A Study on User Responses to Their Residential Interiors

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ABSTRACT

The thesis is primarily concerned with human behaviour and interior environment through various aspects of personal responses to residential interiors both at physical and psychological level.

The study is composed from key components of human behaviour and perception theory to gain insight on user responses to interior environments. Initial part of the thesis attributes to the process of perception theory by investigating the resources from environmental psychology with the intention of exemplifying the influences of surrounding environment on human responses through their physical and psychological needs. The existing literature comprised in installations from not only environmental design issues but also architectural developments through centring the attention essentially on the emotional comfort issues such as privacy, territoriality and personalization in addition to the functional efficiency issues for better residential places all the way through the facts on concerns to turn out a house to be a 'home' environment for its users.

The following part of the thesis relays on the survey of housing projects which are built in the recent years by selection of user profiles that worked with an architect and interior designer on their residential spaces. Centring on both an exceptional user group that who are householders with high income families living in North Cyprus and worked with special designers, provided an opportunity to achieve an understanding on interaction between user and the designed environments related to their perception and individual characteristics.

The key intention of the study was to establish common features of user group's on preferences, as well as investigating the role that their interior designer played in their surrounding environment. As a pilot study, ten different surveys were accomplished between different user groups.

The findings of the study suggest in a wide range of discussions, by assessing user perceptions concerning the impact of residential interior designs played in achieving a sense of self in personal spaces of users.

Keywords: Residential interiors, user response, interior design, human behaviour.

ÖZ

Tezin başlıca konusu; evlerin ve iç mekansal yaşam alanlarının iç tasarımlarına, gerek fiziki gerek psikolojik düzeyde verilen bireysel tepkileri, çeşitli yönleriyle inceleyerek, insan davranışı ve iç mekansal çevre arasındaki ilişkinin irdelenmesidir.

Tez çalışması, kullanıcıların iç mekansal yaşam alanlarına ve çevrelerine verdikleri tepkilerin iç yüzünü kavramak amacıyla, insan davranışı ve algı kuramının ana unsurları temel alınarak yürütülmüştür. Tezin ilk bölümünde, insanların fiziksel ve psikolojik ihtiyaçları doğrultusunda verdikleri tepkilerin yaşam alanlarının ne denli etkisi altında olduğunu örneklerle açıklamak amaçlanmış;çevresel psikolojinin diğer kaynaklarıaraştırılarak algı kuramının işleyişine atıflarda bulunulmuştur.

Mevcut literatür, sadece çevresel tasarım konularından değil, aynı zamanda mimari gelişmelerden de yararlanarak oluşmuştur; ve bu oluşum, kullanıcıları açısından bir konutu yuvaya çevirme kaygıları doğrultusunda, daha kaliteli ikametgâh alanları oluşturabilmek için işlevsel verimlilik konularının yanısıra, esas olarakmahremiyet, özelyaşam; yaşamalanını korumacılık, sahiplenme ve kişiselleştirme, kişiye özgü kılma gibi duygusal rahatlık, konfor kaygıları üzerine odaklanmaktadır.

Tezin bunu izleyen bölümünde,konutlarını tasarlatırken özellikle hem bir mimar hem de iç mimarla çalışan seçilmiş kullanıcı profilinin son yıllarda hayata geçirdiği konut projeleri incelenmiş ve sonuçları aktarılmıştır. Kuzey Kıbrıs'ta yaşayan yüksek gelirli ailelere mensup hane halkından oluşan seçkin bir kullanıcı grubuna odaklanmak,

kullanıcı ve tasarlanmış çevre arasındaki etkileşimi; kullanıcının algıları ve bireysel özellikleri açısından daha iyi kavramaya olanak sağlamıştır.

Çalışmanın temel amacı, kullanıcı gruplarının tercihlerine dayalı ortak özelliklerini değerlendirerek saptamak; ve bunun yanısıra iç mimarın çevre tasarımında oynadığı rolü incelemektir. Pilot çalışma olarak farklı kullanıcı grupları arasında derinlemesine on farklı araştırma/anyapılmıştır.

Çalışmanın bulguları, konut iç mekean tasarımının, kullanıcıların kendi kişisel mekanlardaki kişilik duygusunu elde etmelerinde oynadığı rölü rafklı tartışmalarla ortaya koymaktadır.

Anahtar Kelimeler: Konut iç mekanları, kullanıcı tepkileri, iç mekan tasarımı, insan davranışları.

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Chapter 1

INTRODUCTION

The first chapter of the thesis explains briefly how interior design profession approaches to the processes of user responses and identifies the problems in the field through the various factors besides the special case of residential places.

In this manner, the problems are defined and discussed in research which is related to human behaviour through physical and psychological needs of occupiers.

The objectives of the study are referred in the following section after the definition of the problem. Finally the research methods and limitations have been cited in order to explain the structure of the thesis in a more clear approach.

1.1 Definition of the Problem

It is widely known that interior designer gains profession with the aim of improving good quality of interiors by providing appropriate functional layouts by choosing right furniture, lighting, material and detailing, besides paying attention to ergonomics etc. The interior designer is also responsible for secondary processes of motivation, effect and development which are the quality issues on human being.

Residential environments are special places that provide complicated relations between users and the environment and generally are considered most problematic interior environment to design. The problem generally occurs where there is variety

of factors which affects user's satisfaction and needs regarding to sex, age, health issues, psychological factors, social indicators and cultural background of the users.

Consequently, residential environments, which are occupied by a family with children, are separated to individual and private parts due to the needs of each user. Each residential space requires individual articulation through personal needs and applications in addition to functional separations such as study space, living room, bedroom and service areas etc. Such personal spaces are symbolic environments that fulfil many needs of family members.

It is a "place of self-expression, a vessel of memories, a refuge from outside of the world, a cocoon where we can feel nurtured and let down our guard'' (Marcus, 1995, p.4). It is also claimed by many researchers (Lang, 1987; Altman, 1975; Quarantelli, 1957; Seagert & Winkel, 1990; Vayda, 1969) that inconvenient applications of interior design elements may affect human behaviour negatively.

In order to achieve expected functional efficiency and emotional comfort in residential spaces, interior designers need to understand human responses in different levels.

As a result, the focus of this research is to determine user responses to specified units of a dwelling in order to exemplify the influences of surrounding environment on human responses through their physical and psychological needs.

The relationship between individuals and their environment is important to analyse for understanding how they perceive space and how they react to it on a professional interior design project.

1.2 Aims and Objectives of the Study

The main aim of this study is to understand and define various aspects of personal responses to residential interiors both at physical and psychological level.

Therefore the objectives of the study are:

- To understand the special role of perception theories for approaching human behaviour and environment interactions.
- To determine patterns of responses that have been carried out by different users in residential interiors to satisfy functional efficiency and emotional comfort needs.
- To consider the interaction between user and designer on implications of designs with regard to similarities and contrasts between user decisions and demands versus designer's.
- Following the question, 'WHO AM I ?' through their choices of personal dwellings (Steggell, Binder, Davidson, Vega, Hutton & Rodecap, 2003) through understanding their sense of self in an interior space in response to create the sense of their personal places that are engaging to user physical and psychological level.

1.3 Method of the Study

The study will be based on both qualitative and quantitative research methods. The research will begin with an introductory chapter to the research topic, discussing its

significance and importance. A following literature review about Human Behaviour and Interior Design interactions will be provided.

During these discussions human behaviour and built environment will be evaluated through interior design elements in residential spaces. Discussions will start with brief explanation about how people perceive their residential spaces through five senses.

In the following chapter the role of interior design elements in residential environments will be discussed through physical and psychological needs. Based on Jon Lang's (1987) formulation, ergonomics and spatial configuration will be discussed under the title of 'functional efficiency responses' and privacy, personalization and attachment issues will be analysed through 'emotional responses'.

In the second part of the literature review, discussions will be centred around recent studies on the development of residential interior designs. In this chapter there will be review of developments regarding interior design as a profession to improve housing interiors.

For the objectives of the study case studies through dwelling units of high-income family groups will be selected and analyses in order to measure their functional efficiency and emotional responses to their residential spaces.

The analysis of the case study will be based on surveys. Structured interviews, semi-structured questionnaire survey and site inspection and recording survey related to

user responses will be conducted. Interviews related to response patterns will be held with selected users.

1.4 Limitation of the Study

For aim and objectives of the study, the research has been limited with the single detached residential buildings located in various cities of the Northern Cyprus, which were built within last 10 years.10 selected houses are analysed in details as a pilot study for the future researches.

10 participants from all 10 houses have contributed to the study. All participants belonged to the high income group. The participants have been selected according to the criteria of hiring an architect and an interior designer during the design process of their houses.

The concern of the study is to investigate the user and environment relationship while discovering the user perception. Thus, the selection criteria of user profile is focused neither on design principles nor theories, but centred the attention on how interior design elements are reflected to participants' demands along with an analysis on whether these choices are addressing the life style and personal characteristics of users.

In this manner, 10 participants are selected from different work fields, but demanding similar basic architectural features such as being the owner of a detached house with a garden that are not renovated but recently built.

The selected participants were divided into three types of categories: young married couples, middle age couples and families with young kids. All participants are grown up in similar kinds of physical settings and same culture.

However participants have individual differences with different personalities. Personal choices have also led to various visual patterns in the indoor environment which have not been referred in detail through the research that was out of the scope of this study, but discussed implicitly.

The objective of the study is not to reveal design approaches of residential projects. Therefore the intention of the study is to discover what influence user to make some certain decisions.

Around the research; the residential units are referred as a physical structure which is considered like a place which becomes a territory, locus in space, self and self-identity in everyday lives of occupiers. The symbolic and representative nature of residential units is examined briefly.

Within this respect, the research aims to provide theoretical foundation for later studies besides providing a morphological model of a ‘home’ for interior designers for designing residential projects.

1.5 Structure of the Thesis

The thesis has been structured as it is represented in Figure 1. Below:

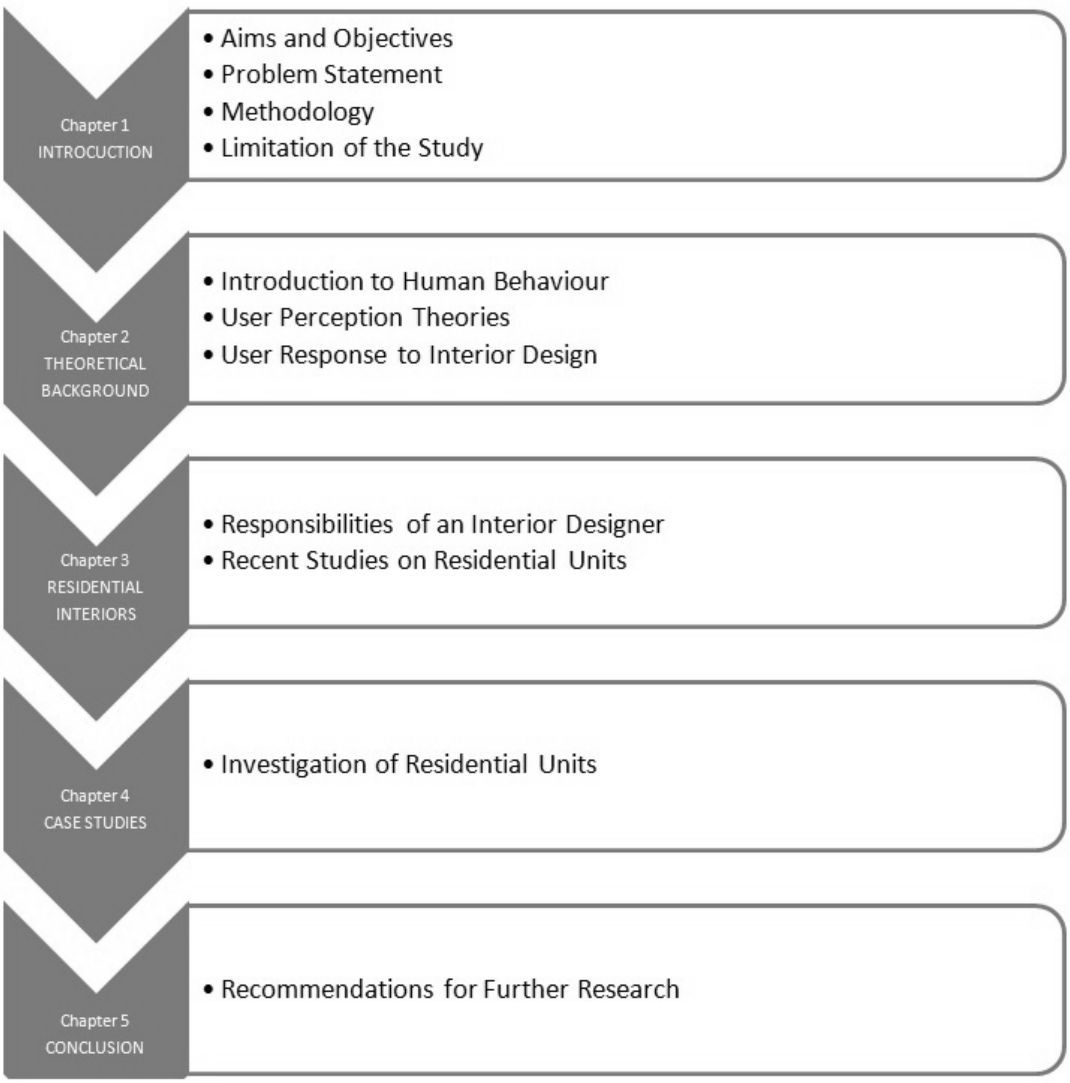


Figure 1. Structure of the Thesis

Chapter 2

INTRODUCTION TO THE THEORY OF HUMAN BEHAVIOUR AND THE ENVIRONMENT STUDIES

In the following chapter the main research area of thesis is comprehensively examined in the course of literature review through individual chapters. First of all, the relation between human behaviour and interior environment is explained, and then an introductory chapter is referred under the title of *Human Behaviour*.

Human behaviour is such a broad field from environmental psychology. Therefore it is important to cite which aspects of the field are going to be examined through the study. Thus, operational definitions have been made before anything else in order to explain the interaction between the physical arrangements with its user.

The most important part of the literature review constituted of approaches of main scholars in the field, such as Gibson (1979), Lang (1987), Moore (1979), Krampen (1997), Rapoport (1990), Nasar (1997), Altman (1974) and several others have been investigated and compared in between each other.

Consequently, latest researches about the theory have become the centre of the attention for the research. Thus, key intention of the study is described through behaviour and environment interactions in the course of categorizations under typologies from those scholars such as theories of ‘Perception’, ‘Cognition’ and ‘Spatial Behaviour’.

Information gathered from literature review has been provided with the consideration of intentions through various reasons which are convenient with perception, cognition and spatial behaviour.

Perception theory has been referred in a wide range in the following chapter. The theory has extended preference of theories on visual and sensory experiences from philosophy to architecture. Many distinctive theoretical approaches occurred from various claims about explanations. Thus, a detailed overview from the theoretical approaches is essential in order to clarify the issues in perceptual research such as Gestalt Theory, Ecological Approach to visual perception and Haptic Theory which are explained in detail in the following sections.

After examining theories on perception, the various levels of user responses to designed environments are introduced. In this manner, first body of the chapter aimed to analyse processing of information and second part is focused on how those information obtained and reacted by the observer. User responses could explain how users become familiar with their environments and purposefully react to it. Finally the survey is conducted to how the built environment could illustrate significance on interaction with its user.

Hence, the theory is aimed to be supported by many scientists and designers in order to explain how perceptions can lead different definitions of living conditions. In this manner, impacts of physical environment qualities and physiological illustrations between user body and mentality discussed accordingly such as functional efficiency

and emotional comfort approaches such as privacy and crowding, personalization and territory at the final part.

Those observations mentioned above described accordingly to experimental and structural perceptions that are involved in sequence of the actual perceived information in terms of physical or social organization of the world.

2.1 Human Behaviour and Interior Environment

Everyday environments in which human spend time accordingly to their needs, show leading evidences with their behaviour while investigating the effect and relationship of surrounding environment of human physical, social and mental life (Seamon, 1993). In order to understand the interaction of the physical arrangement with its users, a holistic approach is essential. Therefore, it is important to make operational definitions of the 'environment' for the human and his/her surrounding's reciprocal relationships as an initial step.

The word definition of 'environment' is precisely described in any clarification as 'surround' by some scholars (Gibson, 1966; Ittleson, 1973). The meaning in the act of 'surround' clarifies the essence and concern of environment issue that should be connected with the object that is surrounded (Lang, 1987). Hence, the function and concept of surrounding environment should be considered with the involved components that are connected to the interior environment.

Accordingly, the primary component of the environment should be considered as its user; since human nature is distinguished through the abilities to think, learn and act both in physical and social life (Adler, 1928). The ability to think, learn and act

related to their capacity of mind and the capacity of their mind related to process of human conscious within a progressive act (Donald, 2004). It is claimed through researches that the progressive act of conscious human activities are surrounded with the physical environment and the objects which displays messages from the unconscious decisions of people about who they are, who they were and who they might become (Marcus, 1995).

The physical environment is not only impressing spatial behaviours of its user, but also influence human life both in social and psychological manner. Understanding the importance of human behaviour and adapt physical supplements in response to those issues might help designers to further out their role in human life cycle with their designs.

In addition to psychoanalyst approaches from Freud and Erikson (1950), observation of the essential facts formed via numerous people like Gibson (1979), Lang (1987), Moore (1979), Krampen (1997), Rapoport (1990), Nasar (1997), Altman (1974) and several others.

All built environments are designed in the sense that they embody human not only decisions, but also choices which help to modify the world in some purposeful way (Rapoport, 1969). Due to uncertainty of defining themselves, individuals may hire interior designers to help clarify and objectify their identities through design (Miller & Schilitt, 1985).

Therefore there is need to better understanding of the process of motivation, perception, cognition and affect so that interior surroundings would better able to structure environment to satisfy human activities and aesthetic values (Lang, 1987; Gibson, 1979; Moore 1979; Rapoport, 1990; Krampen, 1997; Nasar, 1997). In addition to psychological influences of environmental impulse on human behaviour, sociological processes are also affect the interaction such as 'privacy', 'territoriality' and 'crowding' which also needs to be considered for human behaviour and interior design studies (Rapoport, 1969; Altman 1975).

Existing human behaviour theories can illuminate the concerns of human behaviour (Lang, 1987).The judgement of attachment between individuals and their environment is depend on considerations how environment influence user actions. Those environmental influences directed by user him/herself with individual differences of distinctive aspects of sociological needs and psychological state, which is related user perception of space and those user perceptions turn into mental and physical reactions to the environment (Rapoport, 1969).

In the following paragraphs user's perception of interior space and user's response to interior space will be discussed accordingly with 'consideration that the people are in the heart of surrounding' (Ittelson, 1970:84).In addition to Ittelson (1970), other theorists such as Eysenck (1941), Ashby (1954), Birkhoff (1933) and Maslow (1954) accepted the influence of behaviour on environment.

The aim of the chapter is to explain those issues and theories according to human behaviour that are related with the designed environment in terms of spatial-physical

dimension of environment through social-psychological factors (Bonnes & Marino, 2002). During the following discussion, spatial-physical and social-psychological factors will be explained according to the 'environmental perception' and 'cognition' approaches (Patricios, 1975).

However, it should be noted that there are many different theories regarding to the perception, cognition and spatial behaviour. In presenting these theories, the emphasis will be placed on what an interior designer need basically to know in order to clarify positive environmental design theory. The discussion will proceed from motivation to perception to cognition and affect to spatial behaviour to the subject of individual differences in behaviour (Lang, 1987).

2.2 Human Behaviour

People valued in qualities of physical organization through human environment within a building qualified as interior designers because of generally having the knowledge of aesthetic principles, spatial arrangements, materials and detailing. However, those people who work in the field of interior design face with the issues about human aspects in addition to the physical environment factors which might not specifically considered during the education. Those human aspects considered by Irwin Altman as *behavioural mechanisms* which have psychological, emotional and social needs to be satisfied in addition to the physical desires (Altman, 1974). According to Altman (1974), those aspects of behavioural mechanisms are achieved in various sequences, controlled by needs and perceptions related with intended levels.

Hereby, interior designers handling with compounded set of perceptual, cognitive, motivational and behavioural processes additionally to the physical issues of design act once the environment is designed and has begun to be used by people (Altman, 1974).

The process between human and environment is such a complex interaction that design theories are insufficient to explain the influence of designed environment on human behaviour. Designing environment involves in human life more than only a physical environment that various kinds of behaviour come together as a combination (Altman, 1974).

However, those issues could be developed by the designers only if studied in collaboration with researchers and then those interior designers who pay attention to psychological, emotional and social needs of customers could become aware in various levels of behaviour.

In order to understand the effect of built environment on human through regulating perceptual, motivational and behavioural processes, a link between design field and behavioural sciences is essential. If features of user demand, aspirations and behavioural patterns of perceptual-cognitive-motivational states could be established, the designer could then take advantages of on both environmental and behavioural skills in a combined model (Altman, 1974).

Consequently, latest researches about the theory have become the centre of attention on approving the behaviourism through (Krampen, 1997; Nasar, 1997) as follows;

(i) In what way of the surroundings of user awareness,

(ii) The sense of the surroundings in place of personal perception,

(iii)The predictions of different user.

In addition to Gibson (1966), Hall (1971), Altman (1974), Lang (1975) Krampen (1997), Nasar (1997), Moore (1979) and Moleski (1974) also have described behaviour and environment interactions through categorizations under typologies such as Perception, Cognition and Spatial Behaviour.

'Perception' is a course of action that is resulted from a group of information gathered from the surrounding environment during a mental progress which is on the route of 'cognitive' thinking, remembering and feeling as well as presenting a 'spatial behaviour' layout that supply the essential movement through a building where individuals seek to accomplish their objectives (Hall, 1966).

Cognition can be defined as the set of process that enables people to gain information about their environments such as learning, memory, reasoning and problem solving (Goswami, 1988). Cognitive records help people to code information from the relative attributes of the physical environment (Tolman 1932, Moore and Golledge 1976). Cognitive records are a vital part of people's everyday behaviour which is showing the spatial orientation of a person (Downs, 1973).

Spatial behaviour, along with the cultures and subcultures, is range in reactions. Those reactions play an important role on human spatial behaviours that it is precipitated architectural forms in a physical setting (Aiello, 1976). Thus, the design

of a physical setting is under control of the user reaction and those users are under control of culture that originating their behaviours (Altman, Rapoport & Wohlwill; 1980).

