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Housing Architecture and Design From the Past to the Future

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HOUSING ARCHITECTURE AND DESIGN

From the Past to the Future



Editors

Assoc.Prof. Dr. Deniz Demirarslan

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ASSOC.PROF. DR. DENIZ DEMIRARSLAN

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PREFACE

The history of the house and its immediate surroundings, where people live and meet their basic needs, predates the history of cities. Housing is a physical space unit representing the socio-cultural structure of a society in the most obvious manner. Its primary purpose is to shelter and protect people from physical effects. Factors such as the rapid change in socio-cultural life in tandem with technological and economic advances, the differentiation of living environments, and the transformation and diversification of consumer characteristics have contributed to a rise in the number of dwellings available. As a result, the houses and their close surroundings provide a wide range of experiences. Since architecture is a shelter-making practice, and housing is man's first shelter, architecture is often associated with dwellings and housing development.

Since different societies and cultures take different approaches to "housing," the resulting "housing styles" vary. The economy, technology, and laws all play a role in this diversity. Any design relevant to housing and housing design has taken on a new understanding in the twenty-first century, based on changing life needs and construction technologies. Understanding the evolution of structures relating to the house and its environment can help inform future designs.

Because of the multi-dimensional definition of housing, many scientists from various fields have approached housing from multiple angles and used various approaches. Housing research encompasses various topics that intersect in social, technological, political, and demographic contexts.

The authors and chapters who contributed to the book from various fields are as follows: Özgür Algan- "Architectural and Cultural Features of Georgian Villages in Kocaeli: The Case of Gölcük"; Mehtap Özbayraktar& Sonay Ayyıldız- "Revealing the Relationship Between the Traditional House Design and Its Social Structure Using Space Syntax Method: The Case of Izmit Houses"; Gözde Altıparmakoğlu Sakarya& Kemal Sakarya- "Reading the Interaction Between the Formation of The Traditional Housing and The Social Structure Through Different Cultures"; Dilara Sönmez& Selma Kayhan Tunalı - "An Investigation About the Doors of Odunpazari Houses in Traditional Housing Architecture"; Merve

Alıcı Aka- "The Analysis of The Interior Space of Traditional Japanese House in The Context of Visual Perception"; Selma Kayhan Tunalı& Deniz Demirarslan- "Windows: The Eyes of the Residence"; Elif Fatma Salihoğlu& Deniz Demirarslan- "The Development of Hittite Housing Architecture from Hattians Up to The Late Hittite Period"; Deniz Demirarslan& Elif Fatma Salihoğlu- "Housing, Life and Furniture in Phrygian Civilization"; Selma Kayhan Tunalı& Sinem Güneş- "Following the Design: A Read on Charles Rennie Mackintosh's Art Nouveau"; Saadet Aytıs- "Respect for the 'Old', Chance for the 'New' General Overview of Interior and Furniture Design in The Context of Art Movements"; Deniz Demirarslan& Oğuz Demirarslan- "Reading the Architecture Of Le Corbusier In His Own Houses"; Elif Altın- "Development of Architectural Structures in A Water Environment and Floating Houses"; Serpil Özker- "Director's Space from Past to The Present: "Nuri Bilge Ceylan, Lütfi Ömer Akad"; Özge Ürtekin- "Evaluation of Urban Silhouets On the Art of Painting: The Case of Istanbul"; Emine Begüm Savçın- "Housing and Neighborhoods in The Turkish Art"; Elif Ozdoğlar& Çağrı Yalçın – "The Role of Women on Art and Architecture About The Process Of The Westernization In Ottoman Cultural Context"; Elif Özdoğlar& Çağrı Yalçın- "Comparative Analysis Of The Flintstones And The Jetsons In The Context Of Fictional Space"; Şeyma Gündoğdu& Deniz Demirarslan- "Indoor Plants: Their Use and Importance"; Belma Alik& Ahmed Elsaey- "A Study on Planning Methods for Sustainable Waterfront: The Case of Atakoy (Istanbul)"; Tuğba Düzenli& Serap Yılmaz- "Capturing "Genius Loci" In Seating Furniture"; Fatma Kürüm Varolgüneş- "Re-Evaluation Of Solutions For Public Health And Life Quality In The Design Processes With The Covid-19 Pandemic".

These chapters in the book are unique scientific studies that contribute to the literature on housing and its immediate surroundings, ranging from the history of civilization to interior architecture and furniture, from traditional houses to painting, cinema to landscape architecture, from urban planning to architectural history. In addition, scholars and experts will benefit from this book's coverage of current trends in architecture, interior architecture, urbanism, landscape architecture, and other design disciplines. In this regard, we hope that the book we edited will be useful to valuable readers, writers, and the publishing house.

May 2021

Assoc.Prof. Dr. Deniz Demirarslan

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CHAPTER II

REVEALING THE RELATIONSHIP BETWEEN THE TRADITIONAL HOUSE DESIGN AND ITS SOCIAL STRUCTURE USING SPACE SYNTAX METHOD: THE CASE OF IZMIT HOUSES

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1. Introduction

Scholars from a variety of disciplines define the social meaning of the house in many ways: Homes are not just physical artifacts but are also cultural products. According to Rapoport (Rapoport 1969a, 1969b, 1985) the design of the house is influenced by cultural values and choices; Mazumdar states that houses reflect rules, norms, and social relationships (Mazumdar & Mazumdar, 1994), while according to Lawrence and Low, they are replete with symbolic meanings (Lawrence, 1985; Low, 1988). According to Kennedy (1999, pp.9-11) a house is not only a special part of a physical environment, it is also the product of a certain society. The house, as a social unit, reflects a society's cultural and ideological characteristics, and also regenerates the needs

and values of the central system. According to Bourdieu (1990, p.282) the house is a microcosmos, being related to the rest of the universe and the world within the world and regulated together with the same oppositions and homologies in the order of all the universe. According to Bellal (2004) traditional houses include the social and symbolic information assumed by its users.

Hillier & Hanson (1984) argue that the culture is hidden inside the order of the space, and they have revealed the space syntax method examining the society-space relation. From this point, this study aims to examine and put forward the apparent correlation between the system of social relationships and a spatial pattern, and the relationships between the structuring of space within traditional houses in the center of Kocaeli-Izmit using the "space syntax" method. In addition, the study has two significant aims. These aims coincide with the studies conducted with the use of the space syntax method on the houses (Hillier, Hanson, & Graham, p.366; Orhun, Hillier, & Hanson,1995, p. 476; Orhun, 1997, 2010; Dursun, 2002; Dursun & Sağlamer, 2003; Bellal, 2004, p.112; Çil, 2007; Sanlı, 2009, pp. 59-60). Firstly, could the spatial morphology of traditional houses of Izmit city centre be revealed with the method of space syntax? Are there certain tendencies (genotypes) in the models? Secondly, could the connotations and hidden themes of the morphological rules in the houses of Izmit be explained? What is the contribution of the space syntax method to this study?

In order to understand the status of traditional Izmit houses within the context of traditional Turkish houses, this chapter focuses on the technical terms of the Turkish house; the historical context, the planning resources, and the roots of Turkish houses.

2. Historical Context of Turkish Houses

The traditional Turkish house and its historical context have been studied by many researchers. Aksoy (1963) has put forth the idea that forms of the Anatolian Turkish house have been affected from the Hittite and Greek house traditions. Esin (1976) catches the attention to the continuation of the old Chinese mansion tradition in the Middle Asian ighur soils and the transfer of this to the Middle Age Turkish architecture and Turkish house design (as cited in Kuban, 1995, p.39). According to Kazmaoğlu &Tanyeli (1978) "the traditional Anatolian House" is the product of the unity defined as "Anatolian – Turkish" (Arel,1982, p.32). Arel (1982) has defined the traditional house architecture of Turkey as

the "Ottoman house". She has based her approach on the viewpoint of Rapoport (1972) and from this point, she has argued that some properties in the spatial organization of the Ottoman house stem from the cultural structure forming this house type (as cited in Arel,1982, p. 78). Eldem (1984, p.19) stated that the formation of the Ottoman house was based on Turkish house and added that Ottoman-Turkish house has been formed by again Turkish art and Turkish life culture.

