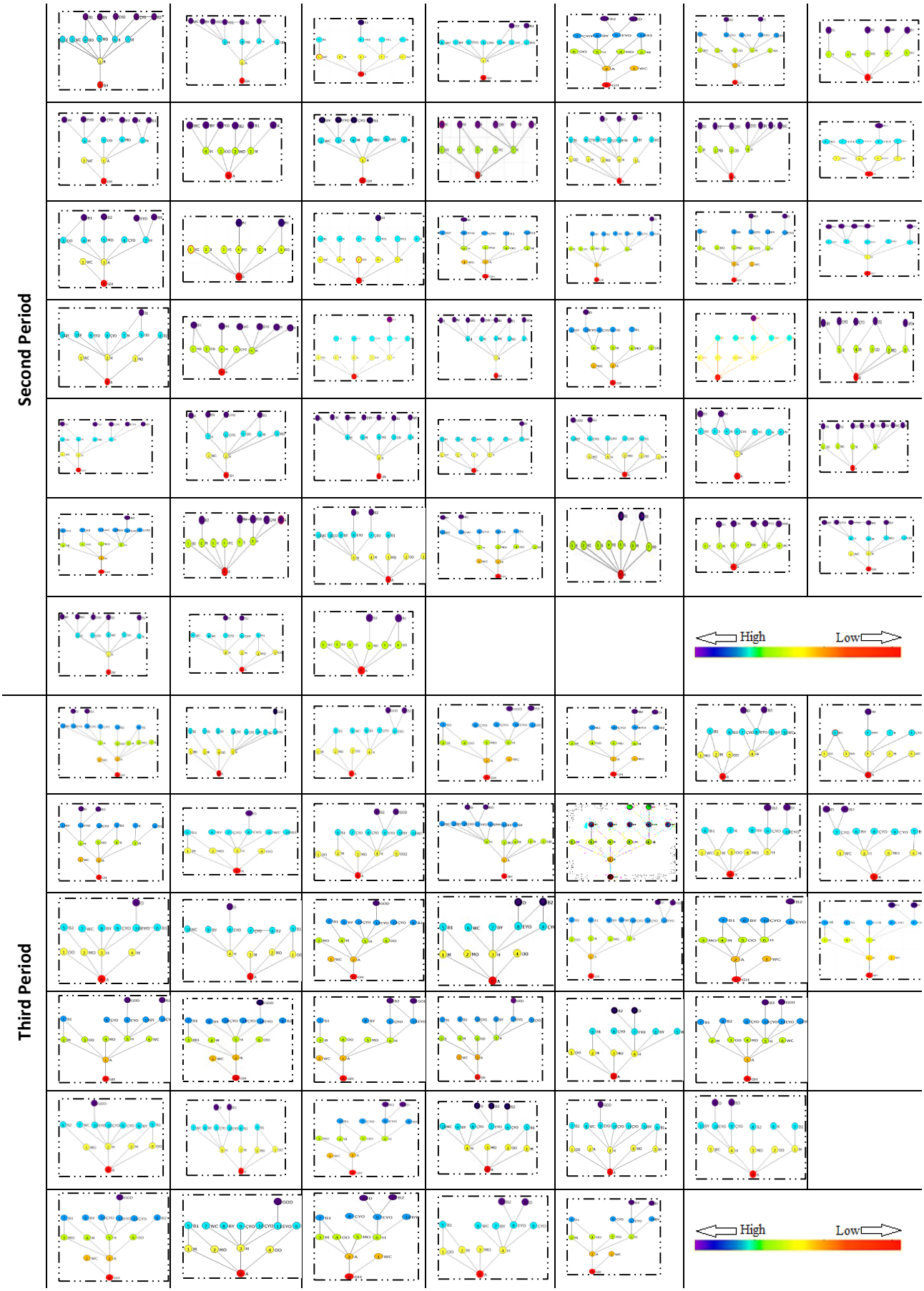


Figure 9. Justified graphs for second and third term houses

Along with these measurements of the systems, the syntactic calculations of the spaces were separately considered. The obtained values reflect meaningful changes in the living room, guest room/hall, kitchen, circulation areas, and bedrooms. The connectivity value tends to decrease continually because the guest room/hall and living room have connections to other rooms and balconies in the first period but those connections are diminished in subsequent periods (Figure 10). However, the links between spaces increase in terms of the connections of the kitchen, which shifts towards the living area, shared balconies, and/or the cellar. The integration values of the guest room/living room and kitchen increase in the second period and decrease in the third period. The integration and control values decrease continuously as the living room loses its characteristics of being a transition space and a central feature of the housing units with the loss of its connections. Together with the overall increase in residential areas, the depth values of the living spaces show an increase.