For instance, Sommer (1974) has stated that traditional cultures generally in a harmony with their architectural forms through considering the weather and cultural traditions of their country. On the other hand; cosmopolitan and multi ethnic cultures are categorized through a less consideration of 'appropriate' architectural design (Altman, Rapoport & Wohlwill; 1980).

In this manner, the connection among spatial behaviour and the built environment is a multifaceted issue. Thus, three potential models of the purposeful associations among human behaviour and the physical environment have been stated by Wohlwill (1970).

1) The ecological background bounds the particular behaviour or behaviour patterns that can take place into.
2) The merits with the purpose of discrimination of particular settings influence equally the behaviour and the personality of users who dwell in.
3) The setting provides as a motivating strength that possibly will effect in each tough feelings or attitude, approach or avoidance behaviour or adaptation.

Several behavioural scientist and designers such as Altman (1975), Sommer (1969), Zeisel & Griffen (1975) have supported that functional designs which are provided with the consideration of intentions through various reasons might be convenient in

spatial behaviour. For instance; if furniture combinations organized in a way which can simply to be assisted in either a larger group communication or small subgroup meetings (Aiello, 1976). When those kinds of approaches applied to a physical setting it would allow spatial behaviour of user more flexible and easy to modify through changing circumstances.

Hall (1966) stated users from different range of cultural groups vary in their spatial behaviours which are reflected from altered norms that are ruled the use of space within different societies (Hall, 1966). Therefore it should also be noted that differences in cultures show leading evidences about how people actively use space and outline a physical setting in order to control their social interaction (Hall, 1966). Hence, diverse perceptions of spaces lead to different definitions of living conditions. People from different cultures, inhabit different 'sensory worlds' with interpersonal spatial usage serving to regulate sensory stimulation (Aiello, 1976).

Proshansky (1978), on the other hand, stated that people who grow up in similar kinds of physical settings would develop common ways of coping with their physical environment. Different settings will produce different demands, create different challenges and provide different levels of satisfaction. In this manner, behaviour influenced perceptions through subjected occasions (Lawton, 1975). Such individual differences reflected in various needs of users (Marshall, 1970).

Different people might have altered considerations to various elements and patterns through a similar environment (Lang, 1987). Individual experimental studies show a variety of linkages between personality and visual pattern preferences (Lang, 1987).

Several concepts from Cooper, 1974; Lang, 1987; Rapoport, 1969; Moore, 1989; Jung, 1954; Brent, 1995; Blunt, 2006; Cieraad, 2006; specified aspects like character variances adjustment of people. Those aspects of environment emphasized by Rapoport (1969) as indicators of individual differences as the user's culture, previous experiences, childhood memories, self-expressions and personal needs which are influencing the form of built environment. Consequently, users with different perceptions and expectations respond in a different way to different physical surroundings according to their background and environmental aspects.

Perception is affected either by environmental impacts or within user brain set in motion through a vision on mind which is influenced by the impressions people previously have. This situation can be explained by investigating individual differences through emphasising diverse users remark and perceive alike incidents in a different way (Joseph, 2010), which will be detailed explained in the following section.

2.3 User Perception of Interior Space

Perception has a wide range of theories on visual and sensory experiences from philosophy to architecture. Thus, theories are barely capable to explain the essence of perception individually and require much deeper analysis in between each other. However, the generated ideas are consistent in spite of being distinctive in theories.

Accordingly, it should be investigated as articulated concepts in order to be a veritable synthesis. Thus, an overview from the theoretical approaches is essential in order to clarify the issues in perceptual research.

Many distinctive theoretical approaches occurred from various claims about the explanations about processes of perception according to distinct theoreticians such as Gestalt psychologists; Ecological Approach to Visual Perception, Haptic Perception and many more (Gibson, 1966; Lang, 1987; Neisser, 1976; Pallasma, 1995). There have been numerous efforts to illustrate and clarify the process of perception, but the common idea about perception is claimed to be a knowledge-driven process, particularly a constructive development (Gordon, 2004; Lang, 1987).

However, each theory handles the aspect in different details through different ways and in the end two basic theories has been placed either focusing on response of sensory experiences or on senses though dynamic and interconnected systems; Gestalt theory and Ecological Approach to Visual perception.

Among many assumptions, Gestalt theory has impact on design theory more than any other perception theory whereas information-processing theories are the base for the inscriptions on aesthetics of people (Lang, 1987). Gestalt theory argues that the basis for the combination is the natural association of sensory inputs to the brain, whereas information-processing theories recommend that there are computer like processes in the brain (Lang, 1987).

Thus, the primary challenges on theory aim to clarify how to sense information is based to the theoretical components of perception which locate together in the brain (Lang, 1987).

In distinction to these conjectures in the environmental approach of James Gibson (1966, 1979) and Eleanor Gibson (1969), which put forward that perception is information base and not to be mystified with the information-processing artificial intelligence models of perception. Then Ulrich Neisser (1977) approach followed through the theory of schemata as being a "connecting link between perception and the higher mental processes" to the basic theory.

During the recent years, haptic theory of perception has been also started to dominate the studies regarding to the design issues. In the following paragraphs main theories which are influence the practice of design will be introduced.

2.3.1 Gestalt Theory

The initial common theory of perception related to design that needs to be addressed is Gestalt Theory which is a formal theory and leaded by pioneer psychologists; such as Max Wertheimer (1880-1943), Wolfgang Köhler (1887-1967) and Kurt Koffka (1886-1941).

According to Gestalt theory, the centre of attention of the knowledge is to investigate unitary occupations throughout stressing the weight of composition in perception (Lang, 1987). In order to be accomplished in unitary functions, Gestalt theory calls attention to the substance of configuration in perception (Lang, 1987). The theory focuses on pattern perception, organization and expression in order to understand models of form, isomorphism and field forces (Lang, 1987).

Form, isomorphism and field forces are the crucial impressions of the Gestalt theory of visual perception (Lang, 1987). Form is considered such a fundamental issue that

placed separately as a closed and structured factor in the visual world (Katz, 1950). Köhler (1929) claims that form as a physical figure that is materialized as a spaced out substance and followed by the ground which give the impression of lengthen without disruption like an identical flat surface (Lang, 1987).

The psychologists that are followed Gestalt theories assembled a directory recording of features that influence the perception of form (Lang, 1987). Seven features of the directory recordings about perception are essential elements to environmental design theory since they enlighten the assumption to a large extent that concerning how components in the surroundings are perceived (Lang, 1987). Those components are accepted as the 'laws' of proximity, similarity, closure, good continuance, closeness, area and symmetry (Lang, 1987).

Proximity is the basic order of configuration (Hochberg, 1964). As mentioned by Gestalt theoreticians, elements, which are tight to each other, give the impression of assembled as one visually, the corresponding proximity proposing the slightest opposition to the connection of sensory units (Lang, 1987). This law is demonstrated in Figure 2. The rows and columns are perceived with equivalent straight forwardness in (a), but in (b) the patterns are comprehended as a set of rows.

(a) (b)

Figure 2. Law of Proximity (Source: Lang, 1987)

The basic order of proximity is capable of turning out to alternative features of organization as shown in the Figure 3, which demonstrates the law of similarity through elements contain similar features as size, texture and colour. Those features perceived tentatively as single components as in (a) rather than (b).

(a) (b)

Figure 3. Law of Similarity (Source: Lang, 1987)

However those elements could be perceived through a conflicting situation under some circumstances as demonstrated in the Figure 4, which feasible to impress an organization supported by either similarity or proximity. The situation has been examined by artists as one of tension (Lang, 1987).

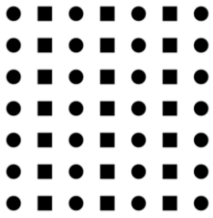


Figure 4. A Conflict between Laws of Proximity and Similarity (Source: Lang, 1987)

There is also law of closure among Gestalt principles of visual organization, which referred those visual components, have a tendency to be closed in one piece as shown in Figure 5 (Köhler, 1929).

The pattern in diagram (a) tends to be seen as a completed circle and (b) as square. The openings in the figures seem insignificant or extremely important depending on one's focus (Lang, 1987).

(a) (b)

Figure 5. Law of Closure (Source: Lang, 1987)

Furthermore, the law of good continuance lead one's perception to perceive continuous elements as single units as shown in the Figure 6 (a, b, c, d, e) which are in different two dimensional layouts yet representing same organization.

For instance, Figure 6 (a) is a combination of lines that are crossing each other rather than as being two individual letters of 'L'. Also, Figure 6 (b) is perceived accordingly to the law of continuance in different layout through the repeating rectangular forms on the background although the figure tends to be closed form as in the law of closeness.

Another continuance perception is shown in the Figure 6 (c) as two dimensional forms which is divided into two on a single plane but still perceived as one single form.

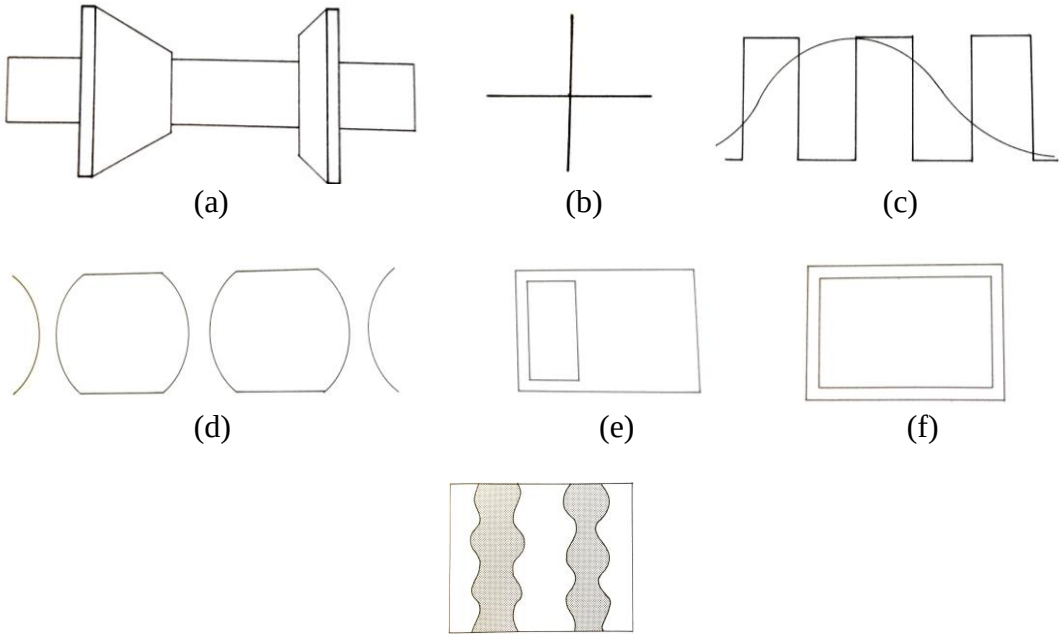


Figure 6. Law of Continuance by Hochberg (1969), (Source: Lang, 1987)

The law of symmetry refers that more symmetrical a closed area is more looks like a figure (Gibson, 1987). Besides, the law of closeness proposed an image through the parts of blocked outlines which is perceived as pieces (Gibson, 1987). Accordingly figure 6 (d) which has the figure with a bunged outline is perceived as an individual part however when the figures entwined together such as in figure 6 (e) and 6 (f) perceived as one figure but in figure 6 (g) when entwined forms are shaded the figures perceived as they are ahead from the bright area (Lang, 1987).

Once those laws are put in plain words in stretch of isomorphism, which is a theorized parallelism among the structure of fundamental neurological development and the configuration of the perceptual understanding (Köhler, 1929).

Rudolf Arnheim (1965) stresses that when those forces are practiced through visual things it could be judged through the psychological correspondent of physiological forces which are dynamic in the brain core of vision. In spite of being a physiological

progression through intelligence, the substances are the items themselves (Lang, 1987).

Reconsidering mentioned facts in short, Gestalt theory put forward that the entire act of perception is controlled by statistics (Lang, 1987). Beyond the prototype lines, planes and objects which are materializing definite 'dynamic' aspects, those forces are also come into sight as if they are moving or being heavy or light which will be clarified more detailed in further pieces (Lang, 1987). Those similarities in form of organisms have been explained by isomorphism which will also be demonstrating in the following parts under the perceptual practice of human neurological process (Köhler, 1938 and 1969). Accordingly, the process generated the foundation for the Gestalt theory of expression in art and architecture (Arnheim, 1949, 1968 and 1977; Levi 1974). As reported by Gestalt theory, those expressions have objective relations with visual patterns which are leaded the perception of pattern (Lang, 1987).

Conversely, the theory of isomorphism has been found controversial and the examination has been brutally confronted in later times by many theorist such as R. L. Gregory (1966), Lashley, Chow and Semmes (1951)and Gibson (1966, 1979) who claimed that sufficient verification for such brain practice is barely available and the method of determining the possessions is extremely problematic. Thus the properties are hardly possible to discern that the process is vastly speculative (Gregory, 1966).

Hereby, one could claim that Gestalt theorists contemplated on the connection between configuration people's nervous system and perceived objects (Köhler, 1938, 1969) and they referred to such communication is speculative outcome as issue of

isomorphism (Albertazzi, Tonder & Vishwanath, 1966). Even though some theoreticians such as Gregory (1966) focused that the Gestalt view of isomorphism does not engage a "picture in the head", in which brain formation accurately reflects the stimulus but as a substitute it engages an additional efficient protection of information. Certainly, "the picture in the head" was unambiguously abandoned by Gestalt theorists (Köhler, 1938) and belatedly by the others (Shepard, 1968; Lang, 1987).

The Gestalt idea of isomorphism can be reliable through the concept of second-order isomorphism which is controlled by the literature on mental imagery (Lang, 1987). Sheppard referred to conservation of practical information in imagery as second-order isomorphism and recommended that such isomorphism is a sign of internalization of geometry and kinematics (Sheppard 1975, 1984 and 1994).

Accordingly, the specified 'field forces' are the psycho-biological stresses that endow with form of lines and planes. Isomorphism is such the term that is revealing the parallelism among the form of fundamental neurological processes and the map of the perceptual experience. Gestalt theory consequently proposes as to a figure is an embodiment of forces (Lang, 1987). Thus visual dynamics are not subjective associations. They precede perceptions of pattern. Today the theory of isomorphism used to explain the principles of visual organization (Gregory, 1966; Gibson 1966 and 1979).

To sum up these principles or laws, which are proximity, similarity, closure, good continuance, closeness, area and symmetry, basic concepts of the Gestalt theory have

always been explained under three categories such as; Form, Field Forces and Isomorphism as mentioned early at the beginning. Form is what stands apart from its background. Field forces are the psycho-biological forces that give expression to lines and planes. Isomorphism, on the other hand, is the term used to explain the parallelism between the form of underlying neurological processes and the form of perceptual experience. Thus, Gestalt theory suggests that a form is a demonstration of forces and Gestalt psychologists believed that a single principle underlies all these leaning of perceptions take the most stable form under the fact (Lang, 1987).

Although the outcomes from Gestalt theory plays a key role equally in psychology and environmental design, a large amount of tentative confirmations suspected the argument such as Gregory (1966), Lashley, Chow and Semmes (1951). Moreover, several issues about the processes of perception have been more thoroughly concentrated on more recent theories such as The Transactional Theory of Perception which centring the attention to the role of experience (Lang, 1987).Perception itself has been regarded as being a transaction in which the environment, the perceiver and the perception are commonly in charge to one another (Lang, 1987).People describe their perceptions either experimentally or structurally, according to studies within the transactional approach (Ittleson, 1976). The important contribution of transactional theory to environmental design theory has become the acknowledgment about what perceiver consider in the environment through what aspects significant to them (Lang, 1987).

During more contemporary researcher, a parallel and at least moderately paradoxical theory of visual perception has been expanded by the approaches of Gibson (1979)

which oppose the Gestalt theory of isomorphism and the transactional understanding of the function of experience in perception and stressed the ecological approach to visual perception (Lang, 1987).

2.3.2 Ecological Approach to Visual Perception

For an extended period of time in research on perception, three approaches of affirmation have been presented such as; nativism, empiricism and Gestalt theory. The nativist approach explained the perception in a relation with a philosophical theory that is accumulated in an innate event and could not be learned later; but empiricism is influenced with past experience during the perception process which is out of the scope of this thesis.

As explained in the previous section, Gestalt theory, which has been influenced the theories of design deeply than other two theories, claims it to be a spontaneous organization in brain (Köhler, 1929; Koffka, 1935; Wertheimer, 1938; Ellis, 1939; Noe and Thompson; 2002). However "there is no independent evidence for such brain process and no independent way of discovering their properties. If there is no way of discovering their properties then they are highly suspect." as stressed by Gregory (1966: p.89).

The origin of the previous analysis's are based on human awareness to surrounding environment that belong to a person's subjective illustration in a social environment which is result of a transmission from a correspondent to a recipient but perception is a transaction in which the environment, the observer and the perception are mutually dependent on each other (Ittelson, 1960; Reed, 1986; Lang, 1987; Noe and Thompson; 2002).

In this manner; Gibson (1979) claimed that perception is not only a subjective theme and asserted an emphasis on not only human values (Reed, 1986) but also the properties of environment that observer live in (Gibson, 1947, 1950 and 1966; Goldstein, 1981). That is to say, the focus of perception theory on Gibson approach is to keep observers in contact with their surroundings rather than focusing on a translation of the physical world into a significant environment (Reed, 1986).

Hence, Gibson (1979) proposed an absolutely dissimilar approach from the common method of perception proceed in psychology and philosophy. Gibson (1979) used the environment as an investigation instrument through examination of perception theory which consecutively guide to a narrative view of 'person - environment' relationships with major suggestion for psychology (Bruce, Green and Georgeson, 2003). These conceptualizations of the environment and person has been distinguished revolutionarily through an 'ecological approach' which become a particular term in studies in environmental behaviour design (Heft, 1981; Kaminski, 1989; Krampen, 1991; Mace, 1977; Landwehr, 1988; Lang, 1987; Neisser, 1976,1990; Reed, 1988, 1996; Reed & Jones, 1979; Turvey 1977).

Gibson's theory of perception has been forwarded in his three books; Perception of the Visual World in 1950, The Senses Considered as Perceptual Systems in 1966 and his final book of The Ecological Approach to Visual Perception which is published in 1979 and demonstrates the concluding outline of his aim (Goldstein, 1981).

Table 1. Development of Gibson's Ecological Approach to Visual Perception

The Visual World (1950)	**The Visual World and The Ecological Approach (1979)**
No distinction between stimulation and information	Explicit concept of information in stimulation
Retinal image concept used	Optic array concept used
Sensation-based theory	Information-based theory
Perception corresponds to stimulation	Perception does not correspond to anything
1:1 correspondence between world and 'total' ordinal image	Impossibility of 1:1 correspondence demonstrated
Uses S - R concepts	S-R Concepts rejected
Retinal Image treated as the stimulus for vision	There is no stimulus for vision. Retinal image is irrelevant for functional vision
Meanings can be contributed to perception by the mind	Meanings (affordances) are discovered
Form Perception as important	Form perception as relevant only for picture perception
Problem of the 'constancies' taken as fundamental	Rejected as false problem
Frozen retinal image and gradients given priority	Changing optic array priority

(Source: James J. Gibson and the Psychology of Perception, 1979: p.283)

Gibson's theories carry diversity of issues in between each other as mentioned in the three publications; however those issues ended up by focusing on a single theme; 'human ability to see the world as it really is' (Reed, 1986). The final theme is concentrated on the direct perception which is claimed as a central issue for psychology by Gibson (1950) despite many psychologist ideas which are claimed that people are not aware of the things around them and just aware of their subjective representations, products of sensation memory and imagination that created by brain and mind (Helmholtz 1867, Reed, 1986).

The approaches on understanding of visual perception have settled through the function which provides human an awareness of the surrounding world (Bruce, Green and Georgeson, 2003). Surrounding environment of a physical setting of surfaces and objects has an immediate impression on an observer through their shapes, movements or identities. Modern vision science has been working on visual perception to understand how such impressions are obtained from a fluctuating pattern of light on the retina (Bruce, Green and Georgeson, 2003). Although the wise knowledge from physiologist has been settled on nerve cells on retina, there is a gap on how the visual system works and failed in explaining vision for the study of perception (Gibson, 1961).

In this manner, Gibson (1961) rejected the approach from modern vision science that take retinal image as a starting point of visual processing and took an ecological geometry as starting points with an emphasis on 'ground' issue which all vibrant lives and 'moves around' on it. To a large extent of the moment in time, individuals occupy in actions such as walking, handling objects or communicating with other people.

The entire performances have need of body movements which inhibited by some information that achieved through the observer's perception (Bruce, Green & Georgeson, 2003). Thus, perception is obliged to a further action than a course of personal imitations of the surrounding (Bruce, Green & Georgeson, 2003).

The ecological approach scheduled the problems of vision that Gibson expected to determine as;

1. Perceiving environmental layout (Inseparable from the problem of the ego and its locomotion),
2. Perceiving the objects of the environment (Including their texture, colour, shape and their affordances),
3. Perceiving events (and their affordances),
4. Perceiving other animals and persons ('together with what they persistently afford and what they momentarily do'),
5. Perceiving the expressive responses of other persons,
6. Perceiving by communication or speech,
7. Knowledge mediated by artificial displays, images, pictures and writing,
8. Thought as mediated by symbols,
9. Attending to sensations,
10. Cultivating of cognitive maps by travelling and sightseeing.

(Spring, 1971; Reed, 1986).

Within this context, the ecological approach tries to answer not only how people see the environment around them with its surfaces, layout, colours and textures but also where they are in environment and how their perception is affected by the cause of

their movement (Gibson, 1961). Ecological psychology is concerned with the relationships between organisms and their environments (Nermudes, Marcel & Eilan, 1998).

Although vision is based on a retinal image, ecological approach handle the aspect through emphasizing the connection of eye with brain, brain with head, head with body and body with the environment through the suggestion from Gibson as 'natural vision depends on the eyes in the *head* on a *body* supported by the *ground*, the brain being only the central organ of a complete visual system' (Gibson, 1961: p. 4).

The view of visual processing challenged and the ecological approach is referred in 1950 rather than emphasizing qualities of the retinal image, the information has been put forwarded which is available in the visual environment to an active observer (Gordon, 1997). It has been accused that perception is a direct act of process that the perception cannot be mediated by a process of inference and cannot be constructed from sensations (Gibson, 1950). According to this approach, relations in the environment have been emphasized such as;

a. '*Optic array'* which makes objects visible;
b. Size judgement in relation to the amount of background *'texture'* covered by object;
c. *'Motion of the observer'* that gives rise to optic flow and
d. *'Affordances'* that gives meaning to perception act (Gibson, 1950).

