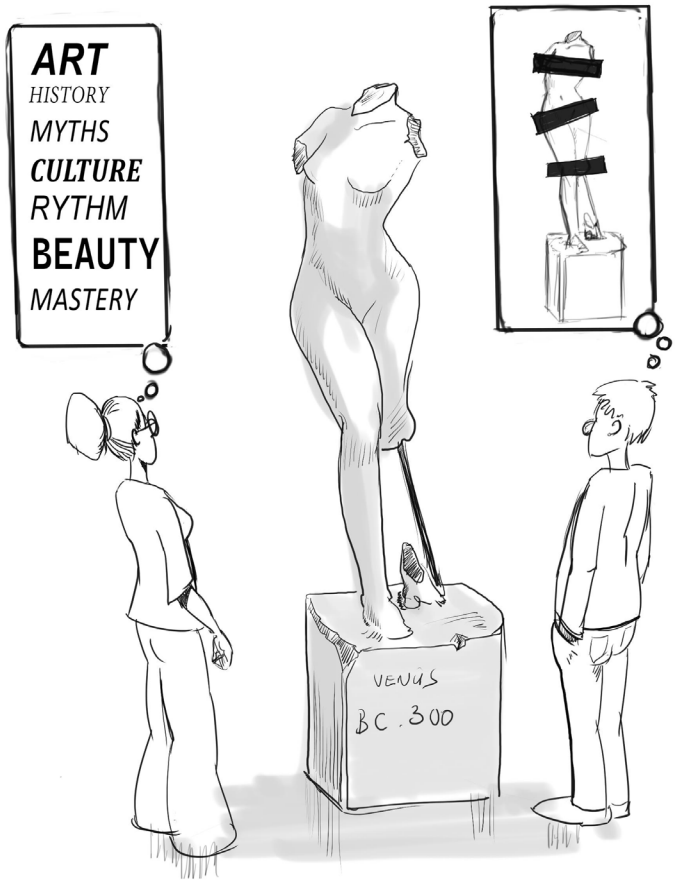

cultural interpretation of visual language

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EDITORIAL

Sketches are powerful communication tools both in art and science. The ESTU Journal of Sketchle aims to create an opportunity to experiment with scientific publications and sketches in terms of easy communication and sharing knowledge. With this 4th issue of the Journal, we end up with the 2nd publication year. Through these two years, we successfully published 3 issues with 15 Sketchles, in the last issue there are 5 more sketchles from different disciplines and different countries. First Sketchle is about the store showcase and brand identity by S.K. Kutlu and O. Ülker. Authors investigate the showcase design elements and their communication abilities in transferring brand image to the consumer. Second Sketchle shed light on space psychology in interior design. Tirth sketchle is about country-to-rural migration and its effect on the living space of migrating families from a sociological, spatial and psychological perspective by A. Alkan and T.K.Yenice. Fourth is about the basic design education in Architectural Schools, how facade drawing of historical buildings affects the students' perception of measure, scale and perception by İA.ATA and S.Yılmaz. The last Sketchle is about the Bionicle properties of the Namibian beetle and their possible usage in desert climate water collection facilities by H.G.Barughi and J. Eiraji.
This last issue has some technical difficulties during the publication process thus it is published one month later than the regular publication date. As ESTU Journal of Sketchle Editorial board, we apologize for this inconvenience.

Levent BURGAZLI
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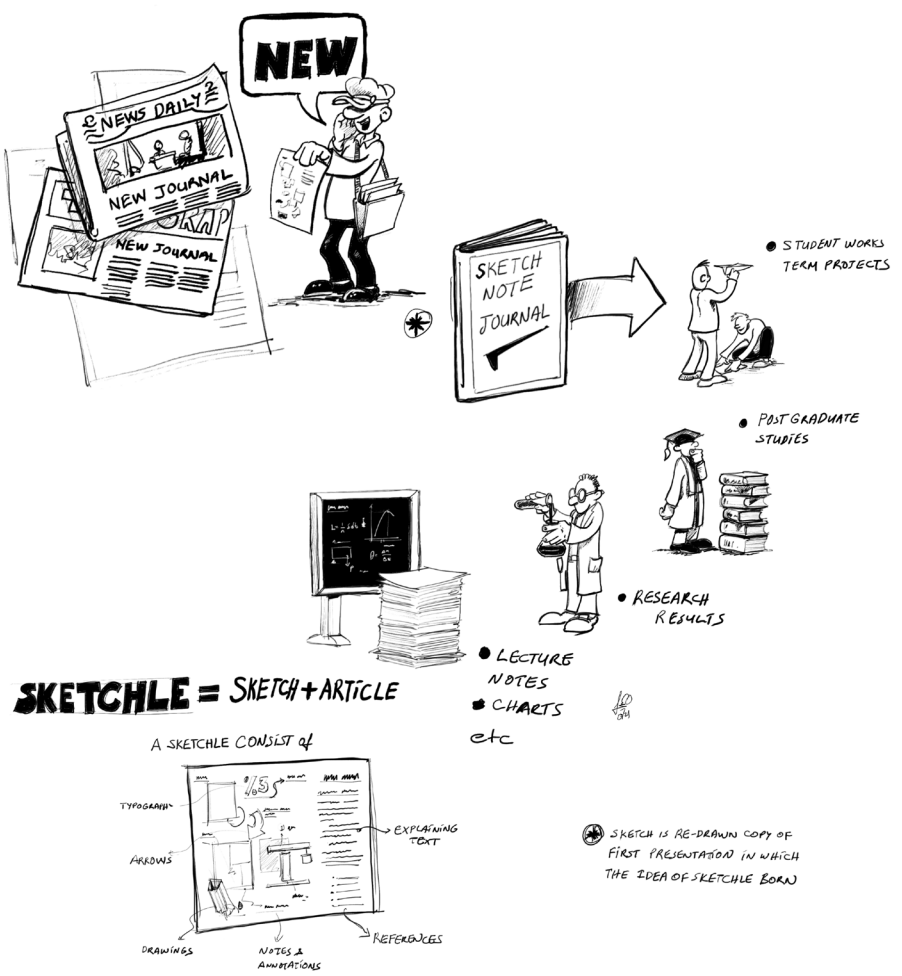

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Sillick, T. J., & Schutte, N. S. (2006). Emotional intelligence and self-esteem mediate between perceived early parental love and adult happiness. *E-Journal of Applied Psychology*, 2(2), 38–48. Retrieved from http://ojs.lib.swin.edu.au/index.php/ejap/article/view/71/100

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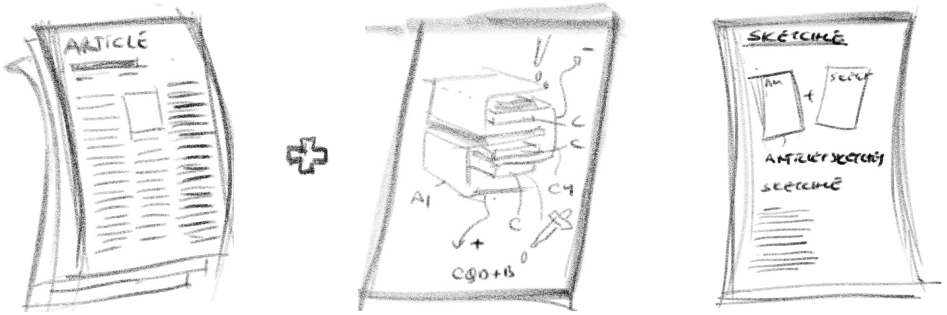

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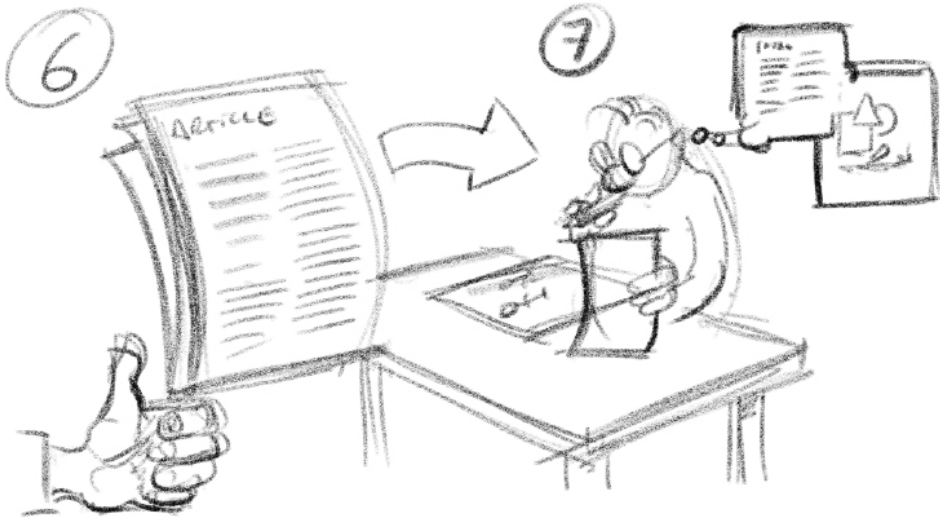

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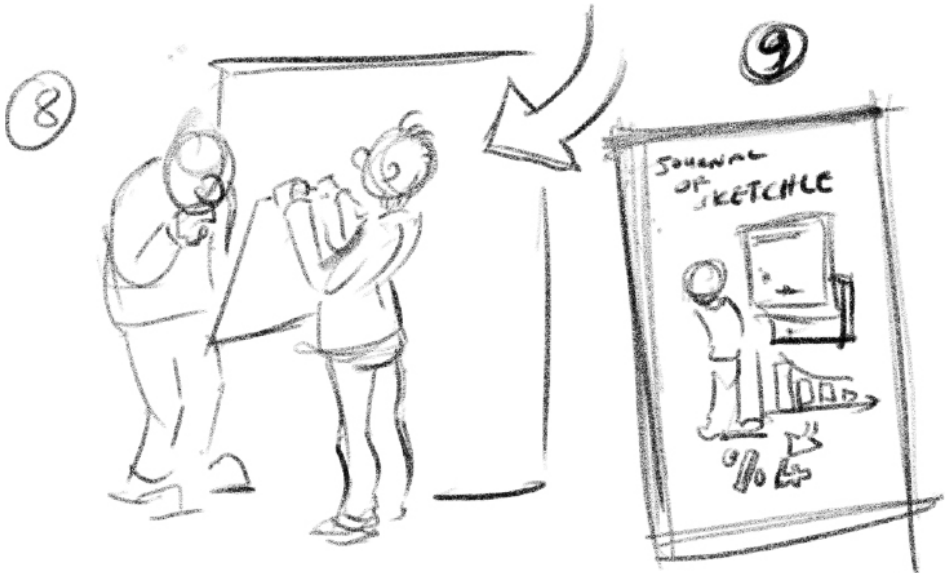

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Transferring the Brand Image to the Consumer Through the Design Elements Used in Store Showcase

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Keywords: Showcase, Design of showcase, Brand image

Nowadays, the stores that consumers can reach in line with supply and demand have increased considerably. In this competitive environment, each brand always aims to be one step ahead of the other and to be the priority choice of the consumer and to increase its memorability. Of course, there are many factors in the consumer's preference for the brand (product, quality, marketing, price, etc.); one of these elements is the shop windows that increase visual perception and establish the first communication with the customer. These Decently designed showcases are one of the most important links of communication between the brand and the consumer. It is seen that the classical understanding of the showcase has changed over time, turning into a kind of installation, concept applications that have entered it with different materials, lighting techniques and colors have come to the fore. Brand showcases should invite the potential consumer to the store at the same time as exciting them. This is only possible with the use of color, light and materials that are effective in the design of the showcase. Although the primary purpose of showcases today is to display the product, it is also to increase the level of brand identity while making the product saleable with the prepared theme. In this context, it is aimed to reveal the effects of the storefronts where the products are marketed, which aim to attract the attention of the consumer; how color, light and surface-material-material come together and decode the design and brand and their effects on the consumer. Showcase that make up the main design elements in this context is limited to a study by the consumer in a shopping mall in Ankara, the most preferred fashion brands showcase a descriptive analysis with detailed readings of examples of arrangements will be made

Figure 1. Example of a Flat Showcase, Ivy Store -Brazil (https://retaildesignblog.net/2013/09/25/ivy-store-by-suite-arquitetos-sao-paulo-brazil/)

1.Introduction

In today's contemporary world, stores have become places that have become an important part of the socio-economy, have become a lifestyle of society and value their 'leisure time' here, have a variety of products, offer consumers opportunities in many areas (Şentürk, 2012). How much shopping on the internet although the pandemic has gained momentum in recent years with PwC (2021) according to a survey conducted by consumer of the people, 54% by going to a physical store to shop, the consumer product rather than buying experience reveals that prefer buying process.

Brands bring their products to the consumer through stores. It has been observed that there are more ready-to-wear stores in shopping centers than other stores. Given the fierce competition between brands today, the showcase is considered the most important visual communication tool, as it is the first point of interaction between the store and customers and Dec Decodes the brand content (Taşkıran, 2012) (Topalian, 1984).

Showcases; brand type, brand theme, brand mission and vision, socio-demographic structure of the consumer target group such as many components come together to form the brand image Dec. In shopping centers that contain many brands and bring competition with them, the importance that brands attach to the design of showcases is gradually increasing in order to maintain its dynamic structure and keep it alive, so that it can get one step ahead of its competitors (Sarıçam, Okur, Erdem, Akdağ, & Kılıkçı, 2018). When the studies about the storefronts that serve as a bridge between brand identity and store are examined, it has been observed that few studies have been conducted in the literature on the brand-storefront-consumer Decoupling. Therefore, it is thought that the analysis of the factors affecting the showcase design to be carried out in the study will contribute to the disciplines interested in this field. In this study, the factors that need to be considered when designing a showcase will be taken into account. The most preferred shopping center in Ankara will be selected and the showcase designs will be examined. As a result, the importance of evaluating the results of this research with store window designs will be emphasized in terms of the information it gives about the brand.

Figure 2. An Example of an Open Storefront, Kenzo Store
(https://tdf-asia.com/window_displays/kenzo-x-kansaiyamamoto-collaboration-open-window-displays/)

Figure 3. Example of a Closed Storefront, Louis Vuitton Store
(https://windowdisplaybangkok.blogspot.com/2022/02/louis-vuitton-window-display-in.html)

2. Literature Review

2.1 Definition and Importance of the Showcase

Showcases have two meanings:" glass "and" the first visible or noticeable part". (Doğan, 2005).

According to Turkish Language institution:

- A place of a shop or store that is separated from the outside by glass and is used to display goods
- Showcase cabinet made to see the things that are put inside (display cabinet), written in TDK dictionary.

The storefront is considered the most important element in visual merchandising elements, as it is the first point of interaction between the store and customers (Taşkıran, 2012). According to Schlosser (1998), "The first impression of the consumer about the store depends on the elements that can be seen or felt from outside the store, such as the window, the size of the store and its external appearance. These elements of the exterior of the store almost resemble the packaging of the store. Depending on these factors, consumers can get different ideas about the store and even make a judgment about the store's approach to its customers. In previous years, retailers preferred to attract consumers with price incentives, thinking that aesthetic shopping experiences did not matter" (Schlosser, 1998).