According to Kuban (1995, pp.18-20) the basic elements and proportion of the Turkish house typology are in a geographical area extending to the Balkans from the east of Middle Anatolia, between the mountain chains surrounding the Anatolian plateau and the Middle Anatolia steppe. The typological development of the Turkish house could be started from the sixteenth century and referred to as the house with hayat. According to Günay (1998, pp.16-18) the houses with authentic room order, plan scheme, multi-storeys, roof type and construction system inherited from the Ottoman Empire and whose samples coming to our age dated back to the seventeenth century are called the Turkish house. Cerasi (1999, pp.155-173) looks at the Hellenistic Olinte, Dacya houses, Hungarian settlements, Macedonian and Anatolian Black Sea countryside houses to understand characteristics of the Ottoman house.

2.1 The Studies Conducted on the Spatial Organization and Typology of the Turkish House

Aksoy (1963) has argued that the "introversion" which is the spatial organization principle of the Anatolian-Turkish house is dependent on the ethnical-cultural tradition. From this point, Arel (1982, p.25, pp.34-54) focused on (1) Mezzanine level principle, (2) Mansion/ Divanhane/ Başoda tradition, (3) Openness/Closeness – Inside/Outside contrariness, and 4. Central sofa properties while examining the regional house architecture samples of Turkey. Eldem (1984, 16, 17-20, 28, 43-44) has specified that the climate, geological structure and cover of the ground and the society and manufacturing conditions in the region are effective in the formation of different house types. He has defined the floors (base floor, mezzanine level) that are efficient in the plan formation of the Turkish house and planning elements such as rooms, sofas, crossings, and staircases. He has classified the Turkish house plan types into four and sequenced the development stages as: without sofa, with open sofa, with inner, and with central sofa. According to Kuban (1995, p.21) the

"Turkish house" or "house with hayat" has cultural meanings and it is the only house typology revealing in the definable geographical and cultural field. In Cerasi's opinion (1999), the Ottoman house consists of three parts: (1) The entrance floor consisting of stone, (2) The seating units all of which are upstairs, (3) The places uniting the rooms: sofa or hayat. Asatekin (2005, pp. 391-395) has classified all of the studies conducted on the Turkish house and separated the studies into three categories: (1) Classification of traditional house units according to the plan type of "Piano nobile" (first floor of the main building unit), (1a) Classification according to the sofa, (1b) Classification of traditional house unit according to the rooms, (2) Classification according to the construction techniques and materials, (3) Classification according to regional characteristics.

3. Methodology of the Study: Space Syntax

The space syntax being the analytical tool of the study is the method and theory examining the society-space relation. Its basic discourse is that the building forms are shaped by the social norms of the society. Namely, the culture was hidden inside the spatial order (Hillier & Hanson, 1984, pp. 89-190; Hillier, Hanson, & Graham, 1987, pp.363-385). It was the first theory that both examines the transmission or arrangement of social ideas in a spatial pattern and transforms them into measurements and symbols that illustrate those spatial structures by using geometric representations of a certain space system (Hillier & Hanson, 1984; Hillier, & Vaughan, 2007). The space syntax method started with the studies on the "discovery of social, economical and cultural information after the spatial analysis". Although the analytical operation of the method was basic, subjective and repeatable, it was criticized in terms of the use of binary coding in the study and production of numerical scales, the fact that the social dimension of the society cannot be revealed by taking the settlement and two-dimensional floor plans into consideration, the form of the building is not just dependent on the use and meaning of space, the interpretation process of the numerical results to be complex, subjective and contrastive (Leach, 1978; Lawrence, 1990; Rapoport,1969a; Osman, & Suliman, 1994, pp.189-198). Some researchers have specifically stated that the numerical data attained as a result of this method should be supported with physical, social and cultural data (Dursun,

2002; Dursun & Sağlamer, 2003; Sanlı, Dursun, &, Sağlamer, 2007) and these data clarify not only the social and cultural factors in the spaces, but how the spaces give opportunity and prevent encounterings between people (Orhun, 2010). In many studies in which the space syntax method has been used, the physical, social and cultural information supporting the method and belonging to the houses and settlement whose analysis has been conducted are also included (Bellal, 2004; Brown & Bellal, 2001; Dursun & Sağlamer, 2003; Orhun, 2010; Kharazmi Nezhad & Hajizadeh Bastani, 2012; Çil, 2007; Şimşek, 2013; Korkmaz, 2011; Orhun, Hillier, & Hanson, 1995). These data have been interpreted together with the data attained from the space syntax method, and genotypes have been attained belonging to the analysed houses.

In the studies in which the traditional Turkish house has been analysed with the use of the space syntax method (Cooking-Integrating C Type, living-integrating L Type: Orhun, 1997, 2010; sofa centred and courtyard centred houses: Orhun, Hillier, & Hanson, 1995, Orhun, 1997; deep-core type, shallow-core type: Orhun, 1997; Çil, 2007; extroverted houses and introverted houses; Orhun, Hillier, & Hanson, 1995, Dursun, 2002; Dursun & Sağlamer ,2003; Çil, 2007), the development of new genotypes in addition to the typologies attained from the studies conducted on the "Turkish house" or supporting of the data attained from the typological analyses with the syntactic data (Ünlü, 1999) has given rise to the selection of the method in this study. By taking the aforementioned studies as examples, the architectural characteristics of the Izmit centre traditional house, socio-cultural usages of the houses, the daily life in the houses has especially been explained for the purpose of making a contribution to the interpretation and supporting the method. We should point out some of the tools, concepts and measurements used in the space syntax method in order to fully comprehend the method.

3.1 Analytical Tools of the Space Syntax Method: Justified Graph /J-Graph

Hillier et al. have suggested a tool called the "justified gamma map" to show the difference between two spatial patterns (Hillier, 1993). The justified gamma map is a graph in which the spaces are expressed with the rings, and the permeabilities are expressed with strips. In this graph, all spaces having the same depth are sequenced on the same horizontal plane (Hillier,

Hanson,& Graham, 1987, p.384). The "JASS" programme was used to create J-graphs.

3.2 Concepts of the Space Syntax Method: Depth, Genotype, Choices/ SLR- Rings

The "depth" concept is one of the most important ideas in space syntax. The depth among a group of spaces is explained through how much that space is segregated or integrated from other spaces and therefore how much the relation between them is easy and natural. If it is possible to pass from one space to another, this space is in the "1" depth of the other one. If another space is required to pass from one space to another, that space is in the "2" depth (Hillier, Hanson, & Graham, 1987, pp.364-365). The depth concept also reveals characteristics of spaces in a system such as "secluded and private" (most segregated spaces) and "shallow and pivotal" (most integrated spaces) (Hanson, 1998, p.30) (The mean depth of the research is presented in Table 3).

According to Hillier & Hanson (1984, p.44, p. 150) a genotype is basically informative in terms of the biological context. A genotype reveals the individual entity named as the description centre. Syntactic positions in the complex and general definitions in the whole of complex show the existence of this genotype. Genotypes are results of relations between house owners and house owners-visitors.