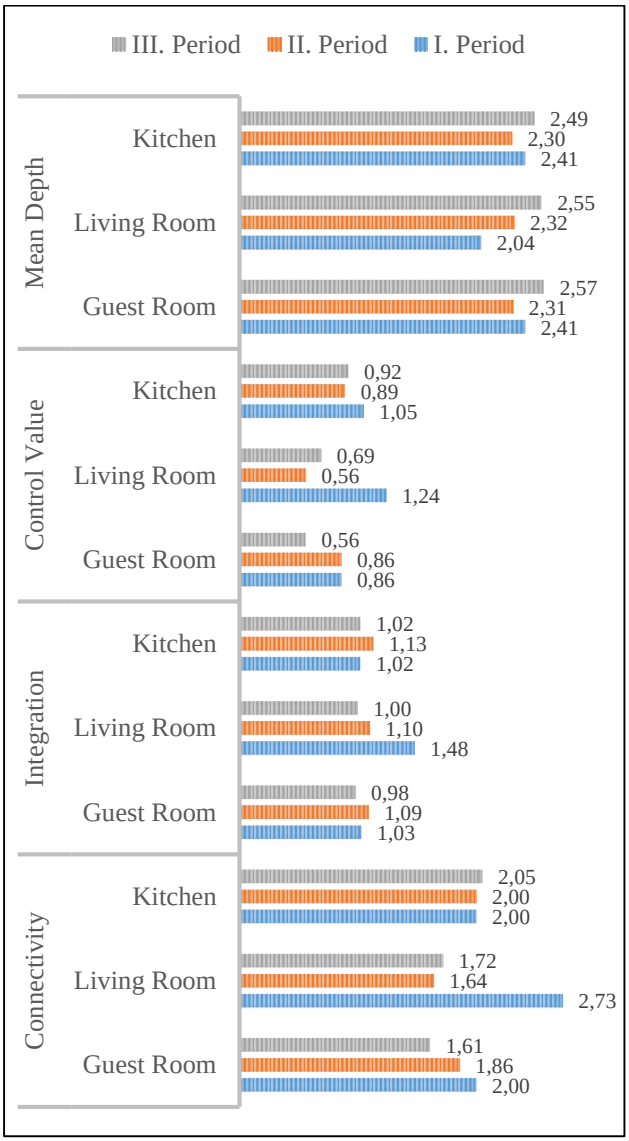


Figure 10. Average syntactic value change of kitchen, living and guest room by periods

When the bedrooms are considered (Figure 11), the connectivity and integration value of the children's bedrooms tend to decline while those of the parent bedroom add up. After the first period, the connectivity and control value of the parent bedroom increased with the addition of a shower unit, but the control value of the children's bedroom decreased (Figure 11).

