

Beyond Functionality: Morphological Design Tools for Users' Satisfaction in Housing*

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Abstract - Various factors can affect an individual's satisfaction level. While studying residential satisfaction and assessing it, subjective perceptions have the most significant influence. An essential element in ensuring satisfaction in housing is to consider the design of spaces that cater to individuals' specific desires and needs that change over time. Housing was frequently constructed considering the specific subjective needs of individuals, before the era of industrialization. As industrialization rises, housing gradually transformed into a commodity. Certain researchers propose that studying traditional built environments and harnessing the data gained from such analyses can be advantageous for contemporary housing production. Notably, Habraken is a prominent researcher who sought to ensure users' satisfaction in housing by devising the "Support System" rooted in his analysis of Dutch houses. Traditional house plans in Türkiye exhibit resemblances to the morphological arrangements observed by Habraken in Dutch houses, yet with some distinctive characteristics. In modern times, designers often prioritize function as the primary consideration. However, there have been attempts, such as Habraken's, to shift towards prioritizing morphology instead. This paper will explain links between users' satisfaction and their ability to change their immediate environments through morphologies that accommodate diverse functions.

Keywords: Sectors; Potentiality; Users' Satisfaction in Housing; Traditional Houses in Türkiye; Morphology.

1. Introduction

The satisfaction of users with the built environment is heavily influenced by their preferences and choices, which are in turn influenced by their ability, capacity, and willingness to alter the environment to suit their needs and desires. As a result, it is crucial for the built environment to be able to accommodate changes. The traditional built environment represents the culture and values of a particular community, and it consists of people's experiences and interactions within their built surroundings in which occupants had maximum control as the case of Muslims' built environment. Traditional

buildings in the Muslim world in general [11], and in Türkiye in particular, are built with sectors that are capable of accommodating various functions and can adapt to changing needs. However, modern approaches to design focuses on function; yet an alternative morphological approach can maximize the potential of the built environment and improve users' satisfaction. Designers can create a more satisfying environment with a morphology-based approach that accommodates change.

2. Satisfaction (in general) – Life Satisfaction

The study of 'satisfaction' has its roots in the 1940s and is currently used in various fields including housing, marketing, landscape architecture and medicine. However, it is dominated by social psychology scholars [5].

Veenhoven [15] mentions that satisfaction is an evaluation of something that pertains to both contentment and enjoyment, and it is a state of mind that covers both cognitive and affective appraisals. This evaluation can be both temporary and long-lasting over time.

Parker & Mathews (2001) assert that satisfaction is commonly defined as a process of evaluation between what was received and what was expected. This description stands as one of the most widely adopted in current literature [5].

Satisfaction has been examined in a variety of distinct subcategories over the years. Life satisfaction stands out as the most all-encompassing subcategory, with the greatest degree of interaction with other domains.

Life satisfaction is the extent to which an individual positively assesses the overall quality of their life-as-a-whole. In essence, it gauges the individual's contentment with the life they are leading [15].

Life satisfaction involves an evaluative process where individuals assess the quality of their lives based on their own distinct set of criteria [1].

An individual presumably engages in a comparison between their perceived life circumstances and a self-imposed standard or set of standards. The extent to which these conditions align with the established standards determines the reported level of high life satisfaction. Therefore, life satisfaction is a conscious cognitive judgment of one's life in which the criteria for judgment are up to the person [1].

In the literature, related terms to life satisfaction encompass happiness (occasionally used interchangeably), quality of life, and subjective or psychological well-being (a more comprehensive term than life satisfaction). The research on life satisfaction and associated concepts is extensive, with ongoing theoretical debates surrounding the nature and stability of life satisfaction [13].

Achieving a sense of satisfaction with one's life is an essential aspect of an individual's well-being and can greatly affect their quality of life over time. Given its importance, it is a matter that should be regarded with great significance and addressed accordingly.

During the 1960s, there was a growing interest in studying life satisfaction, and one of the primary areas of focus was how to measure it. Despite the fact that life satisfaction is highly subjective, researchers attempted to quantify it using

numerical values. Veenhoven [15] noted that for a long time, measurements of life satisfaction were conducted in a similar manner to doctors measuring blood pressure, using an "objective" and "external" evaluation. However, it was later realized that this could not be done in the same manner.

