

ISTANBUL TECHNICAL UNIVERSITY ★ GRADUATE SCHOOL OF SCIENCE
ENGINEERING AND TECHNOLOGY

**INFLUENCE OF RELATIONSHIP BETWEEN CLOSED AND OPEN SPACES
ON RESIDENTIAL SATISFACTION: FULYA CASE STUDY**

M.Sc. THESIS

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Department of Architecture

Architectural Design Program

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İSTANBUL TEKNİK ÜNİVERSİTESİ ★ FEN BİLİMLERİ ENSTİTÜSÜ

**BOŞLUK VE DOLULUK İLİŞKİSİNİN KONUT KULLANICISI
MEMNUNİYETİ ÜZERİNDEKİ ETKİSİ: FULYA ÖRNEĞİ**

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To my parents, spouse and my little Ahmad,

FOREWORD

Foremost, I would like to express my sincere gratitude, Praise and Thanksgiving to ALLAH, for giving me the strength to perform this work and for being all the way with me.

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ABBREVIATIONS

GCs	: Gated Communities
GIS	: Geographic Information System
POS	: Public Open Space
SEL	: Socioeconomic Level
SPSS	: Statistical Package for the Social Sciences
SWOT	: Strength, Weakness, Opportunity, Threats

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INFLUENCE OF RELATIONSHIP BETWEEN CLOSED AND OPEN SPACES ON RESIDENTIAL SATISFACTION: FULYA CASE STUDY

SUMMARY

The topic of this research is concerning with issues that affect directly our daily life inside and outside our homes; the research is applied on a residential area.

Life experiences are gotten from practicing life activities in the spaces. In this research these spaces are categorized into two categories: positive spaces (solid), which are the built area and the negative, spaces (void) which are the open areas. So for every activity a specific space with specific conditions is needed in order to practice that activity safely and easily.

The residential area is an environment where embraces inhabitants from all ages; that is why it should be an inclusive environment which fulfills its inhabitants' needs.

This research is going to highlight the influence of relationship between positive and negative spaces and attached buildings on the residents' satisfaction. Factors that increase residents' satisfaction and those that indicate satisfaction are studied.

Briefly, satisfaction can be achieved when the spaces and their relation to each other match the residents' requirements for practicing different residential activities.

This research is chosen to be in Istanbul; since I figured out the problem in its residential environment when I came to Istanbul and become one of its residents, I noticed that the positive spaces in the residential environment occupied very large areas due to high population density, but the importance of negative spaces in our environments should not be forgotten as they have fundamental functions and roles in the daily life. The selected region of study is Fulya neighborhood, which follows Sisli district; it has a central location, high population density, and crowded buildings.

In order to measure the level of Fulya's residents' satisfaction, the observation and the questionnaire (structured interview) methods were used.

The conclusion is that Fulya's residents complain from the absence of different open spaces and being not so comfortable with the physical features of their dwellings, also they said that the cars and buildings occupied almost all areas and there are no spaces for humans. On the other hand, they get used to their environment; they consider that it is better than many other residential environments in Istanbul, and they like its central location.

BOŞLUK VE DOLULUK İLİŞKİSİNİN KONUT KULLANICISI MEMNUNİYETİ ÜZERİNDEKİ ETKİSİ: FULYA ÖRNEĞİ

ÖZET

Bu araştırmanın konusu konutlarımızın içerisinde ve dış çevresindeki yaşamı doğrudan etkileyen sorunlarla ilgilidir. Uygulaması bir yerleşim alanında yapılmıştır.

Deneyimlerimizi gerçekleştirdiğimiz mekanlarda aktivitelerimizi yaparken, bu mekanları pozitif ve negative alanlar olarak sınıflanmıştır. Pozitif alanlar dolu ve massif binalar; negative alanlar ise boş ve açık alanlardır. Her bir aktivite için onu daha güvenli bir biçimde ve daha kolayca yapabilmesi için insanın özellikli bir ortama, özel koşullara ve özellikli bir mekana, alana gereksinimi vardır. Konut yaşam alanı bir çevredir; öyle ki tüm yaş gruplarından ve çeşitli geçmişi ve tercihleri olan kültür gruplarından oluşur ve onları kapsar. Bu nedenle de, bu çevrede oturau tüm konut sakinlerinin ihtiyaçlarını karşılayacak biçimde kapsayıcı olma özelliğini taşımalıdır.

Bu çalışmada hedeflenen, pozitif ve negative alanların (doluluk ve boşluk; kütle ve açık alanlar arası ilişkinin konut kullanıcılarının memnuniyeti üzerindeki etkisini sorgulamaktır. Bunu gerçekleştirmek üzere, öncelikle kullanıcıların memnuniyet derecesini arttıran faktörler ve memnuniyeti belirleyen faktörler çalışılmıştır. Kısacası, istenen memnuniyet düzeyi, mekanların birbirleriyle ilişkisinin konut kullanıcılarının ihtiyaç ve talepleriyle örtüşmesi sonucu elde edilebilir. Ancak böylelikle farklı konutla ilişkili aktiviteler gerçekleşebilir.

Tez in saha araştırması için yer olarak İstanbul seçilmiştir. Araştırmacının İstanbul'a ilk geldiğinde dikkatini çeken konut yerleşmelerindeki sıkışıklık olmuştur. Kendisi de İstanbul'da yaşamaya başlayınca, konut çevrelerinde yüksek nüfus yoğunluğuna bağlı olarak pozitif alan (yapılı alan) ların çok büyük yer kapladığı görülmüştür. Oysa, günlük yaşamda rolü önemli olan ve temel işlevlere sahip negative alanların (açık, boşluk) ihmal edilmemesi gerekmektedir.

Saha araştırması için seçilen alan, Şişli ilçesine bağlı Fulya mahallesidir . Bu mahalle ilçe ve kent içğinde hem merkezi bir konumdadır, hem de yüksek bir nüfus yoğunluğuna, kalabalık binalara sahiptir,

Fulya Mahallesinde ki konut kullanıcılarının memnuniyet düzeylerini ölçmek için gözlem ve soru cetveli yapılandırılmış görüşmeler kullanılmıştır.

Sonuç olarak; Fulya'daki kullanıcılar, evlerinin yakınlarında farklı tipte açık alan bulunmayışından şikayetçi olmuşlardır. Ayrıca onlar, konutlarının fiziksel özelliklerini de çok konforlu bulmadıklarını ifade etmişlerdir: arabalar ve binalar tüm alanları kaplamakta ve insanlar için alan birtakmamaktadırlar.

Öte yandan, konutların sakinleri, çevrelerine alışmışlardır ve İstanbul'un birçok başka semtine oranla ve özellikle de merkezi bir konumda olması nedeniyle burası çok daha iyi bir yerleşmedir.

1. INTRODUCTION

Spaces in urban zones are created by the way of combination between buildings and other elements; the form of these spaces controls the way of using urban environment where every space should have its own identity and properties, otherwise feeling of placeless will be there [1]. Urban spaces can be categorized into two main categories: positive space which represents building shape and object itself, and negative space which represents the shape of space around an object “empty air space surrounding the building”. Negative spaces include open spaces, void spaces and the setbacks between buildings, which are as important as the object itself [2] [3]. Spaces are the raw material of places where activities are practiced; their relations with each other are the source of users’ experience. Both positive and negative spaces have a specific role in the environment, which cannot be survived without.

In fact, negative spaces are not respected enough during designing and construction; seems that lands’ owners are not aware enough about its role. They are mostly concerned about gaining money by building as much as possible even if they build up every square meter! In the design process to have feeling of individuality and being different within the environment; location, landscape, urban spaces, buildings form and activities of users should be balanced between [1].

Since this issue affects shape of context, way of life, circulation and ventilation, it affects life inside buildings themselves and their livability - a capability of a place to fulfill users’ needs - [4]. As a result, all of those aspects are closely related to human beings and their environment as well, and this presented research is interested in studying the relationship between positive and negative spaces in a residential zone as a particular.

In the residential environment, the problem resides in designing more number of buildings on expense of negative spaces, which means their relation with the positive spaces is ignored! The design process of residential building determines the pattern of the resulted negative spaces and their accessibility [1]. With the increase in residents

the demand on the dwellings (positive space) also increases, this is when the designer starts replacing more and more negative spaces with positive ones. Therefore, a healthy environment with a balanced relationship between its spaces and the sense of place will be missed.

Feeling of placeless in the residential environment could happen because of [1]:

- No relation between roads and activities along them.
- Uniformity of built environment.
- A design that is away from the nature, and doesn't meet users' needs.

This research is highlighting this issue in Istanbul. From my own experience when I came to Istanbul I found that there is a problem in the residential areas, which is the absence of open air spaces between apartments and the buildings. They are in a very close proximity to each other's resulting in an uncomfortable environment inside and outside the apartments. Although Istanbul is one of the largest cities and has a high population density, it's not acceptable to omit the necessary negative spaces for the benefit of raising more buildings in order to accommodate more population in the residential environments.

In particular, Fulya neighborhood is chosen to be the region of this study because of its central location, high population density in addition to its crowded apartments and buildings.

Keywords: Positive vs. Negative spaces, Open/Closed, Solid/Void, Residential satisfaction, Quality of life.

1.1 Purpose of Thesis

Since environment and human are not detached components; the main aim of this research is to employ both, environment and human, for serving each other in a proper and a successful way. This guarantee is achieving a complementary relationship, and getting positive implications from their interactions. This research is interested in studying the residential environment and its spaces, which should give the most relax and comfort for human, as it controls the way and the quality of their daily life.

The goal of this thesis is to raise the awareness about the spaces relationship and to discuss the capability of the available possible solutions in matching residents'

satisfaction and meeting their needs. From this point of view, residents' satisfaction is a dependent variable, which gives an indicator for the quality of life.

The intention of this research is to come up with new recommendations (regulations) from the residents' point of view. In other words, the design should come up from the residents themselves. Furthermore, these recommendations could be generalized and used for planning and designing processes for the residential zones, in order to create more desired, satisfying and comfortable environment. This is more defined by a balanced distribution that respects the users' needs from positive and negative spaces.

This study includes some suggestions to solve the problem resulted from high population density without creating unbalanced relationship between spaces in the residential environment.

Briefly, the ambition is to embrace all population without getting lower in their life quality in their residential environment.

Figure 1.1 represents the summary and mind map of the aim of this research, which concerns with residential satisfaction in terms of relationship between positive and negative spaces in the residential environments that give the daily life experience, this experience will be good and satisfying if the residents find their needs in those spaces, otherwise they will not be satisfied and comfortable, therefore searching the problem and addressing its causes should be applied in order to find the solution .

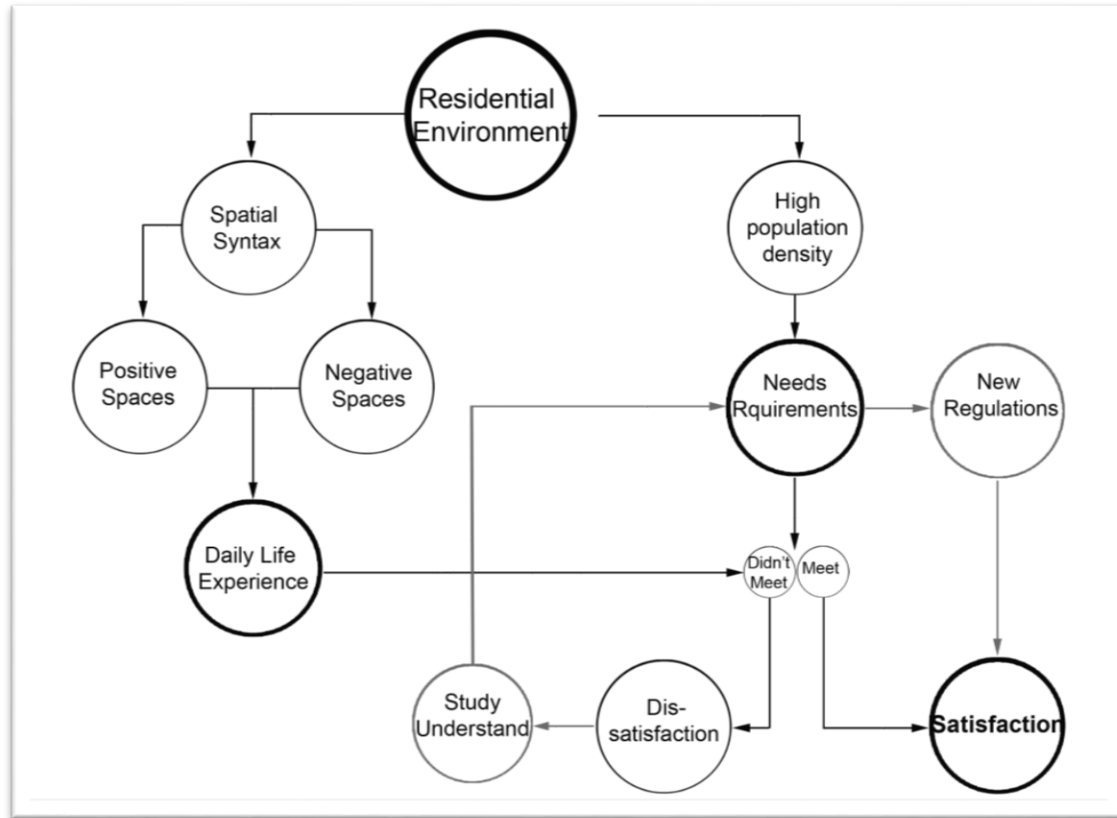


Figure 1.1: Framework for thesis structure.

1.2 Literature Review

City Architecture In between past and future [5].

- The City of Opposites

This research is a corporative work contains different articles, which demonstrate and explain some concepts related to the urban aspects and structure of city architecture in general and link them with residential environment. As well, they interpret how our senses affected by shape of context, way of design, used material, spatial syntax and created spaces, whether it is open or close, accordingly gaining our daily life experiences. The writers use real existing examples of some buildings to help us imagine and understand.

For example; the concept of open/closed was clarified. Openness gives us the light, air, accessibility and views, which are very necessary for the residential buildings and homes. It can be added that these elements are necessary to be found between residential buildings and their surroundings, but also as the research mentioned

opening and open spaces in the residential environment should be controlled and follow the needs and requirements such as: gathering, playing, socializing and sitting without exaggeration.

Another thing is stated is the experience of being outside while you are inside, this can be achieved by glass wall, high ceiling, wide corridors and long spans. Furthermore, the feeling of being inside while you are outside can be achieved by courtyard, covering by trees and awnings. Providing these kinds of spaces in our residential environment help us like it and break boredom, which is one of residents' needs.

As known, open/closed space can be physically defined; furthermore, it can be defined behaviorally based on social agreement on the use of the space. Sometimes the same space is used as an open space and other times as a closed space, as per limitations of time and occasions. This idea saves us space especially in the crowded and high population density districts.

- The Sensuous City

In the city architecture book, another important issue is discussed, which is the design "for the body or from the body". "For the body" means to protect it from hot and cold by providing artificial heating, ventilation, lighting and cooling. It should be from the body; since it is the source of sensation, which gets the experience and takes into consideration daily life activities and users' needs. So designs accommodating natural systems, as much as possible, for the dwellings should be adopted.

"From the body" is highly affected by the relationship between the buildings and the open spaces around them. It affects also the circulation and movement's patterns of users, sense of smell, gaining of natural lighting and the opportunity to place water features, all these elements supply the users with the experiences.

- Urban Form Characteristics

In this article some urban concepts are explained, in addition to some urban theories. There is "the figure-ground theory" which reflects the relationship between building and open spaces, and it can be adjusted by adding mass, subtracting mass or changing some physical geometries.

What this research is looking forward to apply is to study this relationship between positive and negative spaces (mass-void) in the residential environment to make it fit the residents' needs and requirements.