Showcases are the elements that make up the transparent surface and attractive aspect of stores. At the first, the showcase should attract the attention of the consumer who sees it from the outside, reflect the identity of the store and the brand with its design, thus revealing that the store is different from other stores in which it competes (Mun, 1981). There are 2 main purposes in the use of showcases (Mun, 1981);

- Reflecting the store-brand image
- To ensure the entrance of the consumer to the store.

Showcases create a preliminary impression of the brand about the store in the consumer's mind. Therefore, it is a matter that priority should be given to the creation of the showcase and the correct transfer to the consumer in this image study. With the increase of competition in the recent period, the importance of showcases is also increasing gradually. Each store creates its own storefronts with its own brand concepts. Showcase designs have now become a discipline that requires complete expertise (Çivitçi, 2004).

2.2 Storefront Typologies

In the formation of store fronts, could affect from many elements such as their location, the dimensions of the store, the dimensions of the products to be exhibited, the dimensions of the facade of the store play an effective role. Store window dimensions play a key role in terms of consumers' perception of the store and the products displayed in the window. What stores reserve for storefronts the section should be designed by considering the ratio-proportions of the product to be exhibited according to the showcase and the accessories to be used, the dimensions of the showcase glass, the height and depth ratios of the showcase typologies of the showcase (Günsan, 1997). They are designed in diverse types in order for the consumer to perceive stores more easily during the shopping process, to provide the ability to monitor the variety of products and products, and to attract the consumer to the store. As can be seen below, Mun examines the showcase typologies in 6 separate groups (Mun, 1981).

These groups.

- Flat showcase
- Open showcase
- Closed showcase
- Corner showcase
- Arkad showcase
- Double unit showcase.

Flat storefronts are types of storefronts that run parallel to the circulation of the location where the store is located, attracting less attention than other types of storefronts. Flat storefronts, called transparent storefronts, allow the store interior to be clearly visible. Stores with flat storefronts are usually limited to small stores given in Figure 1 (Mills & Moorman, 1995).

The open showcase: The back of the window is completely open, allowing the consumer to fully observe the inside of the store. The fact that stores with this type of showcase have become the brand itself. The concept to be created in open storefronts is usually differentiated by the material on which they display the product, and it should be applied throughout the store so that there is no complexity when looking at the store from the storefront given in Figure 2 (Kavasoğulları, 2015) (Gelgör, 2016).

A closed showcase: It is a type of showcase where only the showcase can be seen, which is turned into a space by closing the surfaces. It has become completely disconnected from the store interior and has become areas where the consumer can only observe the display window. Although this type is usually used in large-scale stores, it makes the consumer feel a sense of curiosity to see the inside of the store while showing a small area in the window. Closed showcase types do not cause confusion, so they allow more effective concepts to be formed closed showcase given in Figure 3(Gelgör, 2016) (Melikoğlu, 2008).

The corner storefront: The location of the store has a major influence. It can meet the consumers from two different directions at the same time. In this way, it will be easier to attract the attention of the consumer. Corner storefronts according to brand preference; It is possible to design open, closed, and semi-open, corner storefront given in Figure 4.

Arkad Showcase: It's a type of showcase in which a transition area (hall) is left between the circulation area and the entrance door to the store. Dec. According to the showcase design, it can be preferred in a flat and recessed way. This type of display windows is another type of display that is preferred especially in street stores because it does not interfere with pedestrian traffic and allows the consumer to easily view the display window, arkad showcase given in Figure 5 (Melikoğlu, 2008).

Double unit storefront: These are storefronts divided into two parts by the entrance located in the center of the store. They are the types of showcases preferred in stores with-

Double unit storefront: These are storefronts divided into two parts by the entrance located in the center of the store. They are the types of showcases preferred in stores with a large area, which are visually effective and have more display area (Melikoğlu, 2008). It is not very preferred by brands nowadays

2.3 The Main Elements Showcase Designs

Window display is a temporary visual expression of the image of a store. Brands update their store windows sometimes monthly and sometimes weekly. Store window themes are inspired by events such as mother's day, new year, the anniversary of the opening of the store, the introduction of a new product, the start of discounted sales, new collections, cultural events, or season changes (Pegler, 2003).

The storefront of the store should make the store attractive and should be capable of attracting the customer inside. Therefore, the items to be used in the showcase must be both aesthetic and functional. At the same time, it is important to use items that are compatible with the concept of the store.

Together with the colors, lights and materials used in store windows and which play an effective role in the showcase arrangement, themes are created for the storefronts. It is aimed to attract the attention of the consumer with different combinations of showcase design (Frings, 1987) (Figure 6).

2.3.1 Color

Color in showcase design; balance, harmony, contrast, etc. it should be used by considering the basic design principles as a whole. Colors attract the most attention of the consumer; they appear as one of the most effective design elements to create a store window atmosphere (Ataoğlu, 2020) .

"Color alone is the biggest factor in the consumer's decision to buy or not to buy. Sunday research has shown that 90% of the consumer's purchase decision is conscious research, and only the remaining 10% is formed as a result of instant influence. And 60% of this planned purchase decision also includes color" (Holtzschue, 2009: 125).

Cyr et al. (2010), in order to symbolize the brand image, they have tried to use a symbolic

Figure 4. Example of a Corner Storefront, Chanel Store (https://unibox.co.uk/types-importance-of-window-displays)

color in stores that can influence consumers' attitudes and expectations towards brands. They examine the degree of trust and satisfaction that occurs against the brand formed in the consumer with the color in the showcase designs. As a result, they confirm that the attractiveness of color influences the audience in feelings of trust and satisfaction (Cry, Head, & Larios, 2010).

LC Waikiki brand has a closed showcase type display case; a design consisting of two-color harmonies formed by similar colors and contrasting colors has been created. While a more pastel green color was chosen in the background, a contrast was created by using more striking colors in the material that will highlight the color of the product (Figure 7). It is known that the green color has an inviting, relaxing, and refreshing effect on the user (Lewison, 1992).

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It is necessary for the colors used in the composition created in the showcase design to be compatible with each other, to convey the desired message about the brand to the consumer in visual communication and for the exhibited products to gain visibility. It is observed that the colors used in the display of the Tommy Hilfiger brand reflect the brandidentity. In the showcase where logo colors are used, the parts consisting of red, which is a warm color, are clearly separated from the blue value in the cold value, while they create an impression that comes to the fore given in Figure 8.

2.3.2 Lighting Design at Showcase

Lighting plays a key role in creating visual identity and increasing aesthetic values by providing color, texture and brightness requirements in the space. The correct lighting arrangement helps to ensure visual conditions, increase the sense of security, transfer the space design and the brand to the consumer correctly.

'500 lux is ideal for moderate illumination as general lighting in store or shop window lighting. Accent lighting can be made with spot luminaires for special products that are desired to attract attention. The use of rail systems for lighting used other than general lighting will be suitable for storefront or store design, which will change in the future. Since it is particularly important to see the products in their true colors in stores and showcases, lighting with high color renderings should be preferred.' (Kavasoğulları, 2015).lighting. Accent lighting can be made with spot luminaires for special products that are desired to attract attention. The use of rail systems for lighting used other than general lighting will be suitable for storefront or store design, which will change in the

Figure 5. Arkad Showcase Design Sample, Hermes Store, Stuttgart (https://www.behance.net/gallery/95358071/Hermes-Window-Displays-Stuttgart-AW19?tracking_source=project_owner_other_projects)

Figure 6. Pre-Application Design Study of Hermes Store Window (https://www.behance.net/gallery/95358071/Hermes-Window-Displays-Stuttgart-AW19/modules/550857653)

Figure 7. LC Waikiki Showcase Design

Figure 8. Tommy Hilfiger Showcase design with Tommy color

future. Since it is particularly important to see the products in their true colors in stores and showcases, lighting with high color renderings should be preferred.' (Kavasoğulları, 2015).

In the design of the showcase, the variety of the product to be exhibited, the type of showcase, directing the consumer's attention to the showcase, etc. many reasons such as are important criteria for determining the correct lighting method. Lighting types that will complement the store and showcase atmosphere; can create spacious, bright, dynamic, dim, exciting effects according to the window composition to be created. For example, neon lights that will create a dynamic effect that will attract the attention of young people and children can be placed in the showcase given in Figure 9 (Gelman, 1976) (Ataoğlu, 2020).

Lighting is a crucial element for the space in order to transfer products to the consumer in store displays and showcases. Especially in shop windows, it appears as a visual material that affects the design of shop windows as well as the need for lighting. As in the window design of the Pull & Bear store, lighting was used as a visual material on the mannequin platforms. In this way, it increases the attractiveness of both the product and the showcase. By using local lighting to draw attention to the products, the products were brought to the forefront with ray spot. Using linear illuminations, the showcase height is limited, the product-showcase ratio is provided. Using hidden lighting on the ceiling, an effect was created on the wall surface, and it was wanted to draw attention to the showcase

2.3.3 Surface, Material and Material

In store windows, the identity and character of the brand can be transferred to the consumer using the materials and materials used. A good surface design and material; the interior and the showcase can be given a brand meaning. According to Brooker and Stone (2011), 'For example, a wall surface covered with an old-looking steel material and a quilted silk-clad version of the same wall will create a very different ambience and character from each other' (Brooker & Stone, 2010, s. 50). The desired ambience to be reflected in the showcase is only possible with the right surface, materials, and materials. Materials and materials may vary depending on the consumer audience that the brand appeals to. For example, the stone material surface that will create a street view is used on the wall surfaces and the fabric-covered storefronts on the walls that will make the consumer feel the brand identity and the ambience formed are very different from each other (Ataoğlu, 2020).

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Material is an essential element that creates different effects in the space with its color, texture and usage... Therefore, each material has its own characteristics, natural, industrial, organic, technical, etc. as such, it constitutes sensory perceptions. As the material knowledge increases, the design ideas also increase; thus, the atmosphere in the space will be able to appeal to the target audience with more alternatives, as a more appropriate design."(Aksaç, 2006, s. 128).

With the showcase concept of Colin's brand, which adopts the street style, it conveys the product category and style of the brand to the consumer with surfaces, materials and materials to the consumer (Figure 11). By combining the cold appearance of the white metal joinery used in the background with the white stone wall surface colored with graffiti on it, the brand conveys its identity to the consumer audience with the concept of a showcase. The use of both male and female mannequin materials conveys to the consumer

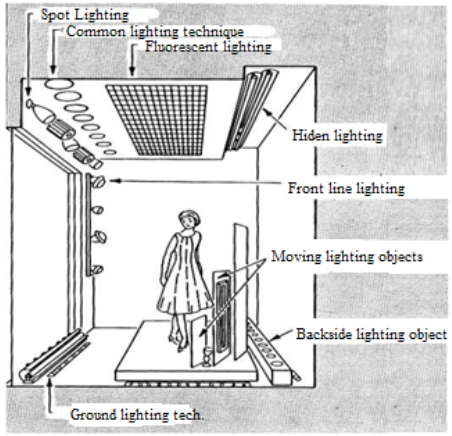

Figure 9. Lighting design at showcase (Ökten, 2004)

Figure 10. The Lighting Method of the Pull & Bear

Figure 11. The Use of Materials and Materials in Colin's Store

which gender and age group the brand's customer base appealing to.
While a warmer and more natural environment is created with the wood used in the Kitikate baby store window; it tries to attract the consumer to the store by emphasizing that the brand products of the cotton plants used are harmless to the baby's health and cotton material is used in the products used (Figure 12).

3. Conclusion

As a result, brands can direct consumption in an increasingly competitive environment over time, the brand identity, and the importance of the store between the consumer and the consumer increases Decisively. It is an effective method to carry brands to better points with the correct use of the basic elements that make up the designs of their storefronts so that they can attract the consumer to the store by influencing them.
Showcases are spaces where products are exhibited, which can also be defined as the visualization of brand identity, which is a conceptual form of expression, and uses the visual language of design in a wide variety of ways. With the unlimited imagination brought by the design language in such a way that distinct colors, surface-material-material and lighting techniques support each other, showcase designs emerge in which brands convey their identities to the consumer in the most accurate way.
In this study, it shows that brands integrate multiple signs and items in their storefronts

Figure 12. Kitikate Baby Store Window Display

to convey corporate identity. According to the findings obtained, it has been understood that storefronts are an effective visual communication tool in transferring the corporate identity of storefronts to the consumer. The visual design elements and concepts used in the showcases will increase the brand priority and the communication of the corporate identity in terms of memorability.

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5. Figure References

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Space Psychology in Interior Design

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Keywords: interior design, interior space, space psychology,

Abstract

The connections between the individual and interior space are articulated through literature, philosophy, and critical theory. These links can be read into all aspects of the domestic environment, from the spatial envelope to the smallest items contained within it. It is from this position of plurality and interdisciplinary that theories of the interior can continue to develop. While the dominance of architectural theory has arguably inhibited the development of critically informed interior studies, this imbalance can be used to stimulate meaningful critique of the interior. Studies of the interior; must embrace the marginality of the interior and further elucidate the implications of this marginal condition if interior de sign is to break away from the discipline of architecture, both in theory and in practice. Many areas of cultural criticism intersect directly with aspects of the interior, both materially and in terms of psychological and social practice. Going forward, theories of the interior will be greatly enriched by careful integration of established methodologies from philosophy, psychology, sociology, history, economics, and anthropology, studies of material culture and literature, and architecture. By embracing the lack of center intrinsic to interior studies and drawing from this wide array of scholarly methods, a meaningful body of critical studies will continue to develop.

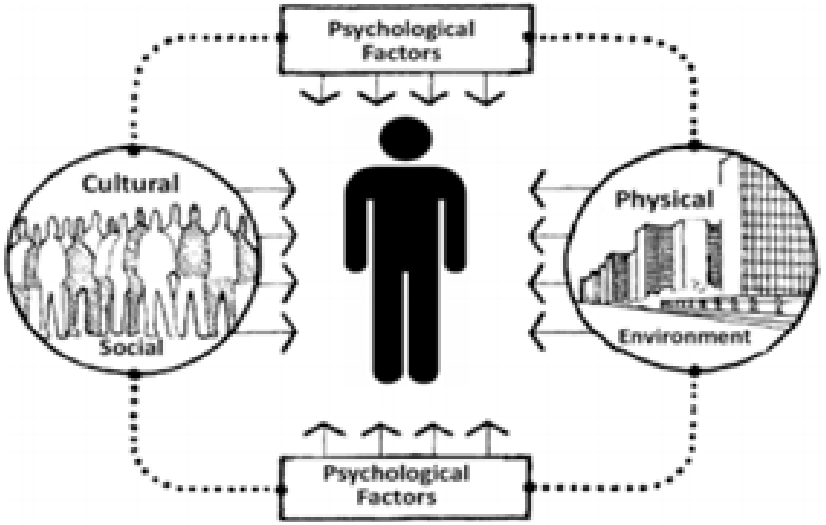

Figure 2.1: Factors impacts human psychology (Moore 1979)

1.Introduction

The satisfaction and psychological state of users and residents are directly linked to a well-planned and designed feature that makes the spaces more useful. In an interior space, the user needs, comfort, habits, aesthetic experience which all are given at the head of the decisive elements that determine the nature of the environment in which he aims to create. It has an immense influence on our mood, behaviour and physical activity: in short, the human psychology. The user may also be aware of the requirements of certain actions. It is often the case that the subconscious is dominant and most of these behaviors, which are now automated, are not even realized. These behaviors, which define the cultural structure and habits of the individual, reveal the integrity as well as the sensory function of the space. In space with comfort individual creates a direct relationship between the environment.Place or space; it can be defined as a space segment that can be perceived by space and boundary observers, which in wide maneuver is different in various approaches, separating it at a certain scale that surrounds the human being and is suitable for carrying out its actions in it. The perception of space is very important for the relation of people to the environment. The definition of a place is made only by understanding the relation of one's place to another. Thus, the person can be directed and moved, experiencing the entire environment, or even interacting with it, changing and shaping it.