Sousa and Lyubomirsky (2001) declare that a significant portion of the research has concentrated on the "objective" determinants of life satisfaction. This involves exploring the correlation between satisfaction and various environmental factors, including both imposed elements such as culture and relatively controllable factors such as income, occupation, education, and marriage, as well as specific aspects of persons (e.g., gender, age). [3].

Day (1980) claims that while everyone knows broadly what satisfaction means, it clearly does not mean the same thing to everyone [5].

Certain factors can be categorized as having an impact on an individual's level of satisfaction, but their effects can vary widely from person to person, and even time to time. This complexity makes it difficult to measure satisfaction accurately.

2.1. Users' Satisfaction in Housing

Housing is perceived as an investment, a commodity, a component of the federal tax system, a design challenge, a building, a set of buildings, a community asset, and more. However, all housing is ultimately viewed by someone as a place for home. As a "place" for home, it represents the core of the physical portion of the social-physical environment that is home [4].

Having a place to live that can be considered home is a fundamental requirement and desire for people in their lives. For this reason, a house plays a significant role in ensuring life satisfaction. Research studies that investigate the level of contentment with one's living arrangements are categorized as residential satisfaction studies.

Residential satisfaction is not a static, uniform experience or state: it is an outcome that perceived by an individual or household, indicating their current housing status aligns with their needs and desires. Because residential satisfaction is based upon perception, the determinant factors essential to attain satisfaction will certainly be different in each case. Given that residential satisfaction is rooted in perception, the determinants crucial for achieving satisfaction will inevitably vary for each case. Factors shaping this perception include expectations, historical context, demographic characteristics, employment status, and other pertinent influences [5].

Balestra and Sultan (2013) assert that the notion of satisfactory housing conditions encompasses not only the physical, architectural, and engineering components of the

house but also those of the surrounding environment. Residential satisfaction, according to their perspective, is further influenced by the social, behavioral, cultural, and demographic characteristics of the household [12].

Studying existing satisfaction models guides to the conclusion that crucial variables that have an impact on residential satisfaction are contained within the following four main domains [5]:

- characteristics of individuals (socio-economic variables)
- dwelling unit
- neighborhood
- community services

Recognizing and acknowledging these factors is a vital step in comprehending the current state of people's satisfaction. However, it's important to bear in mind that these factors are not static and can change over time as people's situations and perspective shift. Although it's a common desire for people to inhabit a prosperous neighborhood, the importance of certain factors can vary greatly from person to person. While some factors are universally sought after and remain unchanged, others can be highly subjective and differ significantly among individuals.

Studies related to residential satisfaction and its assessment are primarily influenced by subjective perceptions. The most crucial aspect of ensuring satisfaction in housing is to take into account designing places that accommodate individuals' specific desires and needs that change in time.

There are two key elements that require consideration: firstly, the unique needs and desires of different individuals, and secondly, the fact that individuals and their needs and desires are not static, but rather evolve and change over time (Fig. 1).

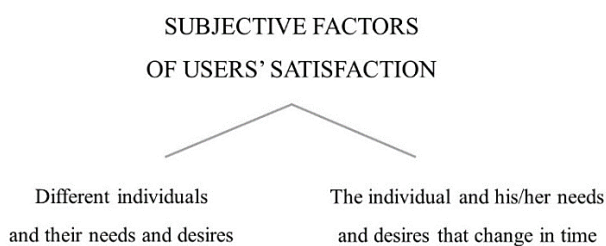


Fig.1: Subjective factors of users' satisfaction (Halise Betül Bulut, 2023)

One of the most significant factors in determining users' satisfaction is recognizing the distinct needs and preferences of each individual. However, it is equally important to acknowledge that these needs and preferences can evolve over time. The passage of time can hold distinct meanings for different individuals, which can also impact their requirements

and preferences. Therefore, in situations involving users' satisfaction, it is crucial to account for the fact that individuals' needs and desires are subject to change over time, just as it is essential to consider the distinct needs and desires of various people.

It's not unexpected that personal preferences play a crucial role in achieving residential satisfaction. Historically, housing has often been built with the individual's subjective needs in mind, before the industrialization. However, with the rise of industrialization, housing has become a commodity, subject to market forces. As a result, the impact of political and economic factors on housing is considerable.