The dynamic effects of open-space conservation policies on residential development density [6].

This article concerns with the influence of open space's presence on adjacent residential land and undeveloped land. It argues that open space could increase value of residential land on the other hand it doesn't affect agricultural one, on the contrary it would cause the conversion of agricultural land to become a residential area. The revenues come from subdividing a residential parcel to get new parcels over development. So the existence of open space may increase density of existing residential parcels, and opposite to expectation it does not increase rate of growth in residential density. They used an econometric test (A discrete-choice econometric model of lakeshore development is estimated with a unique parcel-level spatial-temporal dataset, using maximum simulated likelihood) to investigate the relationship between open space and parcel size and the result was that it is a complementary relation.

In this article, they studied relationship between negative space (open space) and adjacent land, but this research's intention is to study relationship between negative space and adjacent building (positive space).

Crowding and Residential Satisfaction in the Urban Environment: A Contextual Approach [7].

This article concerns study of crowding according to socio physical factor. It aims to find out the relation between negative estimation of social density and residents' satisfaction based on neighborhood, spatial physical characteristic, socio demographic and residents' characteristics. Also this article supposes a contextual approach in environmental psychology "the relationship between the individual and the physical characteristics of the environment", and highlights its features as the following: matter of that environment is to uncover the relation between individual and socio physical characteristics; it is a natural relationship in its place and its experience.

Method: a research program (MAB-UNESCO) was used on urban settlement in Rome city. The role of this program is to connect urban processes to psychological processes of residents with reference to the quality of urban environment. The researchers

divided the neighborhood into zones and took sample of residents for interviews to establish their experiences in their zones. A structured questionnaire related to the problems of spatial aspects, social aspects and functional aspects was used for the purpose.

Results:

- The type of residential life depends on the inhabitants and it varies according to their age and SEL (socioeconomic level), for instance: elders' movement is less than young inhabitants so they are not affected by the human density and traffic like young inhabitants. Also when SEL increase, the inhabitants' tendency to spend their time out of their home and in the neighborhood is higher than compared with the low SEL inhabitants.
- Increasing SEL gives more choices for environmental conditions, which leads to a higher satisfaction of the residents.
- The followed contextual approach is able to uncover the position of crowding perception within the inhabitants' residential satisfaction as well as, ascertaining that in the residential environment the level of crowding is related to the spatial density (closeness) and clarifies that the inhabitants' degree of satisfactions about their environment is linked to the inhabitants' features such as: sociocultural features and residents' experience in the temporal and spatial factors.
- The conclusion was that the level of crowding was affected exclusively with the SEL factor.

This article represents a good example of dealing with an urban issue because it gives due attention to the environment and its features (spatial density, crowding, physical) as well as to the human and their characteristics (social experience, sociocultural, psychological and demographic), and studied their influence on each other. As mentioned that spatial density causes closeness meaning there is no negative space as it should be. The article was looking for the residents' satisfaction and the selected district was too small to generalize a hypothesis according to its findings.

Density, Crowding, and Satisfaction with the residential environment [8].

This study concerned with the relationship between components of density (person per room, rooms per house, houses per structure and housing units per unit area) and

realizing of crowding and relate them to residential satisfaction. Crowding is a multi-dimensional concept and is related to culture, traditions, individuals and their numbers per unit area. Individuals look for an environment which they realize that it meets their needs, this fact could explain the assemblage of individuals in the environment with the same density while they are different in their crowding evaluation. Within a city it is more important to pay attention to the number of housing units in a unit area when establishing crowding.

Method: personal interviews with households' head to collect the census's data for measuring the density, also the interviewers were asking respondents about their communities and neighborhood if it is crowded or not and to give a degree from 1 (least crowded) to 7 (most crowded), in addition they were asked to describe their realization of crowding within their homes. For measuring their satisfaction, they asked to depict whether their community is attractive or not, pleasant or not and if it is satisfied or not.

Result:

- Relationship between objective density and subjective crowding are very low, its correlation coefficient is 0.26.
- Satisfaction is related to perception of crowding in a high level.
- The relationship between density and satisfaction is weak.
- The satisfaction was in the low level for the respondents for the area, which is overcrowded with house units and highly populated (8000 dwelling units per square miles).
- Satisfaction was in the high level for those who live in home with 8-9 rooms and the distance between two residential buildings is approximately 15-30 miles.
- Also economic factor has an influence on density; as high density tends to be for low-income category.
- Satisfaction is affected by individual's experience, ambition, level of adaptation and his characteristics. So quality of life depends on subjective evaluations.

It is easily noticeable that one of the resident's factors for satisfaction is to get a distance between the structure of their building and the adjacent one; which means that

it is necessary to have a negative space (not building) within the building spaces; to serve the residents and provide a satisfaction level of life inside their homes. This issue is the main aim of the presented research.

Evaluative structure of perceived residential environment quality in high-density and mixed-use urban settings: An exploratory study on Taipei City [9].

This article talked about Taipei city in Taiwan; its residential environment and how its residents assessed the quality of life with the conditions of high density, mixed use buildings and small blocks. Evaluation included human, contextual, spatial and functional aspects. One of the important indicators for the quality of life in residential environment is the satisfaction of the residents. Researchers defined three different perspectives in order to figure out residential satisfaction, which are: 1. Affective perspective; consider satisfaction as a dependent variable based on objective features such as: conditions of dwellings, surroundings; greenness, density and health also subjective features: crowding, security and social communications as well as personal characteristics: age, gender and income. 2. Cognitive perspective: scales that residents accordingly assess environment quality. 3. Behavioral perspective: consider satisfaction as an independent variable based on residents' actions with environment and their social relations. Furthermore, evaluative structure and perceived of environment differs with the different cultures and physical environments. In the successful city human and environment should support each other.

Method: comparison between Taipei city and three other high-populated cities (Paris, Tokyo and San Francisco) for their land uses and zoning regulations. Exploratory interview; the answers were analyzed as the following: grouping the similar themes, highlighting key concepts and scaling generalization: "Urban Planning and Design, Security and Social Relations, Transportation and Commercial Services, Residential Atmosphere, Environmental Health and facility and management". In addition to a survey.

Result:

- They found that evaluative structure of Taipei city was similar to that of Italian city, San Francesco and Istanbul.
- Since Taipei city has a mixed use environment (residential and commercial) with a high population density, traffic and a lot of pedestrians; it faced a spatial

problem for accessing ground floor which led to uncomfortable situation for the residents and let their environment unsecure, also this problem caused pressure and stress for the residents.

- Its mixed-use lands cover the boundaries between private and public spaces.
- This kind of residential environment has negative effects on residents, their psychology, emotions, movements and privacy, hence they will be unsatisfied.

Istanbul has the same set of problems as of Taipei, as it is mentioned in this study, both of them have high population densities and mixed use residential and commercial environment, but in Istanbul it is little; since it is preferred from the adults and it is not mixed as much as Taipei. In order to avoid problems and preserve for each space its identity, attention to the relationship between spaces, their functions, locations and distributions should be given.

Investigation of the relationship between place characteristics and child behavior in residential landscape spaces: a case study on the Century Sunshine Garden Residential Quarter in Hefei [10].

This research used the observation and visualization in order to study children's behavior and actions with the landscape and environment to figure out the relationship between place's features in addition to spatial elements and their behavior in China. Then the satisfied space for the children was discussed. Also it mentioned that gaining as much money as possible led to build a residential environment without paying attention to residents' needs and requirements. One of these needs is that parents prefer to have an area for their kids where they can play within their neighborhoods.

Method: it was through choosing a waterside area and divided it into zones with different features and observed children's behavior and actions and noticed their different responses with the different zones.

Results:

- The good environment for the children which attract them and let their parents satisfy is that contains green area, open spaces, water features, easy accessibility, and spaces for cultural events, landscape and public facilities.
- Also location of space, its spatial patterns and its safety are very effective factors for children's' activities.

The way, in which the spatial elements were linked with behavior of users, it seems like “design from the user”. So building an environment for specific users should not follow the financial returns exclusively, but it should meet the users’ needs and satisfaction. The way in which the buildings are distributed in the residential districts and the created spaces have a very big influence on the people’s behavior and their life style and quality of life. So the relationship between the buildings and created spaces is a topic that deserves to be studied.

Residential Experience and Residential Environment Choice Over the Life-course [11].

This research investigated the influence of residential experience on the decision of choosing residential environment and the probability of changing environment (urban, suburban and rural) in the Netherlands. Cities are full with facilities, services, good education and job opportunities. Middle class households usually occupy suburban areas and the services there are good. While rural regions have lack of services but they represent traditional life style and calmness. Work, family and previous life experience are factors that affect people’s movements in addition to physical and social features of spatial patterns. Residential environment choice is the choice of the place according to its spatial features and preferences, resources and restrictions. Spaces were categorized into three categories: activity spaces, social spaces and awareness spaces whose inhabitants have an identity. Awareness is based on individuals’ experience, media, communication with others and their evaluations of their environment. So third category has the strongest influence on inhabitants’ decision.

Method: three retrospective surveys (2000, 1993 and 1992) for thousands of respondents of different age, gender and region.

Result:

- The city is the destination for the people categorized as singles, students or separated.
- Social bonds could cause return migration.
- Also place of birth has a strong influence on the decision of choosing residential environment.

It mentioned that choice of residential environment is the choice of spatial preferences that is why spatial syntax is an important issue in urban studies. Spatial syntax includes

relationship between buildings and open spaces. To contribute towards providing a good residential environment experience; this relationship should meet residents' needs and preferences (aesthetically and functionally).

Residential landscapes as social-ecological systems: a synthesis of multi-scalar interactions between people and their home environment [12].

This article seems like a survey paper, it looked for the residential landscapes' analysis and the results for the previous researches from different disciplinary point of view in order to figure out their understanding of residential landscape (land use, eco services, contextual characteristics and preservation of ecosystem) and to provide a foundation for the future researcher in the field of residential landscape. Landscape is the interaction between people and their environment. So it is related to many disciplines; for example: social researchers studied desired yard for residents, ecological researchers found out biodiversity and environmental aspects and others studied residential land cover paradigms and their usage. In addition, residential landscape has a social role as it encourages social communications, gathering and provides places that give the sense of well-being.

Method: reviewing the publications related to the landscape and residential landscape within science web, for each research; finding its question(s), themes and topics and categorizing them into two groups: social science (residents' preferences) and natural science (ecosystem features) and applying SWOT (strength, weakness, opportunity, threats) analysis in order to understand the research and figure out the commonalities as well as preparing for coming researches.

Result:

- Residents showed their happiness and their approbation for the surrounded open spaces and green areas, also they consider as an aesthetic feature, which is the first priority in their preferences.
- Residents prefer a safe and a healthy landscape as well.
- This research contributed by constituting a guide for the future researches by adding large scales (household scale, neighborhood scale, municipal and broader scale) rather than designing area itself that affect landscaping decisions.

- There are some gaps still exist in the landscape discipline; connection between social carters and ecological results of management decisions.
- The benefits that provided by landscape to residents, interaction between social carters and ecological features on different scales and the ability to generalize process or style across the largest scale which is city.

Open spaces are very important aspects in urban and landscape design; they give the opportunity of having the aesthetic and desired climate in residential environment. If the suitable spaces that serve the residents through landscape and urban design cannot be found, a beautiful context cannot be gained which is the highest requirement for the residents.

Preference for void-to-solid ratio in residential facades [13].

The aim of this article is to determine the relationship between void (openings) and solid (closed wall) in the residential façade and investigates the most desired ratio between them. Also this ratio was defined as the gauge of equilibrium between negative areas against positive areas in the façade. For sure the ratio of void to solid varies according to the function of building. Previously, they were considering residential buildings with small glass area in their facades. The reasons of determining that ratio as they were clarified are; defining facades' descriptors, discovering relationship between desire and void to solid ratio and discovering most desired value of the ratio.

Problems that faced this research are: need to determine descriptors for old preservations and urban projects and how they can fit new buildings into existing environment, this issue considers as an urban design guideline agent, using defined descriptors as a design tool, defining descriptors for the purpose of architectural and urban design education and for theory of architecture; this ratio could be used to distinguish between architectural trends. Some of the previous studies pointed out what should be a balanced ratio, others indicated to understand architectural surfaces and their influence on rules of architecture.

Method: computer software (AutoCAD, 3D MAX) was used in order to prepare 60 paradigms of residential façades resulted from the independent variables; void to solid ratio, windows' orientation and height of the building. Then applied a survey on the resulted images to uncover which paradigm they preferred and why. The subject

variables: gender, area of living and its weather are independent variables as well. For the dependent variable preference statistical tests were used because it is nonparametric data.

Results:

- There were noticed statistical difference in preference for the 60 facades and for windows' orientation, the most preference was given to vertical windows while horizontal and square windows had the same preference.
- On the other hand, the most preferred ratio was (0.41-0.50) for the buildings with four stories.
- Also women like and desire the façade with high ratio of void to solid more than men.

This article represents a physical description for one urban issue in the residential context, and the researcher was looking for the residents' preference for the void to solid ratio, but he did not give enough attention to the need of the residential function that certainly has an influence on that ratio. His study and his result were just according to the participants' opinions and this is not enough to build a hypothesis that can be used as an urban guideline factor.

The Ideal Residential Area [14].

In this research two studies in U.S were explained in order to find out the ideal residential environment. One of them is the analysis of residents' responses from age 25 and older considering environmental features and the other one is a questionnaire format for 90 lone women from age 60 and older who depend on the surroundings for daily life taking into consideration services and facilities around their home. The quality of life is affected by the quality of residential environment considering its physical and social aspects. The research figured out that the surroundings of home are important as much as home itself to get the well-being for older people.

They studied the residential area considering the facilities' location, its function, the identity of the area and the valuable resources. Also the features of ideal community were discussed which are: existence of basic needs (health, education, food, and job), relation to others (relatives, firms, neighbors) and entertainment facilities. The needs are affected by the age of users, for example young prefers school, jobs and entertainment while elder prefers to be near to relatives more.

Environmental Utilization based on resources' salience, resources' distance and their financial and physical statuses. They focused on proximity factor. Also keep in mind that every feature would have a positive and a negative implication on the environment.

Method: first study: an interview with the residents asking about things that affect place positively and negatively. Questionnaire about the attractive factors they consider to be present in the residential area as features for an ideal community from what has been mentioned above, question was which one is more important to be close. The samples of respondents were divided into two categories 25 years old and older.

Second study: an interview with the residents asking about the ideal location for services according to their homes, then asked through a questionnaire; list of services and which one is more important to be close from their home and which one is not important in an ideal situation according to them.

Result of first study:

- Aesthetics qualities of environment were the most important for all ages. Aesthetic features include: water features, green areas, cleanness of environment, well-organized buildings and attractive landscape of open spaces and gardens.
- The residents prefer to have friendly people in their district and it is more important than having relatives and friends.
- While the proximity of restaurants and theatres is less important, but to have close food stores and good walking conditions are very essential for all ages.
- Proximity to school and work is more important for adults.
- Regard to transportation; for old people it was very important to be close to bus stop while adults were more concerned with free way.

Result of Second study:

- Most of the women prefer having a grocery store, pharmacy, bank and dental center near to their home within walking distance.
- The bus stop was the most important facility to be within the walking area for the majority.
- Some of the facilities would be annoying for the others because they cause noise and dirt.

According to the results, these studies were useful in order to help in designing the ideal residential environment, especially in first study because the responses were consistent in the majority of questionnaire items. Also the aesthetic features are very important for all users in different ages. Without giving enough attention to the relationship between building and non-building spaces, an aesthetic residential district will not be had.

The influence of neighborhood residential density, physical and social environments on older adults' physical activity: An exploratory study in two metropolitan areas [15].