The space is the basic condition that reveals the architectural product. Space, architecture, landscape architecture, interior architecture constitutes the main point of the profession and at the same time an architectural product is indispensable as the basic condition that creates an architectural design together with being the only quality. Space in the architectural dictionary; It is defined as 'a gap that separates the person at a certain level and is suitable for carrying on his various actions' (Hasol, 1990). In general, space is a conceptual entity that people can move around, act on, come together with plane elements, or engrave three-dimensional masses. It is becoming increasingly important that spaces with psychological influences should be created where a good design from an architectural point of view is not merely a matter of creating pleasant shapes. (Göler, 2009). When considered as an architectural whole, one of the most important parts of this whole is the concept of "interior space". The interior can be defined as the space bounded by the surfaces of the building shell (Aydıntan, 2001). The individual in the space communicates with any physical elements; such as circulation, color, light intensity, odor and heat of that space. The user who is affected by the sensations he receives can easily exhibit the behaviors that are experienced in that place. At the same time, qualities that will create an aesthetic pleasure can help shape the quality by supporting the arrangements and expectations in the space. Every element that we choose for an interior or exterior area is driven by the psychology of space.

2. Psychology in Interior Space

There is a psychological effect on the subconscious of a space that is not always taken into consideration. The choices made in the design of a space have an influence on our senses and perceptions. Along with the physical things of the place, psychological items need to be questioned about perception. The way the space is used makes a difference in our perception. For example; how long the space is used and what it is used for. Space function in interior design, space form, usage, style and the factors that make up the space, and the color, the material can be perceived correctly when the physical objects such as light are constructed correctly. When we refer to space, it's mostly the aesthetic appeal many of us concern ourselves with, rather than the functionality.

The psychological dimension of emotional integrity, which provides the culture and aesthetic knowledge and experience that are created by social acquisitions such as

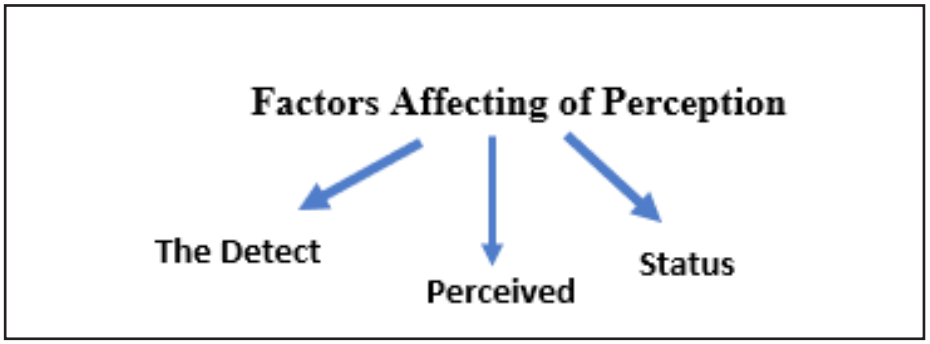

Fig 3.1.1: Factors Affecting of Perception

traditions, education, economy, and environment, act effectively in the formation of the interior space. Different methods of investigating and different approaches were used to recognize and shape the complex network of relations between architecture, interior architecture design and the psychological status of residents and users. "A useful model for seeing the scope of available environment –behavior information Figure 2.1 first proposed by the architectural psychologist Irwin Altman includes three main components: environment behavior phenomena, user groups, and settings" (Burris, 2014). The phenomena that will give rise to this visuality that will determine the quality of the interior are divided into two:

- Culture: Each of the generations of the community everything that an individual can perceive and think can be defined as culture.

- Psychology: Individuals who are in a place can acquire their identity through their spiritual development together with the environment they are in. If you are in the periphery; form, with color, texture, and material, and by influencing it, if the team allows the emotions to move, then the individual is psychologically influenced by this being.

It can be said that every civilization or ethnic group offers a specific architectural identity in accordance with their cultures and traditions at different times. This situation, which determines the behavior of the individual within the space and its interaction with the environment, should be used as a means of reaching.

3.Perception in Space Psychology

The act of acquiring information through perception, sensation; cognition is the comprehension of the perceived thing. Perception is the process of interpreting knowledge and experiences with the help of senses. Psychology of space perception basically means that the person experiences a short or long-term experience around the memory of the place. This experience depends on the concept of movement and evolves. Interior designing, space psychology plays a major role in defining the look and feel of a place. Human perceptions of the space they live in, work, or spend time in are directly impacted by the reflection of personal, social, and cultural identities on these places. The psychological identity sense and its interaction with interior architecture occurs in both larger scale domains such as culture, religion, nation, city, gender, social roles or social class and in smaller domains such as neighborhood, family, homes and rooms. Adaptation to the human artificial periphery may be possible by establishing a biological, physiological and psychological balance by reacting to external physical stimuli (effects). The ability of a person to show this harmony requires

firstly to recognize the environment and to perceive it briefly (Aydıntan, 2001). Basic characteristics of Perception;

- Perception is a phenomenon that varies from person to person.
- The movement plays an important role in the perception (URL 1).

While the perception of space is taken into account, at first, perception based on visual sense is given weight and other forms of feeling are neglected, but perception is actually affected at different rates than all senses. The person defines the space, the space defines the person; the person gives meaning to the space, the space gives meaning to the person. In other words, there is a complex and bilateral interaction between the person and the space in its cultural, psychological, economic and physical dimensions" (Ayalp, 2012)

(Göler, 2009) explain the perception patterns of the space as follows:

- Haptic perception due to the shape of the surfaces forming the shape and the features of the objects and surfaces in the space,
- Tactile and kinesthetic perception based on tactile surface properties such as roughness - texture of boundary elements and surfaces forming space,
- Kinesthetic perceptions due to the elasticity properties of the surfaces forming the space and the roughness of the surfaces,
- The thermal effect of the space and the thermal perception resulting from the thermal conductivities of the objects in the space.

3.1 Perception in Interior Space Psychology

Interior perception can be defined as the perception of the positions of the minister per se and the perimeter of the perimeter, with the most basic definition. It is in constant interaction with the space in which the human being is located. The physical factors within the space, the users constantly warn. To clarify the concept of 'Spatial Perception', which involves the relationship between physical variables of space and psychological factors, it is necessary to determine the total effect of environmental components (Göler, 2009). The form is the shape of the object and it can be in different shapes like rectangle, square, triangle, oval. While triangles and diagonals usually exhibit dynamic characteristics and indicate movement, they evoke a horizontal rectangular serenity. All forms are flat or rough, glossy or matte, with soft or hard texture. Hot or cold spaces can be created with different textures. Color, on the other hand, is the design factor that influences the spatial perception at the highest level. While red can be used to obtain energy, green can provide

The effects on the color perception of the space			
The ambience fits the desired atmosphere	Unity or difference	Help to characterize goods	Define the form of the space

Fig 4.1.1: The effects on the color perception of the space (Aydıntan, 2001)

peace and serenity (Yazıcıoğlu ve Meral, 2011). The line does not only set the direction, it also means the symbol of the mental state and the expression of the width or height. The line thickens and thinness, sharpens and softens, coarsens and opens, adding shape and structure light values, gain efficiency (Kalınkara, 2001).

3.2 Types of Perception Affecting Psychology of Space

3.2.1. Dimensional Perception

Dimensional perception, which is part of visual perception, shows the effect of scale on the perception of the space. Even if the actual dimensions of a space are fixed, they can acquire different dimensional shapes by using different color, texture and form properties. Chromatic diversity causes it to refocus for different colors of interest. For example, hot colors such as yellow and red are zoomed in and the cold colors such as blue and green are repellent. Thus, strong colors zooming; pale, dull and dull colors are repellent.

3.2.3. Visual perception

It is the most effective type of perception and an action that people do unconsciously. The whole perceptual relationship established with the space the senses directly influence the sensation acquired from the space. However, in terms of environmental perception is the most complex of all senses since human senses are the first sense of visual. The light is absolutely necessary for the sense of visual to come true. Vision involves the process of transmitting the wave, which is perceived as light, to the brain through the eye. Peripheral information is perceived by more than about 80 percent of the eye (Berger, 1998). Visual sense is at the beginning of perceptions that play the most important role in perceiving the space.

3.2.3. Auditory Perception

As the number of auditory sense increases in perception so perception becomes more accurate. Sounds help our visual in our perception of the place. Music in a place an element such as voice or human voice changes the way we perceive it. The auditory perception of the place reveals different effects according to the duration of echo and reflection. Shadows appear as if the obstacles in front of the sound emitted in the air are in the light. This is called an acoustic shadow. The obstacles placed between the exterior, especially between the traffic roads and the area that needs to be protected from the noise, keep this area in the acoustic shadow and protect it from noise. This method is also used in some interiors (Göler, 2009).

3.2.4. Odorous Perception

In the perception of space, odorous perception is equally well with auditory perception. Thus, the fragrance inside the place differentiate the perception and experience of the place.

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4. Psychological Meanings of the Principles of Interior Design

4.1. Psychological Meanings of Colors in Space

Color has different psychological and physiological effects on people can be created. Many experiments and studies on this issue have revealed that the colors cause positive and negative effects on the people (Manhke, vd. 2007:30-31'den akt. Manav, 2015:23). As a result of these effects, differences in the process of perceiving the color an occur.

Swiss Psychologist Dr. Max Luscher experiment in 1947 proves that personality traits of color likes. According to habits and experiences the choice of colors, such as the perception of events, also varies. One of the qualifications necessary for defining every organism organized in the space is the use of color. The most important function of the color is to move aesthetic feelings into action. Color use is always personal, personally influenced, enjoyable and historical acquisitions (Kurtich, Eakin, 1993, page:249). Thus, a conscious and balanced selection of colors will help to gain universal qualities of design, including psychological, aesthetic, and perceptual qualities. The fact that the colors in a space affect people's perception and emotions should not be ignored. Color contributes to the perception of space by expressing and performing the function of the space. Not only for interior design, but also for all design color is also an important influence. Color information, considered an evaluation criterion for interior design, plays an important role in space and human interaction. In this context, besides the psychological effects of color, the personality characteristics of the users, the living conditions, some it is seen that it is effective in the variables. Kaufmann (1981: 30) states that light can be seen by reflection or absorption through the surface of an object. Kanat (2001: 95) defines that he expresses more than "successfully applied color, coincidentally attractive or" beautiful ". With strong effects such as creating different perceptions in the physical properties of the space, color, physical adverse effects can turn into positive results with the correct use of the designer. Even if a space is well planned and equipped, it can be dismal because it is dull and tasteless in terms of color (Pile, 1997:11). Along with the effect of colors on the space, the interaction of colors with each other also creates different perceptions. Describe the boundaries better and physical psychological direction to make a correct decision not only wall, floor and ceiling, furniture, accessories and all the textiles used in the fabric to do a detailed color work done is required.

4.2. Effect of Materials in Space Psychology

Material is one of the most important elements affecting the design of space psychology. The type of material, structure, texture, reflection of light, differs between where it is glossy ormatte the perception of the space. J. Kurtic and G. Eakin, in describing the connection between interior architecture and architecture in his book Interior Architecture, make the following definition of material: "Material is an element that describes the human character in interior design".Rasmussen (1994: 180) define, an example as "a brilliant satin and a long feathered velvet touched from the same silk, satin bright and light, velvet will create a deep and warm effect ". Different methods can be applied in the interior design, depending on the design of the materials, the designers' concerns, and the existence of any kind organized to meet the requirements of the users. The first of these deals with the structure of the material. Second, perceptual qualities. Pile (1997: 30) states that texture and surface structure can change color, while rougher surfaces usually appear darker, which is due to the shadow effect on the rough surface emphasizes. Natural materials such as wood, which will be considered different types of material a warmer effect in terms of materials and colors, a colder effect on glass-like surfaces.

4.3. Effect of Lightings in Space Psychology

Lighting in space important both in terms of supply and in the sense that it can be perceived correctly in sufficient quantities. Light is the most basic element that allows any kind of presence in the space to appear. Without light, qualities such as a form, items, color, and texture cannot be seen. Whatever the reason, there is a need for light to see (Kaptan, 1997, page:7). Kaufmann (1981: 20) describes in his book that light can affect emotion and mood, productivity and consciousness. In this context, the perception of light in space; direction and proportion of the light, structure and reflectivity of light source. O. Goeffrey Hayward, Psychological Factors in the Use of Light and Lightening in Building: "Items containing solutions for the lighting design scheme is as follows: Items containing

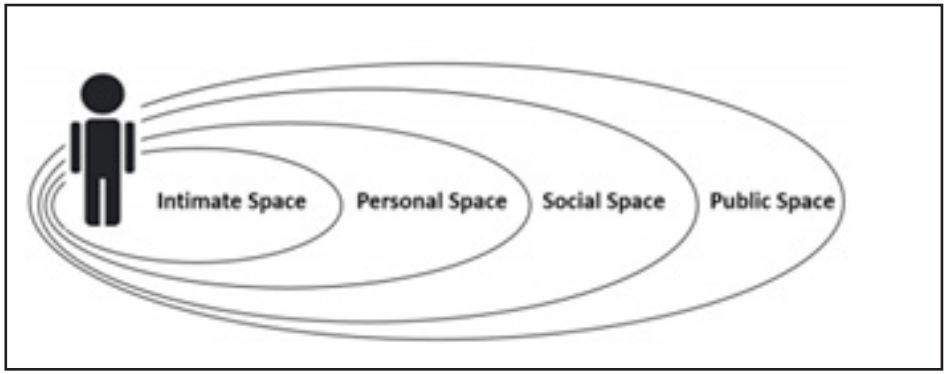

Fig 4.6.1: The main four categories of space, (Hall 1990)

solutions for the lighting design scheme including: First, function and relative liability; second, spatial illumination related to factors related to direction, color, texture and form; an innovative, non-compliant lighting system; fourth is a scheme that allows for individual control" says (Malnar, Vodvarka, 1992, s:252). Light sources; they are divided by two groups natural light and artificial light. Natural light are sunlight, daylight, and candle. Artificial light is lighting elements. Lighting is one of the indispensable elements of an interior. The night shifts the daylight and ensures that the individual in the room sees and perceive the environment, and in particular the movement of the individual within the space.

4.4. Effect of Texture in Space Psychology

The visual effect of the texture of the surfaces in the interior space is greatly influenced by the visual perception of the space, thus the character of the space effected (Yener and Ülker, 1999). Texture is the element that affects two dimensions, such as surface, color and tone, which leads to the third dimension. The texture has the feature of being the element that characterizes the form, shape, surface (Atalayer, 1994, s: 194). In every space, every surface is felt by touching, the space is read by the surfaces. The textures of surfaces in places are visual and objective elements that describe the place (Gezer, 2012). While the texture has a great effect on the visual values of the space, the two senses that characterize the space-surface-material relationship, that is a stimulating communication element that moves the senses of sight and touch (Gezer, 2007).If two surfaces of the same color and the same strength have different texture characteristics, the difference in tone will be seen in different colors. Some textural properties were determined by empirical studies in which the perception of the space as a whole produces warmer or cooler effects. A smooth surface creates a hot effect while a smooth surface creates a cold effect (Porter, 1979).

