EVALUATION OF THE EFFECT OF SHOPPING CENTERS ARCHITECTURAL TYPOLOGIES ON CUSTOMER BEHAVIOR: ERBIL CASE STUDIES

PhD Thesis

Khawola F. MAHMOUD

Eskişehir, 2016

EVALUATION OF THE EFFECT OF SHOPPING CENTERS ARCHITECTURAL TYPOLOGIES ON CUSTOMER BEHAVIOR: ERBIL CASE STUDIES

Khawola F. MAHMOUD

Doctor of Philosophy

Department of Architecture

Assist.Prof.Dr. Mehmet İNCEOĞLU

Assist.Prof.Dr. Nahedh AL-QEMAQCHI

Eskişehir

Anadolu University

Graduate School of Science

March, 2016

JÜRİ VE ENSTİTÜ ONAYI

(**APPROVAL OF JURY AND INSTITUTE**)

Khawola F. MAHMOUD 'nın "**Evaluation of the Effect of Shopping Centers Architectural Typologies on Customer Behavior: Erbil Case Studies"** başlıklı tezi 31/03/2016 tarihinde aşağıdaki jüri tarafından değerlendirilerek "Anadolu Üniversitesi Lisansüstü Eğitim-Öğretim ve Sınav Yönetmeliği"nin ilgili maddeleri uyarınca, **Mimarlık** Anabilim dalında Doktora tezi olarak kabul edilmiştir.

	Unvanı-Adı Soyadı	İmza
Üye (Tez Danışmanı)	:Assist.Prof.Dr. Mehmet İNCEOĞLU	.....
Üye	:Prof.Dr. Ruşen YAMAÇLI	.....
Üye	: Prof.Dr. Meral NALÇAKAN	.....
Üye	: Assist.Prof.Dr. Meltem VATAN KAPTAN	.....
Üye	: Assist.Prof.Dr. Riyad ŞİHAB	.....

.....

Enstitü Müdürü

ABSTRACT

EVALUATION OF THE EFFECT OF SHOPPING CENTERS ARCHITECTURAL TYPOLOGIES ON CUSTOMER BEHAVIOR: ERBIL CASE STUDIES

Khawola F. MAHMOUD

Department of Architecture

Anadolu University, Graduate School of Science, March, 2016

Supervisor: Assist.Prof.Dr. Mehmet İNCEOĞLU

Co-Supervisor: Assist.Prof.Dr. Nahedh AL-QEMAQCHI

Humans are the main users of the environment in general and the built environment in particular. Several studies have investigated and analyzed human behavior and the reciprocal interaction between it and the built environment. These studies stated that human behavior influences the surrounding environment and is influenced by it. The shopping environment is considered one of the important environments in human society that affects human behavior. Most economic and behavioristic studies mentioned the major self and non-self factors that affect and form customer behavior; among these factors is the shopping environment. Previous studies emphasized the influence of the shopping environment's physical characteristics on customer behavior regardless of whether the nature of this influence was approach or avoidance. The degree of this influence varies in accordance with the customer's characteristics. Achieving the best customer-attracting shopping environment requires a study and analysis of the relationship between customer behavior in certain environments and the shopping environment. From this point, the objective of the study is crystallized and is represented by exploring the relationship between customer behavior and the shopping environment. Shopping centers are considered one of the most important patterns of shopping environments because they offer a variety of activities and are among the modern shopping environments that are widely spread in most countries. This situation helped crystallize the objective of the research, which identifies the influence of shopping center syntactics on customer behavior and explores the required procedures to support approach behavior and avert avoidance behavior. To achieve this goal, this research employed the following steps:

A comprehensive theoretical framework was created, demonstrating the most important influential factors that affect human behavior in general and those factors that affect customer behavior in particular, to determine the most important items related to the syntactic characteristics of the shopping space that influence customer behavior. This research notably focused on a certain type of behavior, namely, the approach and avoidance behavior, without dealing with the psychological effects on customers.