Optic array is information in light, not in nervous impulses (Noe & Thompson, 2003). The information in light is engaged in geometrical projection through an

indicated examination rather than being in a communication between a sender and receiver (Noe & Thompson, 2003). It is outside the observer and available to him, not inside his head (Noe & Thompson, 2003).

The patterns of light reaching the eye can be thought of as an optic array containing all the visual information available at the retina. This optic array provides unambiguous information about the layout of objects in space (Goldstein, 1981).

The foremost question of Gibson's theory was about why things look as they do (Gibson, 1950). The acknowledgement is established through the consideration from the psychophysical attitude of the connection between various changeable aspects in stimulus (Gibson, 1950). The basic simulation of a visual surrounding is recorded as surface and edge which are claimed as primary vibrations of a space that need to be exposed. They are all mentioned in requirements of the retinal image which apparently taken in the sense of light stimulus and stimulus-gradient (Gibson, 1951).

As the optic array flows around the observer, the textured gradient of the perceived things gives information about distance, speed etc. The perception involves almost little or no information processing by cognitive system. For this reason, Gibson's theory relies on action or movement. The point to which observer is moving and the horizon in relation to the height of the person is important. These invariants help to maintain size constancy.

The retinal images or the forms projected by objects to the eyes are not specific to the sizes, distances and shapes of their sources. The size and shape of a retinal image

will change with movements of the observer or with object motions (Malebranche, 1980).

A dynamic perceiver who gathers messages from the environment such as the concept of movement, which follows anatomic sensual surveys and also the concept of affordances is explaining the perception through properties of environment that observer live in (Gibson, 1947, 1950 and 1966; Goldstein, 1981). Explaining motions as starting point in terms of visual perception, Gibson (1950) states that an enlightened surrounding is consist of the ray of lights that unite at a direct location which is controlled by the surface features and those surface forms are being transformed through the observer movements of eye, head and body in order to perceive finer details (Lang, 1976). Thus, an active observer is essential who is constantly moving his or her eyes, head and body relative to the environment (Goldstein, 1981) with the remarkable performance of moving that constructs information obtainable from the surrounding (Reed, 1996).

Gibson (1966) demonstrated that the conversions in the optic array illustrated by a moving observer concurrently identifying a trail of locomotion (perspective structure) and the constant environment (invariant structure) (Reed, 1996). Therefore, Gibson (1966) put emphasis on the dynamic nature of the act of perception and how essential is the act of movement (Reed, 1996). According to this model, Figure 7 illustrates that when a person moves through the environment, one panorama after another will be perceived in response to movement such as moving from room to a room in a building (Lang, 1979).

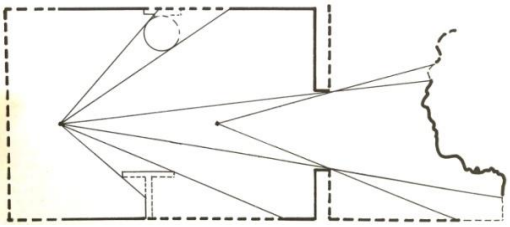


Figure 7. The Occlusion of Surfaces in the Optic Array (Gibson, 1979)

Along with Gibson's ecological approach, what an observer perceives is an extension of the affordances of a physical surrounding. The concept of Gibson endow with a theoretical outline for new impressions of significance and importance of the surroundings (Burtt, 1954). Those significances influence user activities in addition to their perception and mental development. If a physical environment does not support the needs of user, subsequently the user of the space would be aware of the circumstances through shifting the physical setting or adapt their activity to the settings (Kahn, 1977).

Consequently, affordance term lead the meaning to attach particular meanings to visual information (Reed, 1986). Gibson rejected the theory that long term memory provides meaning and he argued that the potential use of an object is directly perceivable such as the impression of a ladder that 'affords' climbing up or down while a chair 'affords' sitting on the other hand (Gibson, 1979).

If an observer does not recognize an object without also perceiving it, then the unitary act of perception is an awareness of an explicit connection among the person and surroundings (Reed, 1986). A single object may yield different affordances to different people, not because affordances are subjective however because they are functional, related to the observer as well as to the environment.

As Gibson referred “an affordance cuts across the dichotomy of subjective-objective and helps us to understand its inadequacies. It is equally a fact of the environment and a fact of behaviour. It is both physical and psychological, yet neither” (Gibson, 1979a: p.129).

'Affordances' is a representation of environment that consists of affordances for not only a realization but also aids that can be perceived in conjunction with the use of perceivers (Reed, 1986). Gibson was inclined with the assumption of affordances in an arrangement all the way through the consideration of information, strength of mind as well as modification would make possible him to go beyond the earliest discuss among subjectivity - objectivity issues and to determine the mind - body dilemma (Reed, 1986).

Accordingly, it is claimed that affordances were neither subjective nor objective (Gibson, 1979). Gibson's approach is featured by an observer and a surrounding's connection with the entire environment (1979). The affordances are not being considered as only relations among two aspects, but also as particulars of the surroundings of all observers that can be used by particular observers (Reed, 1986).

Gibson considered the values as elements of a physical setting of living things which are neither physical nor mental and conceived of mental life as the awareness of the affordances of the environment (Reed, 1986), rather than referring the mental information as possible paths of achievement as Berkeley, Helmholtz and more recent cognitive psychologists have done (Miller, 1960).

2.3.3 Haptic Perception

The act of design is not only a physical act also controls psychological phenomena in the wake of its conception such as motivation which is resulted by a 'sensitized consciousness' to everyday experiences (Hall, 1994). Thus, architecture can be considered as a setting that users place themselves in the range of sensual perceptions through their embodied experience and memory (Boyle, 1994).

In consequence of human acts which they spend their time accordingly their purpose in a surrounding environment through a process, all senses work collectively and then provoke definite feelings and perceptions to arrange in a certain experience which is a cover-all term for the various modes through which a person knows and constructs a reality. According to Tuan (1977) "these modes range from the direct and passive senses of smell, taste and touch in order to active visual perception and the oblique system of symbolization". From beginning to end, a progression of suggestive illustrations used to explain all the senses and their relationship about how they communicate to a space and for that reason Pallasmaa makes the method recognized in which the non-visual senses are collapsing users into a space and become an element of it in addition to vision (Boyle, 1994). To Pallasmaa, "The skin reads the texture, weight, density and temperature of matter... the tactile sense connects us with time and tradition; through marks of touch we shake hands with of countless generations" (Pallasmaa, 1994: p.33).

Pallasmaa addresses the perception theory through *Sensory Perception* which also has been examined by Joy Monice Malnor, Anna Barbara and Anthony Perliss as well (Boyle, 1994). He gives an opinion to people who work in design and

architecture field to consider physical setting of an environment with the intention of design through sensual considerations which are actually in a material form of memory and thoughts of users that are communicating with user through a sensual body (Boyle, 1994). Mainly, for the most of the people who work in design field, organize their physical settings through considering vision factor dominantly; however architecture and design are such fields that involved in all senses from beginning to the end through spatial perception (Holl, Pallasmaa & Gomez, 1994).

Architecture has been claimed by Pallasmaa (1994) in a way that it can be experienced and perceived in all seven senses as combined perception that gives an observer a total experience of a space if they are able to recognize the facts. During the design process to feel the space through sounds, scents and tastes in addition to feelings perceived by the touch of hands on materials through skin, muscles and bones moving through a space is essential as much as the visual aesthetics of a space (Pallasmaa, 1994).

On the whole, facts of sensation and perception through their causes and processes have been investigated diagonally by branches like philosophy, psychology, physiology and psychophysics in the course of cognitive conjectures (Song, 2009). People associated in scientific investigations put forward not only about how those senses can be identified but also how it experienced to perceive them in addition to explain how they afford sensory messages (Goldstein, 1996).

Gibson (1966) was an investigator about the courses of cognitive conjectures who described the expression of senses earlier than Pallasmaa (1994), Malnar and

Vodvarka (2004) as a system of user perception which provide an observer a mixture of sensation.

As mentioned in the previous chapter, Gibson has put forwarded the claim that the senses can get messages from objects from the surrounding environment a part from an involvement of a cerebral course of action (Gibson, 1966).

Haptic perception endow with a sense of concentration in an environment that allocate observer through a combined interaction of body - environment which is a creation from mind that is an outcome from the combination of the altered sensory components (Bresciani, Drewing & Ernst, 2008).Throughout the haptic interaction with daily situations; haptic perception hinges on sensory indicators which are occurred by unconscious messages such as contact forces, torques, movement of objects, mass or weight of objects, stiffness of materials, geometry of objects (Torre, 2008).

Accordingly, human haptic perception is a process that combined with objects, surfaces and environmental properties through their materials as being rough, soft, heavy or light; geometry of shape and size and also through their movements (Bresciani, Drewing& Ernst, 2008).

The perception, which derives from haptic interaction, is relied on the physical aspects according to the perceiver's nervous system (Torre, 2008). Thus, to facilitate a complete evaluation of haptic perception, the stimuli need to be controlled throughout the experimental communication with the environment (Torre, 2008).

However the parameters from the haptic perception are complicated to determine and organize throughout the experiments. Thus, many important aspects of haptic perception stay barely explored until recent times (Torre, 2008).

The haptic theory concentrates on the sense of touch through a framework of a completely active human observer in order to evaluate the connection between skin and external space relative to perception. The evaluation of tangential sensory receptors takes place in skin, muscles, tendons and joints (Lederman &Klatzky, 2009), which will be explained initially.

The theory on haptic awareness is considered as a perceptual system which is intervened by two afferent subsystems such as cutaneous and kinaesthetic that most naturally engages in dynamic physical discovery (Lederman & Klatzky, 2009). While vision and audition are documented for affording vastly accurate spatial and temporal message, correspondingly, the haptic system is particularly efficient on dealing with the qualities of surfaces and objects (Lederman &Klatzky, 2009).

Thus, the attention is given to the behavioural investigation that has concentrated on the phenomenology and functionality on haptic perception related to occupation in neurosciences (Kandel, Schwarts & Jessell, 2000; Square, 2009). Haptic perception; in other words Sense of touch is in a row of facts from physiology to themes of communication, cognition and representation (Heller & Schiff 2009). The psychology of touch combined with coetaneous and kinaesthetic information (Revesz, 1950). In the course of haptics, observer manages to gather messages from

surrounding materials which are dynamically influence them, with covariant coetaneous and kinaesthetic participations (Gibson, 1966).

The cognitive or emotional components of tactile experience give the impression of being diverse from visual experience and may not operate in same direction through differing from several corresponding precepts (Day, 1990; Over, 1968). There is undoubtedly that observer responses are awakened by sight; but, on the other hand, to perceive environment with all senses, an observer needs to use sense of touch which especially indicate an object's characteristics from additional aspects as being hard, soft and also thermal sensations (Lederman & Klatzky, 1987). Consequently, sense of touch possibly will engage in behaviour through perceiving and representing confidence that several observers previously put an emphasis on vision or audition (Heller & Schiff 2009). Also, Berkeley (1994) suggests that visual and auditory experiences are related with tangible ideas which lead people to learn how to associate visual and auditory experiences together with sensory performance (Lederman & Klatzky, 1987).

Physical factors on perception theory are inspired by the function of movement (Katz, 1989; Revesz, 1950). In addition to Gibson's (1962, 1966) argument on the concept of movement Gibson (1966) also emphasized the distinctive feature between active and passive touch (Lederman & Klatzky, 1987). In accordance with Gibson's claim, touch is an inactive act if the observer stay still and active touch is composed of movement which allocates the perceiver to achieve objective messages from surrounding environment (Lederman & Klatzky, 1987). Thus, an observer can

convey messages from environment by intended movements which are claimed as central issues in perceptual theory (Lederman & Klatzky, 1987).

On the other hand Neisser (1976) is well-known along with those who declare that psychological study often be deficient in ecological strength (Lederman & Klatzky, 1987). Despite the theory of Gibson (1979), Neisser claims that the act of touch is active itself (Lederman & Klatzky, 1987).

The sense of touch has chronological foundations through several of academic regulations. Theorist and philosophers have extended negotiations about the consistency of the senses, the connections along with vision, touch and audition and the relative assistances of learning and instinctive aspects to perception. Katz (1987), Revesz (1997) and Gibson (1979) have a major impact on research on touch. A common thread running through their work is the emphasis on importance of hand movement for perception.

In the case of touch, textures are the most common feature in the field of design theory that needs to be considered well with the application of surfaces that users commonly lay a hand on such as wood, woven, fabric, fur, leather and other materials to accomplish warmth, smooth, tough and other touch sensations (Malnar & Vodvarka, 2004).

Smell, on the other hand has a physically powerful relation with feeling and manipulate an observer activity (Yu, 2009). Odour is such an important motivational aspect in human behaviour that has a significant function in behaviour model (Yu,

2009). The act of smell has an effect on human mind which can lead to specific behavioural response through emotions, feelings and motivation (Yu, 2009). Tuan claims that "Odours lend character to objects and places, making them distinctive, easier to identify and remember" (Tuan, 1977; p.11).

For instance, Floor (2006) assures that coffee shops, candle stores, perfumeries, bakeries and lots of other stores are characterized by the smell of their products as part of their environmental experience. Specific fragrances perform precise functions such as the feature of energy alertness of peppermint and lemon as the tension reducing aspect of lavender (Iwahashi, 1992).

Sound also has powerful relationship with observer emotions. Pocock stresses that "Sound not only surrounds but can penetrate to the very core of the sentient. This primitive power, which bypasses the cerebral and directly addresses the heart, elicits an emotional response" (Pocock, 1989: p.194).

The sense of sound enhance sight sensory perceptions though a link which has a protective and enriching function that the lack of sense of hearing effect on vision to be a reduced amount of contrast, attractive and enlightening (Southworth, 1977).

Accordingly, the sense of hearing enhance an observer's awareness on spatial organization (Tuan, 1977: p.16) In this manner, awareness on spatial experience lead observer to be more significant to remember the surrounding space the he or she contributed (Pocock, 1989).

Pallasmaa (1994) referred that observers communicate with the compositions and objects around them through sound. Sound allocates perceivers to visualize a space without really seeing it.

As Steven Holl claims; "The live reflections of echo and re-echo within a stone cathedral increases our awareness of the vastness, geometry and material of its space. Imagine the same space with carpet and acoustically softened. A spatial and experiential dimension of the architecture is lost. We could redefine space by shifting our attention from the visual to how it is shaped by resonant sounds, vibrations of materials and textures" (cited in Ramussen, 1962).

Finally, the development of perspective approaches leads the sense of vision to the focal point of the perceptual world (Pallasmaa, 1994). Sight not only affects users physically and psychologically, but also has strong association with other senses. When an user touch something that he or she does not see they try to determine what they are touching with the sound, smell and taste of the object (Song, 2009). Lindstorm (2005) mentioned that sight often overrules the other senses and has the power to persuade observer against all logic. Through the visual sense, all the spatial elements in an environment will have a role in perceiver's impact (Song, 2009).

Various approaches has been stated according to environmental experiences those that related to human perception and in the end the claim proposed with the intention of the experience of user should be considered both through a physical and psychological state in a spatial interaction which is derived by user needs (Lang, 1987; Maslow, 1987; Sommer, 1969).Robert Sommer(1969), Edward Hall (1966),

Ittleson (1979) Abraham Maslow (1987), Gibson (1987), and several psychologists step forward on individual settings and assessed the process in cooperation with not only user perception but also understanding of user needs (Sommer, 1969).

Therefore user's behaviour after perception of the space will be introduced during the following chapters.

2.4 User Response to Interior Environment

After examining the relationship between individuals and their environment about how they perceive the space, this chapter aims to explain how user reacts to the interior environment according to their perception.

In the earlier chapters, perception issue has been discussed according to different approaches as becoming aware of a space by the essential messages such as sight, hearing, smelling, touching and tasting. In order to evaluate the mental processing of the sensory information cognition term is need to be examined which is involved in. Then those responses and reactions arouse in spatial behaviour patterns of its user from the information obtained from perception and cognition (Lang, 1987).

User response is evaluated through the environmental practice and user perception in the sense of identification of the human-environment relationship about how users become familiar with their environments and purposefully react to it according to their needs and motivations (Lang, 1987).

User needs are originated through a hierarchical consideration by Maslow (1954) which is shown in a pyramid in Figure 8 and provide a foundation for the

understanding of human needs in a surrounding environment. Physiological needs have been put forward initially such as appetite and security requirements, belonging and esteem desires, actualization and cognitive needs as well as aesthetic desire (Maslow, 1954).

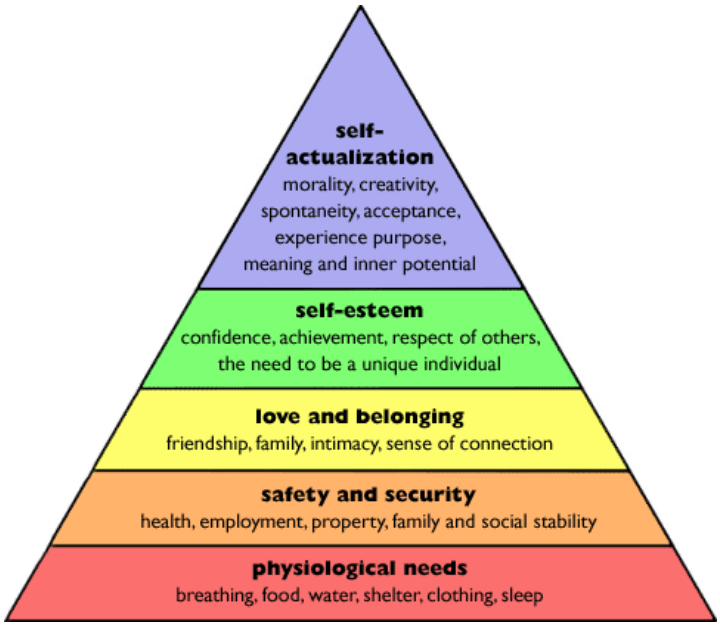


Figure 8. Maslow's Hierarchy of Needs (Source: Psychological Review, 50, 370-396, Maslow, 1943)

Maslow theory's claim is with the intention of fundamental needs that are being satisfied earlier than latter needs become significant because user's minor needs are not dynamic until major needs are fulfilled (Glassman & Hadad, 2009).

Therefore, the pyramid is provided with the most fundamental needs at the bottom under the title of physiological needs which are related to the physical needs of the user of the environment including functionality, ergonomics, life safety and health concerns in design stages.

After basic order of human needs are satisfied such as sheltering, hunger and thirst then the safety requirements followed by social needs of user with other people and finally personal requirements are fulfilled (Maslow, 1943).

In addition to Maslow's approach on human responses, Gibson (1966) analysed the essential development of human behaviour over a model which is concentrated on individuals that are in charge with the concealed aspects on behaviour responses at the scale of buildings. The basic process involved in the interaction between people and their environment are shown in the Figure 9. The model shows that the messages from environment are received through a perceptual process that are leaded by schemata and motivated by needs. These schemata are neither entirely instinctive nor academic, but arrange a connection between cognition and perception through not only emotional but also spatial behaviour (Lang, 175).

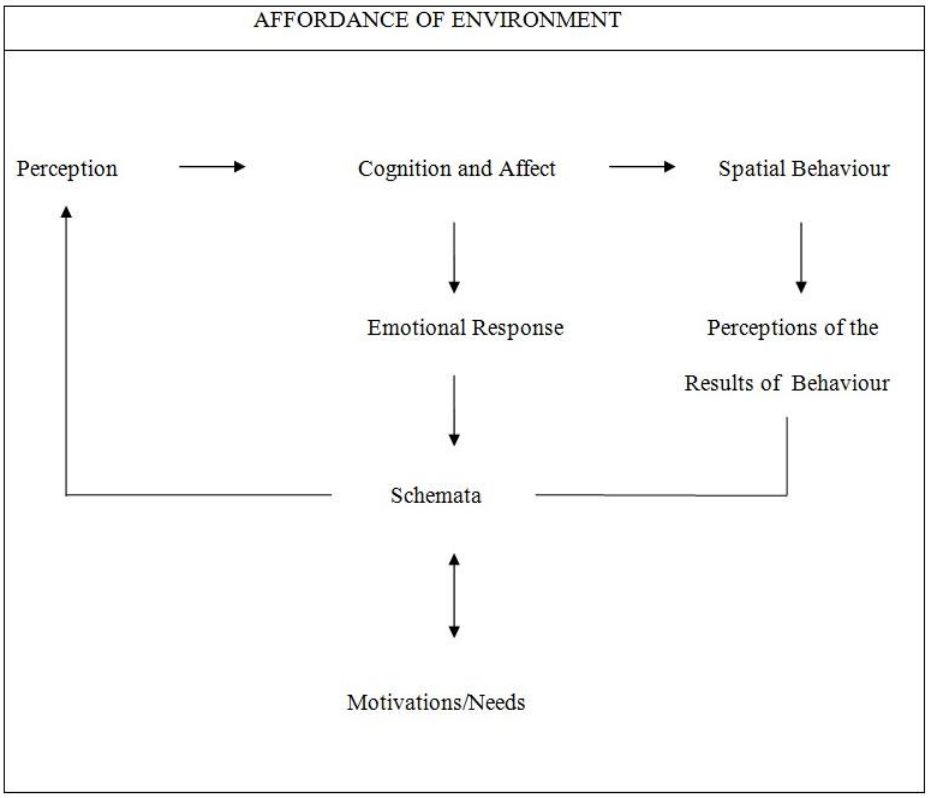


Figure 9. The Fundamental Process of Human Behaviour (Source: Gibson 1966)

Hall (1971), on the other hand, has been put forward the major purposes of architectural environment in three methods as illustrated in Figure 10. First of all, it preserves the physiological condition essential to maintain actions and behaviour; then, the essential behaviour backgrounds are made accessible; and finally; with the help of symbols, psychological conditions are being supported (Nasar, 1997).