Structures that are perceived by touch form the actual texture. In the sense of architectural space, the visual value of the space is the greatest effect, is also an important concept that characterizes the relationship between space and material at the same time. Texture, like color, is an element that defines the surface material, quality and existence. Texture cannot sustain its visuality in a light-free environment, so it cannot be perceived. From this point of view, color and texture as they cannot be separated from each other, can determine the quality of the material.

4.5. The Effect of the Psychology of Space perception on User

It is known that space perception influences human psychology on an important dimension and different types and tones cause different psychological effects on the user such

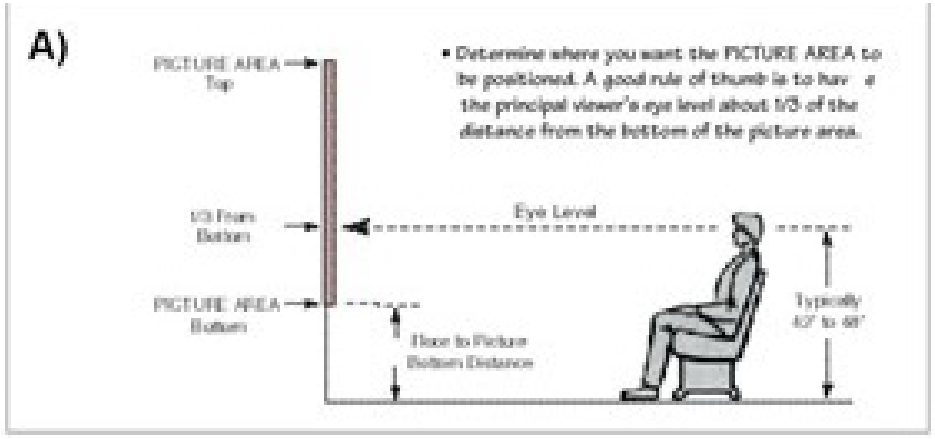

Fig 4.8.1: Safety Consideration in Living Area

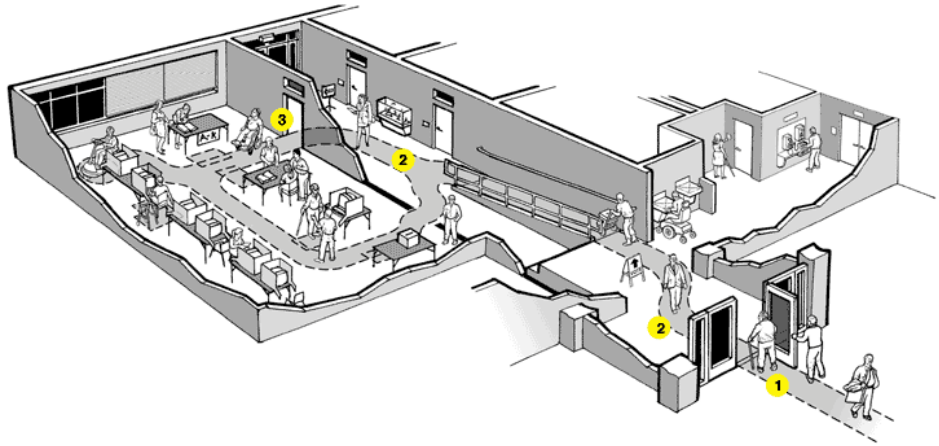

Fig 4.9.1: Approaches Circulation &Accessibility: 1. Accessible entrance 2. Accessible route connects the accessible entrance with the voting area. 3.Accessible door to the voting area

as joy, sadness and energy. Space psychology can also make a difference in the perception of interior spaces, and it needs to be selected in accordance with user specifications. Apart from the psychological effects of interior space, variables affecting color and material choices; personality traits, age and gender, habits and experiences, fashion and style are examined in four groups, and unconscious color and material choices are seen to be related to these groups (Özsavaş, 2015:25-26).

4.6. The Effect of Privacy in Space Psychology

People deal with the concept of space privacy with special concerns, they feel discomfort, anger and anxiety when their space privacy is exposed beyond their desires. "According to environmental psychology, each person is realized and perceived through an invisible shelter or a series of shelters surrounding his body. These personal protective spheres, by which privacy is controlled, vary from person to person and from culture to culture. They also differ from period to period as society and social bonds are continually transformed and reconstructed. Hall defines accordingly four such spheres; intimate, personal, private and public. When the most intimate of these private areas is intruded by other individuals, the person starts to act defensively or to say at least extraordinarily. A typical example of the above fact is indicated by the abnormal behavior of people when standing in an elevator" (Hall, 1969).

4.7. The Effect of Functionality and Flexibility in Space Psychology

Functionality encourages people to live and work effectively in interior design. In addition to the use of the space as an integrated environment, the effect of the possible functions of the interior design makes our interior space livable. It is clear that design can function as a direct source of

pleasure or facilitate pleasurable activities. Such a vision incorporates a view on interior architecture as an activating and dynamic platform that facilitates the occurring of meaningful activities for its inhabitants (Petermans, 2014). User flexibility is an important design aim of modern residential units. It is a natural necessity that is created within the defined residential area, the change of housing needs throughout life, the change of living standards, the use of modern household appliances and the variation in lifestyle and fashion. Maximum and optimum utilization of the interior space requires flexible design of furniture in the space. Many furniture pieces are designed using folding patterns or drawers included with mechanical or electrical features and this furniture can the interior space very efficient through ergonomic and human fitness (Emamgholi, 2011).

4.8. The Effect of Safety and Health in Space Psychology

One of the main psychological concern of users and residents depends on having space and settings that are safe and free from physical hazards. "The quality of space conditions plays a decisive role in the health status of the users. Many health problems are either directly or indirectly related to the building itself, because of the construction materials that were used and the equipment installed, or the size or design of the individual space. Representing the spatial point of reference for each individual, the interior space also has a broad influence on the psychosocial and mental well-being by providing the basis for place attachment and identity as well as a last refuge from daily life. However, especially, for this mental dimension of housing satisfaction and the meaning of home to the resident, not much data on the relation between health and well-being, and subjective satisfaction, and housing perception are available (Bonnefoy, 2007). A home perceived as safe and intimate provides major psychosocial benefits. It represents a protected refuge from the outside world, enables the development of a sense of identity and attachment – as an individual or as a part of a family, and provides a space to be oneself. Any intrusion of external factors or stressors strongly limits this feeling of safety, intimacy, and control, thereby reducing the mental and social function of the home (Kearns, 2000).

Fig 4.8.1: Safety Consideration in Living Area

4.9. The Effect of Circulation &Accessibility in Space Psychology

Accessibility is a continuous process that we use in our daily lives. This process is as easy as moving from one room to another, or as hard as trying to escape from a building in a fire. Efficient navigation through the exteriors and interiors of any space saves physical efforts, enhancing emotional status and introduce a primary impression about the overall quality of the architectural design. Circulation difficulties may cause problems such as loss of time, decreased safety, or causes stress and discomfort. Accessibility and navigation tasks are influenced by two main factors, the architectural and interior design of the space, and the degree of information clarity and accuracy. The impact of accessibility on physical and psychological conditions is even more important when it comes to public buildings, especially public buildings with large complex facilities such as shopping

malls, airports and hospitals. Locations and buildings should be accessible to anyone who has a special interest in children, the elderly, and people with disabilities. Accessibility and circulation vary according to space type, size, layout and user requirements. All routes of both horizontal circulation elements and vertical circulation elements within any space or building should be as free as possible of obstacles and they should be easy to distinguish.

5. Conclusions

The scope of the reciprocal relationship between interior architecture and human psychology is very broad, which depends on multiple interactions with social, cultural, physical, and environmental factors. The location can be perceived differently by the user, even with the use of only the color and the material, and in spite of all negative physical characteristics of the interior space, it can make the situation positive with the right applications. This condition, which affects the visual perception, is directly related to the user of the end-user interaction of the room comfort and the space sensation. Not just the identity of the space, but also how all the characters interact with each other is important. The perception that is to be created in the inner space, choosing the right color, choosing the color should be considered together with the properties of the material and how the texture will reflect the color and the physical relation with the space relation, the surfaces reflected by the light and the physical properties of the light. In order to illuminate a designed interior space from a furnished room, three dimensional a lot of interior space items until it is organized to reflect the individual, users will have to carry the qualities of the individual. Only then can the user of the room, the individual or a group the individual to live can see many things from his or her place and the space itself can feel, in short, it can own it. From this point of view, for the life of a place, only the use of that place by at least one individual is required. Only then can users own the place or make it suitable for them. So that the individual can find the existence of a number of features in the space itself. These features can be found in the cultural or psychological dimension. Together with features such as color, material and texture, which are an evaluation criterion in interior design, the function of the room, its physical properties, the way it is used, physical phenomena such as color, material and light which are factors in user perception, the importance of user selection and psychology in the construction of places should be not forget.

All the data to be taken from the psychological structure of the individual should be regarded as the outcome of the existing features, although subjective. The creation of living spaces, the use of spaces in the most efficient way, the handling of such data as design inputs can be made possible by individual ownership of the spaces. When the different properties of the constituents of the place interact with the sensory structure of the individual, the perceptual process starts the cognitive and mental processes. The voices in the diversity of sounds, levels, textures, colors, odors, surfaces location, physical features are named with a multitude of senses, the individual perceives the space and access to a number of judgments by passing them through the evaluation filter. Most studies on the interaction between interior design and the psychological state of people are comparatively contemporary, and a detailed understanding still needs to be improved. The achievement of an interior designer depends on how the designer balances the most dominant factors such as identity, privacy, security, accessibility, functionality, flexibility, community interaction and adequate space so that a successful design can be achieved.

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A Family in Purgatory 1

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Keywords: Housing, Turkish House, Social Structure and Housing, Industrial Society and Housing

Abstract:
This study aims to analyze and criticize the changing family structure and inevitably changing housing organization in the face of changing time with the example of a single family. The phenomenon of migration from rural to urban, which started as a result of opening up and accelerating industrialization movements that started after 1950 in Turkey, gives the opportunity to follow spatial development and change along with social change. It is a fact that we were caught unprepared and lost a great deal of energy and time by re-experiencing the negativities experienced, despite the "Western example" in front of us, in this process of change that came with a delay of about 200 years from the West. In order to make sense of the social structure-space interaction of the process, the sociological and spatial change experienced by a family that migrated from the countryside to the city in a period of approximately 30 years is summarized.

1.Introduction

Traditional sociological theories explain social change on two levels. Macro-scale developments that affect the phenomenon subject to change from outside itself are defined as "External" factors. External factors predict the inevitable change of the phenomenon and the phenomenon cannot manage or direct these factors. Depending on these factors, the factors that arise in the internal structure of the phenomenon and that it can partially direct and manage are also defined as "internal" factors. These factors, on the other hand, represent a level in which change can be managed and directed, albeit to a limited extent. In the process of social change and development, especially the family and the individual develop and change under the influence of both levels. This change naturally shapes and organizes the space that emerges as a reflection of the behavior patterns of people and society. Similarly, physical space shapes human and social experiences. In order to understand and make sense of this interaction, first of all, it is necessary to briefly explain the notions; housing, internal and external change.

2. Social Structure Change and Housing

2.1. Definition of Housing

According to Aydın (2010: 1), housing is a physical space that meets the basic needs of people, such as eating and drinking, for shelter. Housing is a place with economic value, exchange value, aesthetic value and use value.

According to Teymur (1996: 14), housing is not a simple object; It is a phenomenon that includes diversity, complexity and contradictions with its internal and external formation.

According to Üstün (2000: 7), while the house is a shelter that meets one of the basic needs for the individual and the family, it is a phenomenon with social, economic and spatial content for the society, and is interpreted as the smallest spatial planning unit in the social system. When the concept of housing is used only to describe a stock of houses, it is insufficient and limits the house only as a property. However, housing is a complex process that brings together many individuals and organizations to achieve real and expected results.

Housing is a complex structure that has an important place in human and social life. In addition to seeing houses as a shelter, people also see them in various meanings such as an emotional bond, a status indicator, the point where they go to work (Clapham & Gibb, 2012).

"House has a special place in building production as it creates a living space where the most basic needs of people are met. Individuals' satisfaction with the house and environment they live in increases to the extent that their basic and special needs are met" (Sarıyar and Pakdil, 2012: 163).

For man, home is not just a place to stay, but a window through which he looks at the world throughout his life; A corner where he watches the universe(s) is a home he owns and reflects on. The foundations of the social, psychological and cultural dimensions of life are mostly laid and established in homes. Home is a subjective and personal place, and different people in the society have different understandings and images of home (İmamoğlu and İmamoğlu, 1996: 2).

According to Pallasma, the house is; "It is the embodiment and collection of personal images that help us realize and understand who we are, including protection and privacy. It is the representation of personal memories. It is the way people express their personality to the outside world and the place where they embody the world order. The home is a complex mediator between privacy and community life. The place where we keep our secrets, where we can express ourselves privately, is our resting place and where we feel safe. It is not just an object or a building, it exhibits a complex situation, it includes memories and dreams, desire and fear, past and present. From this perspective, home is It is the fiction of rituals, personal rhythms and daily routines" (Desagis, 2006: 23). This approach gives the house meanings far beyond a structure that responds to the function of shelter and meets our needs. This deep content is the first architectural element constructed by humanity and a past equivalent to human history. relies on the privilege of being.

In his work "Vers une architecture", Le Corbusier compares the evolution of the Greek Doric temple with the automobile and says that the automobile is an example of competence that reflects the production spirit of the Industrial Age. Le Corbusier later said that "the house is a sheltering machine".

Murat Uluğ (1994), who swore not to make a housing project when he was a young architect, says that it is the smell of onions in the pan that will make the house a "home" in his workshops. Fights, celebrations, joys, sorrows... It is the experience that makes the house a house.

After all these definitions, the question of whether we should see the house as a sheltering machine or as a space that reflects a whole of meanings that goes far beyond is a question that deeply affects today's housing production process and interior space formation. This study aimed to analyze and criticize the changing family structure and inevitably changing housing organization in the face of changing time with the example of a single family.

2.2. Historical Development of Social Structure and Housing

The historical development of the house is in parallel with the change in the values of human life and the way of living. For this reason, understanding the historical change of housing systems is also important in order to understand the current housing systems and the demands of users from this change. Theories explaining the relations of social change, development and spatial change are based on three main parameters:

- Theories of socio-economic change; W. Rostow, E. Gungor, Ogburn, Mores etc.
- Theories based on demographic structure. J. Fourastie' etc.
- Theories based on technological developments: A. Toffler, Smithwick etc.

It is clear that the housing production process is in direct interaction with all of these theories as a whole. However, in this research, in terms of a simple and understandable presentation of the subject, the change process of social structure and housing is briefly mentioned through Alvin Toffler's wave theory. Toffler (2008) puts forth in a comprehensible way that knowing the variables in the environment in which the individual lives at every stage of history will significantly increase the productivity effect on his activities. In this framework, he deals with history in three phases and calls them "waves".

1st Wave: Agricultural Society (8000 BC – 1650-1750 AD)

2nd Wave: Industrial Society (1650 AD - AD 1955)

3rd Wave: Information Society (MS1955 - ...)