"Choice" indicates that there are alternative routes to go from one space to another (Hillier, Hanson, & Graham, 1987, p.364). The SLR (Space link ratio) is obtained from the division of 1+ the number of links by the number of spaces. If this value is closer to "1," it means that there is no alternative way in tree-like configurations etc. If the value is above "1," it indicates that there is a ringiness degree (Bellal 2004, p.115). The meaning of the "tree" here is that there are links less than the number of cells and that there is no ring in the graph (Hillier, 2007). While rings show the alternative way to reach private spaces (Hillier & Hanson, 1984; Hanson, 1998, p.78), movements of visitors are under control in tree-like arrangements (Foster, 1989, p. 49) (The SLRs of the research are presented in Table 3.)

3.3 Measurements of the Space Syntax Method: Integration Value/ RRA, Base Difference Factor/ BDF

The integration value of space indicates the relative depth of that space compared to all the other spaces in the obtained graph (Hillier, Hanson,

& Graham, 1987, p. 364). A low integration value shows that the space is integrated with the system and a high integration value shows that the space is in the tendency of leaving the system (Hillier & Hanson, 1984; Osman, & Suliman, 1994, p.191).

Hillier, Hanson, & Graham (1987, p.365) refer to the consistency in spatial patterning as the "inequality genotype". In general terms, this means that "culture is built within a spatial layout." By means of calculating this, the entropy-based measurement, called the "difference factor", is conducted (Hillier, Hanson, & Graham, 1987). BDF is used to measure the strength of the spatial genotype, to exactly find the places of the meaningful house functions in the house samples and to understand which activities are becoming different and which are staying the same (Orhun, Hillier, & Hanson, 1995; Brawn, & Bellal, 2001). When BDFs are closer to 1, the value indicates the system's homogeneity (the integration values within the system are very similar), and when they are closer to "0",(the integration values within the system are very different), the homogeneity decreases (Hanson, 1998, pp. 30-31; Bellal, 2004, p.120).

4. Research Area and Scope

The authors believed that a study of this nature would benefit from data collected from multiple sources. The primary data for this paper came from naturalistic fieldwork in Izmit, and include a visual survey, participant observation, a structured interview with local residents and local elders, as well as photo-documentation[1]. A total of 18 house samples were included in the study and were analyzed using their previous plans before they were renovated. The house projects were collected from freelance architecture offices, and from the archives of both the Kocaeli Metropolitan and Saraybahçe Municipalities. In light of the obtained data, the house plans were reviewed, and redrawn in the same representative style in accordance with the original plans. In addition, the information regarding the Izmit houses was collected from resources in Kocaeli- Izmit (newspapers, article, books, and journals).

[1] All photographs whose source has not been given belong to the writers of the study

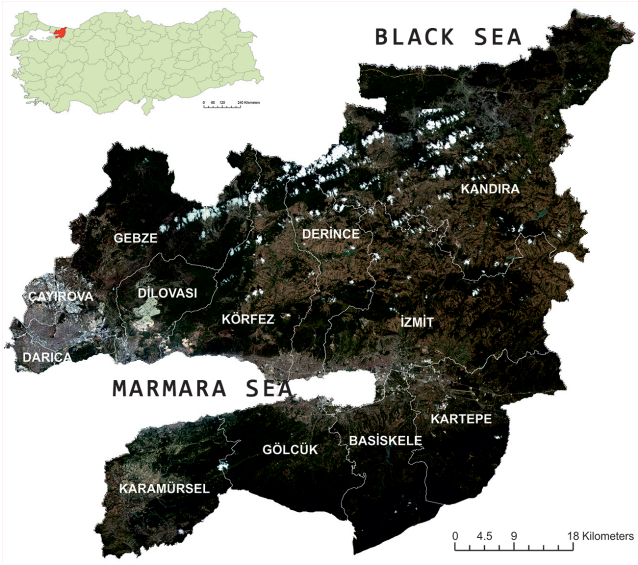


Figure 1: Location of Izmit on the Map of Kocaeli (Map archive of the Architecture and Design Faculty in Kocaeli University, 2021)

The research area is within the boundaries of the region, which has been the city centre since Izmit was first established (Figure 1) (ancient Nicomedia) in the third century BC, and where ancient (Archaic and Classical, Hellenistic, Roman, Byzantine and Turkish civilizations) urban stratification occurred. One of Izmit's notable characteristics is its sloping structure. Due to this structure, parcels consist of irregular forms. Streets are generally narrow and steep and bordered with either houses or garden walls. Most of the buildings in this area belong to the Ottoman period, which is the closest period to our time compared to other historical civilizations.

This study has been conducted on 18 traditional houses built between the eighteenth and twentieth centuries belonging to the Ottoman period and located in six neighborhoods (Akçakoca, Hacıhasan. Kozluk, Ömerağa, Çukurbağ, Veliahmet) (Figure 2) within the borders of Izmit Saraybahçe[2]. The number of registered traditional house remaining from the Ottoman period in the abovementioned neighborhoods is 147. A study of typology has been conducted on 40 registered houses which could protect their authentic character, whose architectural survey drawings and restoration projects could be accomplished and which were taking place in the same area beforehand (Erdoğan, Özbayraktar,

[2] In accordance with the gazette article dated March 22, 2008, on establishing a district, the name of the Saraybahçe Municipality was replaced by the "Izmit" Municipality. In addition, "Kuruçeşme, Bekirpaşa, Alikahya, and Akmeşe" Municipalities were connected to this district (Erdoğan, Özbayraktar, & Ayyıldız, 2011).

& Ayyıldız, 2011, p. 39). As a result of the study, the general architectural characteristics of Izmit's traditional houses have been determined. The first study conducted on the Izmit house was conducted by Eldem (1984) on homes built in the eighteenth century. He states that Izmit was rich in terms of old houses until approximately 1964. There were the ones among them having great mansions with a central sofa and the ones with classical Istanbul style ornamental facades with no impact of ruralness. In her thesis of a syntactic analysis on Turkish houses, Orhun (1997, pp. 91-106), used two Izmit houses on which Eldem (1984) mentioned the vernacular effect of Istanbul. According to this, both İzmit houses were integrated with living spaces, separated from cooking, and receiving spaces, and are the deep-core type.

Eighteen registered traditional houses selected in this study have been modified very little in terms of the space planning and facade properties within the scope of the study conducted previously (Erdoğan, Özbayraktar, & Ayyıldız, 2011) and in this way, they are the houses by which the traces of the traditional Izmit house could be followed more comfortably. Another criterion during the selection is the availability of most of the selected houses to the users and giving the names of the mentioned houses when the Izmit traditional house is referred to during the interviews.