Here eight regions in British Columbia and Metro Portland were selected to study the physical and social effects of neighborhood residential density and environment, considering different population density and level of incomes on elderly's activities to figure out to what extent the environment provides barriers or facilitators to them. As proved before, built environment has a strong effect on daily physical movements. Also residential density increases physical activities for older adults as it expands with more accessible services, which lets neighborhood open for walking, but it still has many negative aspects.

Method: photo voice process was used for 66 participants in order to define their communities through photographs technique. Also face-to-face sessions were held and an ordered questionnaire was asked.

Result:

- Traffic considers as a negative aspect in the high-density regions for older adults' activities.
- Gardens are very necessary to be there in order to facilitate older adults' daily life since they can walk, gathering and sit.

Elders strongly need open spaces and green areas in their neighborhoods, since they spend most of their time in the surroundings. Accordingly, residential district should not be crowded with buildings and houses without an enough distance between the buildings and enough open spaces, which serve residents socially and physically.

Neighborhood satisfaction, sense of community, and attachment: Initial findings from Famagusta quality of urban life study [16].

This was a study for four neighborhoods which differs in their social spatial feature in Turkey (walled city (Surici in Turkish), Baykal, Karakol, and Tuzla), and investigated the residents' satisfaction with facilities, safety condition, green areas, circulation and the noise.... etc. so social and physical characteristics of the residential environment control the level of residents' satisfaction as well as the personal experience and psychology. Furthermore, it is mentioned that there is a difference between satisfaction and attachment, since satisfaction can be related to individual's expectation for a place (it is about needs and function), while attachment happens when individual has a strong physical or social bonds to a place (it is about emotion).

Method: interview, questionnaire and analyzed comparison between four neighborhoods.

Result:

- Satisfaction does not mean having attachment absolutely.
- On the other hand, there is a strong relation between satisfaction and feelings of neighborhood as home.
- From the GIS mapping technique and the analysis for environment and community, the results were that the government should care about quality of life within the design process, and to what extent do environmental conditions meet the resident's perception about life quality.

The presented thesis is trying to reach the spatial situation of the residential environment that could give the sense of comfort as home itself.

Residents' satisfaction of housing environments: the case of Istanbul, Turkey [17].

A volume of research has been done on the residential quality in the western cities. It seems that the quality of urban life in the residential environments of a developing country is neglected. Therefore, the researcher's focus in this research was on a developing city. Istanbul was the case of study for this paper. Istanbul has a rapid population growth as well has a shortage in dwellings.

The paper mentioned two models of satisfaction, conceptual model which focus on physical and social factors of residential environment and their influence on residents' satisfaction, and comprehensive model which focus on all environmental factors such as: ecological, technological, functional and economic then relate them to residents' satisfaction.

Istanbul was divided into four residential environments in terms of their legality and their location from the city center: central planned, new planned, squatter and new squatter.

Method: questionnaire survey about buildings' physical conditions, their age, size, type and neighborhood's density.

Results:

- Residents of central and new planned environments are more satisfied than those of squatter and new squatter regions.
- While residents of new planned region are more satisfied than central regions' residents; more facilities and more physical comfort mean more satisfaction.
- Government should concern with squatter regions and improve them to have the fundamental needs of life.

This study for residential environment in Istanbul was conducted in 1997, and now in 2016 the presented thesis aims to study this environment in Istanbul but from different approach and point of view, which focuses on spaces relationship that produces the satisfying environment.

Effects of housing morphology on user satisfaction [18].

The paper's aim is to figure out the factors that affect users' satisfaction and its relation with housing morphology (inside orders of spaces), which is affected by periods, regions, human relations, societies and their cultures.

Factors that affect users' satisfaction some of them related to user such as: personal characteristics and previous experiences, others are related to environment such as: services, security, planning and accessibility. Also buildings' features such as: age, size, spatial organization, physical comfort and location affect users' satisfaction, as well as factors related to human needs such as: beauty, social contact, convenience, safety and freedom.

It has been stated that the governmental policies should allow different structure types according to needs of different social groups.

Method: gamma analysis method; analyzing houses' spatial syntax, questionnaire and statistical program (SPSS).

Result:

- The asymmetry of the spaces organization of the dwelling gives more privacy then more satisfaction.
- The relationship between spaces organization and users' satisfaction are obvious.
- Also it is clear that the spatial syntax inside the dwellings is affected by social, cultural and economic conditions of the residents.

This paper studied the spatial syntax on dwellings scale, but this thesis focuses on spatial syntax on neighborhood scale, there are similarities and differences between the two scales.

Spatial adaptability and flexibility as parameters of user satisfaction for quality Housing [19].

This is another article which concerns with users' satisfaction according to dwelling space in Atakoy in Istanbul, satisfaction was taken as a function of 3 variables: physical features of space, users' perception about experience and their characteristics. Usually users modify physical environment in order to adapt it to their changing spatial needs in time because the change in household composition. Another problem is the concern of dwelling's quantity without enough care for dwelling's quality; residents always want to improve their residential environment.

Article's assumptions were: size of dwelling (width, length) defines its occupants, flexibility of dwelling depends on its spatial organizational type and adaptability of dwelling depends on its physical features and on its functional suitability.

Method: comparison between four (2+1) apartment for their space organization, size and physical features.

Result:

- The relationship is complicated between spatial perception and dwelling's size according to spatial syntax.

- As long as having a suitable space organization, flexible dwelling can be had.

Also this articles worked on house (dwelling) scale for space organization, it could be like a small study of this research, which works on the wider scale for space organization of residential environments. In the two scales of study, the quality should not be forgotten when concentrating on quantity of dwellings. Having a suitable spaces' relationship gives more flexibility and adaptability for the residential environment that has changed needs of residents whether it is about dwelling's scale or whole residential area's scale.

Environmental Quality and User Satisfaction in Mass Housing Areas: The Case of Istanbul [20].

The concern of this article is to determine the users' satisfaction level of housing and environmental quality in Istanbul. Factors that affect the level of the satisfaction according to location (central or peripheral district) were investigated. Those factors should be taken into consideration within the planning process to enhance users' satisfaction, which affects their behavior in their environment and give an indication to the environmental success.

Level of satisfaction is affected by mass housing location, demographic and socio-economic structure; it is increased with the level of income, but does not influenced by the level of education or family size.

As mentioned before in the previous studies and researches, factors, which affect satisfaction in residential environment, are: accessibility to facilities, security, neighborhood relationship and environmental appearance. Moreover, this research explains that the maintenance of the environment and building in addition to traffic density are the most important environmental features, which affect users' satisfaction.

Method: logistic regression model.

Result:

- Mass-housing area is an important issue to study; managing population distribution – that avoids high mass density in one place - is a key factor to stay away from attacking open spaces (negative space).

The presented thesis agrees with the result of this research.

Residential satisfaction among aging people living in place [21].

This research concerns with addressing the cognitive structure of elders' residential satisfaction and to measure the level of that satisfaction on the scales of their dwellings and their neighborhood context. Both scales highly control the daily life of elderly people; also the dwelling cannot be separated from its social and physical environment. The research is based on four domains in order to examine the elders' satisfaction: physical environment, social environment, psychological variables and demographic variables. These domains included interior and exterior aspects of home, relationship with neighbors, access to the different services, aesthetic features, safety and health properties. The salient aspects for the elders' residential environment are safety and health.

Previous studies stated that in some European countries the aging people had a higher level of residential satisfaction than the younger people, while in U.S and Spain the level of residential satisfaction for women was higher than men.

Method: 103 French elder people ranging from (72-86) years old in a semi-rural environment were surveyed in order to examine their residential satisfaction according to the environmental domains that mentioned above.

Result:

- Generally, the level of the residential satisfaction for the surveyed group was good.
- In addition, the questionnaire showed that the elders' satisfaction matches with four distinguished environmental aspects: local area, accessibility to the services, relationships with the neighbors, and home satisfaction.

The most important points in that research that supports the presented study are: the home and its surrounding cannot be detached from each other in order to get better residential life, the elders are existing in every residential environment and they have special needs to achieve a healthy and safe environment which cannot be gained without a balanced relation between the residential spaces and their functions.

Creating sense of community: The role of public space [22].

It was a study for investigating the influence of the quality of public open space (POS), community centers, schools and shops on the sense of community and feel of

belonging in a residential environment in the Perth metropolitan area, Western Australia. Sense of community means that you have a feeling of being a member of certain community, having social communications with other members and finding your needs in that community. Thus it expresses the relation between people and place; social bonds, physical features and culture. That is why sense of place is covering place attachment, place identity and place dependence.

According to the American organization in this study, the high quality of a space is defined by the presence of accessibility, comfort, appearance, function, activity, and sociability.

A socio-ecological framework was used in this study to measure the correlation between each of: sense of community, availability of public space with good quality and the frequency of visiting these spaces.

Method: a cross-sectional survey within a socio-ecological framework in a residential environment in Western Australia was applied.

Result:

- The study concluded that the quality of public spaces is more important than their size and number where high levels enable better social interaction.
- Quality of physical features (cleanness, attractiveness, security, atmosphere and services) of shops and POS environment are positively correlated to the sense of community, with subjective aspects that are stronger than its objectives ones in terms of correlation.
- Existence of green areas gives positive psychological effects such as sense of community.
- Frequency of visiting a public space does not affect the sense of community.

This study confirms the importance of one more aspect of the presented research subject. It indicates to the positive implications and relations between the quality of spaces and the sense of community. A space with a high quality cannot be achieved without taking into consideration its relation with surroundings, because they affect each other representing part of the physical features that have a big influence on the quality of the space, therefore on the sense of community and residential satisfaction.

How Does Increasing Population and Diversity Affect Resident Satisfaction? A Small Community Case Study [23].

In this study, the interest was mainly about studying the quality of life in a residential environment of Crete, Nebraska in U.S, from different residents' point of view. Crete is distinguished for the variety of job opportunities it provides, it always attracts a huge number of different residents and represents a good resort for refugees. It continuously receives new residents; thus, it has a mixture of old and new residents. The difference in residential satisfaction with its factors for both the old residents (long-time; more than 15 years) and the new residents (short-time; less than 5 years) were studied too in this study.

The residents' judgment on their environment, as mentioned in the previous researches, is influenced by their background, experiences, culture, personality, their own vision, expectations and level of adaptation. So, it is a subjective response. Residential satisfaction indicates the quality of life; on the other hand it is a behavioral predictor.

Here are some doubts that were mentioned in this study regarding evaluation of satisfaction:

- When the evaluation is uniformly high, it is not necessary to reflect the real situation.
- Satisfaction's measures are subjective while the context's measures are objective, so they may not correlate to each other.
- Evaluation of satisfaction for the same individual or the same group could change by time, norms and expectations.
- Sometimes satisfaction is higher than respondents' awareness, they may not reflect the true situation.
- To concentrate on satisfaction instead of overcoming the problems will not give the optimal environment.

Method: basically, they depended on survey and interview for two groups: long-time residents and short-time residents. They use the city official participation about quality of life, gathering information from newspapers and community's meeting, in addition to using the SPSS to analyze the data of 2000 residential buildings.

Result:

- The primary factors that affect the residential satisfaction in long-time residents are stressor, social and cultural factors.
- From the perspective of new residents, the physical factors have the greatest effects on their satisfaction.
- The long-time residents concern with improving the community and the environment.
- On the other hand, the new residents either adapt to the environment or move again to another environment in which their needs could be met.
- To increase the satisfaction, a cross-cultural education must be provided.
- Social events should be planned to make it easier for the old and the new residents to interact.

The physical environment is very important for all residents; old, new, natives and migrants. The doubts of satisfaction that mentioned above should be taken into consideration while planning for a solution.

Mass Housing: User Satisfaction in Housing and its Environment in Istanbul, Turkey [24].

The aim of this study is to determine the factors' categories that increase residential satisfaction with dwelling and its environmental quality in Istanbul, furthermore to take those factors into consideration during the design and the planning for the residential environment.

As mentioned in previous studies, the level of satisfaction reflects the user's response to his environment, which includes physical, social, emotional and economic conditions. The study of residential satisfaction is based on its relation with different variables:

- Users' demographic characteristics.
- Physical aspects of residential environment.
- Relation with neighbors, aesthetic aspects, accessibility and safety.

Method: linear regression analysis by stepwise regression technique.

Result: the following factors increase the user satisfaction:

- Factor categories of accessibility are: centrality, accessibility to educational organizations, open spaces, health organizations and public transportation respectively.
- Factor categories of housing environmental aspects are: maintenance, density of buildings and traffic.
- Security factors are structural and environmental security.
- Factor categories of neighbor relations are: social relations, coherence and distance between neighbors.
- Factors of appearance and aesthetic features are: beauty, cleanness, and attraction.

In addition, the satisfaction's level depends on the demographic and the socio-economic structure of the users as shown in table 1.1 where factors that increase their satisfaction are explained.

Table 1.1: Factors that increase level of satisfaction of different users.

Feature User	Centrality	Recreation area	Maintenance	Physical appearance	Structural security	Neighbors' relationship
Low income	/	/	/			
Middle income	/	/	/			
High income				/		
Low education	/	/	/			
High education	/	/	/	/		
Owner of house	/	/		/		
Tenant user	/	/	/			
User in 100 m	/	/				
User in 101-149 m ²	/	/	/		/	
User in 150-165 m ²	/		/			
User in 0-5th floors	/	/	/			
User in 6th and above			/			
User 10-20 km from center	/	/	/			
User 21-30 km from center	/			/		/
30+ km from center	/			/		

Table 1.1 shows that almost all residents' categories prefer the central location which increases their level of satisfaction. As well, most of them need the recreation area (open spaces) for different outdoor activities and maintenance of the residential environment to be satisfied. Half of the residents' categories are concerned with the physical appearance of the environment, while fewer categories are concerned with the structural security and neighbors' relation.

A great place to live, work and play conceptualizing place satisfaction in the case of a city's residents [25].

It is a survey and a conceptual paper concerned with improving the concept of residential satisfaction about places, and how the managers should understand this concept and apply it. The concept of satisfaction was studied with fields of psychology, sociology and ecology, and marketing. Policy makers, planners and designers have to understand and recognize the residents' needs and requirements of living, working, playing and the needs of practicing their daily life easily and safely.

Most of the residents have the same needs for living such as: transportation, accessibility, education, healthcare, public facilities, social interaction and comfortable dwellings and environments. These needs may change according to individuals' desires and background, which formulate their image about the place. By time, residents' satisfaction for the same place may change, when they make their decision to leave or to stay. The individuals can sort their life events into two categories: pleasant and unpleasant or satisfying and dissatisfying based on their own criteria, experience, vision and expectations

Satisfaction is related to different terms such as: well-being, happiness and subjective perspective.

Method: scanning and reviewing the previous studies about residential satisfaction and life quality, also demonstrated a model of city residents' satisfaction.

Result:

- Residents have a strong influence on formulating the economic, cultural, and social image of the city.
- Satisfied residents give a positive image for the visitors and tourists about the city, while the unhappy residents can damage that image.

- Residents may leave a city looking for more comfortable and satisfying environment or they may choose to stay in the dissatisfying environment although they are unhappy.
- It is the city manager's responsibility to provide a satisfying environment.

This study ascertained the need for policies that guarantee the desired environment after understanding the residents' requirements, so the regulations are inspired from the residents themselves.

The New Mode of Housing Production: Gated Communities in Istanbul [26].

It was a study for mode of new housing form which is gated communities that resulted in Istanbul from social and economic segregation, new demands of housing, lack of security and increase of urban violence. In addition, this research studied gated communities' lifestyle and their effects on planning. Gated community is a social and spatial segregation that means its entry is controlled, its public spaces are exclusive for its residents, it is enclosed, and it has private governance and a special lifestyle. Gated communities (GCs) reflect the spatial transformation of Istanbul after globalization. GCs were criticized as they cause stratification in community and low social relationships.

The upper income inhabitants preferred GCs to gain prestige and privacy, while the middle-income inhabitants choose them to gain services and life style, but the security was a reason for both groups to go to GCs.