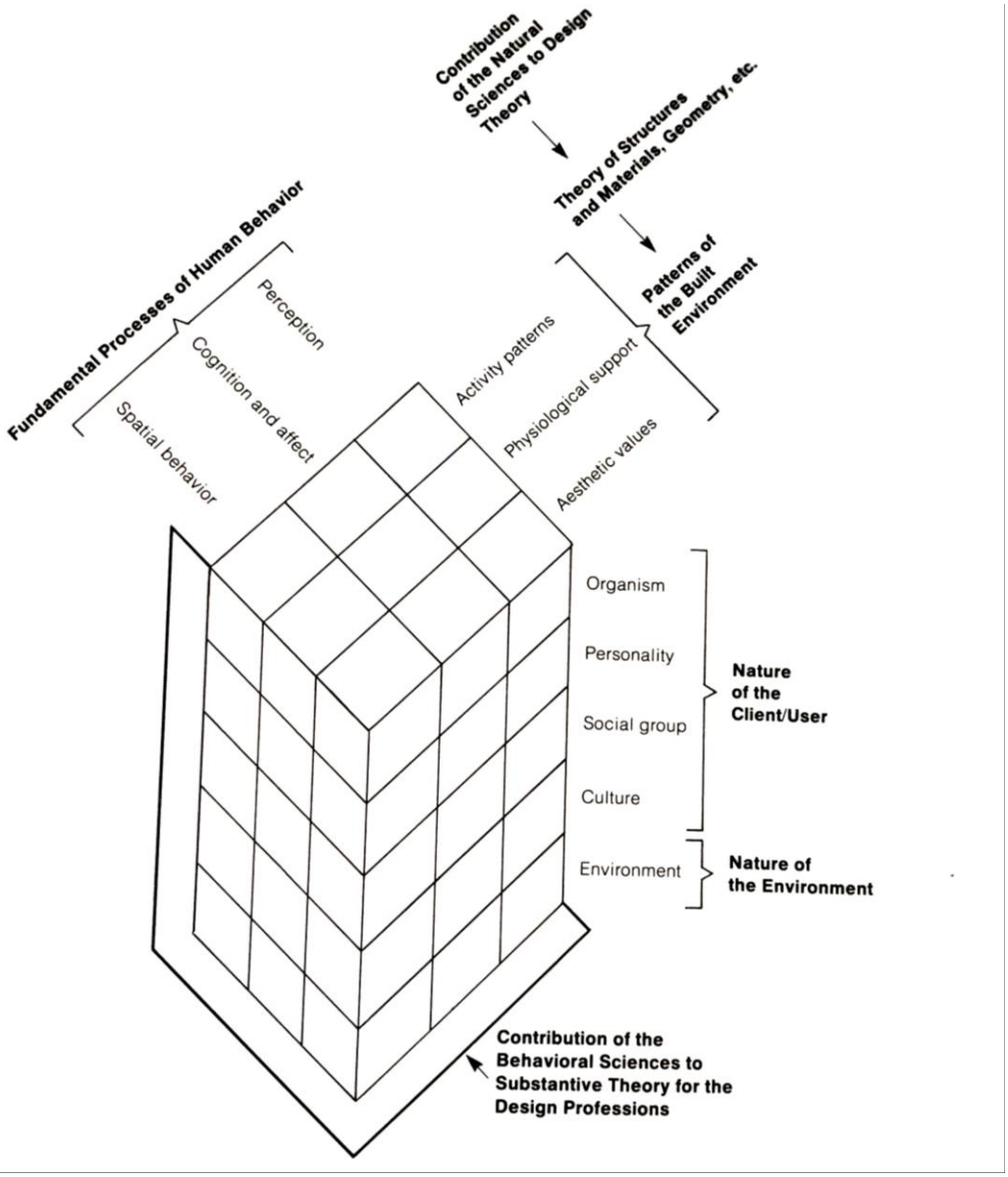


Figure 10. A Model for Organizing the Contribution of the Behavioural Sciences to Positive Substantive Theory for the Design Professions (Source: Lang, 1987)

Behavioural responses are influenced not only by physical stimuli, but also affected by mental stimuli under three categories such as sociological, psychological and physiological (Altman, Rapoport & Wohlwill, 1980; Hall, 1971).

The built environment considered like a physical setting that leading people interaction recognized and identified through their behavioural responses as Newman (1972), Berlyne (1971) and Griffin (1968) hypothesized by a mutual method among surrounding environment and users. The connection among spatial behaviour and the built environment is a multifaceted issue. Thus, three potential models of the purposeful associations among human behaviour and the physical environment have been stated by Wohlwill (1970).

1) The ecological background bounds the particular behaviour or behaviour patterns that can take place into.
2) The merits with the purpose of discrimination of particular settings influence equally the behaviour and the personality of users who dwell in.
3) The setting provides as a motivating strength that possibly will effect in each tough feelings or attitude, approach or avoidance behaviour or adaptation.

According to the concept, the built environment illustrates a vast significance where an interaction is occurred between built environment and users. The built environment has physical effects on user lives through structure, form, material, shape and personal preference of environments. Those aspects form user behaviour and influence the interaction between other users and surroundings (Newman, 1972; Berlyne, 1971; Griffin, 1968) which is called ‘physiological responses’.

Several behavioural scientists and designers such as Altman (1975), Sommer (1969), Zeisel and Griffen (1975) have supported that functional designs which are provided with the consideration on interiors through various reasons might be convenient in spatial behaviour. For instance, if furniture combinations organized in a way which can simply to be assisted in either a larger group communication or small subgroup meetings (Aiello, 1976). When those kinds of approaches applied to a physical setting it would allow spatial behaviour of user more flexible and easy to modify through changing circumstances. For instance, the structure of a physical setting such as room sizes, wall organizations or layout of dwellings often intervenes or strengthens the experiences within it (Aiello, 1976).

Spatial behaviours along with the cultures and subcultures are range in reactions such as mentioned in previous sections. Those reactions play an important role on human spatial behaviours that is precipitated architectural forms in a physical setting (Aiello, 1976). Thus, the design of a physical setting is under control of the user reaction and those users are under control of culture that originating their behaviours (Altman, Rapoport & Wohlwill; 1980). For instance, Sommer (1974) has stated that traditional cultures generally in a harmony with their architectural forms through considering the weather and cultural traditions of their country. On the other hand, cosmopolitan and multi ethnic cultures are categorized through a less consideration of 'appropriate' architectural design (Altman, Rapoport & Wohlwill, 1980).

Proshansky (1978) stated that people who grow up in similar kinds of physical settings would develop common ways of coping with their physical environment. Different settings will produce different demands, create different challenges and

provide different levels of satisfaction. In this manner, user behaviour is influenced by perceptions of users through subjected occasions (Lawton, 1975). Such individual differences related in various needs of users (Marshall, 1970). Different people might have altered considerations to various elements and patterns through a similar environment (Lang, 1987). Individual experimental studies show a variety of linkages between personality and visual pattern preferences (Lang, 1987).

Individual differences have been defined by Parsons (1970) as considering each individual as a member of a 'behavioural system' which is in progress. Hence, physiological abilities of the individuals defined through their character in addition to the social group that they are belong to with its values and environmental aspects (Parsons, 1970). These features that Parsons (1970) evaluated are significant since being a foundation of how and why users perceive the environment and how they use is differently through their consideration, which are out of the scope of this study.

Consequently, users with different perceptions and expectations respond in a different way to different physical surroundings which can be observed through a wide-range according to user background and corporeal aspects.

Hall (1966) stated users from different range of cultural groups vary in their spatial behaviours which are reflected from altered norms that are ruled the use of space within different societies (Hall, 1966). In order to evaluate his claims Hall demonstrated a complete account on spatial usages of users in physical settings such as interior designs of homes and organizations of furniture among European (German, English, French) and non-European (Arab and Japanese) cultures through

the 'experience of space' (Hall, 1966). A response to an empty interior space is a clear example for the cultural difference in between two cultures because of the perception of emptiness within a space. A non-European user, such as a Japanese user, could attach meaning to an empty space whereas European perceives such spaces as just an empty physical setting (Rapoport, 1960).

Hence, diverse perceptions of spaces lead to different definitions of living conditions. People from different cultures, inhabit different 'sensory worlds' with interpersonal spatial usage serving to regulate sensory stimulation (Aiello, 1976). Prepared Table 2 by Lang represents the relationship between the human needs identified by Maslow, Steele's list of the functions of the built environment and the behaviour-built environment mechanism.

Table 2. Human needs and the Socio-physical Mechanisms Required to Afford Them

Human needs and the Socio-physical Mechanisms Required to Afford Them		
Need	Steele’s Concerns	Socio physical Mechanism / Design Issues
Physiological	Shelter and security Task instrumentality	Shelter, access to service
Safety	Social contact	Access to services, privacy, territoriality, defensible space, orientation
Belonging	Social contact Symbolic identification	Access to services, communal settings, symbolic aesthetics
Esteem	Growth, pleasure	Personalization, symbolic aesthetics, control
Actualization	Growth, pleasure	Choice, access to developmental opportunities, control
Cognitive/aesthetic	Growth, pleasure	Access to developmental opportunities, formal aesthetics.

(Source: Lang: p.110)

Within the limits of this study, these needs and corresponding responses, based on the Lang's table (1987) will be explained under Functional Efficiency Response and Emotional Response during the following paragraphs.

In addition to psychologists also biological foundations of human responses has distinguished between 'survival needs' and 'well-being needs' by biologist Stephen Boyden (1971) which also forms a basis for a number of other theoretical perspectives relevant to design and well-being (Orians & Heerwagen, 1992; Kaplan & Kaplan, 1989; Ulrich, 1993; Kellert & Wilson, 1993). Aspects that affect human health affect overall health through the quality of life and psychological health. If an interior design fail to satisfy in terms of survival needs or physiological needs as Maslow referred (1942) it can cause serious illness or death and failure to satisfy well-being needs may cause psychological maladjustments and stress related illness (Heerwagen, 1998). Hence human responses are directly related with building design both in physical and psychological manner (Boyden, 1971).

User response model has been shown through the connection between human needs and environment with the help of pyramid by Maslow (1942) along with Steele's records as shown in the Table 2. The arrangement of the physical setting has an influence on user imagery and these are in turn distress the spatial behaviour models which will be explained in the following chapters. Hence, the evaluation on the arrangement of the environment will be continued with the research on privacy, personal space, and territoriality and design issues in order to enhance the role of the built environment on interaction of user patterns and responses.

2.4.1 Functional Efficiency

The built environment required to afford certain standards of physical comfort degrees which is later relates to psychological well-being (Fitch, 1965; Lang, 1987). The levels of comfort degrees varied in user perceptions related to expectation and habituation degrees of individuals (Kira, 1966; Glassie 1975; Brebner 1982).

The degree which physiological needs are supported in the environment can be explained in functional efficiency terms through physiological well-being which are related to human body requirements to achieve both comfort and efficiency (Fitch, 1965; Lang, 1987). Although designing for user comfort give the impression as an essential objective of designers it can rarely be abstained from physical comfort while accomplishing other design objectives.

Frequently, user physiology and the built environment's functional efficiency evaluated through two fields of study such as anthropometrics and ergonomics (Lang, 1987). Human physical dimensions, capabilities and limitations are studies through the field of anthropometrics and ergonomics focuses on users and machines (Croney, 1971; de Montmollin, 1967; Murrell, 1965; Propst, 1970; Thieberg, 1965-70).

The ergonomic consideration to the design can be reviewed through a user centred applications (Pheasant & Haslegrave, 2006). If an environment or furniture is designed for human utilization, then its design should be supported by physical and mental qualities of its user. In this manner, the term ergonomic is the science which

connects the profession with the worker while connecting the product with its user (Pheasant & Haslegrave, 2006).

In the course of functional efficiency, the emphasis should be on impacts of physical environment qualities for user satisfaction and activity performance. The accurate functioning of a design is thoroughly associated with the reasons of those who inhabit and use it as well as to their physical dimensions and abilities (Ching, 2012).

In this manner the following chapters focus on identifying users not only as individuals, but also specified user group characters in order to identify needs through establishing territorial requirements of personal space, privacy and relations with other people to determine special interests of users with activity requirements and propose possible arrangements with respect to user perception and response.

2.4.2 Emotional Response

Emotional response in environmental psychology analyses emotional reactions in various surroundings. Emotions are combined with physiological illustrations between user body and their mentality (Joseph, 2010). Emotions suggest itself during a brain act along with the effort in accordance with the reflection development contained by the brain to transport consciousness of the user (Joseph, 2010). In this manner, emotion should be defined as the instant physiological expression of the experiences within the user.

Emotions are adjunct to thoughts which are actually linked with each other as Damasio (2003) claims that users react to a physical environment with the consideration of the connection between outer and inner worlds that guided by

emotions which consecutively facilitate users to appraise the surrounding environment.

Emotions can be considered as part of a cognitive course of action that exposing user's not only psychological state, but also physiological condition (Croome, 2002). Consequently user emotions influence to think in other words feelings. Feelings correspond to the existing condition of the body and mind which plays an indicator role on what's happening inside the user body (Joseph, 2010).

The features from surrounding environment suggest emotional responses and carry motivational messages which are inspired from receiver needs. Those messages that achieved from the environment has representative features which provide meaning, value and aesthetic properties to it in response to their need to observe the environment as a pattern of relationships and precedent observations from the foundation for understanding the latest (Lang, 1987: p.90).

Those observations are described according to experimental or structural perceptions that are involved in empirical metaphors through moods, feelings and self-report of users (Lang, 1987; Ittelson, 1976). Structural explanations involve in sequence of the actual perceived information in terms of the physical or social organization of the world (Lang, 1987).

Human natures have power over a natural feeling of reaction to their environments with the consideration of physical forms which are connected to their capability of visual perception to not only favourable aspects but also inauspicious items

(Sommer, 1974). Therefore a physical form of a surrounding environment can cause either a positive or negative response. The physical harmony of a surrounding environment is perceived by its user through an unconscious way that it is performed through an emotional response (Sommer, 1974).

Previously, architectural applications used to be organized by considering people's emotional comfort. However formal aspect has been considered more important than user feelings nowadays.

Therefore, most of the physical environments are admired on an academic level but fail in emotional comfort (Sommer, 1974). Hence, human perception needs to be linked to emotional level of comfort in addition to geometry and materials of a physical setting (Salingaros, 2006).

Emotional reactions that occurred in user places affect user behaviour (Russell & Snodgrass, 1987). The design of a physical place influences the mental state of the user in that space. Thereby, user places shape its user attitude and behaviour (Augustin, 2009).

As mentioned in the earlier paragraphs, motivation has been considered as a major course of action that awakening action, sustaining activity in progress in addition of being a regulating the model of activity and also acting like the key factor of fulfilment (Maslow, 1954; Young, 1955).

As Lang states “A piece of furniture, a work station, a room, a building or a landscape may be very well designed from anthropometric viewpoint but still be deemed uncomfortable by its user' if additional factors of user are not satisfied such as privacy, personal space and territorial behaviour that affect the perceptions of environmental comfort and quality” (Lang, 1987: p. 145).In the following paragraphs these concepts will be introduced accordingly.

2.4.2.1 Privacy and Crowding

Privacy has been described by Altman as "selective control of access to the self or to one's group" (Altman, 1975: p.18), which is much more than personal space or territoriality. Privacy is important in terms of relationship between an individual or a group and the rest of society (Lang, 1987). The relationship between space and behaviour faced people's need for intimacy and privacy (Altman, 1975; Hall, 1966).Required degree and type of privacy rely on the pattern of behaviour on the cultural context of its user in addition to the personality and objectives of the individual involved (Lang, 1987).

Users need to able to control the process of privacy so that they can be alone if they wish, but they can also have access to interaction with others (Cassidy, 1997). Although if user have more privacy than he/she needs, she or he feels isolated from social world as well as insufficient privacy direct the user to have subjective feelings of crowding (Altman, 1975).

There are two important factors for the term privacy such as desired privacy and achieved privacy (Altman, 1975). When those levels of desired and achieved privacy levels are equivalent to each other, the privacy reaches to a most approving condition

(Altman, 1975). The term privacy has a methodical examination that is presented by Westin (1970) such as solitude when an individual is by him or herself and not being watched by others, intimacy that happens through a small crowd, anonymity when individual is lost in a crowd and reserve which is the conception of a psychological blockade in opposition to unwanted interruptions (Westin, 1970).

In addition to the methodical examination of Westin (1970), privacy approach also has been portrayed through a functional analysis of personal autonomy which contends with the central part of the identity, emotional release that allows individuals to settle down from social responsibilities, self-evaluation which involves the integration of experiences and the opportunity to plan future actions and limited and protected communication (Altman, 1975).

On the other hand , when the level of privacy is not succeed on the desired level in such cases that an individual have more contact with others than is required, the feeling of crowding occurs (Altman, 1975). The term crowding is used where individuals wish for more physical space to access to required resources, or a need of interruption period from other people involved in the space (Altman, 1975).

Although the concept tender like a physical matter, crowding is a psychological concept rely on an experimental and motivational foundation which is an individual response to environment (Altman, 1975). In many conditions, crowding subsists when a variety of privacy laws not succeed to generate an equivalent degree among wanted and achieved intensity of privacy. Thus crowding term comes into view when an individual's interpersonal-boundary fails (Altman, 1975).

2.4.2.2 Personalization and Territory

The built environment is filled with patterns of adaptation and personalization of its users (Lang, 1987). Personalization brings up the importance of the accumulation of items through an environment (Becker, 1978). The behaviour is resulted not only from a materialization of an aspiration of territorial control, but also an expression of aesthetic experiences in addition to the result of an attempt to make the surrounding to form improved action patterns (Lang, 1987).

The personalization of spaces provides various reasons such as psychological security and symbolic aesthetics in addition to the adaptation of the environment where particular activity patterns meet with user needs (Lang, 1987). Personalization or in other words 'marking of a place' involved in territorial behaviour that controls social interaction with the intense of helping to satisfy various social and physical motives (Altman, 1975). In this manner, the conception of territoriality copes with behaviour that directly involves in security and maintenance of the physical surroundings (Brower, 1965).

In this manner, the process of personalization is engaged in a controlling method of boundaries in terms of territoriality through several specifying features such as fences and name plates as a sign of possessiveness (Stea, 1965; Altman, 1975). The course of action engaged through a psychological classification through a place which is symbolized with motives of controlling attitudes by arranging of objects in a place through personal ways (Pastalan, 1970). In other words, territoriality is an employment of a user through a space with relevant items to show the place is 'owned' by a user or group (Alman, 1974; Haythron, 1967; Altman, Taylor &

Wheeler, 1971). Possessed objects and furniture could assist individuals to feel home even they move across the world as indication of home (Altman, 1974). Those territorial behaviours are influenced by culture and environment as well as the genetic factors as instinctive qualities of individuals (Ardrey, 1966; Altman, 1974). However territorial needs can be related to individual motives and the adjustment of the territorial requirements are important for user to achieve otherwise can cause lack of self-esteem and self-identity (Altman, 1974). Accordingly, any territorial intrusion involves when people have less privacy than needed. Thus, users need to have a sense of control in their personal spaces with the help of personalization and privacy regulations (Goffman, 1971; Scott, 1967).

Territories are necessarily included areas, objects and places in the environment that exists in environments that people actually use as parts of their daily lives. The smallest territory that is attached to a person is called ‘personal space’. The theory of personal space refers to an allowed distance from other individuals with the intention of a person's physical setting (Altman, Rapoport & Wohlwill; 1980). The term personal space has been stated as being "an area with an invisible boundary surrounding the person's body into which intrudes may not come" (Sommer, 1969: p. 26). Accordingly, such personal space provides major purposes as mentioned in the following lines:

1) A personal space shields in opposition to a potential uncomfortable situations not only in psychological and physical states but also social conflicts through directing the quantity and quality of sensory stimulations (Altman, Rapoport&Wohlwill; 1980).

2) A personal space corresponds messages with reference to the connection among the people around through assembling accessible to others, allows the favoured detachment which has been elected by its user (Altman, Rapoport & Wohlwill; 1980).

Various researchers have accredited the significance of space in social communication, however a number of examines have consumed the correspondence of personal space as a shielding 'bubble', while others have challenged (Altman, Rapoport & Wohlwill; 1980) such as Hall (1960). Hall (1960) has stated that individuals 'carry around a series of spatial spheres' in which various kinds of relations are approved to happen. On the other hand, observers such as Deutsch (1975), Goffman (1971), Kendon (1977) and Scheflen (1976) have disputed that personal space is such a space that should be measured. However as Petterson (1975) and Knowles (1979) claim, spatial behaviour should be considered as a constant variable and not a dichotomous one with separate limitations.

As a result, it can be concluded that a piece of furniture, a work of station, a room, a building or a landscape may be very well designed but still be deemed 'uncomfortable' by its users (Hall, 1963). The reason for this situation is resulted from the factors of privacy, personal space and territorial behaviour which are influenced by the perceptions of environmental comfort and quality (Lang, 1987). The need for privacy, personal space and territory is universal and contributes to the meeting of other human needs such as security, affiliation and esteem (Hall, 1959; Goffman 1963, Lyman and Scott 1967, Skaburskis 1974, Sommer 1969, Altman 1975).

2.4.2.3 Attachment and Belonging

Attachment to a place is the sense of possessiveness through particular relations with self-image or social identity of a user (Brower, 1977). The term 'attachment' is explained through a strong sense of identification of its user; that is result of both likelihood and also an act of appropriation (Brower, 1977). Attachment to a place is reinforced by art and architecture and provides observers to connect completely with their mental dimension of vision, imagination and desires (Pallasmaa, 1994).

Attachment to a place is connected to the symbolic qualities of an environment, with an interaction among the space and the objects in it by the experiences, aspirations and condition of the users (Brower, 1977). Clifford Geertz states that "Man, is an animal suspended in webs of significance he himself has spun" (1973:p. 5). Users could be considered as the creators of their own designs which are assembled throughout a self-conscious assessment course of action from an intended range of ideas (Ingold, 2000). As Joseph Rykwert claims "unlike even the most elaborate animal construction, human building involves decision and choice, always and inevitable; it therefore involves a project" (1991:56).

2.5 Summary of the Chapter

According to Evans and McCoy (1998), individuals spend more than %90 of their lives within buildings However, it is roughly known how ambient of environmental circumstances have emotional impact on human and spatial behaviour. In this manner, it is aimed to investigate in this chapter, the effect and relationship of surrounding environment on human behaviour, in order to provoke additional thinking and research on properties of the built environment. Environment term has

been clarified through components involved in surrounding areas such as user and physical elements related to user.

In order to discover user-environment relationship, the existing human behaviour theories has been identified and perception theories have been explained accordingly through a chronological order. In presenting these theories, the emphasis is placed on what an interior designer need basically to know in order to clarify positive environmental design theory. Then the discussion proceeded from motivation to perception, perception to cognition and its affect to spatial behaviour.