Mankind, who moved from a long-term foraging-hunter society to a settled order by cultivating the land, was able to realize the industrial revolution in a process exceeding 10,000 years. it took more time. This process, which is the most difficult and complex period of human history for Europe, has been a real revolution in which bloody wars, the emergence of a new state structure, and new social systems shaped by class conflicts are shaped. The 2nd wave changed all the institutional structures, values, socio-economic balances, political systems of the first wave (agricultural society) and realized its own institutional structure, political system and spatial organization. The first and longest of these is the agricultural revolution, which took place in a period of about a thousand years, which started with the discovery of agriculture in the first wave of change and became an agricultural society and settled down. The 2nd wave of change is the Industrial Revolution, which started in Europe at the end of the 17th century. Three hundred years was enough for the 2nd wave to take place. Today history moves much faster. While it had

reached its peak in all respects shortly after the end of the 2nd World War, the 3rd wave started great changes in the world, but has not been fully resolved even today and turned into an information society covering the developments at the end of the 20th century.
The 3rd wave of change is highly likely to be completed in a few decades. Those of us who share the planet in this explosive period will be able to feel the full impact of the 3rd Wave in our own lifetimes (Toffler, 2008: 16). By the end of the 17th century, the First Wave had not yet exhausted itself, but just at this time, the industrial revolution broke out in Europe and ushered in a 2nd wave of change across the planet. This new wave – industrialization – spread to countries and continents much faster than the first.
As a result, two waves of change, separate and completely different from each other, began to sweep the world simultaneously but at different speeds. Today the First Wave has apparently subsided. The power of the First Wave appears to have been basically exhausted, except for a minority of people who still rely on agriculture in areas like South America or Papua New Guinea. In First Wave societies, work was usually done in the fields or at home, the entire family population was gathered as an economic unit, and the resulting produce was consumed within the village or household. Work life and home life were mingled and merged. Since each village was highly self-sufficient, the lives of villagers in one place was not affected by what villagers elsewhere did.
Before industrial civilization, the division of labor was very basic. Thus, minimal ties to each other was one of the hallmarks of First Wave civilization. As the 2nd Wave spread, and primarily affected Britain, France, Germany and other Western countries, jobs moved away from the fields and homes into factories, and people became more interdependent. The work now required a joint effort, and the concept of division of labor meant that various skills came together to form a whole. Success now depended on the perfectly planned collaboration of people who lived far from each other, who had never met or met in their lives. When a steel or glass factory could not deliver a desired product on time or at the desired quality, the entire industry and even the regional or national economy paid the price. In the face of this great wave of change that humanity faced for the first time, large masses who grew up within the values of the first wave and positioned their own existence and status within this framework tried to stand against this great change that redefined their own positions. (Toffler, 2008) Today, many societies continue to live as agricultural societies, and even many people living in industrial societies or "advanced consumer societies" continue to defend the institutions and values of the first wave society. The resistance of the great masses, who cannot break away from these institutional structures and values to which they owe their existence, who are not aware of or cannot adapt to the new lifestyle, is the most important factor that delayed the 2nd wave revolution. But this only delayed the change. Couldn't prevent it. Because it is not possible to prevent this change in the course of history.
While the 2nd wave reached its peak in all respects shortly after the end of the 2nd World War, the 3rd Wave started, which started great changes in the world, but which has not been fully resolved even today and which turned into an information society covering the developments at the end of the 20th century. In the emergence of the 3rd wave, there is a dynamic evolution of the first and 2nd waves. That is why the "3rd Wave" expresses a synthesis with its main lines. Information society is a society where the use of information becomes widespread or people's access to information becomes easier. Since the aim of the industrial society is determined as the production of material values, the aim of the information society is the production of knowledge.
While the decrease in individualization and dependencies weakens the tendencies of centralization and agglomeration in cities and encourages more individual living spaces and dispersion, on the other hand, the development of new energy sources and energy transmission systems will turn some dreams of mankind into reality that they have not had the opportunity to realize until today. The differentiation of sectors in which income sources and capital are concentrated (the richest people in the world are no longer an automotive giant or an oil monopoly, but a software developer, communicator, virtual media founders, etc.) will bring the new age's understanding of housing and residential interiors and their demands to a very different line. Houses produced without understanding this will soon appear as difficult problems for countries, politicians and designers. As these technologies advance, we may see "water villages" and floating factories partially or completely submerged. The land value should be zero, at least for now, and the sun, wind, thermal currents, tides, etc. Thanks to the availability of cheap energy on-site, these structures can become competitive with those on land.

2.3. Internal Change

The housing problem in Turkey starts with the acceleration of migration to the city. Before this date, changes begin to take place in the forms of housing presentation and some problems related to the need for housing are seen regionally. The housing problem, which was tried to be solved by the short-term and state aid in the period until the 1950s, is shown as Ankara being the capital city, the foreigners fleeing the war in Europe taking refuge in our country, the state-sponsored industrialization policy in the 1930s, and the establishment of workers' residences around the factories in this framework. (Tekeli, 2012).
There are two important parameters that the apartment building, which emerged in all cities that modernized as a result of industrialization, depends on: sudden population concentration and speculation. Lands gain economic value due to their location. When these two parameters come together, it is seen that apartment building emerges regardless of culture, belief and habits. In the following process, with the beginning of the displacement of the land as an economic value and the concentration of the population in the cities, the apartment building process gains a rapid momentum after the 1950s (Bilgin, 1992).
The phenomenon of migration from rural to urban, which started as a result of opening up and accelerating industrialization movements that started after 1950 in Turkey, gives the opportunity to follow spatial development and change along with social change. It is a fact that we were caught unprepared and lost a great deal of energy and time by re-experiencing the negativities experienced, despite the "Western example" experienced in front of us, in this process of change that came with a delay of about 200 years from the

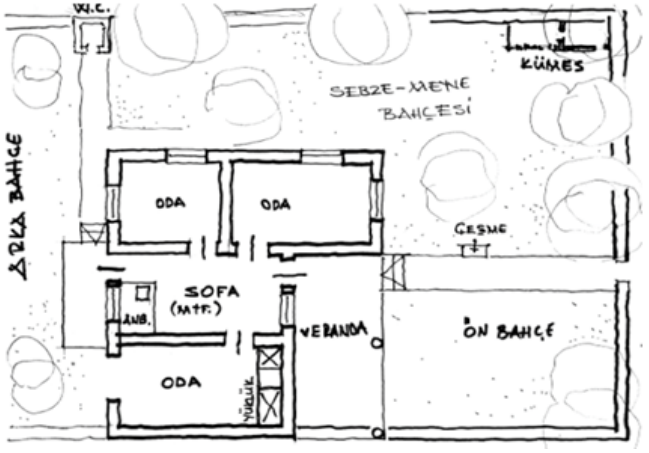

Figure 1: The first house for a family who migrated from the countryside in the 1950s. "house with a middle sofa" plan. Sketch: Prof. Dr. Ahmet Alkan.

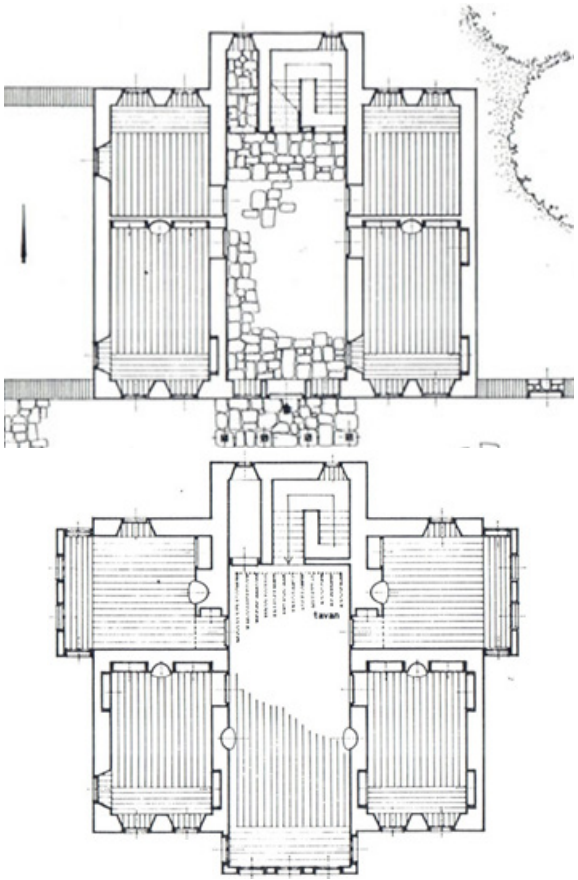

Figure 2: Konya, Nakipoğulları Mansion, ground and first floor plans. (Berk, 1958).

West. In order to make sense of the social structure-space interaction of the process, the sociological and spatial change experienced by a family that migrated from the countryside to the city in a period of approximately 30 years is summarized below.

3. A Family in Purgatory

The first house built by a low-income family with four children, who migrated to Konya from Ahırlı Village, Bozkır District, Konya, using local materials and with their own means, reflects the habits and production tools of the agricultural area to which they migrated, with their barn, haystack and coop.

On the other hand, the similarities of the plan scheme and the use of details with a "mansion" known as the "house of gentry" of the settled life are significant.

In the house of this agricultural family, the three rooms opening to the sofa, the kitchen and the toilet located in the veranda and the garden, the cupboards that have also assumed the function of the bathroom in the bedroom, appear as similar applications of the use of the classical Turkish House. As the socio-economic structure and education level of the family change, the understanding of housing and indoor usage demands will also change significantly in a short period of 30 years.

While the house consisting of three rooms and a central sofa opening to the back and front garden, which served as both a warehouse and a kitchen at the beginning, was sufficient for the small family who migrated with their two children, it became insufficient after the family's two children and grandmother came to the village. While a part of the closed veranda became a more organized kitchen, the area in front of it, as an entrance hall, provided both more economical and effective heating of the house and a sheltered place for shoes on the veranda (Figure 3).

The classical mansion typology has developed as two-storey, some with basement as three-storey types, and the basement floor is where all the outbuildings are resolved together with the kitchen, it is the agricultural period house that reaches advanced examples where the needs of the extended family order are met. On the ground floor, there is usually a living room and guest bedrooms of the first generation (grandparents, aunts, uncles, etc.). The first floor is reserved for the "brides", together with the third generation grandchildren.

The economic means of the family in purgatory are not sufficient for such a restructuring. For him, everything has to be solved on the same plane and as economically as possible. However, the similarities between these two different socio-economic and cultural classes in terms of floor plan and usage areas are at a remarkable level. The basic factor underlying this is that people have the same social codes on the home-family plane, as an understanding. That is, in the stage of social development, it is the fact that families from different income groups are at the same stage of the agricultural society. Although the family that migrated from the countryside mainly lives on the income it receives from a large industrial institution, it still continues to resist the industrial revolution and the home-family system required by it. Defending and owning first-wave social values and spatial formations is equivalent to protecting the sacred for the family, especially the first generation. However, they do not have a chance to resist the great change that has begun.

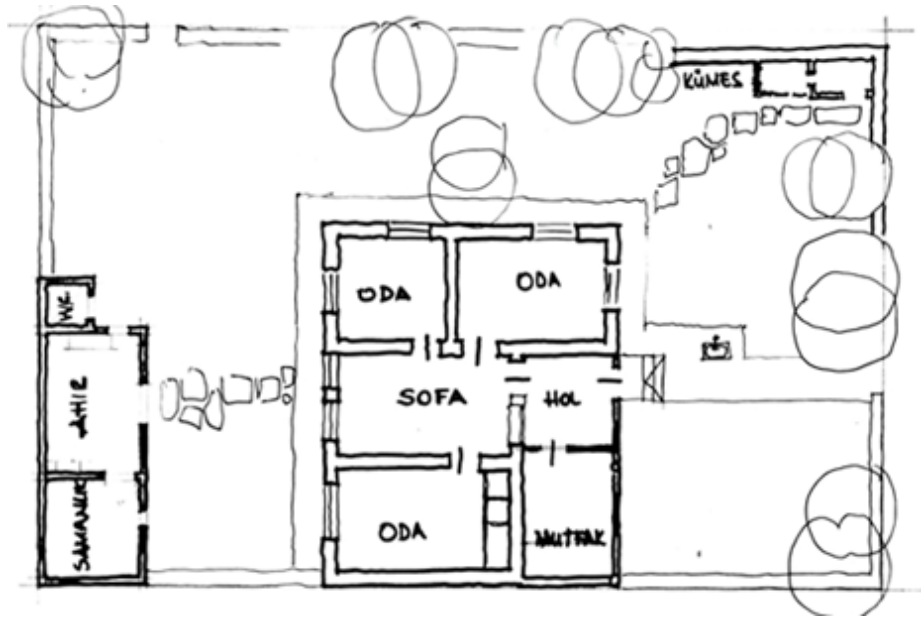

Figure 4: The extended family gathers in the city and as the need increases, the additions increase. While the main space becomes a typical house with a middle sofa, it also produces its own home economy. (heating with a single stove, milk, oil, yoghurt, cheese, egg, vegetable-fruit production, etc.) Sketch: Prof. Dr. Ahmet Alkan.

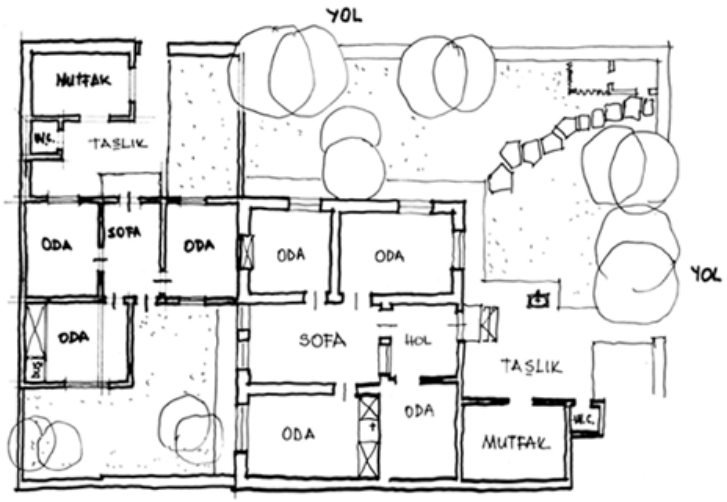

Figure 5: New home for the new nuclear family. No more barns. The Second Wave family definitively initiates transformation within itself. Sketch: Prof. Dr. Ahmet Alkan

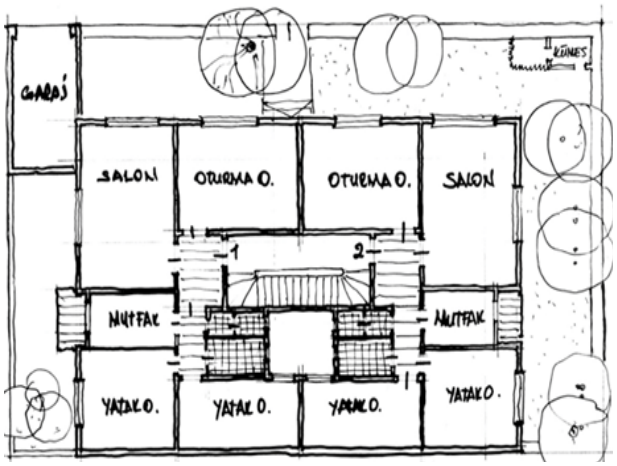

Figure 6: New building first floor plan. Sketch: Prof. Dr. Ahmet Alkan.