GCs in Istanbul are represented firstly with villas (horizontal development) for high-income families, secondly with gated towers (vertical development) in city center for newly couples and businessmen, thirdly with peripheral gated apartment blocks (horizontal development) for middle income.

GCs consider as a small city or village since their residents are belonging to them and to their life style rather than to the city. The idea of GCs is serving and concerning with women and children based on the safety, services and specified places for women and children to practice their activities.

Mainly GCs have some disadvantages such as: distance from city center, far away from public transportation, lack of public services, high rents, problems in infrastructure and weakness of social relationship.

The relation between GCs and planning begins by taking decision of site selection, also they increase quality of urban life in urban spaces.

Result (conclusion of the study):

- GCs reduce social interactions, so they are not good for sustainability of society.
- GCs have social-spatial segregation from the surrounding.
- Life inside GCs is safe, organized, high quality, private and comfortable.
- The belonging in GCs is for their life style not for their spaces.
- Life inside GCs is closed and away from public life and social communication, these were main critical issues.
- GCs have a bad effect on sustainable economy; as they provide prosperous facilities and services for prosperous group.
- Needs for GCs could be reduce by reformulate and reinvest the existing houses and convince the residents to do that in order to improve their quality of life and increase their level of residential satisfaction.

Actually the last point of those conclusions is important for the presented study and could be one of the study's recommendations. On the other hand, that study was not accurate when it talked that the belonging is for life style not for spaces; because gaining of life experience, life style and way of life is coming from the spaces (positive and negative as it is explained in this study) where the practice of life activities is done. Also the study talked about two approaches for planning of residential buildings, which are horizontal and vertical, of course the decision of choosing one of the two approaches highly affects relationship between positive and negative spaces.

Conclusion

Mostly in the previous researches the residential satisfaction considered as a dependent variable that is affected by different personal and environmental factors, it is a strong indicator of life quality as well. Basically, the design is for the users, so they should be our inspiration for the design.

For having a healthy residential environment, the design approach should be from the users. Almost all of those literatures showed the importance of the presented research which points to the need of studying and understanding the spaces' relations in the residential environment; since it has a strong influence on the level of residents'

satisfaction also on their daily life, their environmental choice, aesthetic appearance and sense of community (belonging).

Satisfaction is definitely a subjective issue as it reflects the residents' responses for objective factors, therefore studying the level of satisfaction of specific groups could give a result that can be generalized for many other groups in the same conditions. Figure 1.2 clarifies the connection between subjective satisfaction and objective environment.

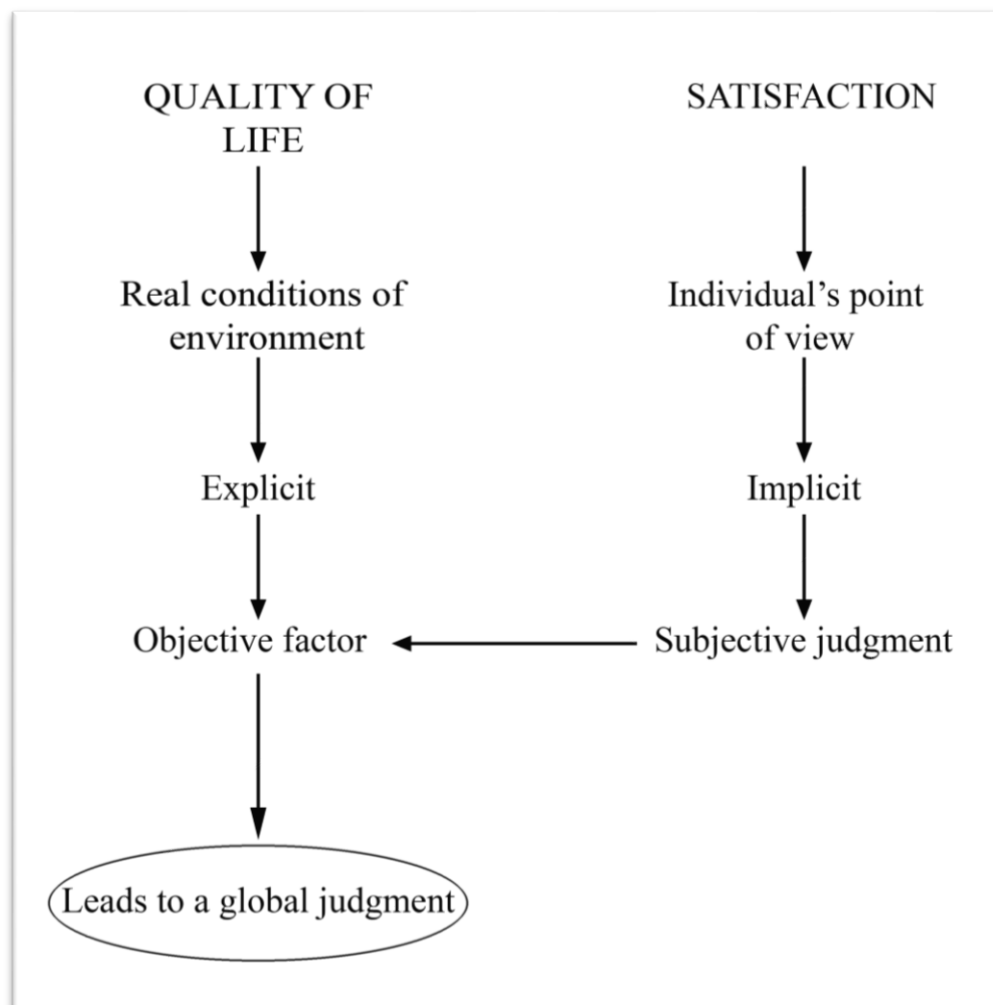


Figure 1.2: Nature of satisfaction.
Inspired by [23].

In addition, having the suitable and the balanced relation between both categories of spaces helps in gaining an inclusive residential environment as represented in figure 1.3. Balanced relation does not mean necessarily the equality of size or amount between both spaces; since it should follow the residents' needs and requirements, they are the source of data, which they have to be gained in order to decide the category of

each space and the size of each category. Then the balanced relation between positive and negative spaces helps special cases of residents such as: children, elders and disable people to find spaces that fit their special needs for the indoor and the outdoor activities.

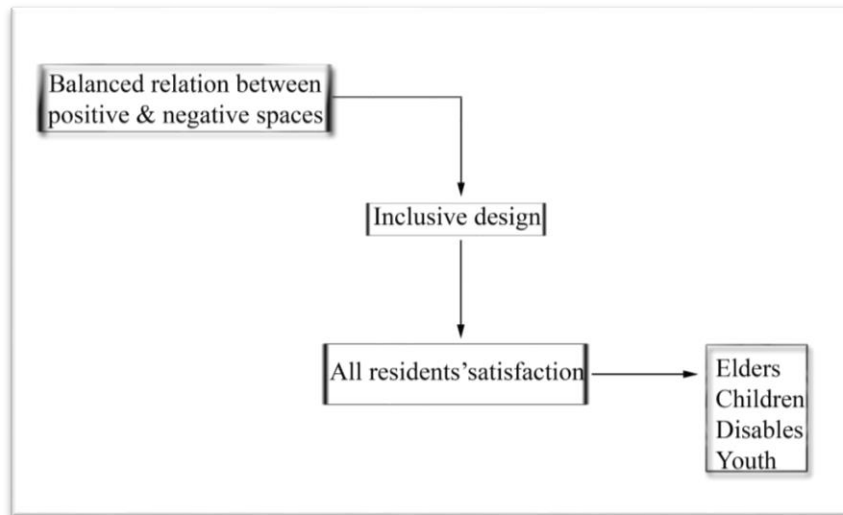


Figure 1.3: Relation between inclusive design and balanced spaces.
Inspired by [10] [15] [21].

There is a strong relation between the residential satisfaction and the place attachment as illustrated in figure 1.4, since having the satisfaction means having positive bonds with the place. They come from comfort, happiness, security, activities and existence of needs and requirements. Then the attachment will be occurred.

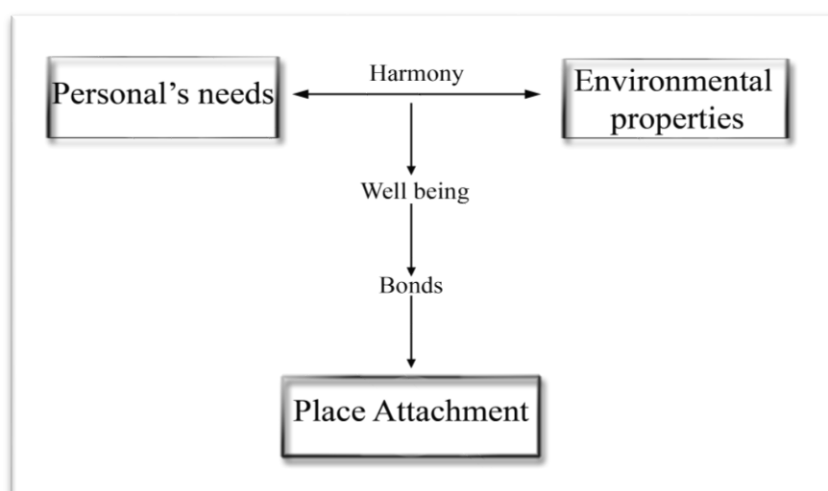


Figure 1.4: Place attachment.
Inspired by [16].

As clarified in figure 1.5, satisfaction has three main domains: physical, social and cultural and economic. Each domain has a lot of factors. Every factor has an influence on the level of satisfaction in different way and correlates with the other factors, so satisfaction is a dependent variable. All of these domains and their factors were discussed in previous studied as it was shown in the literature reviews part. Figure 1.5 summarizes the variables whose implications on residential satisfaction were studied.

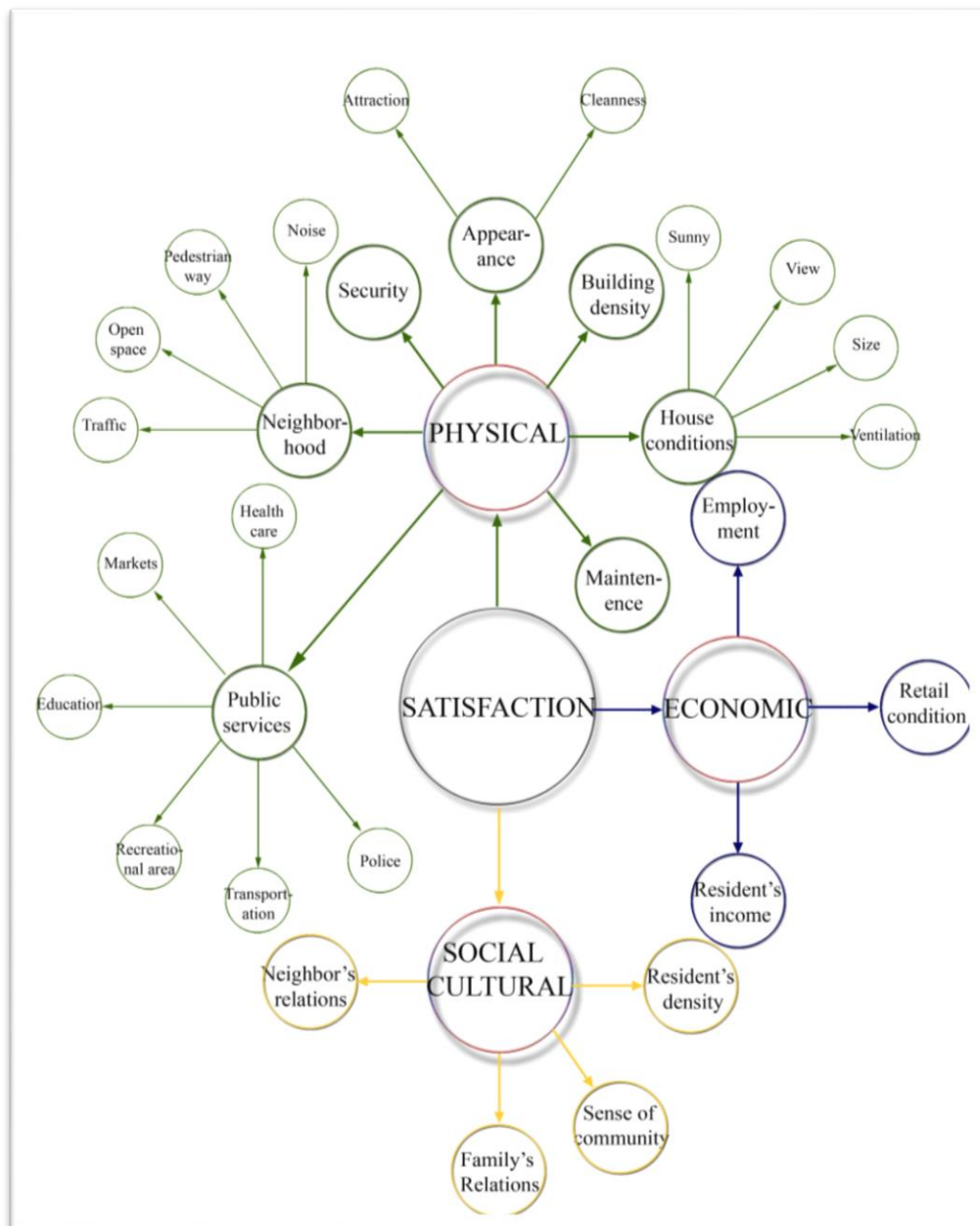


Figure 1.5: Satisfaction's domains.

Inspired by [7] [18] [19].

There was no any research or study in which it studied the level of residential satisfaction due to the relationship between the positive and the negative spaces in the

residential environment. This relation is following the physical domain of satisfaction, and affects residents' daily life inside their dwellings and their environment. As well the positive and negative spaces' relationship affects the conditions of building density, house conditions, security, aesthetic features and neighborhood's features, see figure 1.6. In order to indicate to the importance of this relation, its influence on residential satisfaction and to provide a research for a new physical factor that does not discussed before, this study is applied.