Gibson (1966), Hall (1971), Altman (1974), Lang (1975), Krampen (1997), Nasar (1997), Moore (1979), Rapaport (1963), Maslow (1963) and Pallasma (1998) have described behaviour and environment interactions through the theories of perception, cognition and spatial behaviour. Gestalt (1938) comes forward with formal theories; Gibson (1979) has mentioned the importance of ecological approach to visual perception; and Pallasma (1998) reviled perception theory with Haptic perception. On the other hand, Hall (1971) and Rapaport (1963) discussed the impacts of cultural aspects on human perception and Maslow(1943) has summarized the human behaviour theory through a hierarchy of needs. These researchers that are mentioned above handled the perception theory in different dimensions and the chapter aimed to summarize all those theories in the previous lines with the intention to gain an understanding on human behaviour for better interior designs.

Accordingly, various approaches from perception theory have been stated, in order to examine the relationship between individuals and their environments about how they

perceive the space. After examining the perception process, user responses are evaluated through the environmental practice. The process is illustrated by schematic explanations by pioneer researchers such as Maslow (1943), Gibson (1979) and Hall (1971).

Those schemata showed that the messages from environment are received through a perceptual process that is leaded by needs. In the end, the illustrated schematic approaches are suggesting a connection between cognition and perception through emotional and functional needs. Thus, those needs and responses are discussed within the limits of the study. Ergonomics and anthropometrics have been evaluated through physiological and functional responses, then, emotional responses are discussed through privacy and crowding, personalization and territoriality, attachment and belonging concerns in order to emphasize how physical and emotional needs directly affect and influence the user perception of a physical environment.

In the next chapter, the role of the interior designer will be explained through his or her responsibilities. Following those discussions, the literature review will be linked to human behaviour concerns that have been mentioned previously. For each section of the research, theories are presented through specific environmental psychology issues, which will later on, be linked to interior design matters through establishing a particular dimension of design projects.

Chapter 3

RESIDENTIAL INTERIOR DESIGN

In this chapter, the role of the design and interior designer will be discussed within the highlight of the built environment and human behaviour, besides the recent developments on residential houses.

Interior design profession has always been a compound practice through deciding how to meet functional needs of users while designing a pleasing environment at the same time. For this reason, the information gathered from other fields, such as environmental psychology, is essential in order to gain an insight to be able to examine the user perception to designed environments. Hence, a foundation is provided for understanding how user responses to a designed environment.

Afterwards, responsibilities of an interior designer are explained and linked to human behaviour concerns that have been mentioned previously. The aim is to ascertain and document the interior design profession's body of knowledge through not only examining the career progression of a health, safety and welfare framework but also profits to the customer use of space.

In order to investigate the study on the way of user experience with the aim to provide a foundation for the design process; residential buildings are investigated through occupiers in such a way to use their dwellings along with observing and

engaging by means of not only their behaviour within a building, but also their experience of space.

3.1 Responsibilities of an Interior Designer

The objective of the following section is to ascertain and document the interior design profession's body of knowledge. The aim is not only examining the career progression of a health, safety and welfare framework, but also profits to the customer use of space.

Interior design profession has always been a compound practice through deciding how to meet functional needs of users while designing a pleasing environment at the same time. Interior design is a complicated occupation. In order to achieve a built interior environment, a creative act is necessary while dealing with the requirements of technical resolutions that are applied and controlled by an arrangement according to the user response and physical condition of the space. These functional solutions should enhance the quality of life and culture of the occupants (Piotrowski, 2014).

In this manner, the process of the interior design survey follows an organized and synchronised approach which is comprised in research and investigation of a creative process whereby the needs and properties of the user are fulfilled through an interior space in addition to design objectives (Piotrowski, 2014).

The organized approach of Interior Design profession is signified world widely by the International Federation of Interior Architects/Designers with the following definition;

> "The professional interior architect/designer is a person, qualified by education, experience and recognized skills, who identifies, researches and creatively solves problems pertaining to the function and quality of the interior environment; and performs services relative to interior spaces including programming, design analysis, space planning, aesthetics and inspection of work on site, using specialized knowledge of interior construction, building systems and components, building regulations, equipment, materials and furnishings; and prepares drawings and documents relative to the design of interior space, in order to enhance the quality of life and protect the health, safety and welfare of the public." (IFI, 1985).

Nevertheless, human aspects are not only related with the use spaces in a health, safety and well-being, but also involved in a sense of philosophy. Thus, the practise of space is occupied also in meaning as mentioned in the previous chapter. Accordingly, surrounding environments are inspiring connections between user considerations through considering user needs.

In order to control the interactions between user and space, producing computable outcomes and improvements are necessary for utilizing the process in an iterative and communicating way which is possible with analysis from other fields, in interior spaces which are involved in the lives of the people who use them.

Therefore, the process provides functional, aesthetic and social improvement which illustrate the role of interior design in user life. In this manner, the profession turns out to be an important expression and need to be developed by various research demonstrations in the context of physical, emotional and behavioural patterns of users.

Interior designers should combine users in an environmental ecology while transforming their knowledge in the direction of beauty through addressing all the

senses. In this manner, academic understanding is becoming an essential part as fundamental knowledge of the practice of interior design.

Consequently, the combined model of practices from environmental psychology in addition to the science of anthropometrics is beneficial for interior designers in order to regulate the connection between user to spaces based on psychological and physical parameters with the aim of improving the quality of life.

Interior spaces are such physical environments that are enclosing user activities influence fundamental behaviours of its user's through their everyday lives (Lawson, 2001). Thus, it suggests more than a technical, aesthetic or semiotic explanation. Interior spaces are such places that can bring people together and can separate from each other. In this manner, designing interiors organizes and structures spaces for people and the objects enclosed. Those designed interiors are inhabited by particular rooms which are not only facilitated by technical and aesthetical solutions but also user activities.

The importance of user has been emphasized by Hertzberger (1987) that architect and designers must watch what people do and unfortunately many of them are seemed to interest in buildings but not in their occupants.

Mainly, interior design profession is thought as visual process with some occasional considerations as technical procedures. However, it should be considered as social objects where daily evidences can be gathered through observing building interiors (Lawson, 2001).

3.2 Recent Studies on The Development of Design of Residential Interiors

Human physical and psychological presence are both in a continuous relationship between their bodies and buildings which assembling not only their perception into the habitability of buildings and their environment but also about how they occupy and understand the space (Baker & Mitchell, 2008).

In order to investigate the study on the way of user experience with the aim to provide a foundation for the design process; residential buildings are being investigated through people in such a way to use their dwellings along with observing and engaging by means of not only their behaviour within a building, but also their sensory experience of space.

Designers progress during a building organization is a vital issue for a design practice that the connection between the built form and user always been considered by means of not only its textural and material qualities, but also user's haptic response to it (Baker & Mitchell, 2008). In addition to physical, social, economic and philosophical aspects of residential areas, emotional relationships also play an important role for users while considering dwellings and places with respect to residential satisfaction (Anthony, 1997; Fried, 2000; Hay, 1998; Hidalgo & Hernandez, 2001; Jorgensen & Stedman, 2001; Low, 2000; Manzo, 2003; Moore 2000; Twigger-Ross & Uzzell, 1996).

Thus, residential areas afford a high potential for pragmatic perceptive of human behaviour and involve in environmental framework (Rowle & Chaudhury, 2005).

Residential places are connected with characterization, preservation and generation aspects of the user according to his or her self-identity (Rowles & Chaudhury, 2005). In order to identify with a profound meaning of residential areas, it is essential to investigate the character of the user and more specifically the self in a specified period (Kaufman, 1986).

Researchers and theoreticians from a wide variety of disciplines have studied the meaning of 'home' through visible behaviours such as personalization and attachment (Boudon, 1969; Hansen & Altman, 1976; Haumont & Raymond, 1975; Jacquier & Jeantet, 1876; Leroy, Bedos & Bertelot, 1971).

In this manner the following issues need to be determined as mentioned below:

- Experience and use of the dwelling(Altman, 1981),
- A conceptual framework for residential satisfaction(Altman, 1981),
- The role of housing in the Experience of Dwelling (Altman, 1981).
- Relationship between domestic architecture and the organization of space(Kent, 1993),
- What influences domestic architectural design and the use of space and how each related to the other (Kent, 1993).

3.3 Residential Interiors

The residential interiors examined as an abstract signifier of a wide set of associations and meanings. The most comprehensive definition of home has been put forward by Benjamin (1995, p. 158).

> "The home is that spatially localised, temporally defined, significant and autonomous physical frame and conceptual system for the ordering, transformation and interpretation of the physical and abstract aspects of domestic daily life at several simultaneous spatio-temporal scales, normally activated by the connection to a person or community such as nuclear family."

According to Tuan; "Home is at the centre of an astronomically determined spatial system" (Tuan, 2001: p. 149). Therefore, the form of residential space shows individual differences through user preferences and adaptations of physical settings (Lang, 1987). A residential interior is not only tenders as a shelter where its user get calm with himself but also provides a foundation for his actions and behaviours in his life (Norberg-Schulz, 2000). There is a powerful connection among user's behaviour and the form of his or her residential space (Rapoport, 1969) through user desires, motivations and feelings. However, it is important to evaluate how a physical form of a residential place affects user behaviour and way of life while addressing those user desires, motivations and feelings through a physical form (Rapoport, 1969).

A residential interior is mainly explained as a physical unit which defines a space for its users through proposing a closure for domestic activities for an individual who releases from private as of public areas (Fladei, 1993; Lawrence, 1987; Rapoport, 1995). Residential places are "physically, psychologically and socially constructed in

both 'real' and 'ideal' forms" (Sommerville, 1997: p.226). They have been considered as an "extension of the self through places" (Fuhrer & Kaiser, 1992: p. 105) besides being ‘‘spatially localized, temporally defined. Physical frame and conceptual system is for the ordering, transformation and interpretation of the physical and abstract aspects of domestic daily life (Benjamin, 1995: p.158).

Accordingly, the connection between the socio physical surrounding and individual evaluations, goals, values, emotions are recognizable prospective behaviours which are followed by user requirements needs an explanation in the meaning of residential living (Rowles & Chaudhury, 2005). Hanson states that "houses are sensitive to social relations only insofar as they construct and constrain interfaces between different kinds of inhabitant, and different categories of visitor" (1998:p.77).

Activities in each place of a residential space were characterised using a taxonomy that proposed by Monteiro (1997:20.3) as shown below;

1) Domestic Tasks; cooking, washing dishes and clothes, ironing.

2) Passive Leisure; watching TV, reading, listening music, playing on the computer.

3) Interactive Leisure; meeting friends, drinking, dating.

4) Common Family needs; having breakfast, lunch, dinner.

5) Private Needs; brushing teeth, taking a bath, sleeping, resting, making love.

Among those spaces bedroom cited as the most used space among family members as shown in the Figure 11 with the 29.63% average. Various analyses showed that spatial qualities of private places of dwellings such as bedrooms are organized in a

detailed and extremely personal approach through a figurative way of the self of the user (Blunt, 2006).

Rooms	Number	%
Bedroom	8	29.63
Kitchen	5	29.63
Living room	4	14.81
TV room	4	14.81
Office/library	2	7.41
Pantry	1	3.7
Living room/ TV room	1	3.7
Dining room	1	3.7
Veranda	1	3.7
Balcony		
Backyard		
Living room/dining room		
Total	27	100
% of answers		100%

Figure 11. Spaces where the family spends more time
Source: FrancineyCarreiro de França - Field Research, Brasilia (2003)

Residential indoor environment has a variety of factors such as user psychology, mood and behaviour in addition to spatial design and user activity patterns which are related to living conditions of its user through psychological and physiological responses. People in a residential setting are in a need of sense of security and privacy in addition to psychological needs such as sense of belonging and actualization (Lee, 2013). In this manner, user's material and spiritual life of the interior environment play a crucial role in interior design task.

Interior designer should consider through user perspective through their psychological feelings and basic needs of the home environment. As mention in the previous chapters, it is important to understand how spaces are perceived, judged and evaluated by their users (Croome, 1997).

Aspects and elements of a surrounding environment influence its user psychological feelings, emotions and behaviours such as size and elements of the space. Thus, the ergonomic point of view such as size of the space through its volume and scale should be organized considering its user in the course of the psychological effects of physical elements.

In recent times, residential living have additional functions leisure, study and reading that hosts further behaviour patterns in one form (Lee, 2013). Those requirements of the house is influenced by the user of the place such as social figure, life style, personal preferences, cultural background and various interpersonal factors.

The comfort of the living environment includes not only the function of residential building themselves how the meet the need of use but also how to the design surrounding with physical concerns of user's.

In this manner, the focus of the following chapter is to determine user responses through units of a dwelling in order to investigate the influences of surrounding environment on human responses through their physical and psychological needs.

3.4 A Criticism of Approaches for Better Residential Interiors

Residential buildings have always been drawn attention through design and architecture field as an important task since the 1920s, Modernist Movement when dwelling accepted as being more than a shelter. The value of a residential space to its user gains the importance not only in means of a place of safety where they can feel calm but also it is a place where they can illustrate their activities and personalities purely (Norberg-Schulz, 2000).

Residential building projects used to be controlled by severe rules of architectural styles before modernism due to poor living conditions and insufficient lifestyles (Giedion, 1929). Hence, Modernism Period has a major concern on developing physical living conditions through considering functional requirements in addition to disregarding all the symbolic and cultural illustrations of a dwelling unit has (Cooper, 1974).

However, these functional requirements failed to reach a sufficient level of satisfaction and demonstrated a disadvantage for some scholars such as Cooper (1974) who argued how users perceive their dwellings as an illustration of themselves besides other psychological aspects such as privacy, personalization, aesthetics and personal preferences.

Consequently an occupier's expectation from a dwelling is shaped through the consideration of symbolic elements as much as the formal aesthetics. Those symbolic elements help individuals to state and reveal features of their personality and significance on a residential space of how they transfer their residential spaces into homes (Cooper, 1974).

In order to achieve a complete perceptive of residential spaces, symbolic concerns should be examined through the expressions of built environment which present messages from identities of users and their social back grounds that are linked in the midst of an environment (Rapoport, 1969). Therefore, symbolic aesthetic concerns are converted into a main method of architect and designers in order to analyse impacts on user desires which come from their inner illustrations of physiological,

social and psychological conditions that are influencing the picture of their ideal environments (Lang, 1987; Rapoport, 1969).

In this manner, symbolic aesthetic concerns are converted into a main method of architect and designers in order to analyse impacts on user desires which come from their inner illustrations of physiological, social and psychological conditions that are influencing the picture of their ideal environments (Lang, 1987; Rapoport, 1969).

Hence a residential space can be considered as a 'symbol of the self' with the intention of symbolic expressions in addition to formal factors (Cooper, 1974). Throughout the examination and broad investigation of fundamentals from residential spaces is used to be understood with a more developed concept of housing for its users.

3.5 Summary of the Chapter

Recent studies on the development of design of residential interiors have been analysed through a research on residential interiors about the importance, role and significance on user behaviour. In this manner, a criticism of approaches has been provided from literature review for better residential interiors.

It has been evaluated that there is a powerful connection between users and interior spaces of residential units. However the powerful connection has a compound interaction between users and interior spaces. Thus, the role of the interior design and designer is examined in order to evaluate how a physical form of residential place can affect user behaviour and way of life. Thus, the previous chapter handled how

those aspects and elements of a surrounding environment can influence its user's psychological feelings, emotions and behaviours.

It has been explained how a curial role interior designer play on human behaviour and the practice is evaluated through a comprehend information which is provided from IFI. The provided information is helped to create a link between design field and environmental psychology in order to understand the experience of a space for user and designer through an integrative act of process.

Then, case studies have been selected and examined in the following chapter in order to evaluate the integrative act of process in addition to the observation that has been made through literature survey on recent developments, which is necessary in order to understand the constituent part of design process. Thus, user perceptions and expectations are examined in order to understand their demands from a space before discussing anything else.

Many researchers in the field have been claimed that residential places provide a direct experiential sense which can define the nature and essence of human behaviour through everyday lives. In this manner; residential units have been selected with the special case study analysis.

Chapter 4

AN INVESTIGATION OF RESIDENTIAL INTERIORS IN NORTHERN CYPRUS

This chapter aims to evaluate human behaviour aspects through residential environments relevant to the user responses. Previously, relationships between individuals and surrounding environment are explained through a literature review in order to examine how users perceive the space and react to it.

After understanding the perception act and human behaviour, the survey is constituted through a detailed survey, which observes users and their residential spaces through concerning the issues of human behaviour. In this manner, information from physical settings from residential environments is collected through a detailed review.

User response theory forms the major factor of the analysis. For this reason, interior spaces are utilized mainly through user needs. In this way, interior spaces of residential units are considered like physical settings that are affording certain standards of psychological and emotional comfort degrees in addition to physical and functional concerns.

For the course of physical comfort degrees, spatial organizations and arrangements are analysed in order to examine the impacts of physical environmental qualities for

user satisfaction. Then, emotional responses are evaluated through privacy, territoriality, and personalization concerns in the course of occupancy of spaces and interaction degrees of spaces between each other.

In order to examine provided information through a detailed survey and observation, main characteristics of the participants are discovered through questionnaire and interviews along with a pilot study for further researches.

Furthermore, physical characteristics of residential units are observed through site visits and relevant photographs have been documented. All site inspection surveys have been documented in detail in this chapter, in order to provide each detail about observation.

After all, the last part of the chapter examines the case studies, which are selected in accordance with a set of criterion concerning specific variety of residential spaces, which show individual differences and similar aspects. Each of them is investigated through user preferences and adaptations of physical settings from 5 interior designers with 10 different residential projects.

4.1 Main Characteristics of Participants from Residential Spaces

The structured questionnaires are held by the participants that worked with interior designers through their houses. These interior designers are registered to the UTCCTEA Chamber of Architects and Interior Architects.

After contacting to the interior designers, questionnaires are filled out with participants. Then, each interior designer was asked to contain residential projects of detached houses from customers.

All participants are from different professions aged from 26-65 years as shown in house portfolios. The user profile of respondents is selected from people from North Cyprus who are living in detached houses as a pilot study for a further research. 10families have been interviewed according to their housing preferences. %20 of the selected sample houses are owned by married young couples and %80 houses owned by married people with children. %70 of the house owners is employed and %30 is retired.

The results of the questionnaire survey shows that young couples are less interested in house hold requirements and functional efficiency in terms of activity performances and physical comfort degrees than other couples and commonly interested in how their houses are arranged in aesthetic principles as shown in Appendix C.

Commonly female users pay attention on personalization of interior environment qualities more than male occupiers, such as decorative features of wall covering and furnishings. Male users are more interested in outdoor activities.

Among other spaces; male users are more interested in living room area where they can watch TV and female users are more interested in kitchen designs about how

they can effectively benefit from domestic tasks while spending time with family members at the same time.

All 10 case studies are carried out through high income family members and they do not pay attention to project budgets initially. The initial concern of interior design projects among 10 case studies was to better reflect their personal tastes and enhance the function of their houses thorough their interior design elements and arrangements.

Selected residential projects have open plan designs with multi-functional arrangements. All of the projects are asked to be organized in open plan kitchen arrangements along with an additional space, which can be used as not only a dining area but also as a sitting corner.

The reason behind having an open plan and multi-functional space is said to be, to gather all family members in one place. According to the answers from questionnaires as shown in Appendix C; family members have their individual activities and cannot spend time together during the day. Thus, open plan interiors allow different activities at the same time.

The results showed that all participants' needs are well defined by their designers, hence, occupants are satisfied with the service they have got from their interior designers as shown in Appendix C.

4.2 Physical Characteristics of the Sample Houses

Selected case studies have similar physical characteristics. Residential units are in similar sizes and similar user profiles in order to explore the objectives of the study.

The selected inhabited units are located in residential living areas through different regions of North Cyprus which range from 200 m^2 to 500 m^2. All of the houses are new buildings and designed by interior designers in addition to an architect.

All of the selected houses have an entrance definition with well-designed furniture through large openings and main focus of the projects is kitchen designs. Concerning with the analysis of the respondents' answers, window and door sizes were chosen to be larger than standard sizes, in order to have a physically powerful relationship between the outdoor and indoor environments in addition having bright and open rooms. Many of the houses have large balconies and terraces where they claimed that they spend most of the time outside during the summer time.

Interiors are commonly used as open spaces through open plan kitchens with dining areas along with living rooms. Every house has additional bedrooms for guests. Larger houses have additional facilities such as utility room, study room and hobby room. Smaller houses have multi-functional furniture systems where they can serve various functions in one piece.

Mainly, furniture organizations are organized in a way that they could simple be assisted in either a larger group communications or small sub group meetings. Once those kinds of approaches are applied to a physical setting, it would allow spatial

behaviour of user to be more flexible and easy to modify through changing circumstances.

For instance, the structure of a physical setting such as room sizes, wall organizations or layout of dwellings often intervenes or strengths the experience within in. As Lang (1987) mentioned previously; structural explanations involve in sequence of the actual perceived information in terms of the physical or social organization of the world.

Physical characteristics of the houses have been observed for examining how the design of the units is shaped in the course of physical comfort, such as spatial arrangement, and functional layouts of furniture and interior spaces, which result from emotional responses of users such as privacy, territoriality and personalization concerns.

The primary issue was concentrated on the query through participants' physical surroundings where they display messages from the decisions of people about who they are, who they were and who they might become (Marcus, 1995). Hence, the link between spatial behaviours and emotional responses will be examined accordingly in the following chapters. All the choices of physical arrangements are resisting on relative emotional concerns which are influenced by user perception as mentioned in the earlier chapters.

4.3 Methods of the Case Study

4.3.1 Selection of the Samples

The selected case studies are conducted through interviews, questionnaires and site inspection studies with the aim of achieving how users prefer to use spaces and how they react to the designed environment in the end.

Thus the questions have been asked through general design stages, interior designer's preferences and the final outcome of the project if they manage to achieve what they ask for.

A detailed questionnaire was necessary because a professional interior design project could sometimes be resulted through diverse perceptions of spaces which lead to different definitions of living conditions.

Inspections were directed also to five different interior designers in order to gain a comprehensive understanding, to analyse respondent's personality and visual pattern preferences as shown in Appendix B. The reason for interviewing interior designers in addition to occupiers is to provide a procuring result for observations.

The samples are found in the Northern Cyprus from similar housing zones that was nominated through a casual substance. Selected projects along with housing regions are provided to allow a comparative analysis of human behaviour features that can be obtained from spatial configuration under the title of functional efficiency responses and also privacy, personalization and attachment issues analysed through emotional responses.

4.3.2 Measures

The designed environment is used as an investigation instrument through examination of perception theory which consecutively guide to a narrative view of 'person - environment' relationships with suggestions.