Figure 7:

The change begins with the construction of the roof of the stone-built, mud-plastered, flat-roofed house. It is meeting the comfort of a house that does not flow. It also warms up more easily. But the real change is the children who grow up to be typical second-wave people. This generation is the harbinger of a new education, new dreams and a new world and way of life. This is the generation that was born into the agricultural society, grew up and lived in the industrial society, will also meet the third wave and will even desperately defend the values of the second wave against this great revolution. Although some of them completed their lives without admitting their defeat...

The first generation trying to bring the agricultural society they live in to the city with their clothing style, values and behavior patterns, and educated grandchildren who tend to integrate into urban values. They are unaware that they play an important role as the actors who carry the late reflections of the industrial revolution, which has been affecting the world for nearly two centuries, to the suburbs of the city. But nothing is the same anymore. They feel and try to cope. Despite the violent generation gap...

As a matter of fact, with the marriage of the second son in the family shortly after, the eldest child is allowed to leave the house in accordance with the tradition. However, this permission is enough to move to an additional residence to be built in the side garden. If an upstairs room is not available, it is added to the side. At the same time, this is the transfer of the tradition of "making houses with imece", which continues in the rural settlements they came from, to the city. Naturally, the determinant of this structuring is the economy.

This is actually the footsteps of the approaching second wave that started to make itself felt in the family at the same time. But the family, relying on the values of the First Wave, is not yet aware of this. Despite the parents who are fighting to keep the values of their era, to which they are closely attached, the second generation, who takes their education level and specialization to the next level with each new child, have taken their place in the house even if they are not consciously, and they are rapidly changing with their way of life. The family in purgatory has begun to transform into the "nuclear family" of the industrial society. The natural consequence of this is that the house is demolished and rebuilt. At the beginning, two basic approaches collide;

Mother suggests, the construction of four flats permitted by the zoning permit, three of the five siblings to live in these flats with them, and financial support of the rest,

The father aims to build two flats without difficulty with limited means, and to continue the tradition of "the youngest son lives in the father's house" by adapting it to the new situation.

Although it is in a patriarchal fiction, the mother's thesis is accepted as always in traditional agricultural societies (especially in Turkish society). By forcing all the possibilities, the stone building and the briquette building that was added later were demolished and replaced with a new building with two floors, two flats on the floor, a total of 4 flats, each consisting of 3 rooms, a living room and a kitchen (Figure 6-7). The barn is replaced by the "closed garage" later.

But soon there will be no children left to sit here with their parents. Every child who com-

pletes his education and improves his economic situation will leave the "Father's house" to live in better neighborhoods, in better neighborhoods, in more comfortable houses with elevators, central heating and heating, at or shortly after marriage. This is actually the inevitable end. The family succumbed to the second wave, in other words, the industry included the family that migrated from this countryside into its value system. The new members of the modern middle class will seek ways to increase their education and personal development in order to become new members of the technology and information society without being aware of it. The large agricultural family is now in a process where the nuclear family will begin to collapse, individualization will peak, the electronic home will combine work and accommodation, and the changes of these centuries fit into decades.

4. Conclusion

The nuclear family, which broke away from the agricultural big family, has turned to gated communities nowadays. However, these standard and mass-produced stereotype spaces are now pushing the balance of needs and possibilities. At this stage, the necessity of producing new solutions to individualization, which has become the cornerstone of the new social structure, has emerged within the framework of the possibilities of the individual. A pragmatic approach first describes providing this solution by arranging the existing housing production process. Small interventions to the process will both satisfy individual needs and allow different interior applications under the same roof, and will enable us to do this in the most economical way possible. On the other hand, more innovative solutions such as "tiny house", which may be seen as radical by some, are in demand day by day. It seems that there are many personal and social stories to be written and new ones continue to accumulate every day...

Perhaps as Heidegger pointed out in his 1951 article "Building, Dwelling, Thinking" the real drama of housing does not lie in the housing shortage alone, The real drama is that mortals always re-search the nature of the dwelling, that they must always learn to dwell.

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Comprehending the Principles of Measure, Proportion, Scale on the Facades of Historical Buildings in Basic Design Education

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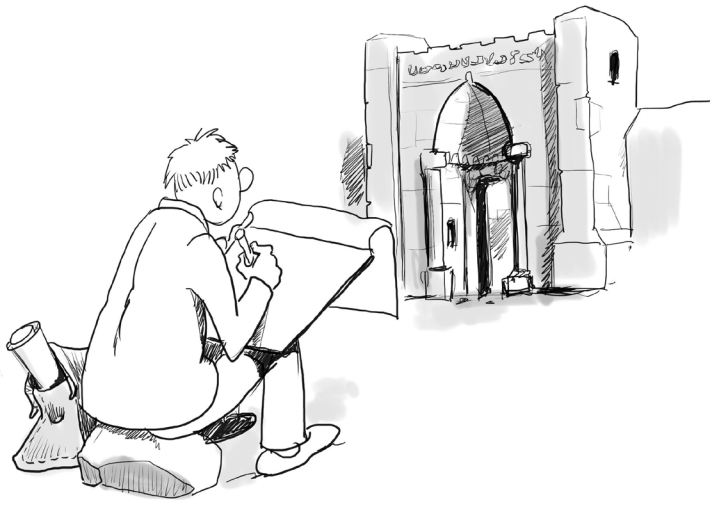
Keywords: Basic Design, Historical Building, Measure, Proportion, Scale

Abstract
The priority of the basic design education given to first-year students of the Department of Architecture is to enable the student to understand architecture and comprehend the basic principles. At this point, the built environment examples given in the course program, content and the examination of these examples according to a certain principle will be able to ensure that the expected output is measurable by providing both situation analysis as design input and measurement of the student's perception and competence. In this study, after explaining the principle of scale, measure and proportion to the students taking the basic design course, in the process of comprehending the subject, each student was asked to sketch the facades of certain buildings in the historical environment, where they could encounter the same built environment and a single building scale. The comments made by the students to each other in the workshop, the criticisms of the lecturer, and the inferences made about the concept through the sketches they made for the given information and problem solving, provided the learning process to be examined after the application. The general inferences of the students after the application of the concept had become clear and after the sketches they had made at the end of the fieldwork had been evaluated in the workshop environment. In addition, this study, which was carried out in the historical built environment, enabled them to experience, in groups, perceiving, analyzing and reading on an existing architectural work with their surroundings on different monumental building groups at human scale.



Introduction

It is a wide area design product from urban scale to space, from works of art to everyday used items. Dener (1998) defines the concept of basic design as "the set of common features related to the basic structure of all kinds of art and design products". The fact that the concept of design, which is so intertwined with life, was taught to professional groups that make design, was started to be given with an academic education carried out in line with certain principles. It dates back to the 17th century (Çetinkaya, 2011). 'Basic Design' education, which has been applied and developed since Bauhaus, is of great importance in architectural education (Erkan, 2006). Basic design in architecture, as a system of thought, is an education in which the principles and elements that guide the student to reach the best while performing their design are taught both theoretically and practically (Atmaca, 2014; Denel, 1981).

In basic design education, after the principles that are aimed to be taught are given, a problem-solving application is expected from the students to understand them (Güngör, 2005). Architecture students who receive design education for the first time are asked to define the design problem presented in the basic design course, to find the most appropriate solution alternatives and to learn it by interpreting it with practice (Kavas, Erbaş, & Danacı, 2016). The analysis of information given in this learning process by students leads to the resultant design product, as a result of research, discussion and reflection, the search for application-oriented sketches, presentation sheets and material for realization (Pazarlıoğlu, 2016).

In design education, the instructor of the course seeks different ways to solve the problem that is presented in line with what is intended to be comprehended. This study deals with the process of teaching the concepts of measure, proportion and scale as a basic design principle to first-year architecture students through an application on the facades of historical buildings. The study focuses on the determinations and inferences for better and more efficient comprehension through the process, not the result products revealed by the students.

Method

The process of the method followed in the study;

1. Giving the theoretical information, showing the applications made on the subject to the student with the demonstration method,
2. Sharing the application problem in line with the given information,
3. Leaving the solution of the method to be followed in the application for the solution of the problem to the student (the student should determine the field boundary and the sample selection),
4. Students do individual research on sample structures before fieldwork and thus the active learning process begins,
5. The student's ability to understand the concept through the building groups suggested for the problem in the field study involving the observation technique and to convey the skills of reading through the built environment by sketching,
6. Examination of the whole process based on the evaluation of the students' experiences in the workshop environment as well as the studies as output can be listed.

In this study, student outcome products are not seen as the output of the course, but only as a step in the teaching process. The students' understanding of the concepts and fulfilling them in line with the expected goals in the application was not based on an evaluation on sketches, but in line with their observations in the field, their own inferences and their sharing with other students in the workshop.

Workshop Practice: Study of Measure, Scale, Ratio on the Facades of Historical Buildings

In basic design education in architecture, measure, scale and proportion are important concepts for the expression and presentation of the designed space, the elements of the building and the perception, and perception of the building by the user and the designer. People perceive their environment according to their own size (width, height). The measure is the uniting of works according to people (Atalayer, 1994). It is an indispensable element of the measure ratio scheme (Civcir, 2015, p. 268). Ratio is a reference result comparison, and the Golden Ratio system created by the Ancient Greeks in history is the most well-known ratio system (Çetinkaya, 2011). Renaissance artists such as Leonardo Da Vinci, Michelangelo and Albert Dürer, the famous architect and city planner Le Corbusier, used the golden ratio principle in their works (Becer, 2013: 69). Objective scale by calculating the physical size of an element according to standard measurement systems; Visual scale emerges when an element is evaluated by its size compared to other elements around it (Özkan, 2007).

Throughout the history of architecture, while creating forms, geometry and proportional system have been used with the concern of reaching the beauty while bringing together the harmony between the building elements and a whole (Gezer, 2014). In the broadest sense, architectural harmony is the ratio between the height and width of a building (Özyalvaç, 2020). In the formation of architectural spaces for centuries; Although factors such as material, color, texture, height and width differ from culture to culture however proportion has never been ignored in facade design (Yılmaz, 2017). In Turkish-Islamic architecture, there is a search for harmony that provides unity and integrity with the elements of rhythm, symmetry and proportion (Özyalvaç, 2020). In the Anatolian Seljuk Period, it is seen that they used the ratio of 2/3 on the front facade and crown doors in architectural structures (Çakmak & Şahin, 2018). In the works of Mimar Sinan, he enriched and enlivened the mass formation and the façade appearance of the buildings with emptiness-fullness and light-shadow plays (Ödekan, 1988).

In the process of teaching the subject in the workshop; In Niğde, students were asked to explore different historical buildings in order to get to know the city, to interact with the environment through observation, to experience the city and space in the built environment and to photograph and sketch in accordance with the concepts of form, size, proportion and scale. The tour route for field study includes Niğde Castle, Rahmaniye

Figure 1. The tour route for field study

Mosque, Alaaddin Mosque, Sungur Bey Mosque, Sokollu Bedesten, Sokullu Mehmet Pasha Bedesteni, Armenian Church, Ak Madrasa, Hüdavent Hatun Tomb (Figure 1). Another factor in choosing this application is to compare the different building groups in the historical environment such as windows, doors, floor moldings, gargoyles, skylights, arches, niches, different building groups based on the top cover and building material, and the building's own units. The aim is to show alternatives in the processes of comprehending the concepts of ratio and scale. The reason why students are left to choose the building within the chosen travel route is to ensure that they first examine all building groups (castle, mosque, church, tomb, madrasah, covered bazaar) in order to solve the given problem.

While evaluating the student sketches of the assignment given in the process of teaching the subject, students who chose the same historical building were asked to explain their work in front of the board at the same time. Thus, the environment for making comparisons with each other and the explanation of the common problems of the lecturer were facilitated. Four sample sketches were selected from each building group, which received different interpretations in the criticisms aimed at making the subject comprehended among the student works (Table 1-2-3-4). The sketches include two sketches in accordance with the concept of measure, proportion and scale, showing information about the history and general architectural features of the building, a photograph from the façade, the representation of occupancy and formal abstraction on the façade (Table 1-2-3-4).

The students worked on sketches on the entrance façade (north) of the Ak Madrasah (Table 1). The dominant element on the entrance façade of the two-storey madrasah is the crown gate higher than the body wall that defines the entrance. The facade-crown door ratio is to the façade is 1/3.55 meters (Doğan, 2013). The importance of the northern façade was strongly emphasized by constructing galleries (sofas) placed symmetrically to the east and west of the crown door and indicated by arches.

west corner of the Citadel on Niğde Alaeddin Hill. They established a ratio between the massive stepped structure of the castle facade and the clock tower. There are rooms that open from the courtyard to the facade with a low arched door. Niğde Clock Tower, on the other hand, was built on an octagonal base with an octagonal body. The tower thins out from the bottom to the top in three stages and is covered with a pendentive dome carried by four stone columns with the help of pointed arches. Stone material was used in both the castle and the clock tower.

Some of the students chose the small-scale Rahmaniye Mosque as a sample and carried out their sketches by concentrating on the entrance facade (Table 3). On the northern (entrance) facade of the Rahmaniye Mosque, the portico courtyard defines the three-eyed arch opening on the columns. There is a minaret with a single balcony in the northeast corner of the mosque. The entrance to the mosque is through a low-arched door and there are two low-arched window openings on this façade.

The students, who chose the Niğde Central Armenian Church, which is dated to the 19th century according to its architectural features, made sketches for the western (entrance) façade (Table 4). On this façade, the dominant elements are the narthex section defined by three low arches and the entrance door, the rectangular window illuminating the gallery floor, and the triangular form brought by the hipped roof as the upper cover. The church is made of cut stone material.

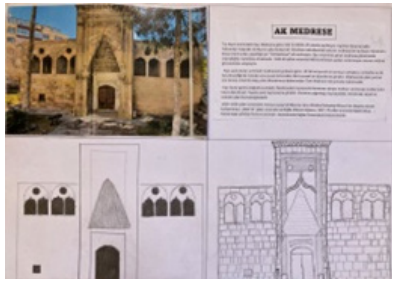
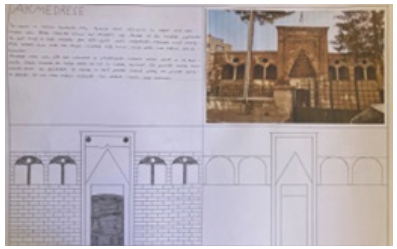
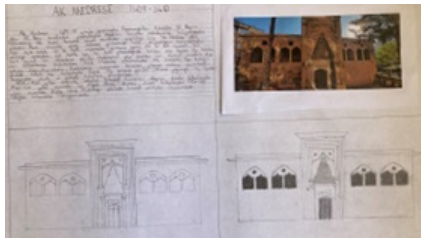
AK MADRASAH		
		
	A. Although there is consistency in the ratios of crown gate and facade height, there are problems with facade width ratios. There are errors in the width of the arches in the gallery and the flattened arch of the entrance door, in the scaling of the arches with each other, in the relationship between occupancy and space on the façade, and the openings on the ground floor are ignored.	B. Although the ratio between the ground floor and first floor heights of the building is incorrect, the ratio between the crown gate and the height of the facade has been achieved, and this ratio has been distorted in the width of the facade. The student, who also processed the stone material in the abstraction work, did not realize the expected abstraction on the facade of the building. He stated that he established a ratio according to the number of stones and worked accordingly.
		