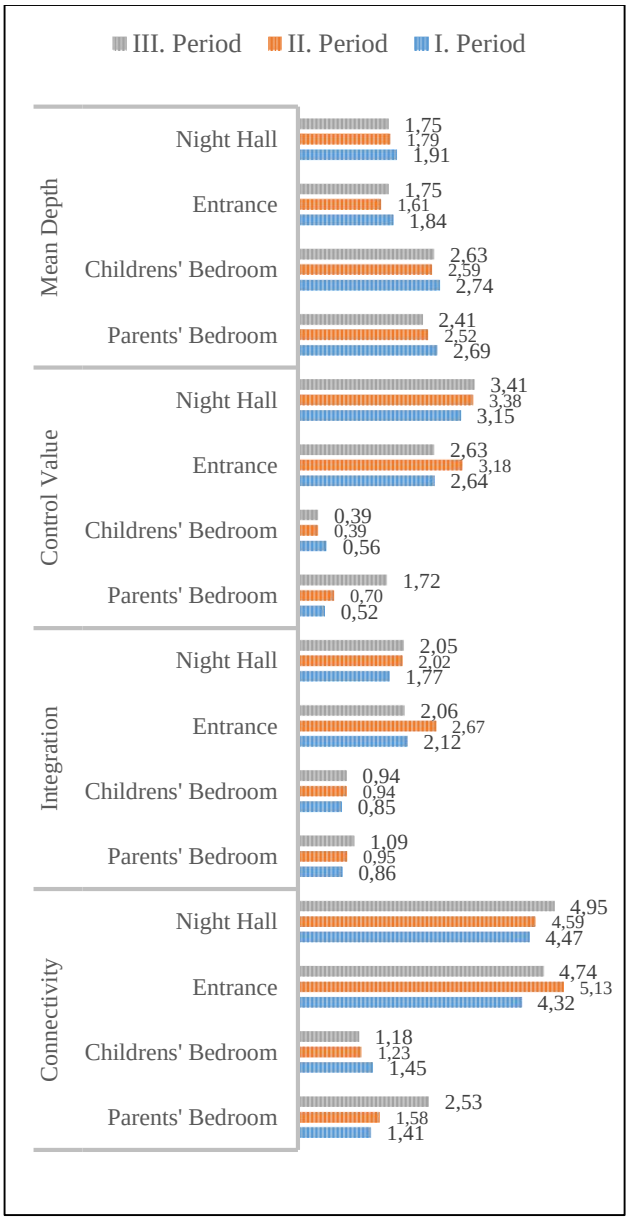


Figure 11. Average syntactic value change by periods

The average depths indicate a partial drop with the units added. As the living room loses its ability to be a transitional space, the connectivity value of the entrance increases. Despite this there is a decrease with the increase in the number of units connected to the night hall (inner hall). It is recognized that the controllability of the entrance hall in the second period and the accessibility value of the hall in the last period have advanced because the private spaces have gained significance (Figure 11). The connectivity, depth, integration, and control value of

the entrance offer an alteration due to the design of the entrance hall and/or the kitchen in the position of a day hall and the differentiation of the number of related spaces. As connectivity and main depth values incline to enlarge, integration and control values tend to curtail, yet the highest value difference is witnessed in the second period. Integration, connectivity, and control values of the night hall (inner hall) unit increased, and the average depth value decreased.

3.1. Evaluation of Findings

In this study, the patterns in the formation of spaces were identified by exploring the social information underlying the spatial setups of multi-storey housing complexes in Diyarbakır across three time periods. It was noted that there were increasing trends in the number of storeys, the number of blocks, the total construction areas, and the total housing areas in the examined housing units moving forward from the first considered period of modern housing.

In the first period, spatial organization and housing size within the plans of these units were undertaken with more economical dimensions for reasons including insufficient areas of planning outside the city walls, the inability to provide technical infrastructure services, the planning of road axes in certain directions due to both natural and artificial barriers, the distance from the city centre and the limited ownership of private vehicles, the lack of access to construction materials, and constraints arising from construction techniques.

In the second period, cooperative blocks and the first formations of cooperative sites can be observed in integrated parcels with parcel-based production. In this period, housing areas increased as a result of the overall increase in housing development areas, improvement of transportation facilities, the widespread use of reinforced concrete construction techniques, changes in the structure of extended families, and credit incentives given based on certain units of square meters. Individual construction was undertaken on the basis of parcels because of the division of lands by inheritance in this period; however, multi-unit buildings undertaken by cooperatives or cooperative unions played an important role in the growth of licensed housing.

On the other hand, in the third period, a transition occurred from the open, multi-block complexes of cooperatives to closed, gated sites throughout the city. Although the construction of multi-block structures by cooperatives has not ceased, the construction of medium-sized buildings by private enterprises became more prevalent in this period. The improvement of construction technologies, easier access to materials, and increased mobility in the construction sector with the implementation of neoliberal policies throughout the country all increased the production of multi-storey housing. Increased public welfare with the increased granting of bank loans accordingly increased the number of home sales. Finally, changes in consumption habits led to the development of hedonist approaches towards a ‘more luxurious’ type of housing. Therefore, it can be seen that an increase in the production of luxury houses occurred in this period due to the transformation of housing from being a means of accommodation and investment to being an indicator of status. This has caused an increase in production in combined parcels in line with zoning practices. In these growing plots, the areas for residential social reinforcement and the sizes of houses have increased. On the other hand, the separation of special places designed for children together with the social transition from extended families to nuclear families was effective in the growth of such spaces.