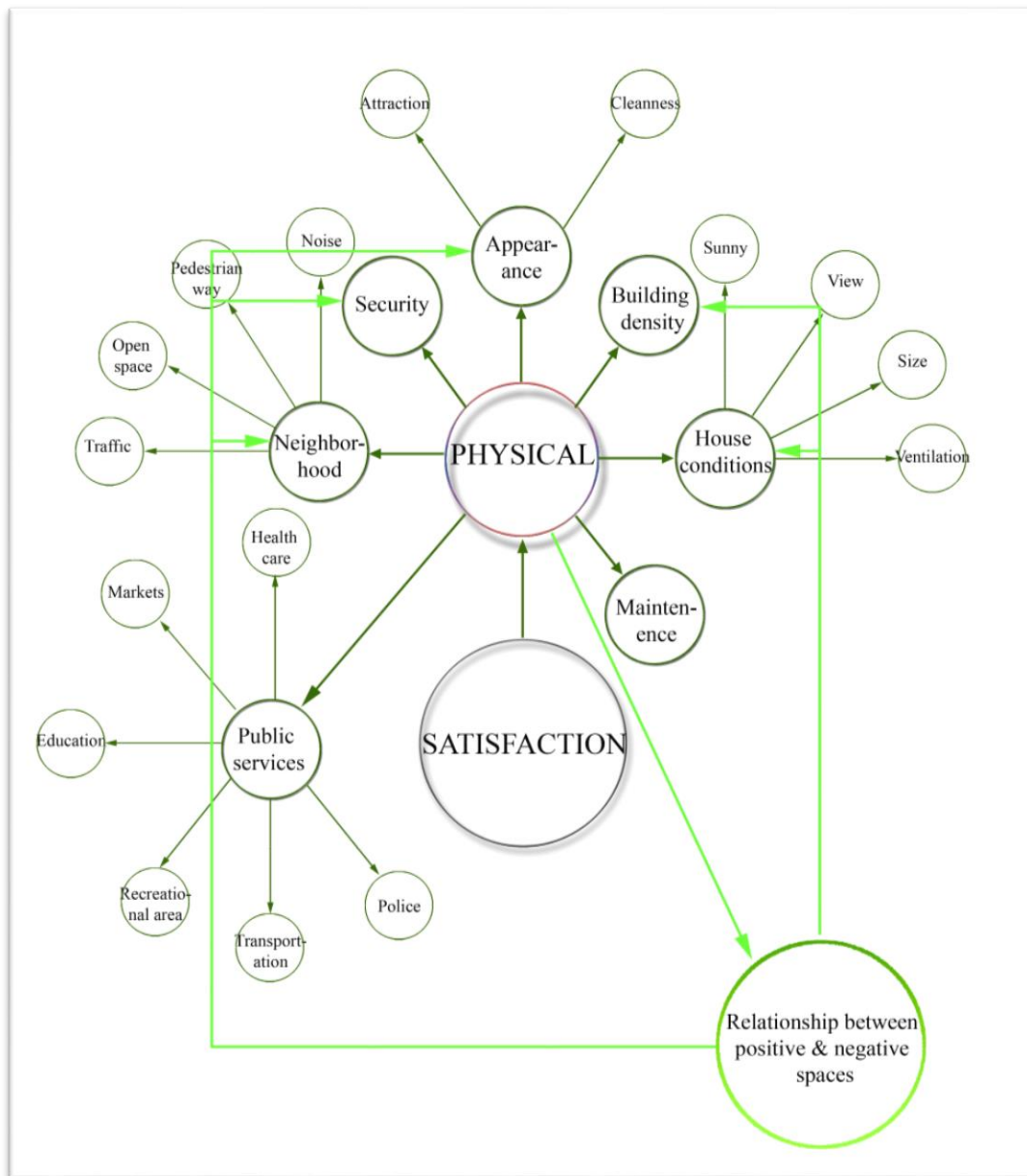


Figure 1.6: The added physical factor of satisfaction.

The importance of this study is getting higher by the increment of population density, that leads to the need of lots of dwellings, more spaces will used for buildings, then

less spaces will remain for negative one. Furthermore, the high population density causes closeness and crowded attached buildings, which they reduce the quality of physical features in dwellings, at the end the level of residential satisfaction will be in the low level. This research is intending to find out the residential environmental situation that provides an opportunity to embrace all population with conserving the existence of needed spaces from both categories (positive, negative).

At the end, figure 1.7 summaries the controllers and the indicators of satisfaction, which they cannot be separated from satisfaction when it is studied.

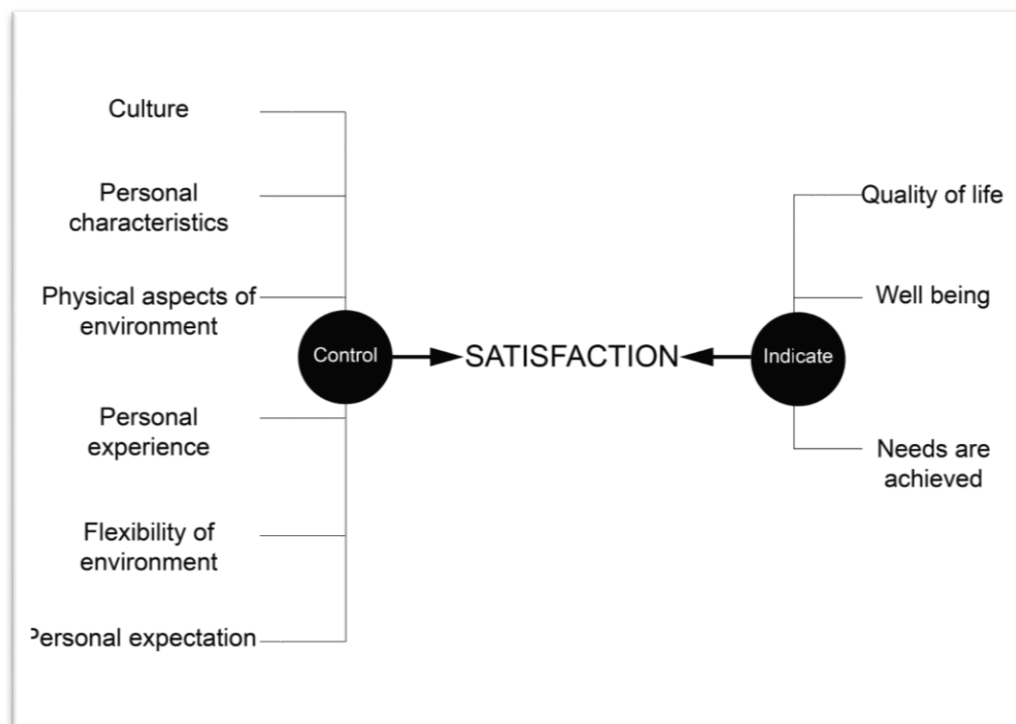


Figure 1.7: Controllers and indicators of satisfaction.
Inspired by [8] [0] [11] [20].

Since livability (place capability to meet user's needs) reflects place quality, life quality and health of environment, it has the same domains of satisfaction, which are social, economic, and environmental [4]; livability is also can be consider as an indicator of satisfaction as clarified in figure 1.8.

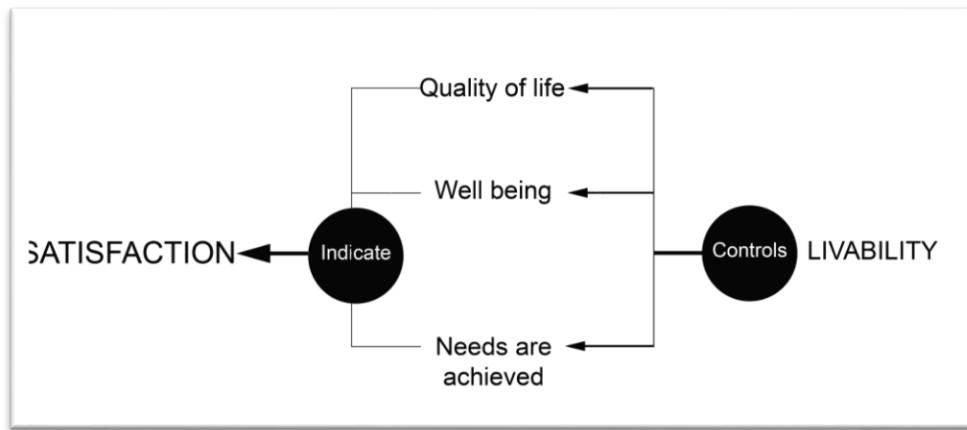


Figure 1.8: Relation between satisfaction and livability.
Inspired by [4].

1.3 Hypothesis

This is a research that trying to build up a hypothesis states that there must be a specific relation between positive and negative spaces in the residential district that have to be taken into consideration within the urban and residential design process, to be enough fit the residents' aspirations. Also to help in establishing a satisfied residential environment which fulfills the needs of users (residents).

Research question

- To what extent do the negative and positive spaces in residential environment match the requirements of its residents?

Understanding and studying physical, social and environmental features of residential environment can answer this research question. Also finding out the applied solution, existing relation between positive and negative spaces and physical properties help to disclose the answer. Noticing the areas occupied by positive spaces and the other, which are negative spaces, is part of understanding and studying process. Beside that information should be gained from the residents in order to measure the degree of their comfort and satisfaction about the existing situation. In this research Fulya's residential environment is the case study.

- What are the recommendations that can be applied on positive and negative spaces in residential environment to improve life quality and residential satisfaction?

According to the first question and its answers, a general case is figured out which provides the answers and the solutions for the second question to reach the aim of this research which is “the comfortable and the satisfied residential environment that achieves users’ requirements”, as well highlighting the importance and effects of spaces relationship on resident’s activities.

The variables in this research are:

- Residential environment.
- Residents (users).
- The positive and the negative spaces.
- Residential satisfaction.

2. INTEGRATED DATA

2.1 Purpose

In the process of data collection, a helpful and useful data would be gotten through which the reasons of problem and its results will be clarified, then analyze them in order to reach a solution or come up with new ideas that deal with the problem. The useful data will not be gained unless the right source is chosen.

In order to achieve the purpose of research, the collected data should not be biased or oriented. The problem of this research is related to residents and spaces in their residential environment, so the suitable sources of the data are: the residents, residential environment and the previous researches about residential environment.

On the other hand, the researcher can be one of sources of data through observation as a pure observer.

Mainly the collected data are about:

- Users' activities such as: playing, gathering, walking and practicing some sport.

These data would be useful in order to understand which kind of spaces (positive and negative) they need for practicing these activities, and to know its variety and amount.

- What are the existing spaces and what are the missed spaces, either they are classified as positive or negative space?

This kind of data helps in disclosing the absent spaces that required by users, and gives a vision about the variety in their function and their amount.

- How are the positive and the negative spaces distributed around each other?

From this data an illustration about the relation between positive and negative spaces can be taken; whose areas are more than the other, which space does embrace the other and which space are the dominant.

- What are the users' requirements in the residential zone?

For the taken case study, the users will be asked about their requirements that related to spaces; actually spaces are designed for the users, so their points of view are very important in order to understand the kinds of needed spaces from both categories.

- Are the residents surviving with physical features of their houses?

Physical features such as: location, size, natural ventilation and closeness from the adjacent buildings are controlling way of life, degree of comfort, degree of having healthy atmosphere inside the house.

2.2 Insight From Istanbul's Demography

The importance of Istanbul derived from its location on Asia and Europe, its history, its area and its population density. Istanbul is the largest city in Turkey and one of the largest communities in Europe; furthermore, it is the fifth largest city over the world according to growing rate of population around 3.45% [27].

The population of Istanbul in 2016 exceeds 14.6 million with density of 2523/ km², while the population density of Turkey is 102/ km². Most of population (64.7%) is on the European side of Istanbul. Only (28%) of the residents are originally from Istanbul [27] [28]. Since it is the city of culture and has an economic importance, it is the

destination for many Turkish residents and for many other residents of different countries in the world.

Studying residents' demography is very important to learn their characteristics, their differences and their density. This information is very helpful in predicting the level of residential satisfaction as it clarified in the previous studied.

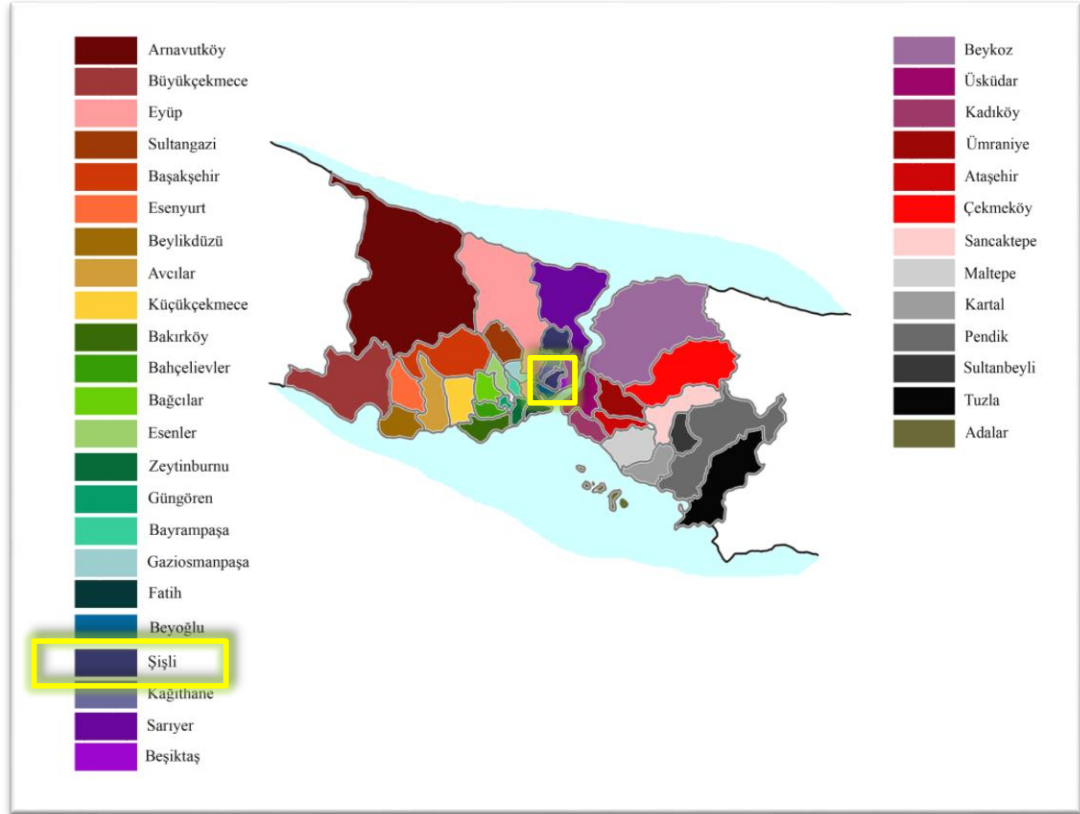


Figure 2.1: Istanbul's districts map [29].

Figure 2.1 illustrates the size of every district in Istanbul of both sides: European and Asian. It is noticeable that the number of European districts is more than the Asian ones, as well as the population and its density are bigger in the European side, which is older than the Asian side.

In table 2.1 the improving of population for each district in Istanbul is clarified, which is increasing year by year and increases the density of districts. This table is followed by chart that orders the districts ascending; while the biggest number of population in 2015 was in Küçükçekmece, the smallest number of population in the same year was in Beşiktaş and then Adalar. But the density of population is related also with the area

of each district, so as clarified in table 2.2 the heaviest density in 2015 was in Gaziosmanpaşa and the lightest density was in Arnavutköy.

Table 2.1: Population of Istanbul's districts.

Source: State Institute of Statistics, Republic of Turkey (web) [30].