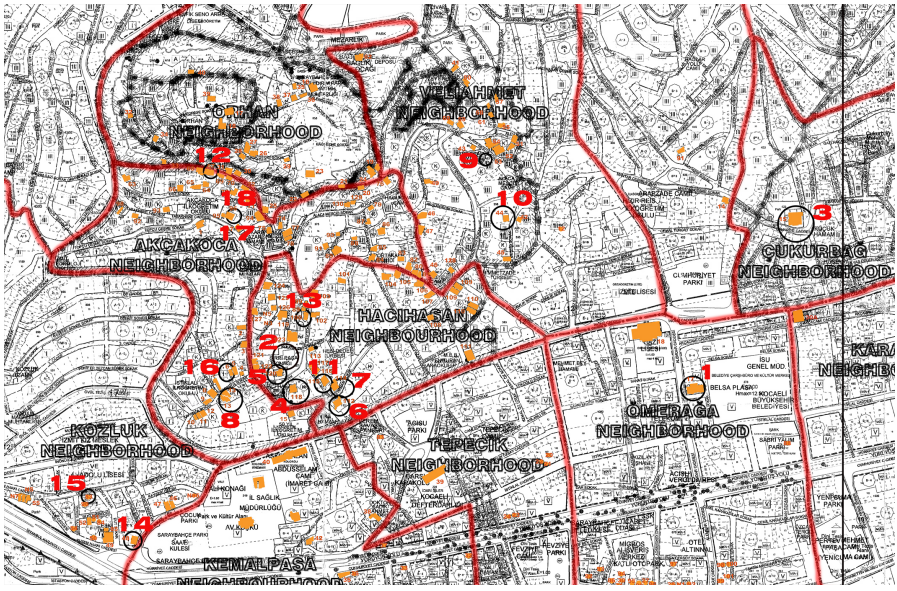


Figure 2: The Houses Analysed in the Study Regarding The Izmit Urban Development Plan and Their Locations**:** 1. Soydan's mansion 2.Sırrı Paşa mension 3.Portakal Hafız mension 4. Green mension 5. Pink mension 6. Köşker's house 7. Ufuk Şensoy's house 8. Inventory 13 9. Saatçi Ali Efendi's house 10. Fatma Güzin Bayraktar's house 11. Aslıhan Kurt's house 12. Ramazan Sürücü's house 13. Şener Gözaydın's house 14. Inventory 48 15. Semahat Aracı's house 16. Uncle Kemal's house 17. Yavuz Ulugün's house 3 18. Yavuz Ulugün's house 2

5. Findings: Analysis of Architectural Features of Selected Houses

In the context of the research, 18 registered houses were examined, and these examinations revealed general physical features of the houses. The acquired physical features and outcomes were tabulated (Table 1).

Table 1: The Houses' Architectural Features

Number of floors	Three floors (11 houses) Four floors (4 houses) Two floors (3 houses).
Number of entrances	Two entrances, one from the garden and the other from the street Main entrances: To the south, landscape direction
The spaces on the main entrance	Sofa- tiled sofa: The main living space that enables connection between all spaces The main staircase associated with the sofa Pabuçluk : The place in the sofa where shoes are taken off , stone-ground
The spaces on the ground floor	Mostly sofa, multifunctional (sitting, sleeping, dining, hosting guests) rooms, kitchen and hela (traditional toilet); rarely halls, bathroom, storing-oriented spaces (cellar, storage, woodhouse, coal cellar), balcony, yard, cistern and spaces that are associated with animals (stable, hayloft)
The spaces on the first floor	In all houses (18houses); Mostly sofa, rooms opening onto sofa (generally bedrooms, most of which include "yüklük içi gusülhane" (traditional bathroom), balcony and helas Seldom başoda, bathroom, kitchen, store and halls
The spaces on the second floor	In houses that have the second floor (5 houses): Mostly sofa, rooms opening to sofa and helas; seldom, main room, bathroom, cellar, store room, halls and yüklük içi gusülhane
The spaces on the basement floor	In houses that have the basement floor (9 houses): Mostly sofa, rooms opening to sofa, kitchen, bathroom, storage and cistern (for storing water), seldom halls, cellar and hela Cistern: One of the spaces of the basement floor or the only space of this floor. It is entered through a lid. This lid is sometimes located in kitchen, sometimes in pabuçluk and in this work, sometimes on the area called "the space above cistern"
The spaces on cihannüma (summer kiosk at the top)	In houses that have cihannüma (summer kiosk at the top) (4 houses); Usually a balcony, reached through cihannüma
The spaces on the attic floor	In houses that have an attic floor (one house); sofa, rooms opening onto sofa and store rooms
The largest space	Sofa (13 houses) The length of the longest sofa: 14.2 m
Room dimensions	The room with the shortest side: 1.85m. The room with the longest side: 7.64m.
Floor height	The lowest floor height: 1.59m in basement floors The highest floor height: 4.2m.
Spaces and components in rooms and their intended purposes	Most of them have "yüklük" (built-in wardrobe) Some have "yüklük içi gusülhane (traditional bathroom)"
Spaces and components in the başoda and their intended purposes	They seldom include seki (raised platform), yüklük (closet), sedir (raised seating) yüklük içi gusülhane For hosting guests
Spaces and components in kitchen and their intended purposes	They generally include a stone oven, randomly cellar and yüklük Generally, on the garden floor, most houses have separate entrances.
Bathing spaces	Bathrooms opening onto sofa and gusülhanes that are located in yüklük (closet)

5.1 Findings on Socio-Cultural Usage of Spaces in Houses Obtained by Face-to-Face Interview

In light of the interviews conducted with the traditional house users, and the people of Izmit[3], the literature research and space analyses performed on the houses, the social usage of traditional houses in the centre of Izmit was explored. The space usage in houses does not differ by gender and all spaces are open to the entire household.

However, this usage can differ in houses of wealthy families (the Soydan's Mansion). In these houses, there is a separated space, called the mabeyn, which is allocated for official guests, and which is separate from the other parts of the house.

Depending on the degree of affinity with the guest, they are allowed to enter the different parts of the house. Temporary guests-neighbors are welcomed in the semi-private sofa spaces on the ground floor and/or living room in the winter and in the garden in the summer.

Official guests are welcomed in the başoda located on the first or second floor, which is the largest, most organized, and scenic room in the house. If there is no başoda, they are welcomed in another room or sofa specifically designated for guests. These spaces are generally on the ground floor. Boarding guests-relatives are welcomed in the başoda or another room on the first floor. Yüklük içi gusülhanes in these rooms can be used for boarding guests as well. Social activities such as wedding, engagement, circumcision ceremonies are performed in the sofa, tiled sofa, başoda or a room designated for guests in winter. In summer, the garden can also be used for these activities.

The spaces where family members gather are the sofa, tiled sofa, a daily room used by the family, the kitchen, the cihannüma, balcony and/or garden. The spaces that are used only for personal use differ in some large houses, and are generally the bathroom, hela, and yüklük içi gusülhanes.

[3] Face-to-face interviews were made for this study by the authors between 2009-2010 (1. Interviews with owners of the traditional houses in central Izmit: Owner of Soydan Mansion, February 2009; owner of Portakal Hafız Mansion, 02.02.2009; owner of Inventory 13, 31.02.2009; owner of house 16, 31.12.2009; owner of Köşker House, 29.01.2010; former owner of Sırrı Paşa Mansion, 31.03.201, 2. Interviews with old izmit local residents on "Life in Traditional Houses) (Erdoğan, Özbayraktar & Ayyıldız, 2011).

5.2 Applying of Space Syntax Method On İzmit City Centre Traditional Houses

As stated in the general objective of the study, the integration value (RRA), base difference factor (BDF), and the choice/space-link ratio (SLR) values of each traditional house were calculated in the syntactic analysis conducted to "reveal the apparent correlation between the system of social relationships and the spatial pattern and the relationships between structuring of space within traditional houses in the centre of Kocaeli-Izmit." These values enable us to compare spaces within the spatial configuration (Bellal, 2004, p.120). This study involved three steps:

The First Step (drawing of "Justified graphs): "The house plans, which were redrawn with the same representative language, were used for the justified graphs (Table 2). In the house plans, each space was numbered according to their function, and used in the analysis as presented below. For each building, two justified graphs were drawn, one with the exterior space and one without exterior space: "X"= Street; "+" = Entrance Garden; "1"= Side garden 1a= Entrance Landing; 1b= Yard; 2= Pabuçluk; 3= Sofa; "3a"= Sekilik (Raised platform); "3b"= Köşk (Kiosk) ; 4= Tiled Sofa; 5= Stairs; 5a= Stairs Landing; 6= Hall; 7=Kitchen; 8= Room; 9= Başoda (Main room); 10= Cihannüma (Summer kiosk at the top); 11a= Bathroom; 11b = Yüklük İçi Gusülhane (Traditional Bathroom); 12= Hela (Traditional Toilet); 13= Balcony; 14= Dining Room; 15 = Storeroom; 16= Mabeyn Room; 17 = Servants Room; 18 = Service Room; 19= Radio Room; 20 = Showcase Room; 21= New Room; 22= Serinlik (Cooling Space); 23a = Storage; 23b= Cellar; 23c = Woodhouse; 23d = Coal-cellar; 24 a= Cistern; 24 b= Space over the Cistern; 25a = Stable; 25b=Hayloft; 26= Laundry Room

The Second Step: The results obtained from the justified graphs are presented in Table 3 without listing the functions of the spaces.