Although the living room and guest room areas experienced enlargement in parallel with the growth of residential areas, their ratio to the overall residential area decreased in the third period. The transfer of cultural rituals to public spaces outside of residential units and the transition from extended family structures to nuclear families can be listed among the reasons for this change. On the other hand, the continual presence of living room and guest room areas can be attributed to habitual patterns of usage, such as hosting guests temporarily or for longer periods in the context of the family structure, and the habit of maintaining separate spaces for the socializing of men and women. The most important change in the space of the living room derived from changes to the heating system, and this space lost its feature of being a central/transitional space in the first period because of socio-cultural changes and its organization as a separate space within the overall living space.

The small kitchens that were arranged according to the acts of cooking and food preparation in the first period may be assumed to have had usages similar to those of the stove in traditional Diyarbakır houses. Furthermore, the space that was previously planned for ease of installation and privacy in the Night hall (inner hall) (inner hallway)(Inner hallway)was arranged in a more central location in the living area in parallel with changes in the position of women in the housing units of the later periods, with the enlargement of the area in addition to the incorporation of more sitting/eating functions. In the first period, the greater need for cellars or pantries for storage space was due to the extended family structure and limitations in the diversity and accessibility of products in terms of their distribution and circulation considering the economic conditions and crises of the period. The traditional habit of storing seasonal local products and their evaluation as economic solutions for the local people of the city, constituting a characteristic of a society focused on savings, also affected the importance of this space. Subsequently, increases in product diversity as the city acquired features of a metropolitan city, changes in rural production/consumption habits, the enlargement of space in the kitchen area, and the loss of a direct connection to the kitchen changed the intended usage of this space and influenced the decreases observed in its occurrence and size.

Balconies were crucial places, leading to changes in their geometrical shapes and expansion of their areas. These

developments were related to the continuation of traditional habits such as sleeping in open air, seasonal preparations of foods to be stored and the cleaning of domestic furniture, and the use of balconies as places to welcome guests and socialize with family members, all of which were factors affecting the increase in the area of the balconies.

The entrance hall can be described as a space that is important for clarifying the boundaries of privacy, with a significant increase in the incidence of this type space and an accompanying effect on the reduction of visible areas.

Due to the transition to nuclear family structures and the decrease in household size, there was differentiation among the bedrooms. In the second period, a shower unit was added to the parents' bedrooms in some of the housing complexes, while a shower and dressing room were added to almost all of the parents' bedrooms in the third period, which made the boundaries of privacy clearer. The most important change was the removal of a direct connection between the bedrooms and living space, which was seen in the first period but not in the following periods. The occurrence of the second bedroom for children was due to larger numbers of children and/or decisions to provide separate bedrooms for girls and boys, as well as the general expansion of the residential areas. Sink units were openly planned between the toilet and other bathroom space in the first period, but this style was not seen in the following periods.

It can furthermore be stated that the parents' bedroom has the quality of centrality among the areas of the housing units used at night when the integration, control, and connectivity values of this room are evaluated together.

Based on syntactic calculations in which the systems were accepted as a whole, it can be concluded that the second period constituted a transition period because the trends of the values of the second period differed in terms of their increases and decreases. Considering the TFF and RRA values, it is clear that the systems were experiencing a trend towards homogeneous and segregated structures, and this is seen most strongly in the third period and weakliest in the second period. According to the average connectivity and integration values of the systems, the relations in the spatial setup weaken with time and there is a tendency toward dissociation. Thanks to the expansion of the areas and the increase in the number of units, the third period possesses the deepest systems. It can be said that the boundaries of privacy become more obvious and the private areas for residents increase within the housing units over time because the VHH values were high in the first period and declined dramatically in the third period.

As shown by the convex space maps and visual space maps, the most integrated and disjointed spaces present parallelism. However, the parents' bedroom is one of the most integrated spaces with the addition of the dressing room and shower unit in the third period according to the convex space maps. Although bathroom areas with water access are the areas most integrated with the circulation area and the balconies are the most disjointed spaces, the living room is prominent in the first period due to its nature as a transition space and its centrality.