Matters regarding participant surroundings, individual inclinations besides visual decisions required to be dignified by a technique of gathering information concerning user response, which is evaluated through the environmental practice of designer and user individually, in addition to user perception in the sense of identification of the human-environment relationship about how users become familiar with their environments and purposefully react to it according to their needs and motivations.

10 sample houses were selected as case studies located in housing regions in North Cyprus. Each owner of residential places completed a questionnaire related to indoor surrounding through mutual facts besides respondent’s physical and aesthetic decisions and interior designer relationships. Also, each sample house's designer is asked to take part in the interviews and questionnaires in order to analyse the design stages of the projects and results.

4.3.2.1 Site Inspection Survey

After completing interviews and questionnaires, place reviews are approved through representative photographs between periods of 10th of August and 20th of November 2014. The place reviews settled for getting physical issues of the samples concerning features such as structure, form, material, shape and personal preference of surrounding environment aspects from user behaviour which influence the

interaction between other users and surroundings that is called physiological responses (Lang, 1987).

The review is required for proper fundamentals from the respondents which are filled with patterns of adaptation and personalization of its users. Therefore, the obtained data is used to recognize arrangements, such as labels and related charms.

The site examination is composed of photographs of each of the model of dwellings from selected parts that are in an order that each dwelling unit would have the similar visual data of essential fundamentals such as;

- Personal objects/spaces
- Dominant aesthetic features
- Additional decorative features
- Semi - Open spaces
- Interior separations/definitions

All those features play a crucial role on user behaviour. Thus, space organizations of residential units are evaluated through those features in buildings, through the following chapter.

Those residential buildings have been analysed through spatial arrangements related to their functional layouts initially. Functional layouts of the spaces showed leading evidences on human behaviour.

Hence, case studies showed that spatial hierarchy of residential spaces display initial messages on surveys of residential places. For this reason, floor planning of residential buildings has been referred in order to have an understanding on occupier's major emphasises in interior settings in addition to site inspection survey.

4.3.2.2 Questionnaire Survey

The beginning part of the survey was planned to make available data for the participants (See Appendix A, B). A number of requests were involved through their family participants to identify criteria about interior design applications and reasons behind their choices. Also, concerns about the use of spaces, the reason behind hiring interior designer and expectation from interior designer issues are important to require in order to have relevant data to analyse the occupiers intention if requested demands are satisfied and needs are met with requested customer issues.

Then physical questions asked with the intention to examine interior design qualities such as;

- Building Dimensions
- Utilities
- Services

Then it is followed by the surveys about interior designer preferences of users related to criteria such as;

- Trust
- Advice
- Artistic
- Service cost
- Waiting time

- Temperate behaviour

In addition to interior designer preferences it is also asked to prioritize the following design goals through their residential areas in order of importance as listed below in order to see the expectations more clearly.

- Find convenient furniture and accessories
- Enhance function of the household requirements more effectively
- Better reflect personal tastes
- To see choices through a computer based drawing programmer
- Get help through material choices through residential areas
- Give artistic dimension to the residential areas

The last part of the survey was planned to comprehend the immediate merits of the participants if users are pleased. The sort of searching set-up was planned in a different way through this section of the survey.

4.3.2.3 Interview Survey

Interview survey was planned to gain a detailed insight into the respondent's particular issues in order to analyse how their activity patterns which are related to their needs affect the interior design qualities.

The achievement of those qualities is occupied in the course of psychological classification through a place which is symbolized with user motives by arranging objects in a place through personal ways. In order to accomplish relevant answers similar questions are asked and each interview lasted up to one hour.

Interview stage was an essential part in order to gain information about personal aspects of occupiers that can help to analyse questionnaire survey through a more detailed data which help to learn what influences user's choices and demands.

Interviews are held with users of the houses and their interior designers. The aim for interviewing users is to understand how residential units of people are expected to be designed, what are their concerns while designing their home and their expectation from interior designer.

4.4 Results and Discussions

All participants have grown up in similar kinds of physical settings. As a result, it could be concluded that they possible could develop common ways of coping with their physical environment because their spatial behaviours are not reflected from altered norms.

However, personal differences have altered considerations to various elements and patterns through similar settings (Lang, 1987). Thus, individual experimental studies have been provided in order to show a variety of linkages between different user perceptions and visual pattern preferences.

Several concepts from various scholars have been examined previously such as the character variances adjustments of people. In this manner, particular aspects of environment emphasized as indicators of individual differences such as the user's culture, previous experiences, childhood memories, self-expressions and personal needs which are influencing the form of built environment and affect user perceptions and visual pattern preferences.

Consequently users with different perceptions and expectations respond in a different way to different physical surroundings according to their background and environmental aspects.

The provided information gives the impression that user perceptions are affected either by environmental aspects or within user brain set in motion through a vision on mind, which is influenced by the impressions of people previously have. This situation is explained by investigating individual differences through emphasizing varied user marks within their residential places.

However, perception has a wide range of theories on visual and sensory experiences from philosophy to architecture. Thus, theories are barely capable to explain the essence of perception individually and require much deeper analysis between each other.

Thus, case studies from different user approaches are essential in order to clarify the issues in perceptual research and the analysis is conducted to investigate 10 different users' responses to designed environments.

Provided interviews and questionnaires showed that users become familiar with their environments and purposefully react to it according to their needs and motivations. Previously, literature survey on user needs is examined through Maslow's hierarchy of needs (1943). The participants are asked to prioritize their considerations in order to provide a foundation for the understanding of human needs in a surrounding environment.

The claim from Maslow's (1943) theory has been followed by participants in the same way. Physiological needs have been put forward initially such as appetite and security requirements, belonging and esteem desires, actualization and cognitive needs as well as aesthetic desires.

The basic process involved in the interaction between people and their environment has shown that the messages from environment are received through a perceptual process that is leaded and motivated by needs. Hence, a connection between cognition and perception can be settled through not only a spatial behaviour concerns but also by emotional concerns.

The case studies have been considered like a physical setting that leads people interaction with recognized and identified through their behavioural responses as mentioned in detail in the following chapters. The built environment has physical effects on user lives through structure, materials, form, shape and personal preferences.

Those preferences from interior environment is called 'physiological responses' according to aspects of user behaviour and those preferences influence the interaction between other users and surroundings (Berlyne, 1971; Griffin, 1968; Newman, 1972). In this manner floor plans are provided with interior photographs in order to examine the mentioned requirements of physical surrounding of the built environment.

Those physiological illustrations are also combined with user mentality in addition to their body. Thus, the features from surrounding environment suggest emotional responses. Those emotional reactions are examined also because those responses also occurred in user interior places of users and affect their behaviour.

Thereby, physical forms influence the mental state of user and cause either a positive or negative emotional reaction. In order to examine emotional responses, additional factors are also evaluated through the surveys from residential places. Investigating user's privacy levels, personal space definitions and territorial behaviours help to discover user emotional reactions in addition to physiological responses.

4.4.1 Findings and Results of Site Inspection Survey

The case studies are selected in accordance with a set criterion concerning specific variety of residential space that shows individual differences. Each of the residential spaces of physical settings is from 5 interior designers with 10 different residential projects. A direct site inspection survey has been conducted through projects along with different user with similar physical characteristics.

Each of the houses belongs to homeowners and constructed on individual plots. Those residential buildings are large properties in terms of square meters. The size of houses is range from 200 to 500 meter square.

The homeowners of houses considered their family needs especially their children aspects while choosing their site and rest of the housing requirements. Also each of the houses has private gardens which are surrounded by all four sides of the property.

All houses from residential buildings have similar large open terraces and balconies and facade detailing and are defined by boundary walls. Visual analysis showed that each house chose to have particular large openings which is used to have more light into indoors and intended to have outdoor facilities.

All of the participants were satisfied with the location, size and floor plans of their houses what they required for. Houses 2, 3 and 6 have been specially called for calm, serene and scenic site where they can be close to the sea and coastal beaches.

Houses 4 and 10 are occupied by a young married couple which are only interested in the location of the houses where they can easily reach their offices and also considered indoor aesthetic issues. Married couples with kids have a special consideration through their kids and they wanted to have a secure garden where their kids can spend time.

The selected houses were all designed by their architects through the criteria which they set and all the interior design projects of the houses are designed by professionals.

Hence, when they are asked if their houses were their ideal homes or not, all of them are strongly agreed with this statement because every detail in the house were settled and designed according to how they wanted. Entirely, users are satisfied with the designs.

House portfolios are provided in order to see general details of the residential units. Through house portfolios; floor plans, exterior façade, interior views and general characteristics of physical issues are referred in order to clarify the examinations of the residential houses such as shown in figures (12, 13, 14, 15, 16, 17, 18, 19, 20, and 21).

The first sample is House 1 as shown in figure 12, which is occupied by a married couple who are retired from governmental work. They generally spend their time at home, but have diverse social activities during the day.

According to their answers, their indoor spatial organization is affording certain standards of physical comfort degrees but in different personal spaces. The levels of comfort degrees varied in their perceptions related to diverse expectation and habituation degree of individuals.

Those individuals' activity requirements led spatial organizations of residential units in particular arrangements with respect to their decisions.

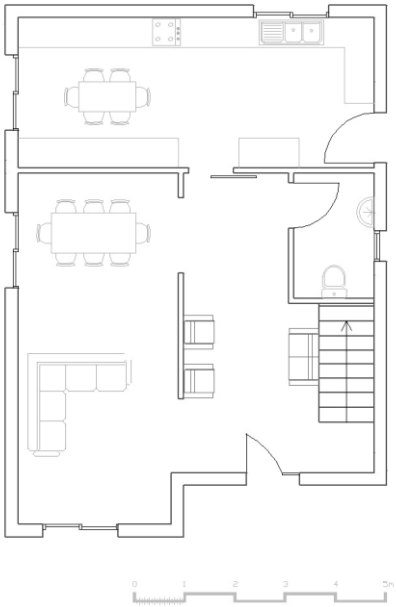
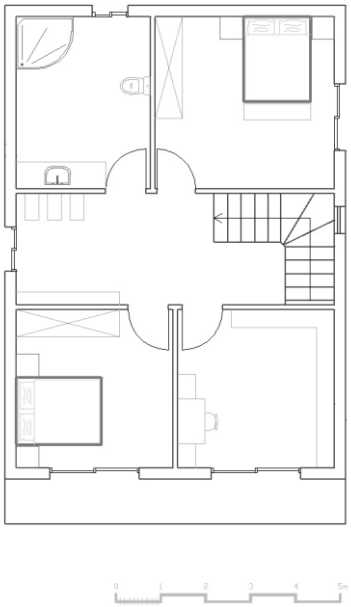
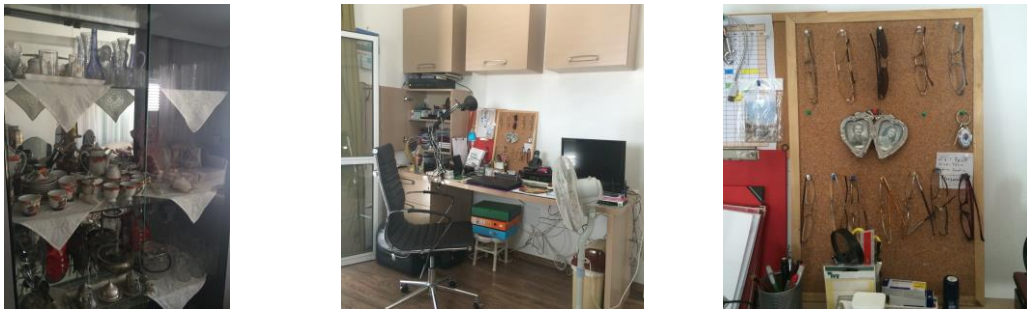
<table>
<tr><td>Exterior View</td><td>Physical Features</td></tr>
<tr><td>  </td><td>• Built in 1974, Re designed in 2013.
• Located in Nicosia.
• Owned by married couple aged 54-60.
• 200 m^2 - 2 Storey.
• 2 bedrooms, 1 kitchen with dining area, 1 living room, 1 dining room, 2 bathrooms, 1 study room.</td></tr>
<tr><td>Ground Floor Plan</td><td>First Floor Plan</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Interior Views</td></tr>
<tr><td colspan="2">  </td></tr>
</table>

Figure 12. House-1 Portfolio

According to the results from interviews and questionnaire, House 1 is divided into individual arrangements because of diverse perception of the couple. Female user prefers to spend her time either in kitchen or living room and invite friends to spend time together. However, male user is more interested in reading books and need more privacy than female user at this study room.

House 1 is the second residential unit of the same family. They designed a new house and moved to this place because the previous residential area was not addressing their needs properly. They have diverse expectations, personalities and objectives but living in the same building. Thus they have their residential design through individual patterns of adaptation and personalization through different places in the same building. It is easy to examine which place belongs to female user or male user because they have their place marks through signs of possessiveness such as shown in Figure 13.

Those possessed objects are said to be reminding special memories from special people from past years. Those places are house owners' territories which necessarily should have been included by their interior designers. However, the pin board for glasses and cabinet for memorial accessories are added later to the house. Those needs which are related to individual intentions are the modifications of the requirements from territorial needs of users. Those requirements are important for user to achieve, otherwise can cause lack of self-esteem and self-identity. Territories are necessarily included areas, objects and places in the environment that exists in environments that people actually use as parts of their daily lives.



(a) (b) (c)

Figure 13. Personal Places and Personal Marks of Home Owners

Those objects are found in personal spaces of users. The glass cabinet as shown in Figure 13 (a) is located in the living room where female user spends her time at most. All the items in the cabinet are valued possession that has been passed down through the generations. Those kinds of cabinets are frequently seen in residential places in Cyprus. She said she wanted to keep all those old items and accessories in a place where she can see every day.

The male user requested to have a study room as shown in Figure 13 (b) with the need of privacy and personal space for himself. He stated that he spends most of his time at the study room. He also said that he needed to be able to control the process of privacy so that he can be alone if he wishes. Moreover, he stresses that her wife has friend meetings during the day which bothers his daily activities of reading. So he uses his study room when he has a need of interruption period from other people involved in the house. On the other hand, he personalized the space through a symbolic way as shown in Figure 13 (c). The glasses are symbolizing how long time he had in past years for learning and teaching before his retirement.

Accordingly built environment is filled with patterns of adaptation and personalization of its users as shown in the first case study. Personalization brings up the importance of the accumulation of items through an environment. Human behaviour is resulted not only from a materialization of an aspiration of territorial control, but also an expression of aesthetic experiences in addition to the result of an attempt to make the surrounding to form improved action patterns through aspects and elements of the space (Lang, 1987).

There is a variety of factors which affect user satisfaction and needs, regarding to sex, age, health issues, psychological factors and social indicators. Those varieties generally provide complicated relations between users and the environment. Residential environments, which are occupied by a family, are separated to individual parts due to the needs of each user as shown in House 1.

On the other hand, users of the House 2 prefer to use interior spaces together with their family members and provide space organization and furniture detailing in a multifunctional way.

The couple said they have long working hours and when they come home they do not want family members to distribute in different places. In this manner, kitchen is positioned in the middle of dining room and living room. Positioning the kitchen in the middle of those rooms with additional functions allowed deriving diverse needs and activities to take place in same area without preventing each other's activities.

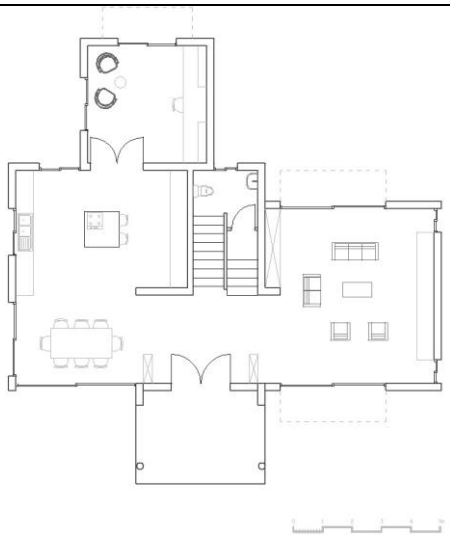
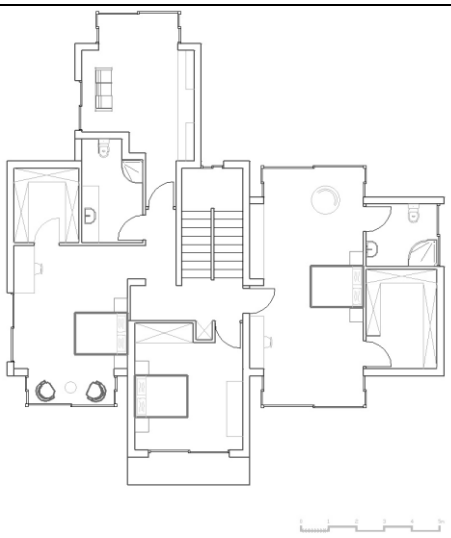
<table>
<tr><td>Exterior View</td><td>Physical Features</td></tr>
<tr><td>  </td><td>• Built in 2000.
• Located in Kyrenia.
• Owned by a married couple aged 31with 2 children.
• 300 m^2 - 2 Storey.
• 3 bedrooms, 1 kitchen with dining area, 2living rooms, 1 dining room, 3 bathrooms, 1 study room.</td></tr>
<tr><td>Ground Floor Plan</td><td>First Floor Plan</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Interior Views</td></tr>
<tr><td colspan="2">    </td></tr>
</table>

Figure 14. House-2 Portfolio

There are two living rooms in the same floor. One of the living rooms is designed next to the kitchen and has additional functions as study room for kids when they need to work on home works and also a playground for their leisure activities. The design of the living room attached to kitchen has expression of kids' aesthetic experiences. On the other hand, the main living room shows another materialization of an aspiration of territorial control over space through adult decisions. Personalization brings up the importance of the accumulation of items through the environment by colours in this case study. According to information provided by home owners, they wanted to help their kids to adapt the environment through their own decisions and they prefer to identify their place with colour definitions.

On the other hand, perceptions are affected by much deeper environmental impacts of a vision on mind which is influenced by the impressions people previously have such as House 3 shown in Figure 15. The home owner said that she was born in a city which is located on a coast line in Turkey. Then she had to move for education to a terrestrial country and settled her life for a long time without feeling any aspects of her home town. She said she always feel the lack of being in coast line and having difficulties with belonging concerns. Afterwards she married with a Cypriot man, moved to Cyprus and bought a land to have a property, where she can feel familiar to her home town. The design of the house was arranged in a way that she can feel sea in every place of her house. In this case, a particular meaning is attached to identical feelings of home from past experience of user. The perception of residential place is related to the past experience of home identification of user. As Gibson (1987) stated, previous experiences influence perceptions and lead people to recognize particular things and respond in specific ways such as shown in figure 15.

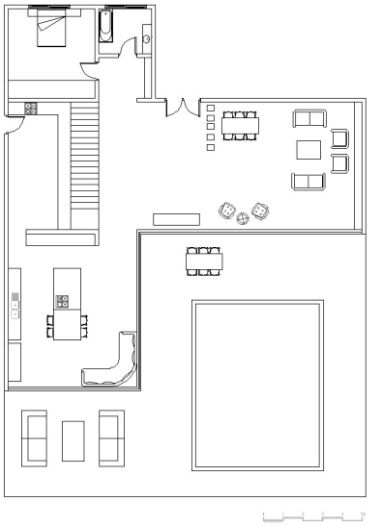
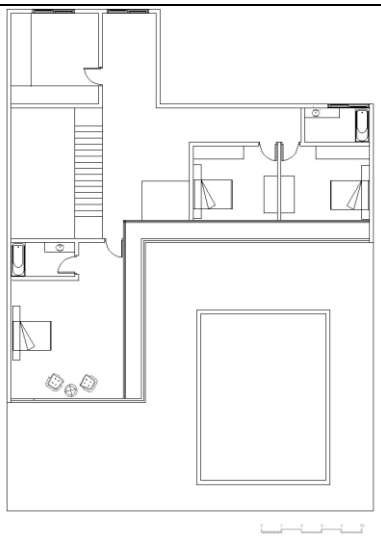
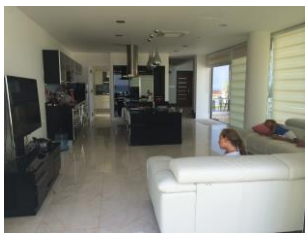
<table>
<tr><td>Exterior View</td><td>Physical Features</td></tr>
<tr><td>  </td><td>• Built in 2013
• Located in Kyrenia
• Owned by a married couple aged 38 - 40 with two kids
• 500 m^2 - 2 Storey.
• 4 bedrooms, 1 kitchen with dining area, 1 living room, 1 dining room, 3 bathrooms, 1 utility room, 1 hobby room.</td></tr>
<tr><td>Ground Floor Plan</td><td>First Floor Plan</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Interior Views</td></tr>
<tr><td colspan="2">    </td></tr>
</table>

Figure 15. House-3 Portfolio

In some cases, users perceive spaces through associating with relative activities to spaces. The House 4 shown in Figure 16, is occupied by a young couple. The residential place is considered through spatial arrangements through open plan applications which are supposed to be functional for various activities.

However, the density and volume of the space influence the crowding feeling and affect their privacy concerns of users in a bad way. The amount of the spaces and open spaces all has effects on crowding feeling on user behaviours.

According to the information provided by user; selected open plan diagrams provide flexibility and easy access in between each other but destroys the personal zones on the other hand. Each part of the ground floor has related functions but affect each other's activity in an interrupted way and blocking the concentration to relevant activities.

In this manner, they are advised by their interior designer to have moveable partitions which will allow controlling openness and semi fixed furniture will help them to change the function of houses according to changing circumstances. They requested to enhance the functional efficiency of the house and the emphasis has been put forward to physical environment qualities.

Thus, functional efficiency of the residential space carries an important role on human behaviour. The built environment required to afford certain standards of physical comfort degrees, which later relates to psychological well-being (Fitch, 1965; Lang, 1987).