The Third Step: The results obtained from the justified graphs are presented in Table 4 in order to exhibit a combination of their different functions with their integration values. The following points were considered while conducting the analyses:

- Of the selected houses, 11 houses (1, 2, 3, 5, 6, 10, 13, 15, 16, 17, 18) opened out to the street through the garden. Four houses (4, 11, 12, 14) had a direct entrance onto the street. Three houses (7, 8, 9) opened onto the street, both directly and through the garden. For the houses, the "garden entrance, side garden, entrance landing and yard balconies" are important in space

structure. For this reason, each space was given a number and is located in the justified graphs.

- The analyses were conducted for all the floors of the houses.
- The stairs were also given a space number as a circulation element and are located in the justified graphs.
- In all the houses, the root space was considered as the "street" in graphs with exterior space. In graphs without exterior space, the closest space to the entrance, the "pabuçluk", was considered as the root space. In the houses without this space, the "tiled sofa" or "sofa" in the entrance was considered to be the root space.

Table 2: Selected Houses and Their Justified Graphs

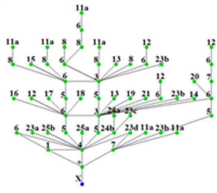
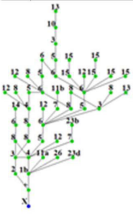
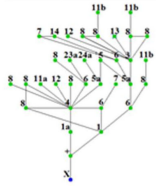
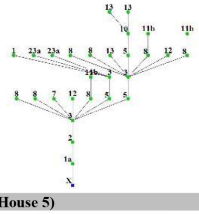
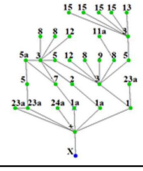
Soydan Mension (House1)
 (Turgay, 2007, p. 249) 
Sırrı Paşa Mension (House2)
 (Yavuz Ulugün's Archive) 
Portakal Hafız Mension (House 3)
 
Green Mension (House 4)
 
Pink Mension (House 5)
 

Table 2: Selected Houses and Their Justified Graphs (Continue)

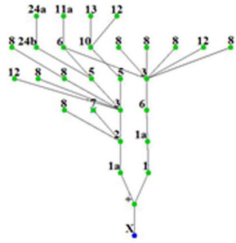
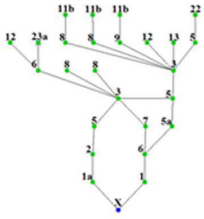
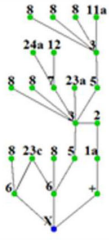
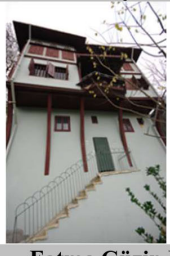
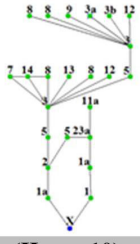
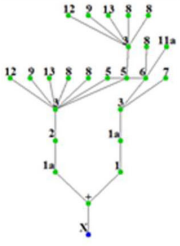
Köşker's House (House 6)
 (Yavuz Ulugün's Archive), Photo İ. Sağıroğlu 
Ufuk Şensoy's House (House 7)
 
Inventory 13 (House 8)
 
Saatçi Ali Efendi's House (House 9)
 
Fatma Güzin Bayraktar's House (House 10)
 

Table 2: Selected Houses and Their Justified Graphs (Continue)

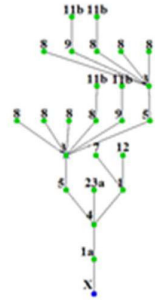
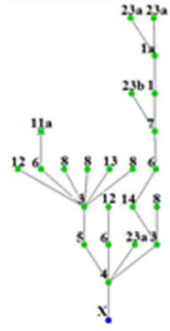
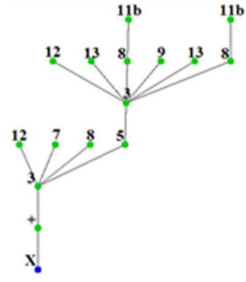
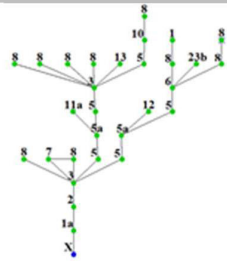
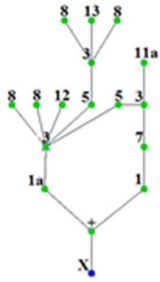
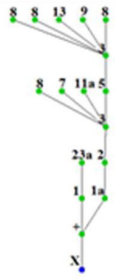
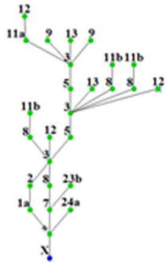
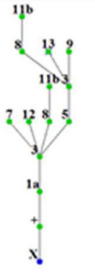
Aslıhan Kurt's House (House 11)
 
Ramazan Sürücü's House (House 12)
 
Şener Gözaydın House (House 13)
 
Inventory 48 (House 14)
 
(Yavuz Ulugün's Archive)

Table 2. Selected Houses and Their Justified Graphs (Continue)

Semahat Aracı House (House 15)	
	
Uncle Kemal's House (House 16)	
	
Yavuz Ulugün House 3 (House 17)	
 (Yavuz Ulugün's Archive)	
Yavuz Ulugün House 2 (House 18)	
It was demolished	

In this chapter, the data obtained from the "justified graphs" of all the houses investigated in this study (Table 3, Table 4) are evaluated. Table 3 consists of the "Basic syntactic data" both with and without the exterior space of the selected houses.

Table 3: Basic Syntactic Data

House Number	Number Of cells	Space - Link ratio	Mean Dept	Integration with exterior			BDF	Integration Without exterior			BDF
				Mean	Min	Max		Mean	Min	Max	
1	58	1.10	5.26	1.05	0.52	1.82	0.72	1.09	0.58	1.87	0.75
2	50	1.10	6.24	1.27	0.71	2.24	0.75	1.26	0.71	1.99	0.80
3	35	1.06	4.53	1.08	0.67	1.53	0.87	1.26	0.75	1.81	0.85
4	29	1.00	5.21	1.17	0.62	1.69	0.82	1.12	0.58	1.68	0.80
5	31	1.16	3.83	1.02	0.54	1.39	0.84	1.30	0.72	2.27	0.75
6	29	1.03	4.96	1.20	0.67	1.69	0.84	1.21	0.64	1.84	0.80
7	26	1.08	4.76	1.11	0.58	1.60	0.81	1.10	0.56	1.56	0.81
8	23	1.09	3.55	1.19	0.58	1.94	0.74	1.28	0.60	2.31	0.68
9	24	1.13	4.61	1.30	0.70	1.97	0.80	1.27	0.65	2.49	0.67
10	25	1.08	4.79	1.19	0.60	1.68	0.81	1.23	0.59	1.95	0.75
11	25	1.00	5.13	1.27	0.63	1.79	0,81	1.16	0.57	1.82	0,76
12	24	1.00	4.09	1.37	0.95	2.68	0.77	1.47	0.81	2,60	0.74
13	16	1.00	4.07	1.12	0.53	1.75	0.75	1.26	0.57	1.72	0.79
14	30	1.03	6.31	1.73	1.03	2.23	0.85	1.75	1.09	2.69	0.84
15	17	1.06	3.94	1.21	0.58	1.64	0.81	1.37	0.64	1.91	0.79
16	17	1.00	4.75	1.49	0.82	2.49	0.77	1.16	0.60	1.68	0.81
17	27	1.04	5.85	1.40	0.80	2.02	0.84	1.52	0.82	2.54	0.76
18	14	1.00	4.38	1.36	0.67	2.11	0.77	1.47	0.82	2.27	0.81
Mean	28	1.05	4.79	1.25	0.68	1.90	0.80	1.29	0.68	2.06	0.78