3. Traditional Built Environment

Before industrialization, individuals were in a position to create their own built environment as they are in control especially in the Muslim world as according to the Islamic legal system was invested in the hands of occupants [11]. Within the conditions they had, they built their homes according to their own desires and needs, and during the time they lived there, they were able to modify their homes to suit their changing desires and needs.

The most efficient solutions were of course those arrived at by the people who lived on a site and knew what its constraints and advantages were. Each had his own unique situation to deal with. As a result the urban environment became a huge laboratory for trying out a vast variety of solutions. When others saw that a solution worked, they adopted it too and in the process improved on it. In this way, the accretion of decisions that came to govern each property became the generator of affordable innovative solutions [11].

When examining traditional environment, it becomes apparent that typologies developed over time in response to local conditions, culture, and characteristics of the region. People passed down their knowledge and experience to shape these typologies, which changed and progressed to reach their present-day form. Indeed, the term "convention" as many demonstrated reflects the accumulations of environmental knowledge [6].

Housing is a complex matter involving issues such as financial, sociological, or political. However, here we will limit its focus to the design aspect of housing. In this regard, typology is a promising tool that can aid in designing effective solutions to accommodate change.

According to Petruccioli [2], studying typological processes can serve a dual purpose. Firstly, it allows us to identify the essential characteristics of a building that enable its continuity during changes over time. Secondly, it highlights the unique characteristics that differ from the norm and add value to the experimentation of building design. In other words, analyzing

typological processes gives insight into both the regular and exceptional features of a building.

Habraken [14] argues that historical urban areas were not structured solely by function, but rather by the type and location of buildings. The arrangement of the house had a degree of autonomy. Across cultures, there have been significant variations in house design, but upon closer inspection, there is a consistency in the way spaces are classified according to size.

When we talk about a type or about a convention that generated a type, we are not talking about function but only about spaces that are arranged according to certain rules. The functions can always change; function is the variable within the form [11].

3.1. Support System

Some researchers believe that analyzing traditional built environment and utilizing the knowledge gained from such analysis could be beneficial for modern housing production. An important researcher is Habraken [10], who aimed to ensure users' satisfaction in housing by developing the support system based on his analysis of Dutch houses.

In designing a support, the objective is to find a solution that allows for all the desired variations while using as few detachable units as possible. The design of a support is a matter of optimization. How can the greatest variety in lifestyle and personal idiosyncrasies be accommodated using as few detachable units as possible?

Why people change their houses [7]:

- The need for identification
- Changes in lifestyle
- New technological possibilities
- The changing family

Individuals make changes to their houses when they have the chance. In spite of all the technical, legal and financial restrictions, they try to change their living environments. They take the opportunity when it arises, when they have control.

Three principles for the design of supports follow [7]:

- First, each dwelling unit in a "Support System" must allow for a number of different layouts
- Secondly, it must be possible to change the floor area, either by additional construction or by changing the boundaries of the units within the support
- In the third place, supports or parts of a support have to be adaptable to non-residential functions

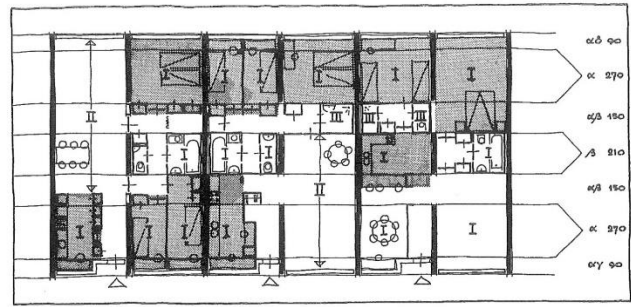


Fig.2. Zones and sectors [7]

According to Habraken, traditional houses in the Netherlands are made up of components called 'zone' and 'sector' and he noticed that these houses were designed based on morphology (Fig. 2). Similarly, when examining traditional buildings in Türkiye, it can be seen that there are same approaches in their house plan patterns.

3.2. Traditional Houses in Türkiye

As a concept, The Turkish House is a subject on which there has been much debate and contains too many different examples to provide a clear definition. The aim of this study is to benefit from the logic of typologies of traditional houses in Türkiye in general terms, not specific examples.