When the averages of the syntactic values of the spaces in these housing plans are inspected, parallelism with the convex space maps and visual space maps of the housing plans can be seen. In line with those maps and the integration values, the spaces that are most integrated and displaying centrality vary across the periods. The living room and guest room constitute transition space in the first period, while the circulation areas in the second period and the circulation areas and parents' bedroom in the third period are more prominent.

Considering the justified graphs and syntactic calculations, the circulation areas are spaces with high accessibility, strong control, and the shallowest/surficial spaces. In this regard, they are joined by the kitchen in the first period and the parents' bedroom in the third period. The lowest values are observed for the balconies, storage units if there is water access, and the third children's bedrooms.

Offering a better understanding of the relationships between spaces, spaces with high connectivity are the living room in the first period, the kitchen in the second period, and the parents' bedroom in the third period. The weakest relationship is found for bathroom/water-access areas and storage units. It can be said that the increase in the visual area values of the kitchen space is dependent on the kitchen's full transition to the living area, the creation of sitting and resting areas within it, and its differentiation as a living space because of the socialization provided by it and the connected balcony. Likewise, if the balconies are linked with both the kitchen and the living room, their values double. The fact that the spatial relationship weakens with the separation of living units can be understood by considering the connectivity values. Whereas the integration values of these units tend to decrease, the kitchen's value increases in the second period.

The general differences in the values of the second period hint at that period being a kind of transition. The reduction in the control value is an indication that boundaries and connections/disconnections become more evident in areas where privacy is desired. This is related to the incorporation of additional areas, the loss of the centrality of the living room and its previous nature as a transition area with connections to hallways or bedrooms in the first period, and the planning of the kitchen as a living area in the second period. The spaces where more than one function is performed also change over time. The increase in housing areas can be seen together with increases and changes in depths. For the bedrooms, the control value is low in areas where privacy is wanted. As the value of the children's bedrooms decreased, that of the parents' bedroom increased together with the additional incorporated units. The parents' bedroom could be described as having centrality among the sections of the housing units used at night upon consideration of the integration, control, and connectedness values. The peak points of the values show parallelism with increasing and

decreasing trends in circulation areas in the second period. This reveals the existence of differences between the periods.

4. CONCLUSIONS

Thanks to the values calculated as a result of analyses and the data obtained from visual maps, the transformations and changes occurring in housing units could be read in a concrete manner in this study. These changes included the separation and differentiation of functions and increases in areas that changed the boundaries of the spaces in which privacy is desired.

With these transformations, circulation and living units also became clearer, and the addition of new spaces and the introduction of new functions for existing spaces could be seen. This is reflected by the control values and integration values obtained in this study. The obtained values also show the differences for areas for socialization within the family. Therefore, this study has provided abstract data that allow different periods of housing to be understood concretely.

The spatial formation of multi-storey housing in Diyarbakır was divided into three periods here, with each period reflecting consistent trends within itself and differing from the other periods. It was noted that a linkage existed between the multi-storey housing plans and traditional housing arrangements within the first period. The spatial organization of housing units then began to transition in the second period. The spatial setup acquired homogeneous privacy and integration values in the third period, moving towards “uniformization”. Situations also varied with the loss or the addition of various old and new functional areas. Collective life could be described as appearing in the form of extended families in the traditional houses of Diyarbakır, marked by courtyards. This is also witnessed in the housing structures of the first period. A housing structure shaped by a more flexible privacy structure, where family ties and relationships with visitors are strong, can be observed.

The second period constituted a transition process as socio-economic, cultural, and political parameters begin to change, and a more chaotic appearance arose due to the pursuit of a more individualized order. In this period, the structure of the housing units began changing, and the boundaries of privacy became clearer with the separation of the spaces where time was spent during the day versus at night.

In the third period, collective life is seen to have changed with reference to the decreased roles of extended family and guests. Neighbourhood and kinship relations become more distinct in this period with regard to both quality and quantity, and the nuclear family structure becomes the dominant cultural feature. Just as it is possible to say that the number of multi-storey houses designed for collective living increased quantitatively, the privacy boundaries between visitors and residents also increased qualitatively, and housing organizations in which the need for private space is emphasized gained prominence. Understanding housing according to the qualitative shifts of collective life makes the formation of these structures more meaningful.

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Author Contribution and Conflict of Interest Disclosure Information

There is no conflict of interest between the authors.

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