The space-link ratios of the six cases (for house numbers: 4, 11, 12, 13, 16, 18) show that there is no ringiness in these houses (they have one value-tree-like form). There are no alternative ways to be used by the householders and the guests (neighbors, relatives, official guests) in these houses, and this situation shows that the movements of the users inside the house are under control. In other cases, the space-link ratio over one shows the presence of ringiness (for house numbers: 1, 2, 3, 5, 6, 7, 8, 9, 10, 14, 15 and 17). As has been expressed before (Bellal, 2004; Sanlı, 2009), these rings are the alternative ways of the householders and the guests (neighbors, relatives, official guests). Four cases (for house numbers: 6, 14, 15, 17) have only one ring. These houses branch out and get deeper and do not present alternative ways for the user. Four cases (for house numbers: 1, 2, 3, 5) have the highest number of rings. These rings are in the main functional spaces; namely, the entrance garden, front garden, side garden, tiled sofa, sofa, stairs and hall. Convex spaces diversify from 14 to 58 (Table 3).

The total "mean depth" value of the cases is "4.79." This value shows the mean depth from the root to the other spaces (Bellal, 2004, p. 125). Out

of all the cases, the one that has the highest depth value is house number 14 with a "6.31" mean depth. This is followed by house number 2 ("6.24" mean depth) and house number 17 ("5.85" mean depth). Out of all the cases, the shallowest case is house number 8, with a "3.55" mean depth. This is followed by house number 5 ("3.83" mean depth) and house number 15 ("3.94" mean depth) (Table 3).

The houses in which the mean integration value arises in their analysis without exterior space (House 1,3, 5, 6, 8, 10, 12, 13, 14, 15, 17, 18) are the ones in which the inner-outer integrity is strong and in which the connectiveness of the exterior spaces in the whole of the house is emphasized (extroverted houses). Houses are mostly extroverted houses among chosen samples (12 houses). Most integrated spaces are nearly always the same in both analyses with and without exterior space: sofa, stairs, and tiled sofa. Most segregated spaces are different in analysis with exterior space: bathroom, yüklük içi gusülhane, hela, balcony, storeroom, room, storage.

Again, when the exterior spaces are not taken into consideration, the houses in which the mean integration decreases (houses 2, 4, 7, 9, 11, 16) are the ones having introversive configuration (introverted houses, ; Orhun, Hillier, & Hanson, 1995, Dursun, 2002; Dursun & Sağlamer, 2003; Çil, 2007). When exterior spaces are considered in introverted houses in Izmit centre traditional houses example, "street, entrance garden and side garden" have integration values above average. The most segregated spaces are exterior spaces such as "street, balcony" and bathroom and storage places in exterior spaces. When the exterior spaces are not taken into consideration, the most segregated spaces are diversified: cihannüma, storage spaces, bathroom, hall and sofa.

The samples' spatial structures reveal the following features:

It can be seen that the most easily accessible spaces from the street are the exterior spaces such as the entrance garden and the side garden. These spaces in traditional houses of Izmit's city centre are used for hosting temporary guests (neighbors) in summer, social activities (wedding, engagement, and circumcision), family gatherings and children's play (Table 2).

The spaces with the lowest mean integration are the sofa, tiled sofa , stairs, and stair-landing. The analyses show that these spaces are integrated within the house. However, the sofa, where the temporary and official guests are welcomed, social activities are performed, and where family members gather, is the most integrated space in the houses (14 cases:1, 4, 5, 6, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18) (Table 4).

There is no unity in the most segregated spaces in the analyzed cases. However, the "street" (seven cases: 4, 7, 10, 11, 13, 17, 18), and the balcony (five cases: 2, 4, 5, 6, 15) are the most segregated spaces (Table 4).

Table 3 shows that except for house number 3 (0.87), which has the weak base difference factor (BDF) from the cases analysed, the remaining houses present a strong difference factor.