Name	Population Estimate 2009-12-31	Population Estimate 2011-12-31	Population Estimate 2013-12-31	Population Estimate 2015-12-31
Bağcılar	724,268	746,650	752,250	757,162
Küçükçekmece	674,795	711,112	740,090	761,064
Bahçelievler	576,799	600,900	602,931	602,040
Ümraniye	573,265	631,603	660,125	688,347
Pendik	562,122	609,535	646,375	681,736
Kadıköy	529,191	531,997	506,293	465,954
Üsküdar	524,379	532,182	534,636	540,617
Gaziosmanpaşa	461,230	482,553	495,006	501,546
Esenler	459,980	461,382	461,621	459,983
Sultangazi	452,563	483,225	505,190	521,524
Fatih	433,796	429,351	425,875	419,345
Maltepe	427,041	452,099	471,059	487,337
Kartal	426,680	440,887	447,110	457,552
Kağıthane	413,797	419,865	428,755	437,942
Esenyurt	403,895	500,027	624,733	742,810
Ataşehir	361,615	387,502	405,974	419,368
Avcılar	348,635	383,736	407,240	425,228
Eyüp	331,548	345,790	361,531	375,409
Şişli	316,058	320,763	274,420	274,017
Güngören	311,672	309,135	306,854	302,066
Zeytinburnu	290,147	293,228	292,313	289,685
Sultanbeyli	286,622	298,143	309,347	321,730
Sarıyer	278,527	287,309	335,598	344,159
Bayrampaşa	269,425	269,709	269,677	272,374
Beyoğlu	244,516	248,206	245,219	242,250
Beykoz	244,137	247,284	248,056	249,727
Sancaktepe	241,233	267,537	304,406	354,882
Başakşehir	226,387	284,488	333,047	353,311
Bakırköy	218,352	220,663	220,974	223,248
Beylikdüzü	193,972	218,120	244,760	279,999
Beşiktaş	185,054	187,053	186,570	190,033
Tuzla	181,658	197,230	208,807	234,372
Arnavutköy	175,871	198,230	215,531	236,222
Büyükçekmece	171,222	192,843	211,000	231,064
Çekmeköy	154,103	183,013	207,476	231,818
Adalar	14,341	13,883	16,166	15,623
İstanbul	12,688,896	13,387,233	13,907,015	14,391,544

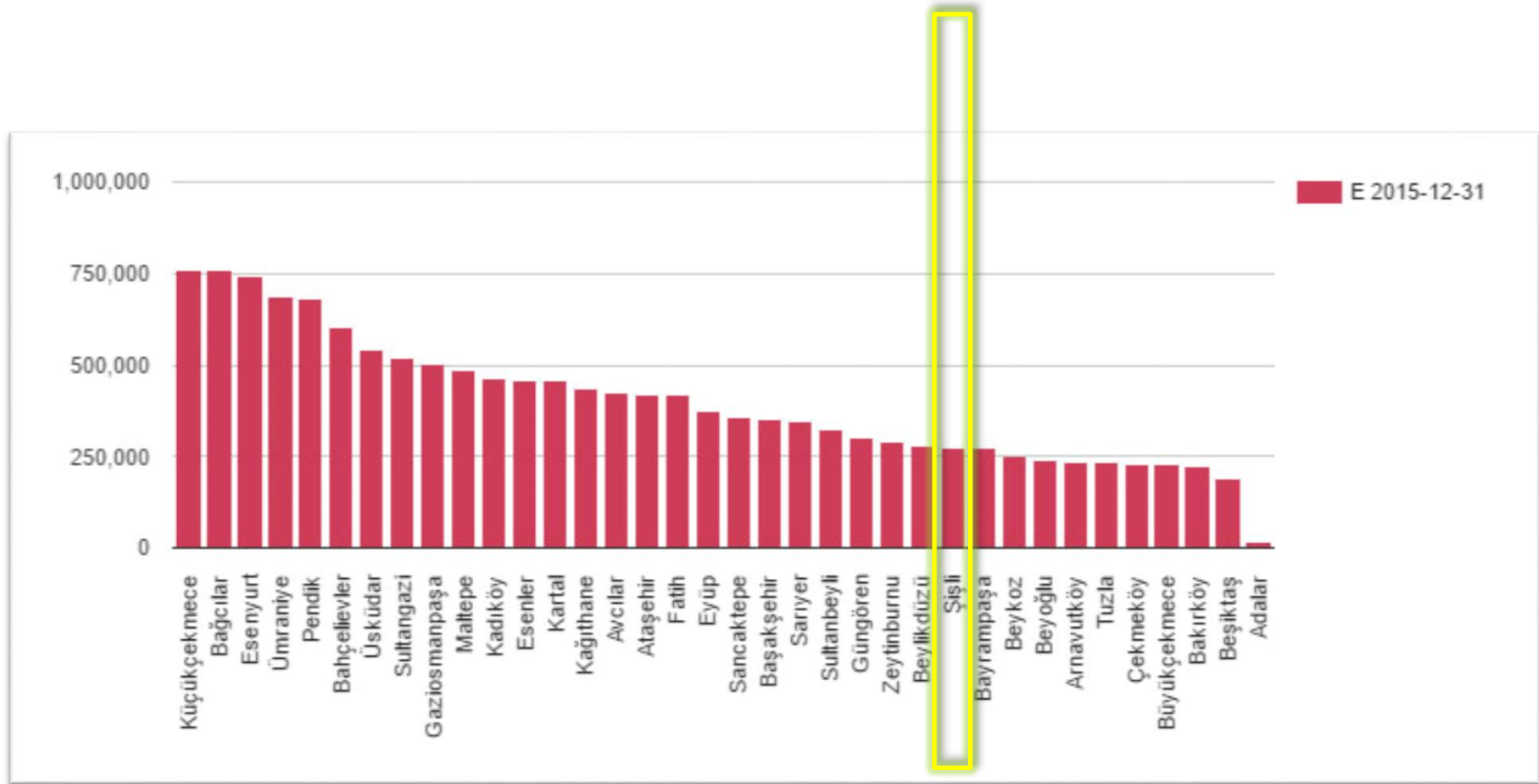


Figure 2.2: Population chart of Istanbul's districts [29].

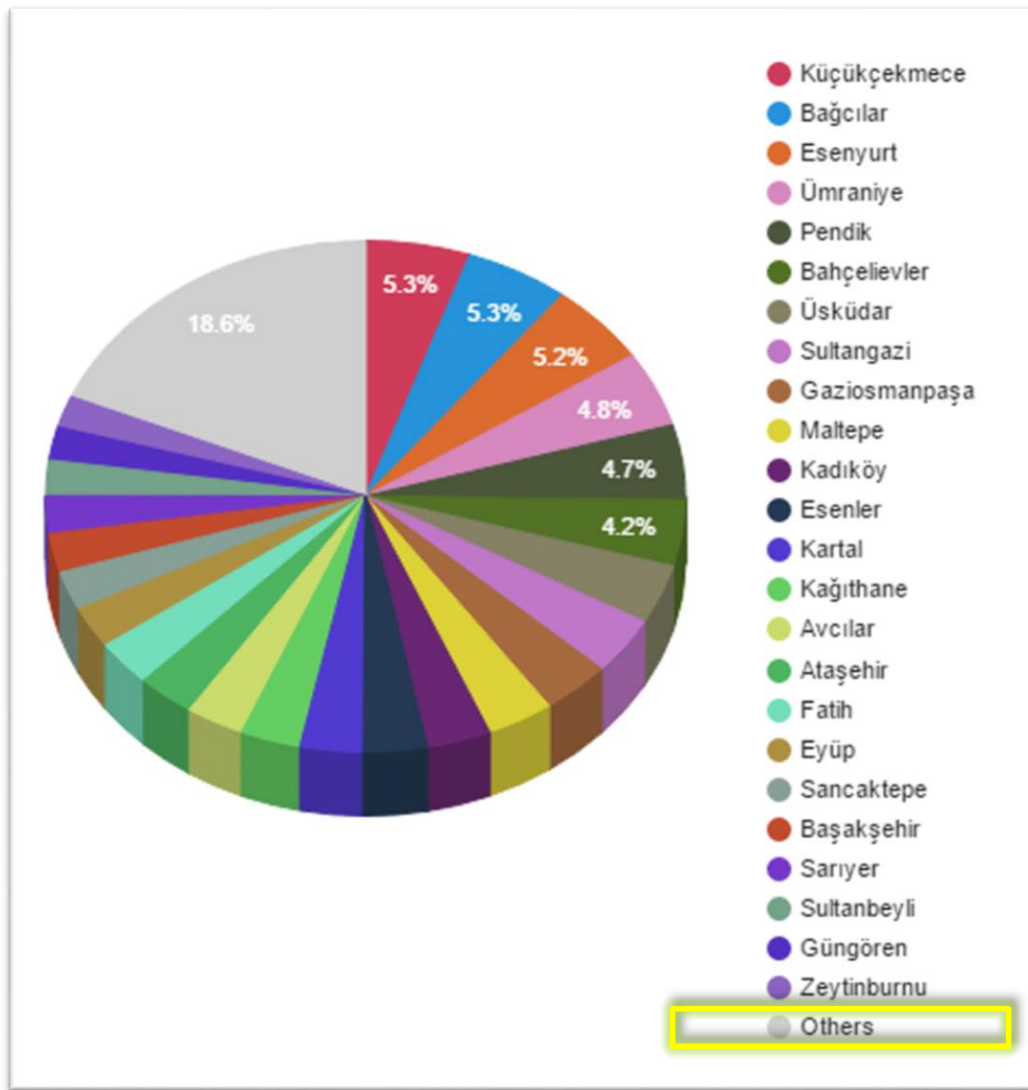


Figure 2.3: Pie chart of Istanbul's districts population [29].

In figure 2.3, Şişli district, which includes the area of study for this research, is following the category of others, as it is not one of the highest population densities in Istanbul. Although it has a high population density, there are other districts whose densities are higher and higher.

Table 2.2: Population density of Istanbul's districts [29][31].

Name	Area km ²	Population Density /km ² 2011-12-31	Population Density /km ² 2015-12-31
Bağcılar	22.4	5,880	33801.9
Küçükçekmece	37.51	6,003.5	20289.6
Bahçelievler	16.57	36,000	36333.1
Ümraniye	45.3	13,940	15195.3
Pendik	180.2	3,000	3783.2
Kadıköy	25.07	13,000	18586.1
Üsküdar	35.34	14,900	15297.6
Gaziosmanpaşa	11.67	41,350	42997.4
Esenler	18.51	12,000	24850.5
Sultangazi	36.24	9,900	14390.8
Fatih	15.93	33,000	26324.2
Maltepe	53.06	8,521	9184.6
Kartal	38.54	11,440	11872.1
Kağıthane	14.83	28,310	29530.8
Esenyurt	43.12	11,600	17226.6
Ataşehir	25.87	14,980	16210.6
Avcılar	41.92	9,169	10143.8
Eyüp	228.14	1,540	1645.5
Şişli	34.98	11,000	7833.5
Güngören	7.17	43,800	42129.1
Zeytinburnu	11.31	25,930	25613.2
Sultanbeyli	28.86	10,330	11148
Sarıyer	151.26	1,770	2275.3
Bayrampaşa	9.54	28,300	28550.7
Beyoğlu	8.96	28,300	27036.8
Beykoz	310.36	1,030	804.6
Sancaktepe	61.87	1,120	5735.9
Başakşehir	104.48	2,726.8	3381.6
Bakırköy	29.65	6,900	7529.4
Beylikdüzü	37.74	5,780	7419.2
Beşiktaş	18.04	10,370	10534
Tuzla	123.86	2900	1892.2
Arnavutköy	506.48	391.39	466.4
Büyükçekmece	157.68	807	1465.4
Çekmeköy	148.02	1,240	1566.1
Adalar	11.05	875.9	1413.8

2.3 Case Study: Fulya Neighborhood

2.3.1 Fulya's location

Fulya neighborhood follows Sisli district, Sisli's area is about 35.01 km², its population in 2012 was about 318,217 and the population density was 9,100/km² [32], where as Fulya's area is around 0.683 km² and its population in 2014 was about 17,538 [33]. Fulya has a strategic location since it is accessible by different modes of transportation and lies near to various landmarks. In addition, it has a high population density and a high building density.



Figure 2.4: Sisli's location.



Figure 2.5: Fulya's location.

Fulya neighborhood has 10 quarters consisting of 727 dwellings, 103 workplaces, 2 parking, 3 public buildings, 2 hotels, 1 factory, 5 educational institutions, 6 health centers, 5 social buildings, 8 transportation station, 1 spore building, 2 religious buildings and 1 park [34].

2.3.2 Boundaries of area of study

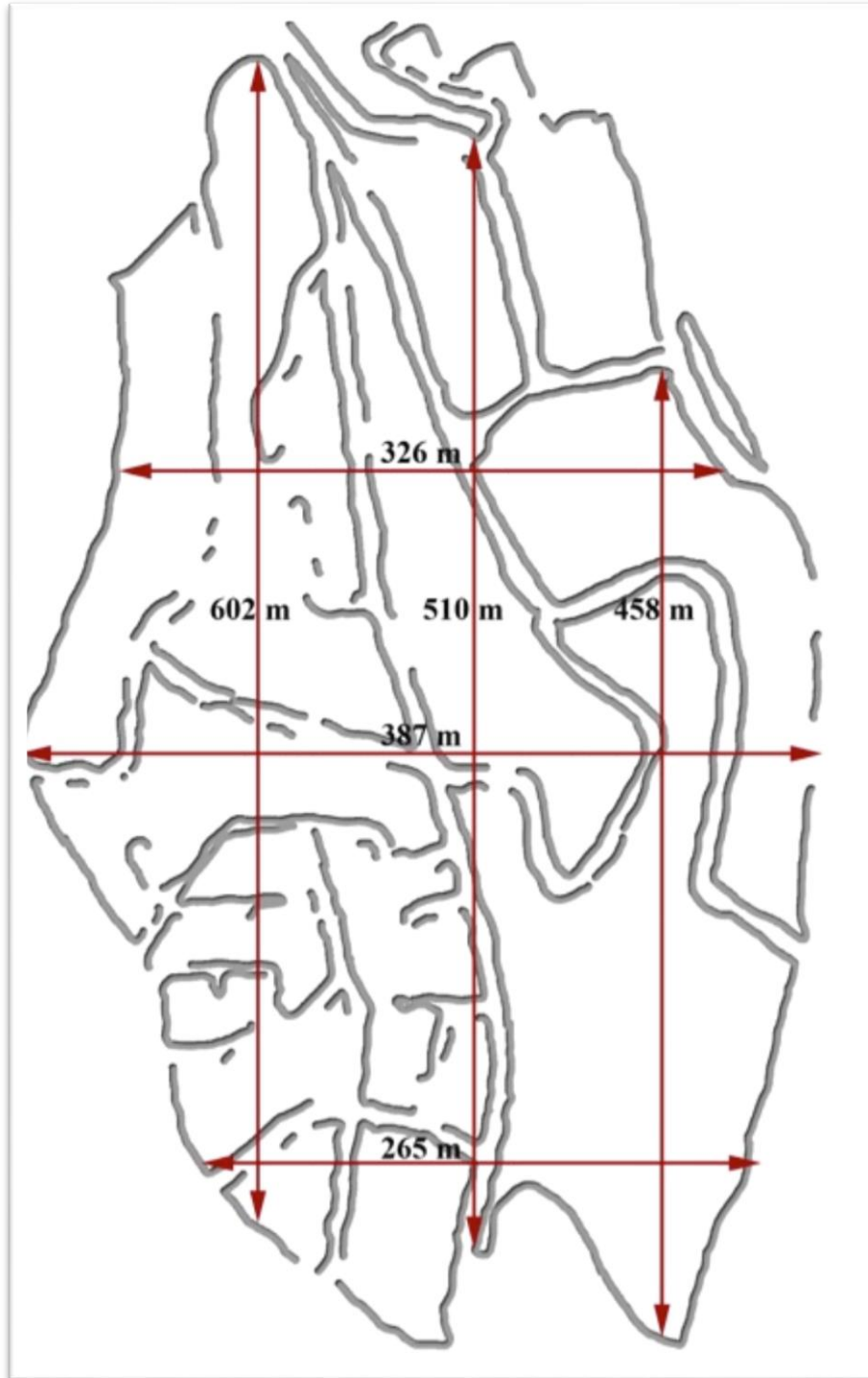


Figure 2.6: Boundaries of the studying area (Fulya).

The dimensions of the selected area in Fulya for the aim of study of this thesis are shown in figure 2.6.