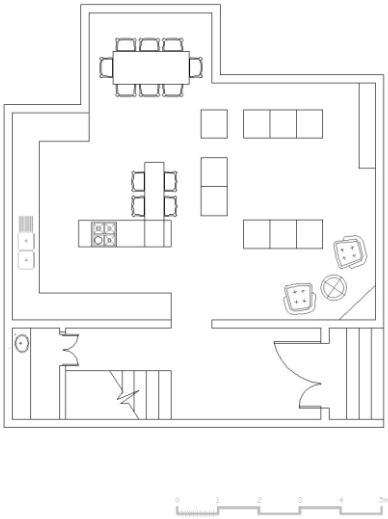
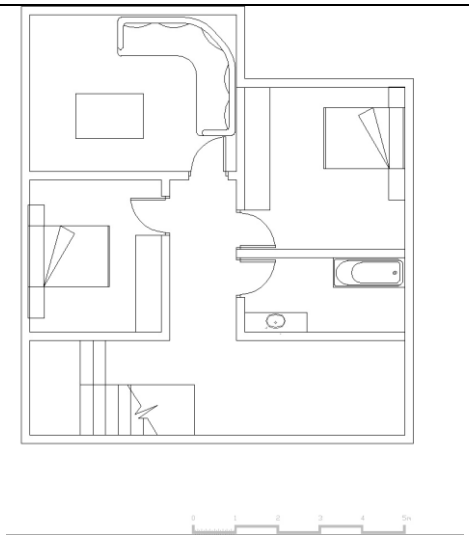
Exterior View	Physical Features
	• Built in 2012 • Located in Guzelyurt • Owned by a married couple aged 26 • 240 m^2 - 2 Storey. • 2 bedrooms, 1 kitchen with dining area, 2 living rooms, 1 dining room, 2 bathrooms
Ground Floor Plan	First Floor Plan
	
Interior Views	
  	

Figure 16. House-4 Portfolio

The House 5 is occupied by a family with 2 children. The family used to stay in a flat before moving to a new house. As a result, the family needs are not supported in terms of functional efficiency issues at their previous residential place so they consider the problematic areas of their previous house and try to avoid from small places while designing their new house.

The female user of the house is working in a governmental position with flexible working hours. The male occupier is working in a private sector and has in flexible long working hours. Hence, the mother is taking care of kids for most of the time. For this reason she preferred to use kitchen and living room in the same place in order to do domestic tasks when her kids are doing other activities at living room.

The couple have different friend groups and diverse interest areas. Thus, they need their own spaces in the house. There are 3 living rooms in the house in order to accommodate individual activities. One of the living rooms is designed in a way that it can be also used as a hobby room for children.

Accordingly, the House 5 is occupies by a family with different requirements. Thus, the dwelling is separated to individual and private parts due to the different characters of users. Such personal spaces are symbolic environments that fulfil many needs of family members. Those symbolic environments are essential because they are "places for self-expression, a vessel of memories, a refuge from outside of the world, a cocoon where they can feel nurtured and let down their guard" (Marcus, 1995: p.4).

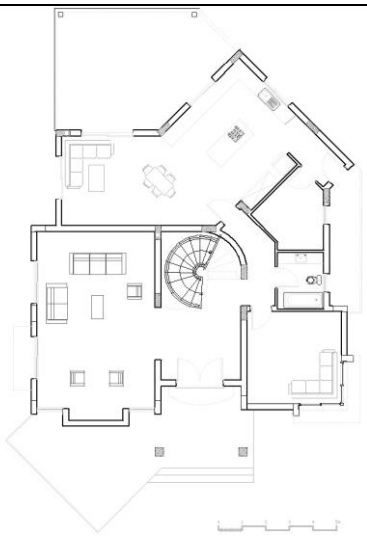
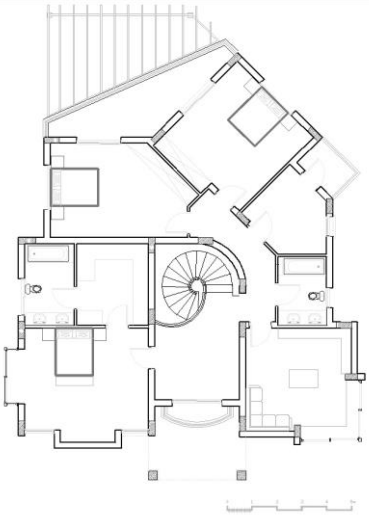
<table>
<tr><td>Exterior View</td><td>Physical Features</td></tr>
<tr><td>  </td><td>• Built in 2013
• Located in Nicosia
• Owned by a married couple aged 38 - 40 with two kids
• 300 m^2 - 3 Storey.
• 3 bedrooms, 1 kitchen with dining area, 3 living rooms, 1 dining area, 3 bathrooms, 1 utility room, 1 hobby room.</td></tr>
<tr><td>Ground Floor Plan</td><td>First Floor Plan</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Interior Views</td></tr>
<tr><td colspan="2">    </td></tr>
</table>

Figure 17. House-5 Portfolio

The House 6 is occupied by a married couple who are retired from private sectors and commonly spend their time at their residential place. They designed the house when they got retired from their works. The physical concerns of the house are said to be designed through their daily activities. They said the house is not only used just a physical unit which defines a space for proposing a closure for domestic activities but also a place for their personal and social activities and a space for displaying their characters. However they also stressed that they know what they need from their home but could not decide what materials and organizations to use for defining themselves. Hence, they hire an interior designer.

They are interested in reading books and visiting foreign countries thus they requested for special places reading books and shelves for books and for displaying souvenirs that they collected from their visits such as shown in interior views from provided photographs.

In addition to souvenirs they collect lots of traditional objects from Cyprus. Those objects have symbolic meaning for occupiers. The features from traditional objects from surrounding environment suggest emotional responses and carry motivational messages which are inspired from. Those messages that achieved from the environment has representative features which provide meaning, value and aesthetic properties to it in response to their need to observe the environment as a pattern of relationship and precedent observations from the foundation for understanding the latest.

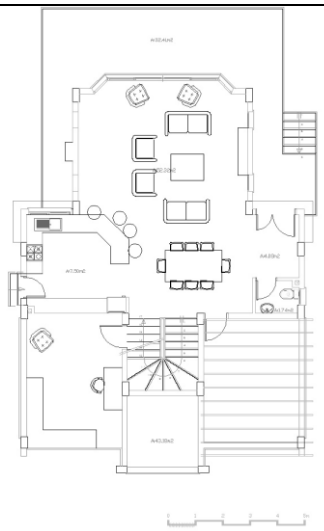
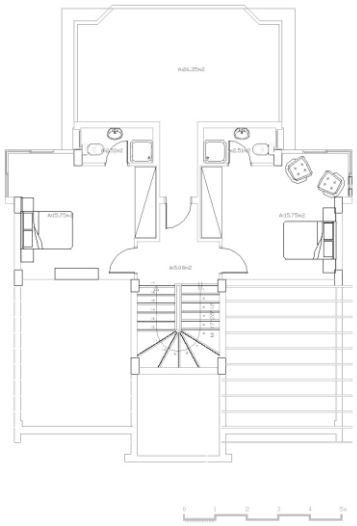
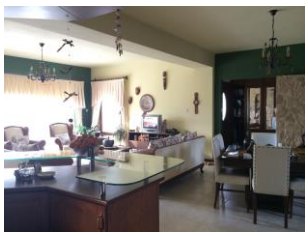
<table>
<tr><td>Exterior View</td><td>Physical Features</td></tr>
<tr><td>  </td><td>• Built in 2011
• Located in Kyrenia.
• Owned by married couple, 54-60.
• 250 m^2 - 2 Storey.
• 2 bedrooms, 1 kitchen with dining area, 1 living room, 1 dining room, 3 bathrooms, 1 study room.</td></tr>
<tr><td>Ground Floor Plan</td><td>First Floor Plan</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Interior Views</td></tr>
<tr><td colspan="2">    </td></tr>
</table>

Figure 18. House-6 Portfolio

The House 7 as shown in the figure 19 is occupied by a married couple with 2 children. They are retired from private sectors and their children are married and do not live with them in the same property. The interior design is supported by occupier's considerations of intentions through relevant reasons which found in convenient by them with spatial behaviours.

During the weekdays occupiers live alone but their children and grandchildren visit them on weekends. Thus they need a house with functional furniture organizations which are combined in a way that can simply be assisted in either for themselves when they are alone or for a group of communications when they have visitors in the house.

They prefer to use additional rooms at the first floor as bedrooms for their children. They are married and move to their houses but the parents still wanted to provide a place for their children at their homes. They believed bedrooms are important spaces to make their children still feel they are part of this house even though they are married and have their own families.

According to the occupiers of the residential unit in the House 7, a home is a place where family members come together and should address functional needs and aesthetic desires of every one of them. Thus, they designed the common areas of residential place with the common decisions from all family members.

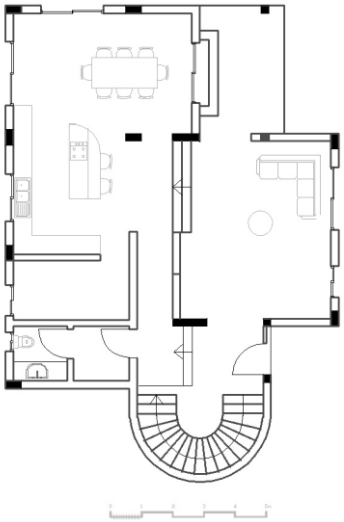
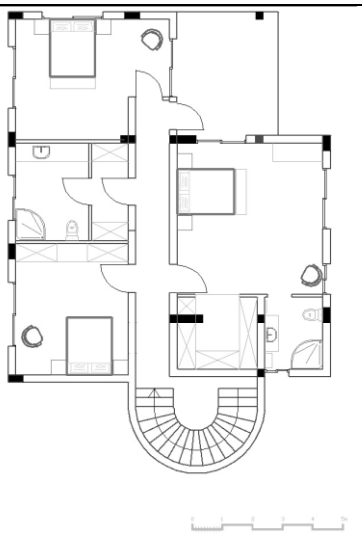
<table>
<tr><td>Exterior View</td><td>Physical Features</td></tr>
<tr><td>  </td><td>• Built in 2013
• Located in Kyrenia
• Owned by a married couple aged 54 with two kids
• 280 m^2 - 2 Storey.
• 4 bedroom, 1 kitchen with dining area, 2 living room, 1 dining area, 3 bathroom, 1 utility room, 1 hobby room.</td></tr>
<tr><td>Ground Floor Plan</td><td>First Floor Plan</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Interior Views</td></tr>
<tr><td colspan="2">  </td></tr>
</table>

Figure 19. House-7 Portfolio

The House 8 is belonging to a family with 2 children. The parents are working for long hours and children are studying in other countries and only using their houses when they come for holiday. The occupiers of the house have also stressful jobs and they come home very late. Their residential interior space is a physical unit for them which defines a space for a closure for releasing from responsibilities.

It is important to understand how to evaluate a physical form of a residential place through examining the way of life its user while addressing user desires, motivations and feelings. Thus, user's lives that take place at work is important concerns and affects their behaviour and expectations from their residential places.

They said they were working in open plan offices through a loudly atmosphere and when they come home they said they do not what to have all functions in one place and they are in need of a silent zone which is provided by a separated living room from other places of residential unit. They come home from work and directly start domestic tasks which are necessary actions. They have very little time for both domestic tasks and resting during the week days. For this reason they want a small kitchen corner which will allow them to work quickly and easily.

Accordingly, the residential unit for occupiers is very important to release from work and crowding feeling which lead them to have strong separations between each room to keep every part private.

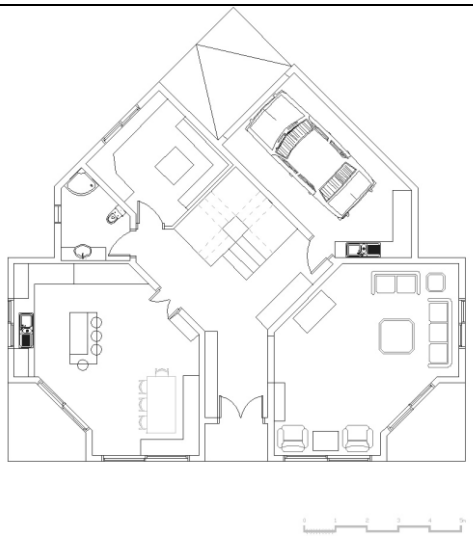
Exterior View	Physical Features
	• Built in 2000. • Located in Nicosia. • Owned by married couple aged 50. • 250 m^2 - 2 Storey. 3 bedrooms, 1 kitchen with dining area, 2 living rooms, 3 bathrooms.
Ground Floor Plan	First Floor Plan
	
Interior Views	
  	

Figure 20. The House-8 Portfolio

The House 9 is occupied by a family with 2 children. They are working in private sectors and they were used to stay in a rental house before moving to their current property. The rental house has negative effects on users which are not planned through their needs and considerations. They said it was so difficult to stay in a house which is not reflecting their personalities and addressing their needs. They had almost nothing personal in the house apart from possessed objects and furniture which assisted individuals to have feeling of home through their rental residential place as indication of home.

Then they bought a land and start to build their own house which will reflect their characters and personalities. However, they are having difficulties with the design of their residential unit and hire an interior designer. Hence, their attachment to a place would be reinforced by more dynamic elements of interior design and provides occupiers to connect completely with their mental dimension of vision, imagination and desires.

The intention from the design of the residential place is to have connected areas which can accommodate various needs at the same time. They wanted their living room to be spacious through multi-functional furniture in order to keep all family members in the same area.

Accordingly, the physical environment of users influences human life both in social and psychological manner. Thus, physical supplements of residential units are important in response to embody human decisions and also choices which help to modify the world in some purposeful way.

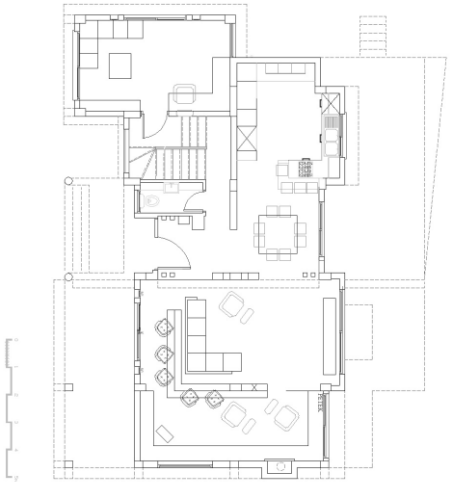
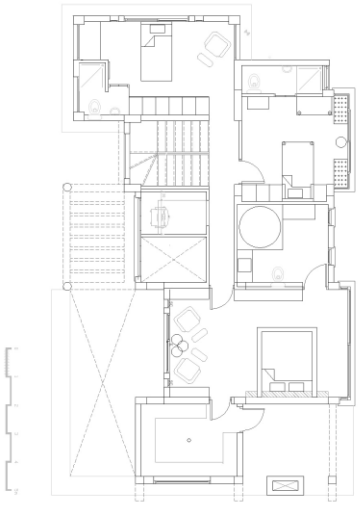
<table>
<tr><td>Exterior View</td><td>Physical Features</td></tr>
<tr><td>  </td><td>• Built in 2013.
• Located in Kyrenia.
• Owned by married couple aged 35 with two kids.
• 300 m^2 - 2 Storey.
3 bedrooms, 1 kitchen with dining area, 1 living room, 3 bathrooms, 1 study room.</td></tr>
<tr><td>Ground Floor Plan</td><td>First Floor Plan</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Interior Views</td></tr>
<tr><td colspan="2">   </td></tr>
</table>

Figure 21. House-9 Portfolio

The final case study is occupied buy a young couple aged 30 with one child. According to the answers provided from questionnaires, the size of their residential unit is exceeding in the use of volume according to their life in the house.

They said they are influenced from aesthetic principles such as semi open rooms and spacious interior spaces when designing their residential space. However when they started to live in the house they did not like the feeling of spacious places and now they are planning to change their interior design of their house according to these spatial concerns.

Hence, Interior designer's progress during a building organization is a vital issue for a design practice that the connection between the built form and user always been considered by means of not only its textural and material qualities, but also user's emotional experience in it.

The connection between user and environment has been provided in the course of formal analysis through their residential space. However, it is important to evaluate how a physical form of a residential place affects user behaviour and way of life while addressing those user motivations.

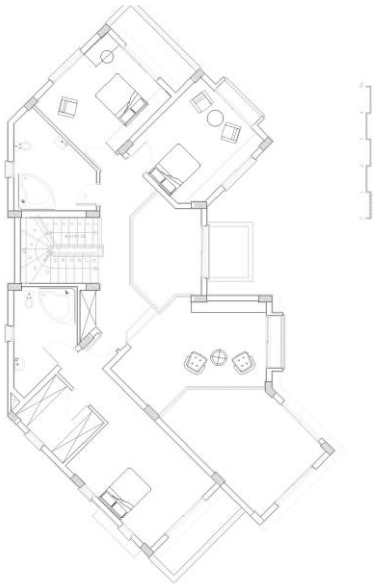
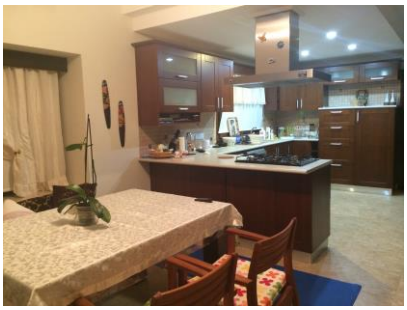
<table>
<tr><td>Exterior View</td><td>Physical Features</td></tr>
<tr><td>  </td><td>• Built in 2010
• Located in Nicosia.
• Owned by married couple aged 30 with 1 kid.
• 230 m^2 - 2 Storey.
• 2 bedrooms, 1 kitchen with dining area, 1 living room, 1 dining room, 3 bathrooms, 1 study room.</td></tr>
<tr><td>Ground Floor Plan</td><td>First Floor Plan</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Interior Views</td></tr>
<tr><td colspan="2">    </td></tr>
</table>

Figure 22. The House-10 Portfolio

4.4.2 Results of the Questionnaire Survey

The aim of the questionnaire survey is to investigate residential places though physical and functional qualities. Two separate questionnaire surveys were conducted both with 10 users and 5 interior designers as a pilot study for a further research. Results and discussions about questionnaire survey are explained in detail in the following section.

4.4.2.1 Results of the Questionnaire Survey with Users

Questionnaire survey shown in appendix A, allowed to examine residential places to be investigated though important physical and functional qualities of the sample houses. Physical surroundings are altered according to its occupiers. Thus, different people respond in different way to same questions according to their personal expectations. Questionnaire survey has been held to 10 different people from different professions but similar backgrounds such as shown in appendix C. Each of the participants were asked about their physical qualities of their houses such as its size and age, functional room qualities, size characteristics related to functional uses.

During the survey it was identified that all of the houses had open plan interior spaces with extra bedrooms for guests. The reason behind having extra bedrooms and open space plan solutions were explained by respondents that they always entertaining guests in their houses and gather family member in one space.

Most of the occupiers of the houses (except 4 and 10) mentioned that they used to stay in a smaller residential area and having troubles with the size and circulation of the rooms. Thus, they had preferred their interiors as spacious as possible in order to circulate more free in the house.

Respondents who used to have a house before were more experienced about how to use their houses and focused on functional efficiency initially. On the other hand, young couples (such as house 4 and 10) had priority related to the aesthetic issues while making decisions on qualities of physical issues.

During the survey the respondents were asked to arrange following aspects related to their expectation from an interior designer according to the degree of importance. Trust came first for 8/10 of respondents and advice for 2 of the participants. Also all of the participants agreed that they cannot work with a designer who does not have a tempered behaviour. A male participant said:

> "It is me who is going to dwell in this house. If an interior designer wants to design the house according to his or her demands it is going to be his or her house. There is no point to be insistent about design principles. I am going to live in the house every day and if the interior designer is not flexible on my requests I will not work with him or her." (Male, 52 years).

Almost the least important factor for all the participants was waiting time and service cost. They mentioned that if interior designer fail to gain customer confidence on advice and artistic approach the project cannot be finalized anyway.

After questioning the interior designer issues in the second part of the questionnaire survey, the respondents were also asked to prioritize their design goals through the importance. All of the occupiers of the houses mentioned that they initially requested their interior designers to enhance the function of the household requirements more effectively and secondly need help to better reflect their personal tastes as shown in appendix C.

In general 7/10 of the participants had difficulties through material choices and wanted to see their choices through computer based drawings and put these criteria on third line and rest of them having difficulties with convenient furniture and accessories related to size and position of their physical indoor environment. On the other hand 3/10 of participants stated that they wanted to decide furnishing and accessories by themselves because they believe they only need interior designers for functional enquiries that they are trained for.

The least important request from an interior designer by the users was to give an artistic dimension to the residential area because of being an everyday environment with particular elements.

In general, 8/10 of the respondents stated that they were happy and satisfied in terms of functional efficiency and the physical features of their houses in addition to the service that they get from their interior designer. Only 2 of them were undecided about their functional efficiency because they could not spend long hours at their house because of working hours of their professions.

4.4.2.2 Results of the Questionnaire Survey with Interior Designers

According to the results from the questionnaire survey which was settled with interior designers, it was mentioned that all of them faced with the importance of human aspects in terms of design issues. Although, as it was mentioned in the survey that they tried to understand customer's social lives and preferences as an initial step in order to have the chance to provide convenient interiors for the users of the residential units, yet it was mentioned that expectations from the users were sometimes difficult to handle by the designers.

All of the interior designers agreed that the interaction between human and environment is complex and believed design theories are insufficient to explain the influences of social life and past experiences on user behaviour. Thus, interior designers tried to analyse user behaviours, choices and values while designing residential units for them. To understand a user's personality and behaviour, designers involved decision making processes of occupiers of the houses in order to examine how their attitudes, beliefs and character qualities fit together through a residential environment.

Interior designers also mentioned that kitchen area had been considered as the most important part of the residential units. It was said that users were approaching kitchen as an important place to keep all families together and wanted to have a spacious area for kitchen to accommodate all family members together.

Interior designers commonly design interiors according to the concerns of users because they believe that residential units influence user emotional comfort directly. Therefore interior designers believed that If an occupier was fail to achieve the expected feeling from his or her residential unit his or her life could be influenced badly.

As a result of the questionnaire survey which was conducted with the interior designers, it could be concluded that in order to understand the complex interaction, a link is necessary between design field and behavioural sciences. Human aspects could only be understood in a combined model of environmental and behavioural skills with interior design issues. An interior designer could take advantages of

human behaviour difficulties when create the link between design field with environmental psychology.

4.4.3 Results of the Interview Survey

For the objectives of the study, interior designers and occupiers of the residential units were interviewed separately and patterns of responses are determined which have been carried out by different users in residential interiors to discover functional efficiency and emotional comfort needs.

In order to have a discussion according to objectives of the study, interaction between user and designer on implications of designs are considered with regard to similarities and contrasts between user decisions and demands versus designers.

Each interview lasted approximately 45 minutes. In the following paragraphs, result of the interviews surveys were presented understand the special role of perception theories for approaching human behaviour and environment interactions.