	C. The student's work does not meet the concepts of measure, scale and proportion among the dominant elements of the façade. The height of the crown gate remained flat compared to the façade, and the occupancy-space relationship on the façade was not shown.	D. Although there is a ratio between the facade elements, there are problems in the scaling of the structure in the study. The crown gate is also flattened according to the whole facade and, accordingly, the aspect ratio. The occupancy-space relationship analysis was made, but it did not meet the expectations regarding the abstraction of the elements on the façade.

Table 1. Student sketches on the sample structure Ak Madrasah, workshop criticisms of the students and the lecturer

The students made their sketches in Niğde Castle by taking the bastions of the inner castle surrounding the upper part of Alaeddin Hill and the walls connecting them (Table 2). In their sketches, they showed the 41-meter-high Niğde Clock Tower in the south-

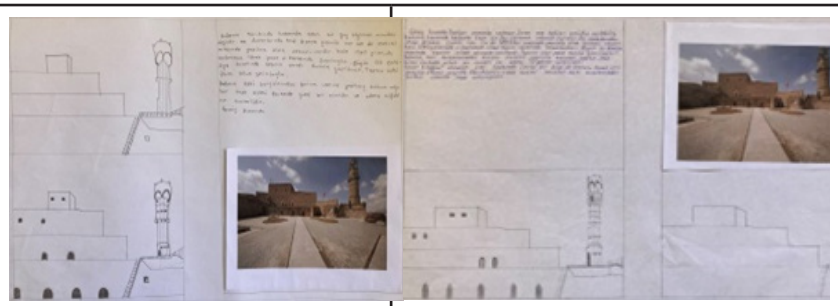
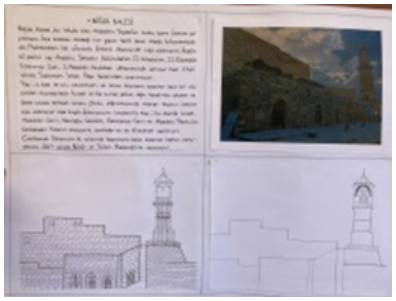
NİĞDE CASTLE		
		
	A. The ratios of the heights of the castle and the clock tower are problematic. When the student was asked how many levels there are in the gradation of the castle, he realized that there is one level more. There are errors in the ratio between the arched door openings on the horse level of the castle and their heights, in all levels. There are inconsistencies in the scale and proportion of the tower, tapering from bottom to top, and the top pedestal.	B. An extra level of the castle is shown in the sketch practice. Although the height ratios of the clock tower and the castle are consistent with each other, there are errors both among themselves and between the elements of the tower in their width ratios. Despite the errors in the general scale in the occupancy-space study, the placement and aspect ratios of the elements (door, window) are more proportional.
		
	C. In the study, the height ratios of the castle facade and the clock tower are incorrect. The castle and the clock tower are not suitable for size and proportion in formal abstraction; There are errors and deficiencies in the drawing of the entire façade and in the number, placement and dimensions of the door and window showing occupancy.	D. Although the height ratios of the castle and the clock tower are consistent, there are errors and deficiencies in the facade abstraction of the two historical buildings, in the number, form and placement of the elevations and in the elements (door, window) , and in the scale and proportion between each other.

Table 2. Student sketches over the sample structure Niğde Castle, workshop criticisms of students and lecturers

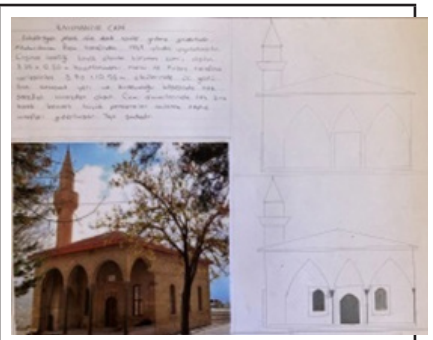
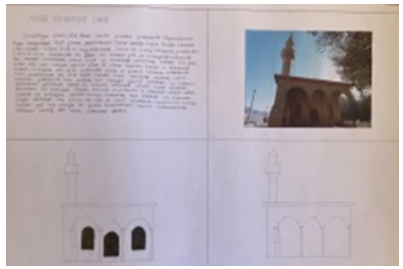
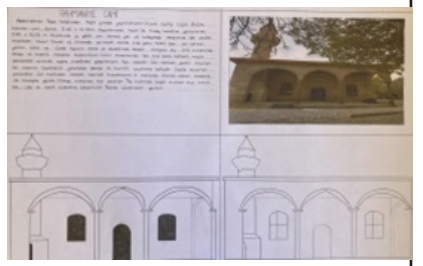
AHMANIYE MOSQUE		
		
	A. Although there is consistency in the proportions of façade and minaret heights and dominant arch openings in the portico courtyard, technical errors in perspective are reflected in the scale. There are errors and deficiencies in the study showing the relationship between the facade elements in the occupancy-space study..	B. There are errors in the student's work in the height of the façade and the minaret, the shape of the arches on the façade, and the proportions with each other. Although there is no deficiency in the elements of the openings at the building scale, which are taken as occupancy.
		
	C. In the sketch study, there is a ratio problem between the height of the facade and the height of the minaret. The height and formal forms of the arches in the portico, which are dominant on the façade, are scaled. Consistency is observed in the scaling and proportions of the entrance door and window openings on both sides of each other in the occupancy space.	D. There are errors in the width and height ratios of the building in the sketch study. The building is flat in the drawing, although the shapes of the arches are consistent in abstraction, the scale problem is observed in the height and width of the arches throughout the façade. There are errors in the dimensioning of the door and window elements that show opening in the occupied space.

Table 3. Student sketches on the sample structure Rahmaniye Mosque, workshop criticisms of the students and the lecturer

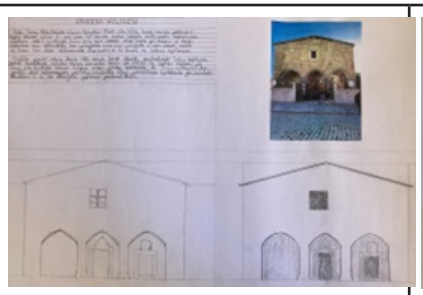
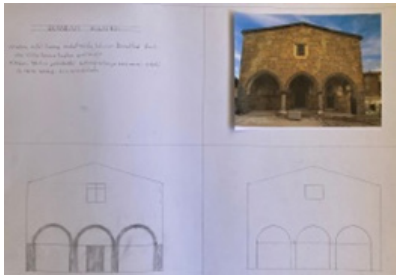
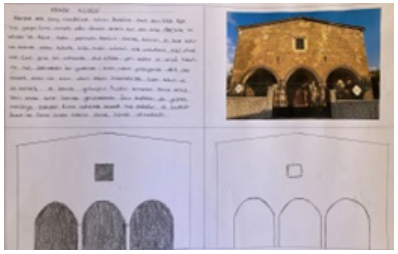
ARMENIAN CHURCH		
		
	A. In the sketch study, there are errors in the measurement of the exterior lines in terms of height and width on the façade, the placement of the arches and the rectangular window on the gallery floor and their scaling with each other. In the arch and door opening, which are proportional to each other, occupancy is shown.	B. In the study, the proportions of the facade elements with each other are appropriate for the facade scale. However, the student did not do the fill-gap study on the expected front.
		
	C. There are scale problems on the front of the study. There are disproportions in the dimensions of the rectangular window in the arch opening and supporting columns.	D. In the study, problems regarding size, scale and proportion are observed throughout the façade. Firstly, the height and width ratios of the arch, the other opening on the façade and the rectangular window and scale problems draw attention.

Table 4. Student sketches on the sample structure of the Armenian Church, workshop criticisms of the students and the lecturer

3. Conclusion

Within the scope of this study, the evaluation made in the basic design course workshop depends on the process-oriented approach, not the result-oriented approach. Because, as Denel (1979) states, the weakest point of the basic design is that the end product takes precedence over the process. Therefore, especially after the application given to the students, the criticisms made in the workshop environment and the comments among the students ensure that the problems arising from the deficiencies in the field of observation arise during the process of comprehending the subject.

The results in the workshop environment, the criticisms made on the products and the students' comments on each other's work for the application process given to be comprehended in the study are as follows:

The students' comments towards each other were more impressive than the application in teaching the concepts suitable for the learning environment and purpose. Instead of criticizing their faulty work, they had told the student that they would like to learn more about their work.

Although they did not have the necessary knowledge of building elements and architectural history as first year students, they were asked to use the knowledge they acquired in the description of the building in the narratives. In practice, they were expected to abstract the facades without going into details. Most students were successful in learning expressions such as arch, column, window, crown door with general research and showing them with formal geometric simple forms. In the application sketches (Table1-d, Table2-d) selected for the study, they did not make abstractions, they tried to show the facade elements with the form and material in accordance with reality.

It was observed that the most difficult group in the studies were the students who worked in the large-scale building group according to their own scale (human scale) and made sketches on the castle and clock tower.

It has been observed that the students who said that they spent more time in the field study explaining their work, reading and comprehending the deficiencies over the structure and over the elements on the facade were faster in the in-class interpretations.

When the students were asked what they would do if they were asked to repeat this study again, it was provided that they would fulfill their individual deficiencies as well as fulfill the suggestions they received from their friends. This feedback received from the students at the end of the lesson during the comprehension process, which continued in the workshop environment after the application, shows that reinforcement and multi-actor learning took place in the study.

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Utilization of the Bionic Properties of Namib Beetle for Water Supply in Desert and Dry Climatic Regions

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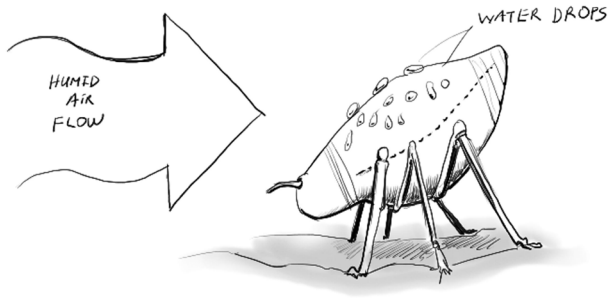
Keywords: Bionic Architecture, Namib Beetle, Water Supply, Dry Climate

Abstract:
The dry and hot countries have very poor water resources, low rainfall and small vegetation. On the other hand, other water solutions have not been seriously investigated before in these areas. In this paper, the aggregation of the water in desert condition with a bionic approach has been studied. At first, the morphological and physiological adaptation of Namib beetle, as the case study of the research, has been analyzed. The scientific and biological basis for the behavior of these beetles is the combined use of two super hydrophilic surfaces to absorb water and another surface to guide the water towards the mouth, leading to the emergence of ideas for collecting water in arid areas. The product of this research will be the design process of the enclosure in the walls of the monuments located in the desert and in these areas by using a porous and super hydrophilic material, which is called the metal-organic framework, the research goals are reached. This research is a qualified-applied research and information gathering has been carried out as a library and collective style.



Introduction:
In recent decades, intensified human intervention in the environment, as well as climate change, has put increasing pressure on the quantity and quality of water resources. In dry and hot countries, where most of its area is located in arid and semi-arid climate and water scarcity, paying attention to water resources management has particular importance. In these countries, in one hand, most of the region surface water resources have been depleted, and on the other hand, the overload of groundwater resources has intensified due to factors such as excessive development of agricultural land. So, the water status has reached a state of water stress and in some cases critical. Providing clean water for future generations will become one of the major challenges in the region, if this process continues. Therefore, it seems necessary to study and provide natural, sustainable and low cost solutions to these problems.
Due to the existing conditions, the desert margins are also moving towards desertification, and alternative ways of accessing the water needed should be explored. Sometimes it is necessary to return to nature and to find ways to overcome it. In this research, morphological and physiological adaptation of some desert biomasses to climatic conditions and nature solutions for water access from humidity in the air will be investigated and will be attempted to achieve natural water by using the aforementioned natural patterns.
Cases and Methods:
In this study, the morphological and physiological adaptation pattern of desert biomasses, as well as the operating conditions of the Namib beetle water supply system, as the case study of the research, will be studied and the components of this process such as super-hydrophobic and super-hydrophobic surfaces will be identified. The study of their industrialization will be inspired by the research pattern and finally how the desert water is extracted by the multicolored mechanism in the future walls of the desert-built buildings will be cleared.
1. Bionic Science:
Asking about nature and how it responds to its needs has always enabled humans to have the most optimal answer to the same issues in their daily lives, because nature has always been the easiest and best way to respond.
The word "Bionic" is a combination of two terms biology and technology. As its name implies, the science of bionics deals with the study of structures and patterns in nature and their use in solving human problems. In other words, bionics means the art of applying the knowledge gained from living organisms to solving technical problems.
It is not a mere copying or mimicry of nature, but rather an accurate modeling of knowledge derived from nature.
The word "Biomimetic" is also very common along with the word bionic. It is also a combination of biology and mimicry, which means imitation. Mimicry is a special word used in biology to study animal behavior. This means that animals imitate certain behaviors in terms of appearance, color, or behavior to improve their performance. Biomimicry focuses on the interactions between organisms and the environment around them.
The mimicry behavior of animals is actually due to their need to adapt to the environment around them, not because of their nature. Both the terms bionic and biomimetic are used in the same sense, and generally mean a way of studying the best ideas in nature and then applying it in everyday life using a tool called technology (Golabchi, 2010).
In view of the above, in the present study, the strategy of desert biomasses for survival in arid and dry conditions is investigated.

1.1 Namib Beetle
This beetle has devised a way to collect water from the fog; the beetle sits 45 degrees below its head and its back is up against the foggy wind. The water accumulates behind this beetle, then flows through its body. The scientific basis of this beetle's behavior has led to the emergence of ideas for water harvesting technology in arid regions (Jiang, 2010).
In 2001, a zoologist accidentally saw a photo of these beetles eating a locust in the Namib desert. The locust, driven by the strong winds of the area, was killed as soon as the sand was hit by excessive heat. However, the beetles had no problem with high sand temperatures. He speculated that these beetles must have sophisticated surfaces to reflect heat, and that further studies of his efforts resulted in significant reports.
While this zoologist's guess was accurate and the beetles reflected the heat, but when he examined and tested them behind them, he thought this was the same lotus effect in the morning water collection process. Much of the insect's back is a rough, uneven surface, tangy and super-hydrophobic. However, the tip of the hump is not a sealant and is water-repellent. These hydrophilic spots absorb water through the fog, creating small droplets. These droplets rapidly grow larger, reaching the point where the gravitational force and the superconducting area around the drop move them away. He found that such a structure was up to twice as efficient as a smooth surface. In 2006, the researchers were able to build super-hydrophilic silica spots on multiple layers of ultra-hydrophobic material, and this became one of the areas of imitation of nature (Masibi, 2009).
According to the rules that examined the structure of water absorption in desert beetles, it was found that the organism uses two different structures in combination to absorb water. The super-hydrophilic structure on the hump tip of the organisms on the back of the organism and the ultra-hydrophobic part as the water-transfer plate, which we will describe below [Fig. 1].