Table 4: Order of Integration of the Main Functions with Exterior

House Number	Order of integration
1	*Sofa* < Hall < Stairs < Stairs = Side Garden < Stairs < *Sofa* = *Tiled Sofa* < Hall < Stairs < Hall= Hall< New Room = Cellar= Dining Room = Radio room = Balcony < *Mabeyn* Room = *Hela* = Servant Room = Room< Stairs < Entrance Garden < Coal – cellar < Hall< Space over the Cistern= - Kitchen = Hall = Room< - Hall = Room = Cellar= Balcony = Storage = Hayloft= Stable< Showcase Room < Cellar < Room= Room< Store Room = *Hela* < Kitchen< Street= Room< Room< Hall= Cistern = Woodhouse < *Hela* = Bathroom < Bathroom = Bathroom < Bathroom= Bathroom< Hall< *Hela* < Bathroom 0.52/ 0.64 /0.65 /0.68 / 0.73/ 0.74/ 0.75/ 0.76 / 0.83 /0.84/ 0.93/ 0.96 / 0.97/ 0.98/ 0.99/1.01/ 1.03/ 1.04/ 1.09/ 1.10/ 1.12 / 1.15 / 1.25 / 1.27/ 1.30/ 1.31/1.39 /1.44/ 1.53 / 1.59 /1.82
2	Hall< Stairs < Stairs < *Tiled Sofa*< Room< Hall< *Sofa* < Hall< Kitchen < *Hela* < *Sofa* < Room= Room< Yard < Stairs < Room < Kitchen < *Hela* = Stairs < Room< *Tiled Sofa* = Hall< Store Room = Store Room < Store Room = Store Room = *Hela* < Room = Balcony < *Hela* = Room < *Pabuçluk* <*Yüklük İçi Gusülhane* < Room < Entrance Room < Stairs < Hall< Bathroom= Laundry Room = Coal- Cellar < Cellar < Room = *Hela* < Store Room = Store Room < Street = *Sofa* = Dining Room < *Cihannüma* < Balcony 0.71 / 0.80 / 0.84 /0.86 / 0.87 /0.96 /0.98 / 0.99 / 1.00/ 1.01/ 1.05 /1.09 /1.10 /1.12 / 1.14 /1.15 / 1.17 / 1.22/1.24 /1.26 / 1.27 /1.28 / 1.29 / 1.30/ 1.31 / 1.32 / 1.33 / 1.36 / 1.38 / 1.40/ 1.46 / 1.54 / 1.56 / 1.64 / 1.93 / 2.24
3	Stairs Landing < Hall< Side Garden = *Tiled Sofa* = Stairs Landing = Stairs < Hall < Room < *Sofa* < Entrance Garden < Hall < Entrance Landing < Room < Hall< Room < Room = Bathroom = *Hela* = Room = Cistern < Kitchen = Room = Room < Room = Room < *Hela* = Balcony < Street < Kitchen = Dining room < Room = Storage < *Yüklük İçi Gusülhane* < *Yüklük İçi Gusülhane* = *Yüklük İçi Gusülhane* 0.67/ 0.72/ 0.73/ 0.82/ 0.83 /0.85 /0.94 /0.98 /1.00 /1.03 /1.04 /1.06 /1.09 /1.17 /1.18 /1.21 /1.29 /1.32 / 1.40/ 1.41/1.53
4	*Sofa* < Stairs < *Sofa* < Stairs < *Pabuçluk* < Room = Stairs < Room = Room = Kitchen = *Hela* < Room < Room < Room = Room = Balcony = *Hela* < *Sofa* < Entrance Landing = *Cihannüma* < *Yüklük İçi Gusülhane* < *Yüklük İçi Gusülhane* = *Yüklük İçi Gusülhane* < Side Garden = Storage = Storage < Street = Balcony = Balcony 0.62 /0.63 /0.67/0.89/0.95 / 0.98/ 1.00/ 1.03/ 1.06/ 1.19/1.31/ 1.36/ 1.42/ 1.58/1.69
5	Sofa < Side Garden < stairs < Entrance Garden < Sofa < Stairs < Room < Hela = Room = Baş Oda < Kitchen = Entrance Landing < Entrance Landing < Pabuçluk < Starage = Stairs Landing < Sofa < Storage < Storage < Street = Cistern < Room = Room = Hela < Stairs < Bathroom < Store Room = Store Room = Store Room = Store Room = Balcony 0.54 /0.66 / 0.69/ 0.72/ 0.75/ 0.76/ 0.89 / 0.92 / 0.93 / 0.95/ 0.96/ 0.98 / 1.01/ 1.04 / 1,06 /1.10 / 1.13 / 1.17 / 1.27 /1.39
6	*Sofa* < Stairs < Hall < *Pabuçluk* < *Sofa* < Stairs < Room < *Hela* = Room < Space over the Cistern< Entrance Landing < Hall< Entrance Garden Bathroom < Room = Kitchen < Side Garden = Room = *Hela* = Room = Room= Room= *Cihannüma* < Entrance Landing < Room < Cistern < Street < Balcony = *Hela* 0.67/ 0.72/ 0.82 / 0.86 / 0.92/ 0. 98/ 1.03/ 1.06 /1.08/1.10 /1.16 /1.21 / 1.25 / 1.31/ 1.35/ 1.42 / 1.46 / 1.59 / 1.69
7	Stairs < *Sofa* < *Sofa* < Stairs Landing < Kitchen < Stairs < Hall< Hall < Room = Room = *Baş Oda* = Stairs < Room = Room < *Hela* = Balcony < *Pabuçluk* < Side Garden < *Hela* = Storage <*Yüklük İçi Gusülhane* = *Yüklük İçi Gusülhane* = *Yüklük İçi Gusülhane* = *Serinlik* < Entrance Landing < Street 0.58 / 0.63/ 0.65 / 0.85/ 0.92 / 0.94/ 0.97 / 0.99 / 1.02 / 1.04 / 1.05 / 1.24 / 1.29 / 1.38 / 1.43 / 1.53 / 1.60

Table 4: Order of Integration of the Main Functions with Exterior (Continue).

House Number	Order of Integration
8	*Sofa* < Stairs < Stairs < *Pabuçluk* < Hall < Kitchen < Room = Room= Storage < Entrance Landing = *Sofa* < Street < Entrance Garden < Woodhouse < Room < Cistern = *Hela* < Hall = Room = Room= Room= Bathroom< Room 0.58 / 0.74 / 0.81 / 0.87 / 0.91/ 0.93 / 1.01/ 1.08 / 1.16 / 1.24 / 1.26 / 1.34 / 1.36 / 1.51/ 1.94
9	*Sofa* < Stairs < Stairs < *Pabuçluk* < *Sofa* < Dining Room < Kitchen = Room < Balcony = Room = *Hela* < Stairs < Entrance Landing < Room= Room = *Baş Oda* = *Hela* = *Sekilik* = *Köşk* < Storage < Street< Entrance Landing < Side Garden < Bathroom 0.70/ 0.81/ 0.85 / 0.97 / 1.04/ 1.08 / 1.10/ 1.12 / 1.26 / 1.29 / 1.47 / 1.55 / 1.60 / 1.87 / 1.89 / 1.97
10	*Sofa* < Stairs < Stairs < *Pabuçluk* < Hall < Hela = *Baş Oda* = Balcony = Room = Room < *Sofa* < Entrance Landing <*Sofa* < Entrance Garden < Bathroom = Room < Entrance Landing < Side Garden = *Hela* = *Baş Oda* = Balcony = Room = Room < Kitchen < Street 0.60 / 0.78 / 0.80 / 0.85 / 0.94 / 1.01/ 1.03 / 1.09 / 1.16 / 1.27/ 1.36/ 1.41 / 1.45/ 1.57 / 1.68
11	*Sofa* < Stairs < Stairs < *Sofa* < *Tiled Sofa* < Room = *Baş Oda* < Room =Room = Room < *Baş Oda* = Room< Side Garden= Room= Room = Room < Entrance Landing < Storage < *Yüklük İçi Gusülhane* = *Yüklük İçi Gusülhane* < *Yüklük İçi Gusülhane* = *Yüklük İçi Gusülhane* < *Hela* = Kitchen< Street 0.63/ 0.76 / 0.80 / 0.92 / 1.00 / 1.01 / 1.05/ 1.30/ 1.34 / 1.38 / 1.41 / 1.43 / 1.72 / 1.76 / 1.79
12	*Tiled Sofa* < *Sofa* < Stairs < Dining Room< *Sofa* < Hall< Street= Storage = Hall< Room< Kitchen= Hall< *Hela* = Room= Room= Balcony = Room < *Hela* < Side Garden< Cellar= Bathroom< Entrance Landing < Storage = Storage 0.95 / 1.02 / 1.06 / 1.18 / 1.22 / 1.33 / 1.37 / 1.45 / 1.60 / 1.64 / 1.76 / 1.91 / 2.03/ 2.26 / 2.68
13	*Sofa* < Stairs < *Sofa* < Room = Room < *Hela* = Balcony = *Baş Oda* = Balcony < Entrance Garden < Hela = Kitchen = Room < *Yüklük İçi Gusülhane* = *Yüklük İçi Gusülhane* < Street 0.53/ 0.61 / 0.76/ 0.99/ 1.06 / 1.21/ 1.29 / 1.52/ 1.75
14	*Sofa* < Stairs< Stairs Landing = Stairs < Stairs < Stairs Landing < *Pabuçluk* < Kitchen= Room< Room< *Sofa* < Bathroom= Stairs< Entrance Landing = *Hela* < Stairs = Hall < Room Room = Room= Balcony = Room < Street < *Cihannüma*= Room = Room < Cellar< Room = Side Garden= Room 1.03/ 1.09 / 1.17 / 1.31/ 1.33 / 1.36 / 1.40 / 1.42 / 1.47 / 1.55/ 1.72 / 1.80 / 1.85 / 2.10 / 2.15 / 2.18 / 2.53
15	*Sofa* < Stairs < Entrance Landing = Stairs < Entrance Garden= Room = Room = *Hela* = *Sofa* < *Sofa* < Side Garden = Kitchen < Street = Bathroom< Room = Balcony = Room 0.58/ 0.82 / 0.85/ 1.09 / 1,13 / 1.37 / 1.61/ 1.64
16	*Sofa* < Stairs < *Pabuçluk* < *Sofa* < Entrance Garden< Room= Kitchen= Bathroom< Entrance Garden< Room = Room= Balcony = *Baş Oda* = Room < Side Garden< Street < Storage 0.82 / 0.92 / 0.99 / 1.09/ 1.23/ 1.33/ 1.54 / 1.61/ 1.99/ 2.05 / 2.49
17	*Sofa* < Stairs < Sofa < Stairs < Room < *Pabuçluk* < Room = Room < *Hela* = Balcony < Room < *Sofa* < *Hela* < Kitchen < Entrance Landing < *Yüklük İçi Gusülhane* = *Yüklük İçi Gusülhane* < Entrance Garden = Bathroom< *Yüklük İçi Gusülhane* < *Baş Oda* = Balcony = *Baş Oda* < Cellar < Street = Cistern = *Hela* 0.80/ 0.82/ 0.87 / 1.01/ 1.11/ 1.14/ 1.17/ 1.20 / 1.23/ 1.25/1.27 / 1.35/ 1.38/ 1.57/ 1.62 / 1.64 /1.65 / 1.75 /2.02
18	*Sofa* < Stairs < *Sofa* < Entrance Landing < Room< Kitchen = *Hela* < Room < Entrance Garden = Balcony = *Baş Oda* < *Yüklük İçi Gusülhane* < *Yüklük İçi Gusülhane* < Street 0.67/ 0.77 / 0.96 / 1.06 / 1.15 / 1.25 / 1.44 / 1.54 /1.73/ 2.02/ 2.11