2.3.3 Natural features of Fulya's neighborhood

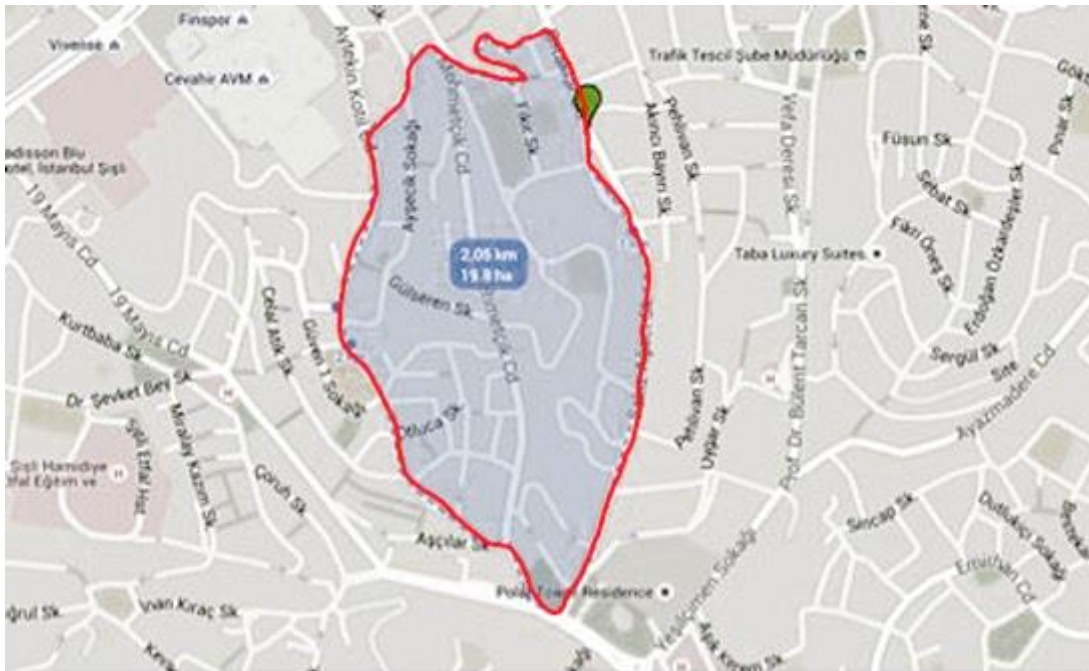


Figure 2.7: Area of study between Ortaklar street and Aytakin Kotil street.

The area where this study was conducted is situated between Ortaklar street and Aytekin Kotil street. It is about 198000 m² as shown in figure 2.7. The area is considered to be desirable by residents since it lies in close proximity to the Cevahir shopping mall and the main street.



Figure 2.8: Ortaklar street.

The area of interest is considered to be a mixed-use environment; since it blends commercial, residential & cultural elements with the presence of residential dwellings. Moreover, the area is crowded with people, vehicles and buildings.



Figure 2.9: Mehmetcik street.

The presence of numerous attached buildings in the area is of particular interest in this study. As attached buildings have a negative impact on the living conditions of the residential dwelling. For instance, in “Sokak’s dwellings”, the street between opposite buildings is narrower than the main street in the district.



Figure 2.10: Aytekin Kotil street.

Given that the area has high building density, more positive spaces are present relative to negative ones creating an imbalance between urban spaces and defects in the spatial syntax of physical movement.

2.3.4 Children's play ground



Figure 2.11: Playground's locations.

It is noticeable from figure 2.11 that there are few play grounds for kids and their areas are not that much large. Absolutely they will not be enough for all resident's kids of the residential environment.

2.3.5 Positive and negative map (solid/void)



Figure 2.12: Solid / Void map.

As demonstrated on figure 2.12, the buildings are clustered heavily in many locations in Fulya, because of high population density. Noticeably, half of the map is occupied with attached buildings. One can only imagine the amount of discomfort this creates for the residents.

Solid/ void map illustrates the imbalance between the positive and the negative spaces, with the buildings occupying most of the spaces, obliterating a huge portion of the open space, children's play grounds and green areas.

3. METHODOLOGY

This research is followed the qualitative style, as it is studying the understanding of users' satisfaction level for residential environment's spaces (positive and negative).

Therefore, observation and questionnaire techniques were used to disclose that level of residential satisfaction.

Observation

Observation method was used for this research; the researcher will observe in an objective manner to eliminate bias. Observations were made on the following factors: The presence of open spaces, the crowding of objects (buildings), whether there is enough space between buildings, or the presence of any hindrance to pedestrian movement. In addition, the presence of enough green areas and kids' playgrounds was also looked into. As discussed earlier in the literature review, the beauty of the environment is an essential requirement to residents, therefore, the aesthetic component of the area was also observed. Through this method, a general realistic perspective for the residential environment would be gained.

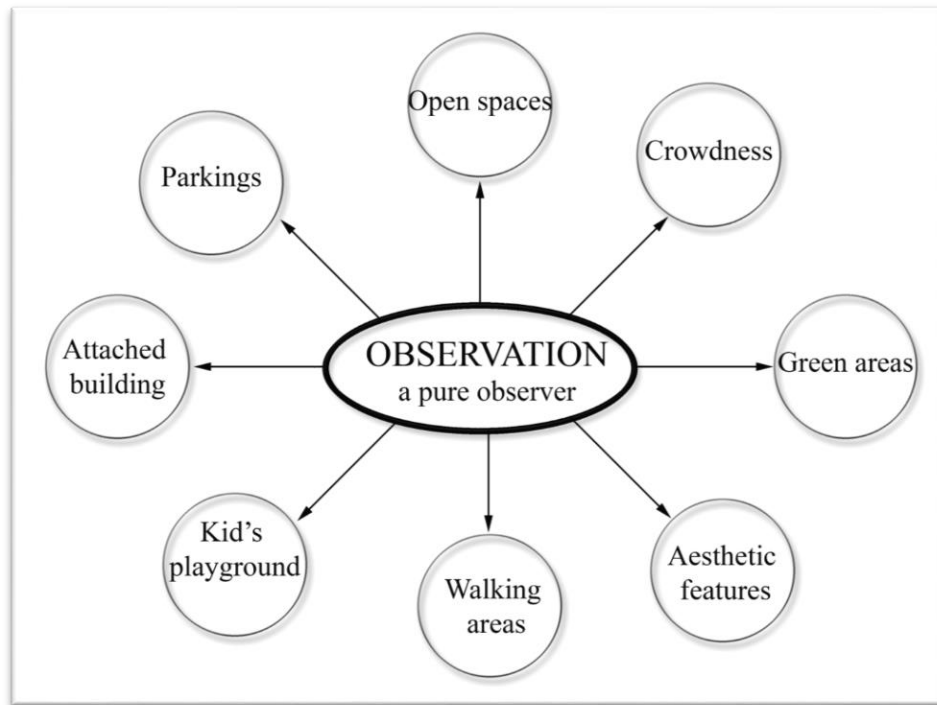


Figure 3.1: Observation's elements.

Questionnaire

In order to describe, explain and compare residents' activities, preferences, behavior and values of residential environment, the interview method was used, which is an important tool as it is a guide for the researchers in social science [35]. There are many types of interview, basically in this research structured interview (questionnaire) was based on. It is the suitable method for studying the relationship between variables of a specific group (Fyly's residents), aiming to find out a new regulation (recommendations) that can be generalized and fit the most residents.

Mainly, the questionnaire was for 25 interviewees of different ages from males and females; it consisted of 4 closed-ended questions and 5 open-ended questions.

For one of the closed-ended question the respondents were asked to determine the level of some environmental and physical features for their dwellings and surrounded context; whether they are in the low level, in the moderate level or in the high level. The other 3 closed-ended questions were yes/no questions; if the residents were seeing their residential environment pleasant, if they were surviving with the crowded environment and if they wished to change their dwellings.

For the open-ended questions the respondents gave answers for what problems they faced due to the high population density and crowd, what their daily activities in their residential environment and which one of them they cannot find a space for practicing it. In addition, residents were asked to mention their requirements in their residential environment and what open space is missed.

4. FINDINGS

4.1 Result Of Questionnaire

After applying the questionnaire method, the following results were gotten:

Table 4.1: The availability of some physical and environmental aspects in the dwellings and the residential district.

Aspect	Availability						Total	
	Low		Moderate		High			
Natural Ventilation	11	44%	14	56%	0	0%	25	100%
Noise	5	20%	19	76%	1	4%	25	100%
Privacy	1	4%	23	92%	1	4%	25	100%
Sun Ray	9	36%	15	60%	1	4%	25	100%
Safety Open Space	5	20%	20	80%	0	0%	25	100%
Pedestrian Way	10	40%	14	56%	1	4%	25	100%
Quality of Life	1	4%	24	96%	0	0%	25	100%
Aesthetic Features	18	72%	7	28%	0	0%	25	100%

The table 4.1 shows the result of availability of some physical and environmental aspects in the dwellings of Fulya's residential district. They can be explained as the following:

- For the natural ventilation aspect inside dwellings; more than half (56%) of the surveyed residents gave the answer for the moderate level and the rest (44%) said that the natural ventilation is in the low level, on the other hand there was no answer registered for the high level.

- Almost three quarters of the respondents (76%) registered the moderate level for noise aspect, while less than quarter (20%) pointed to the low level of noise. Just few respondents (4%) pointed to the high level of noise in their residential environment.
- Most of the respondents (92%) gave the privacy aspect for their dwellings the moderate level, and very few respondents (4%) said either it is in the low level or in the high level.
- For the sunny dwellings; around two third (60%) said that their dwellings are in the moderate level while the other one third approximately (36%) said that their dwellings are not so sunny, again for the high level there were very few respondents (4%).
- More than three quarters (80%) of interviewees put the aspect of safety open space in the moderate level, the rest (20%) said it is in the low level.
- More than half of interviewees (56%) registered the moderate level for the availability of pedestrian ways in their residential zone, more than one third (40%) of them gave mark to the low level of pedestrian ways' availability.
- Almost all of the surveyed residents agreed that the quality of life of their residential environment is in the moderate level.
- As well, more than two third (72%) went with the low level for the availability of aesthetic features in their residential environment, while the rest (28%) agreed with the moderate level for them.

It is noticeable that the interviewees who gave a mark for the high level of all the mentioned physical and environmental aspects in Fulya district was either zero or neglected answer which just came from (4%) of interviewees. On the other hand, for each measured aspect the moderate level was taken the highest percentage excluding the availability of aesthetic features, it had the highest percentage for the low level.

Table 4.2: Fulya's Residential pleasantness.

Yes		No		Total	
24	96%	1	4%	25	100%

In table 4.2, the percentage of approval or disapproval with considering Fulya's residential environment pleasant is shown. Almost all of the interviewees were content

with their residential environment; they found it pleasant because of its central location, its nice people, its cleanness and easy transportation. Also it is better than many other places in Istanbul as they said. They clarified that they had gotten attached to Fulya as it was the place where they born and growing up.

Table 4.3: Surviving with Fulya’s crowd.

Yes		No		Total	
22	88%	3	12%	25	100%

The percentage of survived residents with crowd of Fulya’s residential district is registered in table 4.3. The majority of the interviewees (88%) were surviving with the crowd of Fulya as they became compatible with its public life and they were getting used to its place and location. Otherwise only small percentage of interviewees (12%) was not able to survive with their crowded residential environment because of pollution, noise and traffic.

Table 4.4: The problems resulted from crowding and high population density.

Problem	Number	Percentage%
Noise	9	36
Traffic	19	76
Shortage of auto park	16	64
Pollution	1	4
Security	1	4
No social activity	1	4
Transportation problem		

Table 4.4 shows the group of gathered problems in Fulya’s residential environment, which were facing the residents. More than three quarters (76%) of surveyed residents approved with the existence of traffic problem. More than half (64%) of them complained from the shortage of parking; as cars filled all streets and most of pedestrian ways there was no enough space for humans. About one third (36%) complained from noise. Have been considered by some residents’ quite unimportant answers, which are neglectable (4%).

Table 4.5: Daily activities in the residential environment of Fulya.

Daily activity	Number	Percentage%
No time	8	32
Walking	4	16
Drinking tea in a cafe	3	12
Going to bazar	1	4
Taking kids to green area	2	8
Going to coiffure	1	4

The daily residential activities of Fulya's residents were listed in table 4.5. The surprised result was that about one third (32%) of residents said there is no time for residential daily activities; they clarified that they spent most of their time in their works then they spent a lot of time in the traffic, especially when they are going to their works and coming back to their homes. While (16%) mentioned walking activity, (12%) mentioned the activity of drinking tea in a cafe and only (8%) said taking kids to green area. The other listed activities in the table could be uncountable. There were few interviewees (4%) who mentioned some other activities, which are not necessary to be daily activities such as: going to bazar and going to coiffure.

Table 4.6: Missed open spaces in Fulya's residential environment.

Missed open space	Number	Percentage%
Green area	22	88
Auto park	8	32
Sitting places	1	4
Park	3	12
Café	2	8
Walking area	1	4
Biking area	1	4

Table 4.6 shows the answers of what open spaces are missed in Fulya's residential environment. The highest percentage (88%) is for the green area; the majority complained from the shortage of green areas, about one third (32%) of surveyed residents pay attention to the parking shortage, other answers were lack of parks (12%)

and lack of cafes (8%). There was a very small percentage (4%) mentioned the lack of sitting places, walking area and biking area.

Table 4.7: Daily activities cannot practice easily the lack of their spaces.

Daily activity	Number	Percentage%
Sport	15	6
Walking	9	36
Sitting/Resting	2	8
Kids playground	1	4
Biking for kids	2	8
Playing with pets	1	4

Table 4.7 lists what daily activities residents cannot practice easily because the lack of their space whether it is an open or a closed space in their residential environment. About one third (36%) answered walking activity, and small percentage (8%) was for sitting and for biking activities, and another small percentage (6%) talked about sport activities. very few residents (4%) mentioned the need for spaces specified for pets, and same for kids' playground.

Table 4.8: Resident's main requirements in Fulya's residential environment.

Requirement	Number	Percentage%
Auto park	21	84
Public transport	6	24
Green area	11	44
Kids playground	3	12
Walking area	2	8
Shopping mall	1	4

Table 4.8 lists the main requirements in Fulya's residential environment according to its residents. The majority (84%) agreed with the need of parking, around half (44%) mentioned their need to green areas, about quarter (24%) said they need public transportation; actually this was strange! their neighborhood's location is central and close to a lot of public transportation, also others (12%) stated their need to kids' playground, while (8%) of surveyed residents need walking areas. The need of shopping mall is not a strong or a necessary need, which stated just by (4%) of

respondents; because they located behind Cevahir mall and near from many shopping centers.

Table 4.9: Residents' preference to change their dwelling type.

Yes		No		Total	
23	92%	2	8%	25	100%

In table 4.9 the residents who wished to change their dwellings are registered. A high percentage of surveyed residents (92%) was going with the preference of changing their dwelling from attached buildings to detached buildings; because the bad conditions of physical and environmental aspects in their dwellings and the surroundings which measured in table 3.1. But the rest (8%) did not want to change their dwellings because they got used to them, although their dwellings have many disadvantages.

4.2 Result Of Observation



Figure 4.1: Two views of Fulya's residential buildings in the minor street "sokak".

It is seeable in figure 4.1 the absence of open space between the adjacent (attached) buildings, which leads to a low level of physical features that discussed before. This problem becomes harder when the closeness also comes from the front side because of narrow street, while the situation of those features are better in the buildings where located on the both sides of main street which is wider than the minor street as seen in figure 4.2.



Figure 4.2: Fulya’s residential buildings on the main street.

It is very common in Istanbul the system of “sokak-dwellings”, as was observed this system gives a lot of problems and disadvantages to the dwellings; mostly the buildings are attached, there are no setbacks between them, the street is narrow and very crowded. All of these features of the “sokak-dwellings” reduce the quality of life inside dwellings because of bad physical conditions; therefore reduce the level of satisfaction.



Figure 4.3: Multi use buildings in Fulya’s residential environment.

There are a lot of residential buildings in Fulya include shops and commercial functions, it is clear in figure 4.3, in which they affect life inside dwellings; they could cause noise and less of privacy. On the other hand, the multi-use building could be

preferable from the residents as multi-use buildings serve them, save their time and protect them from traffic and need of using transportation.



Figure 4.4: Street and pedestrian way in Fulya's residential environment.

Shortage of parking increases the traffic problem; since the parked cars take spaces from the street width, in addition it causes encroaching on the pedestrian way when cars used it as a parking as it is noticed in figure 4.4.



Figure 4.5: Fulya's residential buildings' skyline.

Generally, residential buildings of Fulya are not so high; they are in the moderate level with approximate average of 6 stories, the dwellings were horizontally distributed and furnished on ground, as seen in figure 4.5.