It has been suggested that the origin of the concept of the traditional houses in Türkiye goes back to the nomadic period and, indeed, the whole Turkish way of life prior to their migration and settlement in Anatolia bore all the characteristics of the nomadic way of life [9].

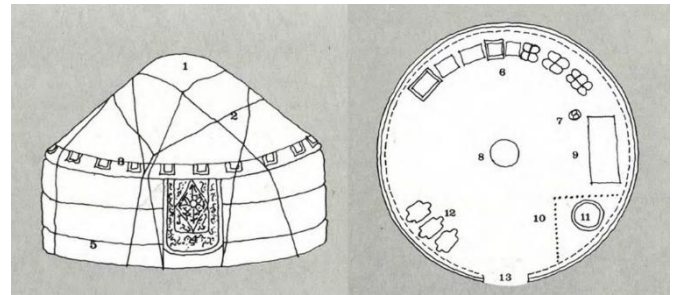


Fig. 3. The tent [9]

The tent, the dwelling unit of the nomad, was used either communally or in a cluster or adjacent units and now became transformed into the rooms inside the house. But as with the tents, there is negligible communication between the rooms, each one having a single door opening onto the courtyard or the sofa (hall). This goes to show that the rooms were conceived and used as independent units [9].

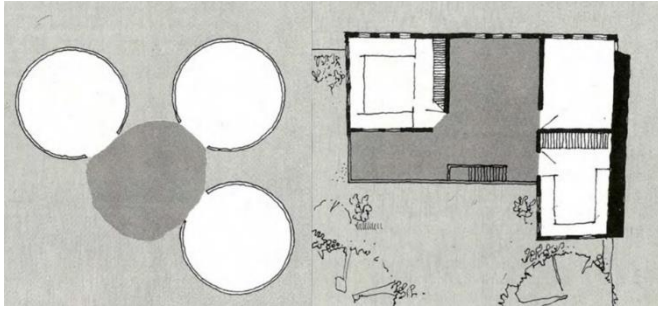


Fig. 4. Comparison of a tent and a house [9]

Comparison of life in a tent and a house [9]: Similarities exist in how living units and communal spaces are organized in both. The connection between the rooms and the sofa in a house mirrors the relationship between individual tents and their shared communal space.

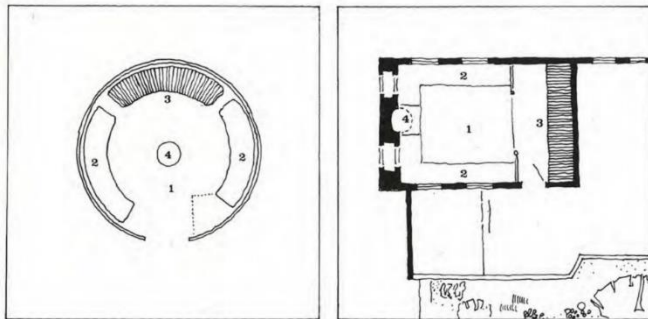


Fig. 5. Comparison of a tent and a room [9]

Comparison of the general arrangement and use of the room and the tent [9]: The importance resides in the akin functionality, use of space and the relationship between them.

1. Multi-purpose central area
2. Periphery used for seating
3. Closed utility areas, cupboards, chests, bedding
4. Heating; the central hearth in the tent is moved to aside wall in the house

Traditional houses consist of sofa and rooms which serve multiple functions. The sofa is an area providing access between the various rooms and has a varied technical terminology in Turkish "sergah, sergi, sayvan, çardak, divanhane, hayat" etc. In addition to providing an interior passage, it also serves as a gathering space, with the surrounding area adjusted to accommodate seating. In time, various sections became distinct features and concepts like the "eyvan, sekilik, taht, köşk" came into being. Thus the "sofa" became the most important element of the form of the traditional houses in Türkiye and influenced its whole shape [9].