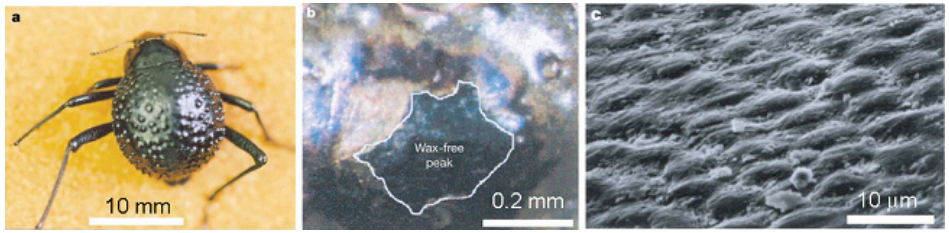


Fig. 1: The water collected in the body of the beetle is affected by super-hydrophilic nanometer (Masibi, 2009)

1.2. Hydrophilic Coatings:
To identify the super-hydrophilic structure on the body of the Namib beetles, we first examine the super-hydrophilic structures in general. Coatings with the ability to disperse water droplets rapidly to the surface and forming a contact angle of less than 5 degrees in less than 0.5 seconds are called super-hydrophilic coatings. The super-hydrophilic property of some materials is caused by light radiation and in some other substances inherently without the need for an external agent (Cebeci, 2006) [Fig. 2].
Under sunlight, water droplets on surfaces such as titanium dioxide create a contact angle of approximately zero. This effect is said to have been discovered by ultraviolet-activated ultraviolet (UV) radiation in 1997 for titanium dioxide exposed to sunlight.
There are currently several mechanisms provided for surfaces that reach super-hydro-

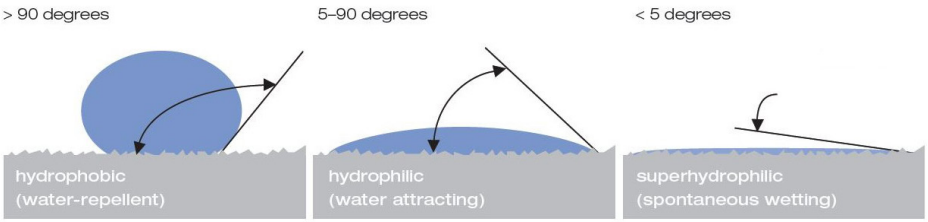


Fig. 2: hydrophilic, super-hydrophilic and hydrophobic profile (Cebeci, 2006).

phobicity by sunlight. One of these mechanisms is the change of surface structure to a non-stable structure. But for surfaces that are super-hydrophilic without the need for light and intrinsically, the process is different. The super-hydrophilic property of these surfaces is due to the nature of the material and its surface energy or is affected by its surface texture and roughness (Wang, 1997).

1.2.1. Approaches to the construction of super-hydrophilic surfaces:

In this section, we will first discuss the super-hydrophobic surfaces in nature that often exist in plants and then describe two common approaches to synthetic hydrophobic surfaces.

1.2.1.1. Natural Hydrophilic Superficial Levels:

Hyper-phosphorylation is a common and widespread species of independent phylogenic plant species throughout the nature. There are also many examples of aquatic plants or macrophytes growing in or near water resources. The above-mentioned hydrophilic surfaces can be divided into three categories.

1.2.1-1.1- Permanent Surfaces:

These surfaces are commonly found in submerged macrophytes that grow below the surface of the water and are immune to drying. Unlike land plants where gas is absorbed and excreted directly around the atmosphere, marine plants should do so in aquatic environments where concentrations, solubility and infiltration rates are all significantly lower. As a result, many marine plants have large, thin leaves with a high specific surface area.

1.2.1-1.2- Water-Absorbing Plant Surfaces:

These surfaces usually have holes, for example the moss surface shown in the figure has a set of holes with a diameter of 10-20 mm on their sponge-like structure through which water can penetrate it. . This ability to absorb and stay moist together with the ability to exchange ions are the reasons for using moss in sandy soil conditions (Zhang, 2014) [Fig. 3].

1.2.1.1.3 Providing Extraordinary Surfaces:

These levels have been observed in several egret (insect catch) plants. At these levels, the rapid expansion of water on the surface due to the loss of special structure reduces the drying period of the plant, which is an indication of the increased season of air and water.

1.2.1.2- Hydrophilic Surfaces Caused by Light Radiation:

Ultraviolet light is emitted to the surfaces of some semiconductors, including titanium dioxide, by the electron-cavity coupling that creates a hydrophilic property by reacting with the surface. The super-hydrophilic cause of UV radiation to the surface can

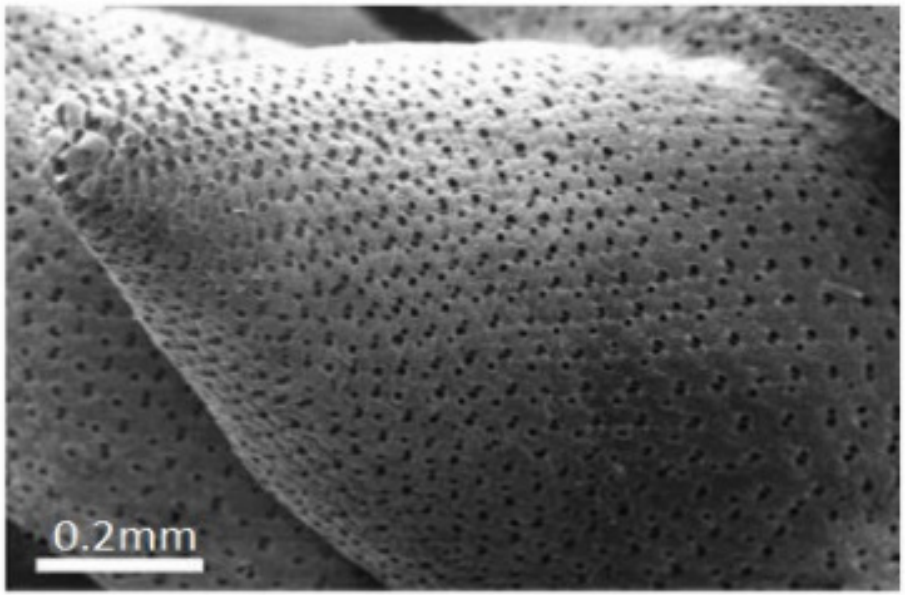


Fig. 3: An image of the surface of a water absorber moss (Zhang, 2014)

be accounted for by electrons and cavities in conduction band and capacitance band (Eshaghi, 2010).

1.2-1.3- Surface Texture:

Surface morphology correction is another way that can be used to construct the surface of the abutment. The hydrophilicity of the surfaces can be enhanced by modifying the surface texture, which includes porosity enhancement and porosity.

It seems that there are many methods and structures for the creation and induction of surface roughness that result in those layers being highly hydrophilic. For example, lithographic texture and porosity can tend to coat the surface with hydro-foam. For example, nano-porous thin-layer can be controlled by a layer-by-layer method of lower contact with silica nanoparticles. The degree and timing of the broadcast was 0.5 seconds. This small tangential angle was attributed to the rapid penetration of water into 3D nano-porous networks (Ishaqi, 2016). It is interesting to note that several studies on the conversion of light-sensitive materials such as titanium dioxide to super-hydrophilic materials without exposure to ultraviolet light have been successfully carried out by the creation of porous structures. Zorba and colleagues developed a hierarchical porous titanium dioxide surface that had sustained ultrafiltration without the need for UV light. The primitive surface of the Namib desert beetle has a super-hydrophilic natural porous structure.

After examining and identifying the super-hydrophobic surfaces, we will continue to describe the super-hydrophobic surfaces that are the transducer surface in the water-harvesting mechanism of desert beetles.

1, Extraction of water from humidity:

Describing the constituent surfaces of the mechanism of action of desert beetles for producing water from the air, here are some of the nature-based solutions for producing

water and one of the simplest methods will be explained.
Water extraction from humidity is any activity that compresses and collects water vapor in the atmosphere. The Middle East, North Africa, China and India have a long history in this case (Sekar, 2007).
Canary Islanders have been using droplets of mist as a source of access to water for about 2,000 years. In ancient Palestine, they also built low-lying honeycomb walls around vineyards to extract water from moisture so they could convert fog and dew into water droplets and use them to irrigate plants. Also, the ancient Greeks in the sixth century AD were able to satisfy the water requirement of Theodosia by extracting water from humidity. In the Atacama Desert, water was extracted from the moisture of the air through rock pipes; they were designed to allow water to pass through the mist every time the mist passed through them. It was directed downward into a central reservoir (Oliever, 2004).

2.1 - Using Curtain Collector, One of the Simplest Ways to Extract Water from Air Humidity:

In a feasibility study of water humidity extraction conducted in south of Sistan and Baluchestan province in Iran from September 1, 2011 till the end of September 2012, the research team conducted a feasibility study to estimate the amount of water extracted from air humidity put into operation.
The results of this study showed that due to the high relative humidity in the southeastern coast of Iran, it is susceptible to water harvesting plans. The average water content

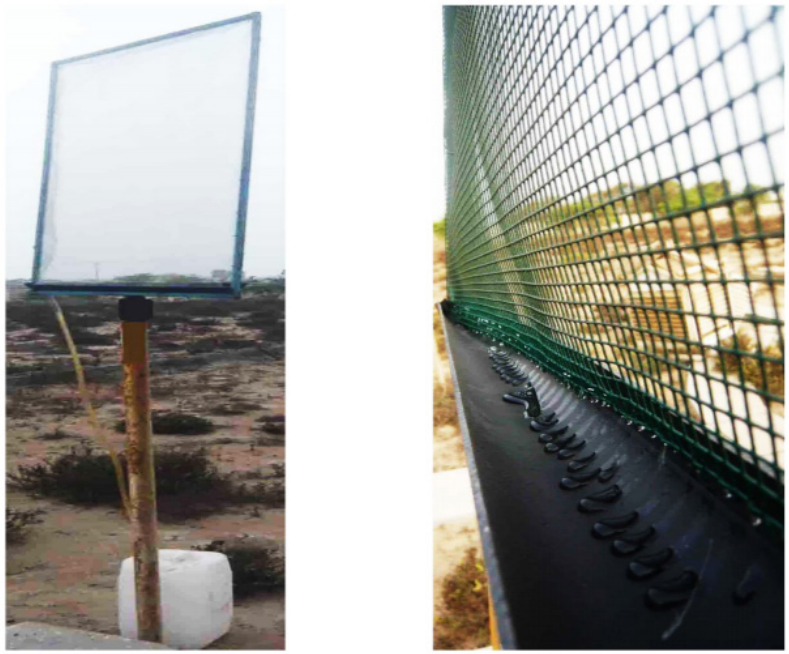


Fig. 4: Scraper designed like curtains (Mahmoodi, 2016).

in one cubic meter of air in the study area was estimated to be 29 grams in the humid state and 1.8 grams in the driest. But since water extraction depends on different conditions and in the best case scenario, not all the moisture in the atmosphere can be collected, field tests and statistics revealed that about 20 percent of the water in the air can be collected in the area. Therefore, according to this threshold, the maximum amount of water extracted was in June with 6.8 liters and the lowest with 1.1 liters in February.
This method is one of the simplest ways to produce water from air humidity, in which the main part is a curtain rack or metal frame. The frame selected for this task is a 1 x 1 m metal frame. The reason for this choice lies in the fact that these dimensions can easily calculate the water output per unit area. Of course, these dimensions can also be smaller or larger. The height of the frame was about 90 cm above the ground, with the bottom side of the frame inserted into a connecting pipe along the length of which the slot was properly fitted. The two ends of this pipe are fully insulated. The pipe is embedded in a gentle gradient of 1% and attached to the lower end of the hose, which transfers water to the tank. Droplets formed on the grid and yarn together form larger droplets and as a result of the earth's gravity, move to the collector underneath the frame and are then driven to a collecting gallon. No unnatural energy is used in this method and only nature is used to produce water (Mahmoodi, 2016).
The results of various studies show that having relative humidity above 70% during the year is the most appropriate threshold for detecting a region's potential for performing water humidity extraction projects. But in the desert, and in Iran in general, where about 65% of the area is covered by dry and ultra-dry climates and generally the relative humidity in the air is significantly below 70%, the above method is a good response to produce water from the air will not be. The low moisture content indicates the failure of the project to collect water from the air using simple methods such as the one above. Considering the dryness of the air in the desert and the necessity of using new methods to produce water from air humidity, the approach to the morphological and physiological structure of desert beetles is again taken into consideration (Zorba, 2010).

2.2 - Molecular Structure of Materials for Dry Air Production:
Water extractors all require special conditions to operate; high humidity or a power supply are the needs of these devices, but scientists are developing a way that even people living in arid and desert areas can access electricity without using it. Researchers at the University of California, Berkeley were able to produce a small amount of moisture in the dry desert air. This is done by powder with a specific molecular structure in which there is an empty space in which a gas molecule such as water can enter and remain in it. This powder is placed in the desert at night to absorb the moisture, then in the day it is placed in a box and placed under the sunlight, thereby releasing water from the sun's heat. Each kilogram of this powder can produce 175 ml or a small glass of water (Fathieh, 2017) [Fig. 9].
Designed in the form of a simple box, without the use of electricity or any additional energy, it can only form the vapor of water and then drinking water by receiving only natural sunlight. Inside the box is a new porous material called the metal-organic framework or MOF. So a chevron that is apparently about the size of a sugar grain will actually have an inner surface the size of a football field. This internal range guarantees MOF's high capacity for steam confinement and water production (Macdonal, 2017).
This will provide the energy needed to reverse weak links. According to him, water extraction is possible even in arid areas, where humidity is 2 to 5 percent. He also noted that the use of zirconium metal in the prototype was for experimental purposes only and was not cost-effective. Outlaw believes that in the future he wants to use aluminum,

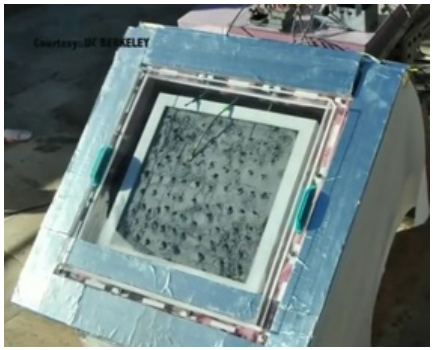


Fig. 9: A system made by Berkeley University researcher [16].

which is cheaper and that output can be doubled (Yaghhi, 1977).

Conclusion:

The use of metal-organic molecular frameworks as porous materials with unique chemical properties as a super-hydrophilic surface can be used to absorb water molecules from the air. It performs the same function as the super-hydrophilic surface on the body of Namib beetles. Placing it in fixed boxes on the walls of the buildings dedicated to it will absorb water molecules during the night when the air humidity is higher.

The best way to extract water molecules in the intermolecular space is to use the evaporation method. In the desert there is abundant sun energy that can be used for evaporation. Therefore, the evaporator must be enclosed in a box in front of sunlight to evaporate the water molecules absorbed in the intermolecular space by sunlight. After separation of water molecules by evaporation, there is a need for a surface to collect water droplets from evaporation. In this phase of the project, it requires super-hydrophobic surfaces to provide maximum performance for the system. For this purpose, using hydrophobic coatings based on nanotechnology is a good solution. By increasing the power of the liquid particles on the surface, water vapor condensation can be performed with high efficiency. This feature can be used to collect water particles more efficiently. This is similar to the performance pattern of the second level skin of the Namib beetle for transferring water to the mouth of this organism.

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