4.4.3.1 Results of the Interview Surveys with Users

Investigating individual experimental studies from different houses and users showed a variety of linkages between different personalities and visual pattern preferences. Those aspects of interior environment emphasized by answers from participants as indicators of individual differences as the user's residential experiences through self-expressions and personal choices through built environment.

In this manner, each of the participants was asked to describe which part of the house reflects their character at most. However 8/10 of the participants did not mention any particular place and claim that every part of the house reflected their character. They

claimed that they have used particular colours and detailing all around the house which presents their personality.

In order to investigate those personal environments in which human display messages from the unconscious decisions, interior surroundings are analysed and 45 minutes long interviews that had been provided in order to provide answers for emotional comfort of people in addition to the functional aspects.

During the interview, the emphasis had been put forwarded on kitchen designs through open and multifunctional plans through the houses. The information gathered from the participants it was explained that the reason behind having this prominence that they could not stay at home for long hours due to the working hours and when they were at home they spent most of the time in the kitchen. Home owners claimed that they liked to spend those limited times together with other house hold members. Accordingly, they focused mainly kitchen and other places adjusted into the kitchen in order to host other daily activities of other house hold members.

Users with children were more focused on social and common areas at their home where they could spend more time together with individual activities. Married young couples were more interested in fashion and style. Middle aged user was more interested in function and usage.

From the question "Which part of the house is more focused by user" was following an answer from a course of action which was resulted by information gathered from a mental process of user perception. This question helped to evaluate how user

perception presents a ‘spatial behaviour’ layout which provides an essential progress through an interior environment where individuals seek to accomplish their objectives.

Occupiers were coding information unconsciously about their environments from past experiences and social impacts of their everyday environments. Hence they had accumulated unconscious records from relative attributes from their everyday environments those records are the essential part of the design process because they show spatial orientation of a person such as indoor planning choices. Those indoor choices were seemed to be unconscious decisions of occupier about who they are.

When it was asked about important requirements for a residential area to be called as a ‘home’ environment, many participants had a common idea as it should be a place where they could satisfy their activities with people who they loved to spend time, at the same time an escape point from the exterior world.

On the other hand, few residential places (such as House 1) were occupied by a family with different needs which were needed to be separated to individual and private parts due to the needs of each user. A female[1] user of the house mentioned that she had more social meetings than her husband during the day and spent her time in the kitchen. Conversely, a male user of a space was a retired teacher and he liked to spend his time with reading books in a study room where he considered the space as a refuge from outside of the world, an isolate area where he could feel cultivated with himself.

[1] The names of the participants were not given due to the privacy issues.

Hence, individual parts of the residential area were created to provide those different people with different life styles of through their own environments that they could be considered as a place of self-expression.

Obviously the user responses achieved through different levels. In this manner, it was important to analyse how occupiers perceive space and how they reacted to it since diverse perceptions of spaces lead to different definitions of living conditions.

Consequently, personalities of users who dwell in along with the needs were well analysed and defined by their interior designer that they were happy with the result through aesthetic principles, spatial arrangements, and materials and detailing.

Different settings were produced through different demands and furniture detailing is created in different challenges and provided different levels of satisfaction. Consequently, even though users were in the same house with different perceptions and expectations, could live a differently than each other in same physical surrounding through their own personal spaces.

The survey showed cognitive results about why it was planned in a proper individual ways. On the other hand, some of the users were seeking to achieve their previous house qualities when designing their new property such as the House 3.

After collecting information about respondents, user responses were evaluated through the environmental practice and user perception in the sense of identification

of the human-environment relationship about how users become familiar with their environments and purposefully react to it according to their needs and motivations.

Subsequently each of respondents was requested to explain their homes if they have chance to live their life through their desired conditions and happy to be not restricted in conveying personal preferences along with individual qualities of their home.

4.4.3.2 Results of the Interview Survey with Designers

Interviews shown in Appendix B, were settled with five different interior designers from North Cyprus showed that all of them were aware of the fact that interior designers should know human psychology as much as design theory and techniques.

All five designers stressed that they faced with human aspects which were difficult to analyse only with design issues. Hence, they also mentioned that they all barely improved their knowledge on human behaviour during the residential design projects.

Interior designers also said that they needed to improve themselves through human aspects which they were not educated during their educations. They figured out that they had influenced on user behaviour as shown in Appendix D. Indeed, it is important to know what an interior designer play a role in achieving a sense of self in their dwellings. User preferences of participants seemed to be controlled by physical desires; however users generally are influenced by emotional and social factors. Those needs are unconscious decisions of users. Hence, an interior designer needs to have the ability to discover what is behind those user desires. Environmental aspects

should be considered such as focusing on user perception in order to discover more deeply how design process can be conducted through an appropriate way of design stages with concerning secondary issues of human aspect such as emotional responses.

4.5 Summary of the Chapter

Given extensive survey, the data was collected from everyday environments of the users through their personalities and needs. Residential buildings were shown common features between each other through similar spatial organizations but have distinctive interior markings with personal objects and accessories. Interior spaces were utilized according to user's functional efficiency and aesthetic desire levels through their residential areas by interviewing both interior designers and users. In this manner, provided information above relied on answers that they are provided from occupiers and interior designers.

In order to provide information about users, their physical, social and mental worlds were discovered in order to understand the relationship with surrounding environment. Ambiguities or misinformation about organization of interior elements could be aroused between user and designer while designing a residential unit. In this manner, perception theory is analysed through the literature survey in order to examine user responses for avoiding insufficient spatial resources and inflexible spatial arrangements which are all threaten individual behaviours within the interior space (Sherrod & Cohen, 1979; Hedge, 1991).

During the surveys, it was discovered that selected user groups were reacted to physical environments of their residential buildings with consideration of their inner

worlds. Thus, emotions considered as a cognitive course of action within the limits of selected case studies. Emotions influence occupier decisions and demands within the spatial organizations of environments.

The physical features gathered from residential buildings carry messages from users. Those messages achieved from the environment have representative features which later provide meaning, value and aesthetic properties in response to users. Observations that had been made through experimental and structural perceptions are involved in user moods, feelings and self-report of users. That self-reports and explanations were involved in sequences of actual perceived information in terms of physical and social organizations of the user worlds. Physical forms, spatial organizations and furniture arrangements influence mental state of the users in residential buildings. Thereby, user places shape its user attitude and behaviour.

Chapter 5

CONCLUSION

The aim of the study was to survey human perception according to physical environment and gains an insight on human behaviour with the factors that are influencing an individual's preferences. User responses to designed environments investigated through not only in terms of functional efficiency of the surrounding environment, but also the emotional responses in terms of privacy, territoriality and personalization aspects.

Previous chapters of the study focused on a survey through existing literature in order to understand how user perception process handled by diverse theoreticians in different ways. Understanding the process of perception provide a satisfactory foundation through analysing how human behaviour is influenced by individual perceptions. The built environment considered like a physical setting that leads to people interaction to be recognized and identified through their behavioural responses within the scope of study.

Along with the theory, the built environment demonstrates a vast consequence that a communication is suggesting itself among built environment and users. Hence, the built environment has physical effects on user lives through structure, form, material, shape and personal preference of environments. Those features form user behaviour, power the relations among other users and surroundings which is called

‘physiological responses’. Those reactions have an essential role on user's spatial behaviours that is occurred in architectural forms. Therefore, the design of a physical setting has a control over the user reactions.

Based on the analysis, physical surroundings are found to be in a continuous relationship between their bodies and buildings which are not only assembling their perception into the habitability of buildings and their environment; but also about how they occupy and understand the space. In this manner, emotional responses through attachment and belonging theories which shape user behaviours with their physical surroundings also carry essential role on human perception and behaviour. Those descriptions could best be seen from home environments, where the concept of environmental issues belongs to user groups which are connected with characterization and preservation aspects of their home environments according to their self-identity. The analysis is supported with a selected user group, through their housing environments in Northern Cyprus that is provided with the evidence of common interior design features and design solutions. These common architectural features and preferences were evaluated with a pilot study through ten types of field investigations and site visiting.

Related to the outcomes of the investigations, overall features of the illustrations were recognized as spacious buildings with well-furnished interiors, decorated interior walls plus open space plans. With the aid of the structured interviews, determining what role an interior designer played in achieving sense of self of user, after analysing the issues behind their decisions, it is more clear to understand their

perception through the designed environment and how they manage to reproduce private inclinations in the interior.

The issue of having moderate relationship with interior designers was an important and powerful aspect for house owners in order to have their ideal homes in the end of the project. They hire interior designers because of ability to reflect their personalities in a proper way, in addition to necessary aspects such as functional decisions that are made up of desired elements, materials and colours. Those issues could be considered essential aspect for the interior designer.

Due to the individual characteristics, users perceive their interior environment individually; and respond diversely through their choices of aesthetic and functional outcomes of their dwellings. The analysis showed that spatial qualities of private places of dwellings are organized in a detailed and extremely personal approach through a figurative way of the self of the user through their interest.

The collected evidences show how commonly women pay attention on personalization of interior environment qualities more than men such as decorative features of wall covering and furnishings. Male users are more interested in garden and living room where they could watch TV and female users are interested in kitchen design in addition to how they could effectively benefit from domestic tasks.

The determination of the analysis convinced that interiors display messages from the decisions of people about who they are, who they were and who they might become (Marcus, 1995). The designed environment is used as an investigation instrument

through examination of perception theory, which consecutively guide to a narrative view of 'person - environment' relationships with suggestions.

User responses are evaluated through the environmental practice of designer and user individually, in addition to user perception in the sense of identification of the human-environment relationship about how users become familiar with their environments and purposefully react to it according to their needs and motivations.

5.1 Recommendations for Further Research

Residential interiors have always been the centre of inquiries within the environmental psychology. Despite the responsiveness, there has been a lack of pioneering theories and methods to examine *home* through interior design of residential spaces.

In this manner, the concept of residential interiors contained by the psychological concerns should be inclined with a more detailed emphasis on the empirical and personal features of home for a further research.

According to the aim of the research, the research is to broaden the current debate on residential interiors within the environmental psychology by examining key themes in the social science literature on '*home'*. It could be argued in a more detailed survey through identifying core sites of meaning, towards a context-sensitive focus on the experience and use of residential interiors in an advance research in future.

The difficulty in coming to grips with the concept of home is its increasingly central role in everyday life, coupled with its rich social and cultural significance. For this

reason, the case studies could be evaluated through different social groups of users and could be compared in between each other in the future studies. It could be illustrated by a comparison with the concept of different user groups as shown in chapters through the pilot study.

Investigating residential interiors in a more detailed analysis would provide a foundation for the answers which could be beneficial for researchers and interior designers in fields that are concentrated on user responses of design. It is important to analyse secondary processes of human behaviour in order to turn a house into a 'home' by determining elements relating to their aesthetic demands as well.

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APPENDICES

Appendix A: Sample of Questionnaire Survey

Personal preferences relating to physical qualities of their houses:

Name: _____

Address: _____

Age: _____

Gender: Male ☐ Female ☐

Place of Birth: _____

Marital Status: Married ☐ Divorced ☐ Single ☐ Other ☐

Education qualification: _____

Occupation: _____

Family Origin: _____

PHYSICAL / FORMAL CHARACTERISTICS

Q1) Did you move to a new house or re design the existing one?

Q2) Did you make any physical changes such as breaking a wall or extending? If yes what was the reason?

Q3) How many square meter is your house?

Q4) Are you satisfied with the size of your house?

Q5) How many rooms do you have in your house?

Bedroom:
Bathroom:
Living room:
Study room:
Kitchen:
Dining room:
Hobby room:

Q6) What part of your house do you use the most?

Q7) What part of your house do you use the least?

Q8) What is your favourite part in the house and why?

Q9) Do you have any special personal object / area in your residential area?

Q10) What kind of spatial habits do you have or do you have any? (As having fixed sitting arrangements related to roles in family)

INTERIOR DESIGNER CRITERIA

Q11) Have you ever hired an interior designer before ?

- Yes
- No

If yes, when did this take place and were you pleased with the experience and the result?

Q12) What are the selection criteria of an interior designer for you ?

Please rank your answers from 1to 5. 1 is the most important and 5 is the least important.

• Trust	5	4	3	2	1
• Advice	5	4	3	2	1
• Originality	5	4	3	2	1
• Service Cost	5	4	3	2	1
• Waiting Time	5	4	3	2	1
• Other, please specify:	5	4	3	2	1

INTERIOR DESIGN PREFERENCES

Q17) What feeling were you seeking to achieve?

- Casual
- Formal
- Sophisticated
- Romantic
- Contemporary
- Warm/cozy
- Spacious
- Welcoming
- Other, please specify

Q18) How often do you change your interior design?

- More than once every two years
- Between once every 2 years and once every 5 years
- Less often
- Other, please specify:

Q19) Prioritize the following design goals four your home in order of importance;

- Find you some furniture, ornaments, etc.
- Function more effectively for my household
- Better reflect my personal tastes
- To visualize your choices through a computer based drawing programme
- Help your material choices through your project
- Give an artistic dimension to your project
- Other, please specify:

Q20) Which of these solutions do you prefer?

- Solution A : The designer only sells you the project idea.
- Solution B : The designer sells you the project and ensures its correct implementation (The purchasing of the furniture, material and ornaments, looking for craftsmen and managing the work on your house)

Q21) Do you keep any memorial accessories or piece of furniture?

Q22) Which factors influence your choices and decisions while designing your residential space?

Q23) What is your major purposes to achieve from your residential design project?

Q24) What is your daily activities at home?

Q25) Prioritize the following design goals four your home in order of importance;

- Security requirement
- Belonging and esteem
- Aesthetic desires
- Actualization and cognitive needs

Q26) Please define 'home' in your own words.

_____

_____

_____

_____

ENVIRONMENTAL ASPECTS

In order to answer the following questions please refer to the table below and mark which comment best presents your answer.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
I am satisfied with the service that I have from interior designer.					
I am happy with the result.					
In terms of functional efficiency the surrounding environment meets my needs.					
Designed environment satisfies my life style and requirements.					
This is my ideal house.					
The size of my house meets my family's needs.					
The interior design qualities are sufficient and satisfying.					

Please give ratings to residential activities at your house.

	5	4	3	2	1
Domestic tasks (Cooking, washing, ironing)					
Passive leisure (Watching TV, listening music, playing computer)					
Interactive leisure (Meeting friends, drinking)					
Common family needs (Having breakfast, lunch, dinner)					
Private needs (Brushing teeth, taking bath, sleeping, making love)					

Appendix B: Sample of Questionnaire Survey

Interior Designer preferences relating to qualities of their houses:

PERSONAL INFORMATION

Name:
Address:
Age:
Gender: Male ☐ Female ☐
Place of Birth:
Marital Status: Married ☐ Divorced ☐ Single ☐ Other ☐
Education Qualification:
Occupation:
Family Origin:

Q1) What are the user of the house preferences?

Q2) What kind of social life do users have?

Q3) How many square meter is the house?

Q4) How many rooms do you have in the house?

Bedroom:
Bathroom:
Living room:
Study room:
Kitchen:
Dining room:
Hobby room:

Q5) What are the main reasons for requesting this certain amount and functional type of rooms?

Q6) Why people need to hire an interior designer?

Q7) What is your customer's expectation from you while designing a residential space?

Q8) How can interior designer enhance the function of the interior environment?

Q9) Which part of the residential building considered most important?

Q10) What features of the house did user requested to change from the actual plan? Why?

Q11) Please note any important requirements you included when designing a residential space?

Q12) Please note any other important factors you wish to share about the design process of your house and reasoning's behind certain decisions which were made.

Q13) Does interior designer help user choices and decisions through a residential space's design to define oneself through his or her house?

Q14) Which factors influence your choices and decisions while designing a residential space?

Q15) What are your consideration factors when designing a residential place?

Q16) Please range below issues according to your customer's preferences from most desired to less desire.

- Security requirement
- Belonging and esteem
- Aesthetic desires
- Actualization and cognitive needs

Q17) What is your customer's intimacy level of privacy?

Q18) Please define 'home' in your own words.

_____

_____

_____

Please check the number ranging from -3 to +3 to indicate how much you agree with the item, according to the following scale:

Strongly Agree /Strongly Disagree

	-3	-2	-1	0	+1	+2	+3
I don't usually bother to analyse user behaviours, choices and values.							
I have figured out I have influence on user behaviour.							
I believe it is important to analyse and understand user's decision making process.							
I have found that relationship between a person's attitudes, beliefs, and character traits are usually simple and straightforward.							
I have found that the causes for people's behaviour are usually complex rather than simple.							
To understand a person's personality and behaviour I have found it is important to know how that person's attitudes, beliefs and character traits fit together.							
When I try to understand user's behaviour, external factors of physical surrounding might be affecting them.							
I think a lot about the influence that society and cultural background has on other people.							

Appendix C: Results of Questionnaire Survey with Users

PHYSICAL / FORMAL CHARACTERISTICS	
Users move to a new house or re design th existing one	**N=10**
New House	9
Re-design existing one	1

Physical changes in residential buildings	**N=10**
Breaking walls	7
Extensions	3

Reasoning for Physical changes	**N=10**
To have more spacious interior areas	2
To unify seperated rooms	7
To have additional rooms	1

Square meter of Residential Places	**N=10**
200-250	5
250-300	4
300-350	0
350-400	0
400-Above	1

Number of Family Members	**N-10**
1 Person	0
2 People	5
3 People	2
4 People	3

Satisfied with the size of the Residential Place	**N=10**
Yes	10
No	0

Commonly used rooms / Favourite Part of the House (Female User)	**N=10**
Bedroom	0
Bathroom	0
Living Room	0
Study Room	0
Kitchen	10
Dining Room	0
Hobby Room	0

Commonly used rooms / Favourite Part of the House (Male user)	N=10
Bedroom	0
Bathroom	0
Living Room	9
Study Room	1
Kitchen	0
Dining Room	0
Hobby Room	0

Commonly used rooms / Favourite Part of the House (Male user)	N=3
Bedroom	3
Bathroom	0
Living Room	0
Study Room	0
Kitchen	0
Dining Room	0
Hobby Room	0

Special Belongings	N=10
Memorial objects from family elders	3
Personal Objects	7

Fixed seating arrangements related to roles in family	N=10
Yes	10
No	0

INTERIOR DESIGNER CRITERIA	
Worked with Interior Designer before	**N=10**
Yes	2
No	8

Most important criteria for users from their interior designer	N=10
Trust	2
Advice	1
Originality	3
Service Cost	0
Waiting Time	0
Tempered Behaviour	4

Least important criteria for users from their interior designer	N=10
Trust	0
Advice	0
Originality	2
Service Cost	4
Waiting Time	4
Tempered Behaviour	0

Reason for Hiring Interior Designer	N=10
Find some furniture, ornaments etc.	0
Improve function more effectively for household requirements	7
Better reflect personal tastes	0
To visualize choices through a computer based programme	0
Help material choices	0
Give an artistic dimension to the project	3

INTERIOR DESIGN PREFERENCES	
Feeling seeking for	**N=10**
Casual	0
Formal	0
Sophisticated	0
Romantic	0
Contemporary	3
Warm/Cozy	0
Spacious	7
Welcoming	0

The frequency for need to change design of Residential Places	N=10
More than once every two years	0
Between once every 2 years and once every 5 years	2
Less often	8

Preferred Solution for the design of Residential Place	N=10
Solution A: Interior designer sells the project idea	10
Solution B: Interior designer sells the project idea and ensures its correct implementation	0

Factors influencing choices and decisions of users	N=10
Past Experience	1
Physical Needs	6
Aestehic Desires	3

Major purporses expected to be achived from Residential Place	N=10
To adress family needs	3
A shelter from outside of the world	5
A place to express personal characteristics	2

ENVIRONMENTAL ASPECTS	
I am satisfied with the service that I have from Interior Designer	
Sampling	**N=10**
Strongly Agree	8
Agree	2
Undecided	0
Disagree	0
Strongly Disagree	0

I am happy with the result	
Sampling	**N=10**
Strongly Agree	8
Agree	2
Undecided	0
Disagree	0
Strongly Disagree	0

I am happy with the result	
Sampling	**N=10**
Strongly Agree	8
Agree	2
Undecided	0
Disagree	0
Strongly Disagree	0

Surrounding environment meets my needs	
Sampling	**N=10**
Strongly Agree	0
Agree	8
Undecided	2
Disagree	0
Strongly Disagree	0

Designed environment satisfies my lifestyle and requirements	
Sampling	**N=10**
Strongly Agree	0
Agree	8
Undecided	2
Disagree	0
Strongly Disagree	0

This is my ideal house	
Sampling	**N=10**
Strongly Agree	10
Agree	0
Undecided	0
Disagree	0
Strongly Disagree	0

The size of my house meets my family's needs	
Sampling	**N=10**
Strongly Agree	10
Agree	0
Undecided	0
Disagree	0
Strongly Disagree	0

The interior design qualities are sufficient and satisfying	
Sampling	**N=10**
Strongly Agree	10
Agree	0
Undecided	0
Disagree	0
Strongly Disagree	0

Appendix D: Results of Questionnaire Survey with Interior Designers

I don't usually bother to analyze user behaviours, choices and values.	
Sampling	**N=5**
Strongly Agree	0
Agree	0
Undecided	0
Disagree	0
Strongly Disagree	5

I have figured out I have influence on user behaviour.	
Sampling	**N=5**
Strongly Agree	0
Agree	5
Undecided	0
Disagree	0
Strongly Disagree	0

I believed it is important to analyze and understand user's decision making process.	
Sampling	**N=5**
Strongly Agree	5
Agree	0
Undecided	0
Disagree	0
Strongly Disagree	0

I have found that relationship between a person's attidues, beliefs and character traits are usually simple and straightforward.	
Sampling	**N=5**
Strongly Agree	0
Agree	0
Undecided	0
Disagree	5
Strongly Disagree	0

I have found that the causes for people's behaviour are usually complex rather than simple.	
Sampling	**N=5**
Strongly Agree	5
Agree	0
Undecided	0
Disagree	0
Strongly Disagree	0

To understand a person's personality and behaviour I have found it is important to know how that person's attidues, beliefs and character traits fit together	
Sampling	**N=5**
Strongly Agree	0
Agree	5
Undecided	0
Disagree	0
Strongly Disagree	0

When I try to understand user's behaviour, external factors of surrounding might be affecting them.	
Sampling	**N=5**
Strongly Agree	0
Agree	3
Undecided	2
Disagree	0
Strongly Disagree	0

I think a lot about the influence that society and cultural background has on other people.	
Sampling	**N=5**
Strongly Agree	0
Agree	5
Undecided	0
Disagree	0
Strongly Disagree	0