6. Conclusion and Discussion

The results of the analysis attained from this study are important in terms of the fact that it reveals the spatial morphology of Izmit traditional houses and the social norms in them by means of a numerical model (space syntax) in addition to the difficulty of revealing the physical properties of the traditional house of

Izmit city centre (Erdoğan, Özbayraktar, & Ayyıldız, 2011). The first findings of the study support the study previously conducted. A study of typology has been conducted on 40 registered houses which were able to protect their authentic character, whose surveying and restoration projects could be attained, and which took place in the same area previously (Erdoğan, Özbayraktar, & Ayyıldız, 2011, p.39). As a result of the study, "The general architectural characteristics of Izmit traditional houses have been determined. According to this, Izmit central traditional houses are the ones on both the street and side borders in terms of settlement, having entrances both from the street and the garden, generally consisting of basement +ground floor+1st floor, in which wood-stone and plaster have been used together, with hipped roof and narrow eaves , having an inner sofa in the shape of an "I", angle brace, in which single floor cantilever and balcony front elements have been densely used, with two sections vertical sash, with double wings and a wooden main entrance door". As a result of the analysis conducted in this study, the properties possible to be a genotype for the Izmit traditional house have been determined:

In the traditional houses of Izmit city centre, the sofa's function is to connect all the spaces to each other. The syntactic analysis for the selected houses showed that 78% of the houses (14 houses) are sofa-centred. The hall (one sample), landing (one sample), stairs (one sample), and the tiled sofa (one sample) are the centres of the four other samples (Table 4). This case overlaps with the idea of Orhun (1997) that two houses from Izmit are the examples of living-integrated house and deep-core type house emphasizing on the sofa.

Moreover, in the analyses of extroverted houses (12 houses) as having powerful inside-outside integrity and introverted houses (6 houses) were determined.

Most of the analyzed houses have a ringed structure in the justified graphs with exterior space (12 houses) that present alternative ways to the householders and the guests. Other houses (6 houses) are in tree-like structures in which the movements of the users are under control (Hillier, 2007; Bellal, 2004; Sanlı, 2009).

The rings both pass from the exterior spaces (entrance garden, side garden) and the internal spaces (stairs and hall, sofa, and tiled sofa). Crossing the ring from exterior spaces coincides with the results of the interviews revealing the fact that temporary guests have been welcomed in summer, the family individuals have come together, and social activities have been performed (circumcision,

wedding, engagement). Justified graphs with exterior space of the houses (Table 2) have shown that the spaces that are easiest to reach (most shallow) have been the exterior spaces (entrance garden, side garden). The garden is an important space in the daily life of Izmit houses. It provides the relationship of women with external world. It is a place in which the guests are welcomed and daily work (handwork, preparing meals, washing) are performed and the children play games when not at school. This case is explained as inside-outside relation within the Ottoman home by Arel (1982, p.49). Against the outside, which is represented by a courtyard or a garden, the sofa is inside. However, opposition of inside/outside turns into summer house/winter house opposition as in the case of Izmit houses; the garden may turn into the "inside" in summer. Günay's (1998, p.29) opinion that in the settlement order of the Turkish city, the garden walls are high in order to protect and preserve home life supports the idea that the garden is in "interior" space.

Here, it is necessary to turn back to the question, "Could the social connotations and the hidden themes of the morphological rules in the Izmit house be explained? What is the contribution of the space syntax method to this study?" As mentioned in the social usage of the spaces for the Izmit houses, the sofa is a space where guests are welcomed in winter, social activities such as weddings, engagements, circumcision, and other ceremonies are conducted, family members gather in daily life, and where all the spaces are interconnected. Once again, this unifying feature of the sofa in Izmit houses has been proved by this syntactic analysis. In addition, the facts that the majority of the examined houses (67% -12 houses) are in a branched and ringed structure giving the opportunity of alternative movements to the householders and the guests, the importance of the exterior spaces (entrance garden, side garden) in the daily life of the family and the social activities are performed have been revealed by means of the "justified graph" and "syntactic" data of the method.

As has been explained at the beginning of the study, many studies have been conducted "trying to reveal the cultural, economic and social information and reveal the social norms regulating the social relationships between the people" in the floor plan with the numerical data attained with the use of the space syntax method. In some studies (Leach, 1978; Lawrence, 1990; Rapoport, 1969; Osman, & Suliman, 1994, pp.189-198), it has been stated that these cannot be revealed only by looking at the numerical results; these data should only be supported with physical, social and cultural data (Dursun& Sağlamer,

2003; Sanlı, Dursun, &, Sağlamer, 2007). The mathematical expressions and graph methods such as space syntax are only the tools to explain the social norms shaping the space (Dursun and Sağlamer, 2003). The data of traditional houses of Izmit city centre attained with the space syntax method support the above criticisms. As is mentioned above, in the previous detailed typology study carried out on traditional houses of Izmit city centre (Erdoğan, Özbayraktar, & Ayyıldız, 2011), only physical characteristics of these traditional houses could be determined. However, connotations and hidden themes of the morphological rules in the house were missing. Data obtained through the space syntax method, architectural characteristics obtained through a typology study and data obtained through interviews completed the socio-cultural use of the space; and have enabled an explanation of the Izmit house as a whole. Thanks to space syntax, in addition to the information above, extroverted, and introverted characteristics of the Izmit house, the deep-core type of Izmit house which is living-integrated, drawing different spaces, and emphasizing the sofa could be defined. Moreover, the importance of the garden and its being included in the interior space in the relationship of inside-outside, and the ring and tree-like structure of Izmit houses could be determined. This study is important for determining the location of the Izmit houses within the traditional Turkish house. With the study, the experts and architects working on İzmit house will understand the house of Izmit not only in terms of typology but also in terms of the relationship between everyday life, culture, and space.

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This book includes on Architectural, Georgian Villages, Traditional House Design, Space Syntax Method, Doors of Odunpazari Houses, Traditional Housing Architecture, Traditional Japanese House, Architecture of Hattians, Phrygian Civilization, Charles Rennie Mackintosh, Art Nouveau, Furniture Design, Architecture of Le Corbusier, Floating Houses, Urban Silhouets, Turkish Art, Ottoman Cultural Context, Flintstones, Jetsons, Fictional Space, Indoor Plants, Planning Methods, Sustainable Waterfront, Seating Furniture, Design Processes, Covid-19 Pandemic

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