The key feature of a room in a traditional houses in Türkiye is its versatility, as it serves multiple functions within the

household. Similar to a nomadic tent, each room serves as a space for sitting, eating, working, and sleeping. The formation and function of the rooms may be summarized as follows [9]:

- They are independent units serving specific functions
- The interior arrangement is limited by definite principles
- These principles are created by social characteristics
- The rooms are arranged around a single common utility area
- The position and state of the common area varies according to several factors

Traditional houses in Türkiye have a unique feature that is able to accommodate changes for their users' needs and desires over time. This feature ensured that the same typology can be implemented in various places for ages by different generations.

3.3. Sectors within Traditional Houses in Türkiye

The plans in Türkiye have similar morphological arrangements as those observed by Habraken in Dutch Houses.

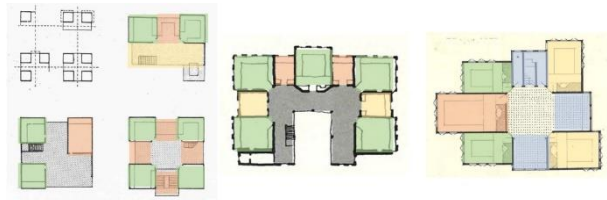


Fig. 6. Sector analysis - traditional houses in Türkiye [8, 9] (coloring by Halise Betül Bulut - colors represent varying space sizes)

Habraken's concept is illustrated in the plans as if they were rooms and sofas. In Fig. 6, the colors don't denote distinct functions; instead, they indicate spaces of equal size within specific plans. These spaces aren't assigned a fixed function but rather evolve morphologically, allowing for versatile use across various functions.

It's evident that there are sectors in traditional house plans in Türkiye. Nonetheless, there exists a significant distinction. It is noticeable that traditional house plans in Türkiye do not have well-defined zones but rather quite clear sectors.

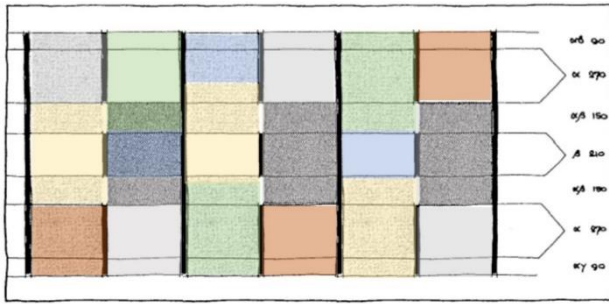


Fig. 7. Sectors with zones [7] (coloring by Halise Betül Bulut - colors represent varying space sizes)

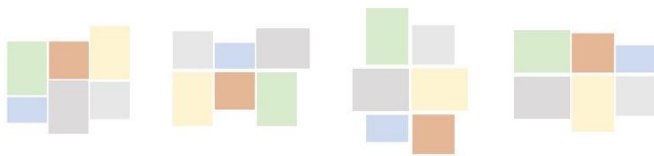


Fig. 8. Sectors without zones (Halise Betül Bulut - colors represent varying space sizes)

Traditional houses in Türkiye are based on sectors which accommodates different functions. Plans with sectors have more potential than contemporary designs to accommodate change and different people's needs and desires (Fig. 8).

4. Conclusion

Several factors influencing individual satisfaction in housing can vary greatly among individuals and personally over time. Subjective perceptions play a significant role in studying residential satisfaction. Designing spaces that adapt to individuals' changing desires and needs is crucial for ensuring satisfaction. Historically, housing prioritized subjective needs but shifted towards commodification with industrialization.

Some researchers propose that exploring traditional built environments and utilizing the knowledge acquired from such investigations can be advantageous for modern housing production. Notably, Habraken aimed to ensure users' satisfaction in housing by developing the support system based on his analysis of Dutch houses. Traditional house plans in Türkiye bear resemblances to the morphological arrangements observed in Dutch houses by Habraken, albeit with distinct characteristics.

A notable feature of traditional houses in Türkiye is their ability to serve multiple functions within a single room. These rooms, as sectors, have the potential to be utilized for various purposes at different times.

Currently, design methodology is heavily focused on functionality, however, there is an alternative approach that prioritizes maximum potential and users' satisfaction by allowing them to adapt the physical environment to their

specific needs. This approach is based on morphology, which emphasizes form to better suit the needs of its users through sectors.

A design tool that is developed with considering these issues may have more potential for design and help to ensure more users' satisfaction.

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