Figure 4.6: Clustered buildings in Fulya's residential environment.

The clustered buildings almost occupied wide areas, even there are no spaces for green area or aesthetic features, which increase the residents' satisfaction and their comfort, see figure 4.6.



Figure 4.7: General view of Fulya's residential environment.

Can be noticed from figure 4.7 the cleanness of Fulya's residential environment, which increases level of residential satisfaction and relaxation. As well it considered as one of beauty and pleasantness features.



Figure 4.8: Residential buildings without outdoors space.



Figure 4.9: Another views of residential buildings without specific outdoors space.

Although there are no enough green areas and play grounds in Fulya's residential environment, its residential buildings were designed without a shared outdoor space or a shared courtyard or a shared garden in which residents can gather, sit, practice activities for their kids, as shown in figures 4.8, 4.9.

5. CONCLUSION

Based on those results, can be concluded the following about Fulya's residents' satisfaction with their environment:

- They are not so satisfied about the physical features of their dwellings, as most of their residential buildings are located within an attached building that does not have open air spaces around it to serve the dwellings from inside, this prove the importance of this research that concern with the balanced relationship between positive and negative spaces.
- They gave their residential environment a not bad level for quality of life; since it has advantages such as: central location, easy transportation and nice inhabitants.
- Almost all of the residents agreed that their residential environment needs aesthetic features, also during the study of the literature reviews the importance of these features was obviously presented for all residents of the all-different districts. It is affecting their residential satisfaction.
- The majority of residents approved the existence of traffic problem because of high population density, high building density, central location and shortage in parking. This problem affects their daily life strongly, since it takes a lot of their time and prevents them from practicing other residential activities, which leads to less residential environmental satisfaction.
- The residents indicated to the need of open spaces (negative spaces) which their functions complement the functions of closed spaces (positive spaces) for their daily life within their residential environment, mainly they need open spaces for parking, green areas, playgrounds for kids and pedestrian ways. As well this point indicates to the importance of a complementary relationship between spaces in residential districts that meets the residents' needs.

- The complementary relationship between positive and negative spaces makes the environment satisfied, functional; provide the needed requirements of residential activities, more pleasant and more inclusive.
- Accordingly, the summary is that the majority of residents wished to live in dwellings inside detached buildings, and within a residential environment that respects the need of open spaces (negative spaces) and their existence in a harmony through a balanced relationship with built spaces (positive spaces).
- The complementary relationship between positive and negative spaces in the residential environment contributes in having an organized healthy relationship between human and environment, where each side serve the other without encroaching him/it.
- The buildings' distribution of Fulya is taking the horizontal approach, which means larger areas for positive spaces within the environment of high population density.

6. RECOMMENDATIONS

These are some recommendations and suggestions for solving the problem of low level of residential satisfaction that resulted from the bad unbalanced relationship between positive and negative spaces in the residential environment:

- In the first step of residential environment layout, start defining the space of roads and streets without having an idea about the coming buildings, their sizes, their features, and their requirements should not be applied, to avoid giving the streets the dominant role and overwhelm the buildings and open spaces as shown in figure 6.1.

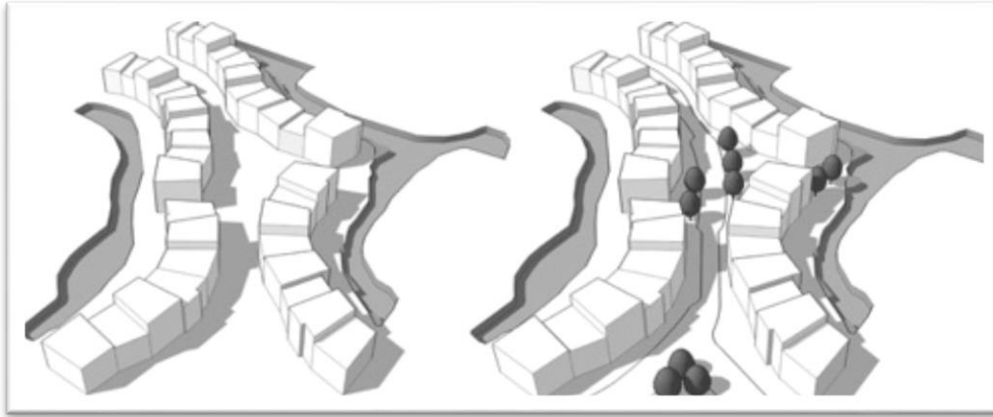


Figure 6.1: Buildings controlled by streets [1].

- During the process of clustering buildings, realize that every group of clustered buildings have to have specific negative space serves them and allows the users of these buildings to practice their outdoor activities. It should be like one package, which consists of number of buildings and shared open space, figure 6.2 shows some sketches of the suggested packages.

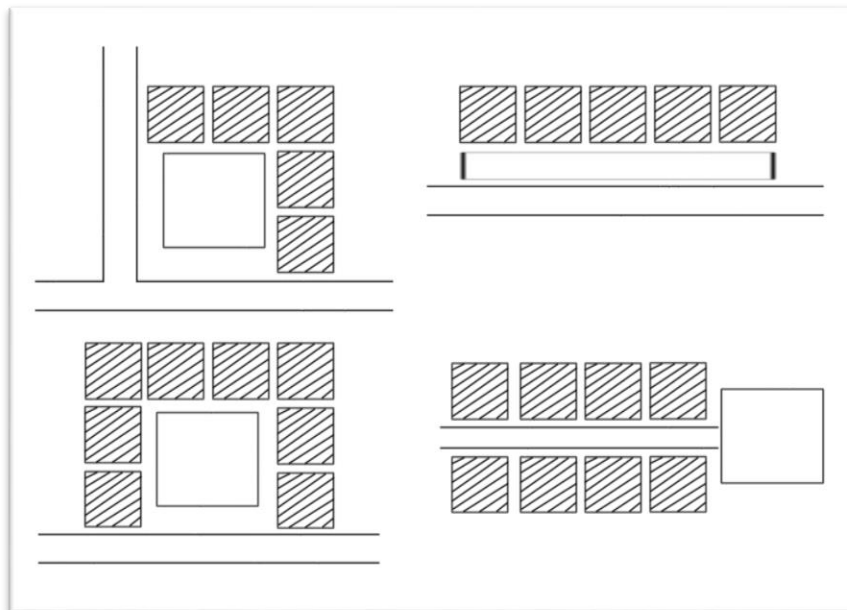


Figure 6.2: Examples of clustered buildings with a shared open space.

- Should be taken into consideration that besides the need of functional spaces, the spaces should be attractive, clean and beautiful. Which means having the requirements of aesthetic features is also a demand. The space should be beautiful and works for employing its function. Figure 6.3 shows that these two demands should be in the same weight for space.

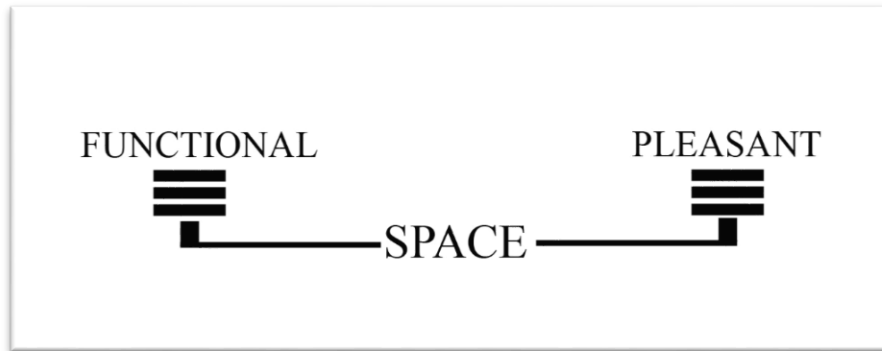


Figure 6.3: Main demands of space.

- High aware of pedestrian way grids should be there, they have to penetrate and be part from the other spaces in the residential area; as they necessary for elders and children in particular and whole residents in general to reach different facilities and public services, basically movements and transfers within residential zone are by walking.
- Avoid attached buildings for more than one side; as it is the case in “sokak-dwellings”, figure 6.4 reflects the case of “sokak-dwellings” and shows accurately the miserable situation of these dwellings inside attached buildings from all sides.

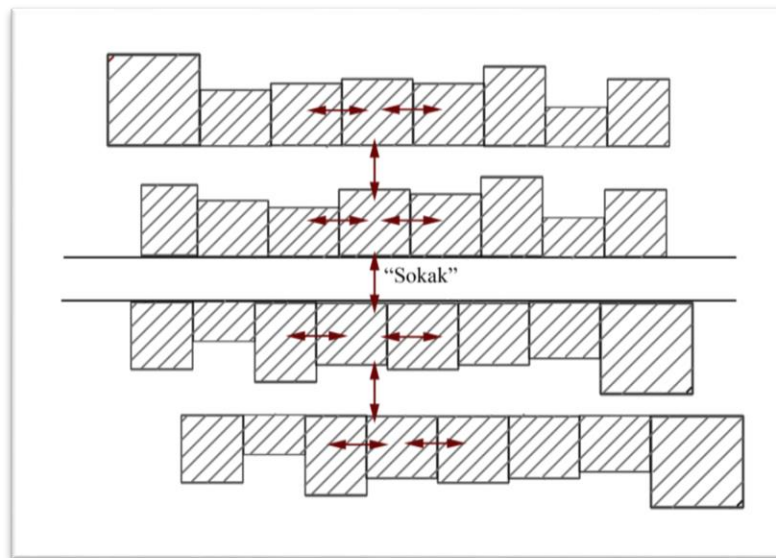


Figure 6.4: The situation of existing “sokak-dwellings” system.

- For “sokak-dwellings” in Istanbul a reorganized of buildings should be applied as illustrated in figure 6.5 by replacing (demolishing) some of positive spaces with negative spaces. The government should compensate the residents whose dwellings will demolish by another dwelling in another place or by money to

convince them to move in order to reduce crowd of buildings and create a better healthy environment without harming them. Maybe demolishing the existing building is not an easy solution, so the reorganized of “sokak-dwellings” should be into account for the designers and planners of new residential environment.

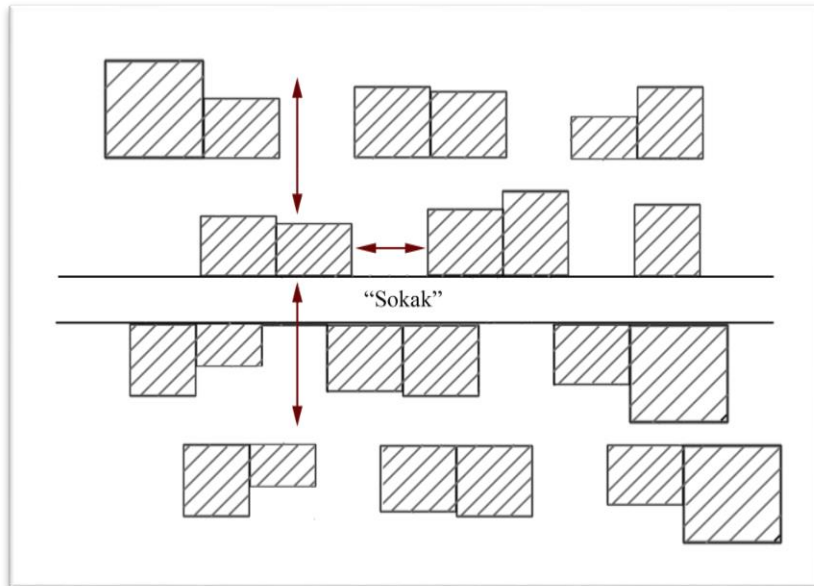


Figure 6.5: Suggested solution for “sokak-dwellings”.

- In order to have a healthy environment inside dwellings, setbacks between residential buildings themselves and between them and streets should be preserved by rules that cannot be canceled, because the setbacks allow natural ventilation, sunlight and privacy, which are demands for all people of all economic levels. Figure 6.6 represents this point.

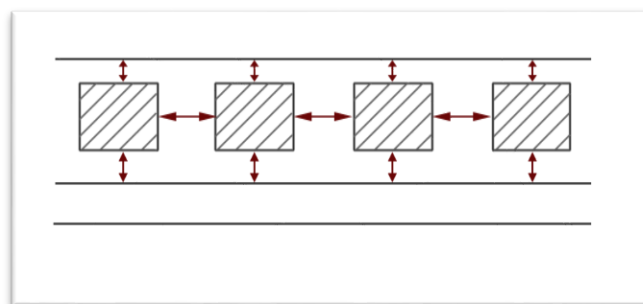


Figure 6.6: Setbacks between buildings.

- The vertical buildings help in reducing crowded buildings and give more opportunity for having negative spaces. As their capacity is bigger than horizontal ones. But this approach would result in increasing of traffic and

transportation problem, following this approach needs rules for using only public transportation in rush hours.

- For increasing negative spaces of gardens in the crowded environments, roof of buildings could be used as open space to serve their residents, as shown in figure 6.7.



Figure 6.7: Example of open space on building's roof [36].

- Cars also need spaces in residential environment that cannot be ignored, mostly the spaces of green areas or open spaces are using as parking and lose their original function. Parking should be located on a specific place from the beginning of design process; it could be in underground levels or in a vertical specific building where provides more capacity.
- Avoid dwellings that are completely located on underground levels, their physical features are very bad, therefore the level of satisfaction will be very low; instead these levels can be used for parking, as illustrated in figure 6.8.

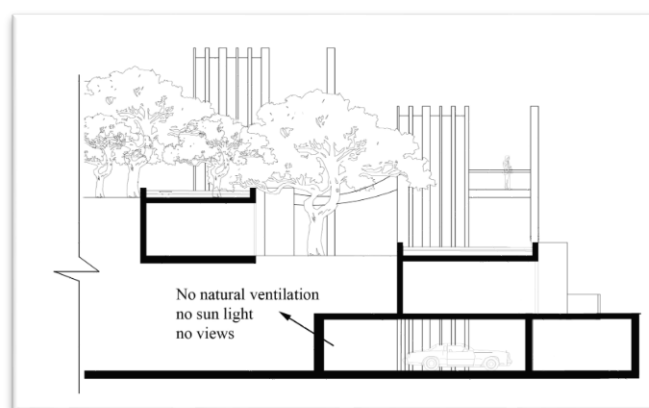


Figure 6.8: Sketch for underground level.

- As mentioned before in the literature reviews gated communities provide a lot of facilities, services, open spaces and life style for their residents. On the other hand, their problems are: weak social communication and spatial segregation. The suggestion is to improve existing residential environments inside the city to have the same physical features of gated communities, and they do not have a spatial segregation and a weak social life, so they will be better than gated communities. Figure 6.9 illustrates an example of gated community.



Figure 6.9: Example of gated community [37].

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APPENDICES

APPENDIX A: Questionnaire

APPENDIX A

Study of the residential environment for its spatial relationship and its influence on Residents' satisfaction and life quality

1. Please fill the table by choosing the level of availability for aspects of your residential environment.

Feature	Low	Moderate	High
Natural ventilation			
Noise			
Privacy			
Sun ray			
Safety open space			
Pedestrian way			
Quality of Life			

2. Is your residential environment pleasant?

☐ Yes, because

.....

.....

☐ No, because

.....

.....

3. Are you survived with your crowded residential environment?

☐ Yes

☐ No, because.....

4. What problems are you faced in your residential environment because of crowding and high population density?

.....

.....

.....

5. Mainly, what are your daily activities in your residential environment?

.....

.....

.....

6. What are the missed open spaces in your residential environment?

.....
.....
.....

7. What are the daily activities you cannot practice easily because the absence of their spaces?

.....
.....
.....

8. What are your mainly requirements in your residential environment?

.....
.....
.....

9. Are you wishing that you could change your dwelling from attached buildings to detached buildings?

☐ Yes
☐ No

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