A practical study was conducted to test the hypothesis of the research by selecting a number of shopping centers in Erbil, Iraq. The hypothesis underscores the role of the syntactic characteristics of the shopping centers as represented by the effect on customer behavior whether it was approach or avoidance.

Photographs, available maps, and observation through manual scan were all used to measure the variables with a certain degree of influence on customer behavior to be tested.

SPSS 20 was used to analyze the results of the practical study with multiple linear regressions to explore the nature of the relationship between the syntactic characteristics' elements of the shopping center and customer behavior as represented by pedestrian flow. The most important malls in the case study were explored, starting from where the syntactic characteristics' elements are found, which affect customer behavior. Exploration was performed using certain mathematical (statistical) tools.

Finally, a set of conclusions were reached, and suggestions were submitted. The conclusions confirmed the importance of some syntactic characteristic elements of the shopping center and their vital role in influencing the customers' approach and avoidance behavior; these elements include mall length, number of magnet points, position of magnets, number of entrances, position of free nodes, position of vertical circulation, number of specialty shops, and size of shops.

Keywords: Customer Behavior, Shopping Environment, Syntactic Characteristic, Approach Behavior, Avoidance Behavior.

ÖZET

ALIŞVERİŞ MERKEZLERİNİN MİMARİ TİPOLOJİLERİNİN TÜKETİCİ DAVRANIŞLARI ÜZERİNDEKİ ETKİSİNİN DEĞERLENDİRİLMESİ: ERBİL İÇİN ÖRNEK ÇALIŞMALAR

Khawola F. MAHMOUD
Mimarlık Anabilim Dalı
Anadolu Üniversitesi, Fen Bilimleri Enstitüsü, Mart,2016
Danışman: Yard.Doç. Dr. Mehmet İNCEOĞLU
İkinci Danışman: Yard.Doç. Dr. Nahedh AL-QEMAQCHI

İnsan, genel olarak çevre ve özellikle yapılı çevrenin ana kullanıcısıdır. İnsan davranışlarını, ele alan çeşitli çalışmalar ve bilimsel araştırmalarda yapılı çevre ve insan arasındaki karşılıklı etkileşimi analiz etmişlerdir. Bu çalışmalarda insan davranışının çevreyi etkilediğini ve aynı zamanda onun tarafından da etkilenir olduğunu belirginleştirmiş ve alışveriş ortamı insan davranışını etkileyen önemli ortamlardan biri olarak kabul edilmektedir. Ekonomik ve davranış üzerine yapılan çalışmaların çoğunda, müşteri davranışı üzerinde başlıca bir etkiye sahip durum, faktörleri oluşturan ortamlardır. Bu faktörlerin arasında etkili olanlardan biri de alışveriş ortamıdır. Müşteri davranışları üzerine yapılan eski çalışmalarda alışveriş ortamının fiziksel özelliklerinin etkisi vurgulanmış, bu yaklaşımla da müşteri davranışının etkisinin doğası göz ardı edilmiş ya da araştırmalarda çok fazla değinilmemiştir. Bu etkinin derecesi, müşterinin özelliklerine göre; kendisi ve müşterinin belirli ortamlarda davranışı ve alışveriş ortamı arasındaki ilişki iyi okunabilmeli ve analiz edilmelidir ki, bu da iyi müşteri çeken bir alışveriş ortamı sağlamak amacıyla değişken bir fiziksel ortam oluşturur. Bu noktadan itibaren çalışmanın ana amacı; müşterinin, alışveriş çevresi ve bu fiziksel çevre ile arasındaki davranış ilişkisini incelemektedir. Alışveriş merkezleri, tüm dünyada birçok ülkede faaliyetlerindeki çeşitlilik nedeniyle yaygın modern mimarlık türlerinden biri olarak kabul edilir. Bu da, müşteri davranışı üzerindeki söz dizimsel alışveriş merkezinin etkisinin belirlenmesi ile araştırmanın amacının kristalize edilmesine yardımcı olmuş, aynı zamanda davranış yaklaşımını desteklemek için takip edilmesi gereken prosedürleri keşfetmek ve müşteri davranışlarında kaçınmanın önlenmesi ile temsil edilmektedir. Bu durumun başarılı olması için araştırma da aşağıdaki adımları izlemek gerekmektedir:

İnsan davranışını etkileyen en önemli etkili faktör; genel olarak ispat eden kapsamlı bir teorik çerçeve koymak ve özellikle müşterinin davranışını etkileyen bu etkiler ile alışveriş alanı söz dizimsel özelliklerine ilişkin en önemli öğeleri sonuçlandırmak için müşterinin davranışlarının incelenmesidir. Buna ek olarak, güncel araştırmalarda müşterilerin psikolojik etkileri ile uğraşmadan, belirli bir davranış türüne dikkat edilmiş ve bu anlamda bir yaklaşım ve kaçınma davranışı için odaklanılmıştır.

Müşterilerin davranışını etkileyen mekanların dizimsel özelliklerinin oynadığı rolün altını çizerek aynı zamanda araştırmanın hipotezini test etmek için, Irak Erbil'de alışveriş merkezlerinden bazılarını bu yaklaşım veya pratik çalışma yürütmek amacıyla, bu alışveriş merkezleri temsilen seçilmişlerdir.

Mevcut haritalar, fotoğraflar, manuel tarama, yanı sıra gözlem ve tüm müşteri davranışları üzerindeki etkisi belirli bir ölçüde test edilmesi gereken değişkenleri ölçmek için kullanılmıştır.

Temsil için seçilen alışveriş merkezlerinin mekansal dizimsel karakteristiklerini 'mimari elemanları ve müşteri davranışları arasındaki ilişkinin doğasını keşfetmek için, çoklu doğrusal regresyon kullanılarak, pratik çalışmanın sonuçlarını ve yaya akışını analiz etmek için (SPSS 20) programı kullanıldı. Ayrıca, müşterinin davranışlarını etkileyen, mekanın dizimsel nitelikleri belirli matematiksel (istatistiksel) araçları da ve yeni belirlenen bir yöntem kullanılarak gerçekleştirildi.

Araştırma sonuçlarında ve önerilerde çekim noktaları, çekim noktalarının pozisyonu, giriş sayısı, serbest düğüm pozisyonuna giriş konumunun bazı özellikleri ile alışveriş merkezi elemanları, alışveriş merkezi uzunluğu, büyük dükkan sayısının önemini, dikey hareketi, özel dükkan sayısı, dükkan büyüklüğü ile ilgili bilgiler sunuldu. Alışveriş merkezlerinin mekansal sentaksının (dizinlerinin) müşterinin yaklaşım ve kaçınma davranışlarını aynı zamanda da tasarım yaklaşımını etkileyen hayati bir rol oynadığı tespit edilmiştir.

Anahtar Sözcükler: Müşteri Davranışı, Alışveriş Çevresi, Sentaktik Karakteristik, Yaklaşım Davranışı, Kaçınma Davranışı.

ACKNOWLEDGMENTS

Firstly, I would like to express my sincere gratitude to my Supervisor Assist. Prof. Dr. Mehmet İNCEOĞLU and my Co-Supervisor Assist.Prof.Dr. Nahedh AL-QEMAQCHI for the continuous support of my PhD study and related research, for their patience, motivation, and immense knowledge. Their guidance helped me in all the time of research and writing of this thesis.

I would like to thank the rest of my thesis committee: Prof. Dr. Ruşen YAMAÇLI, Prof. Dr. Meral NALÇAKAN, Assist. Prof. Dr. Meltem VATAN KAPTAN, and Assist. Prof. Dr. Riyad ŞİHAB, for giving me valuable comments regarding the study.

I would like to thank my family: my parents and to my brothers and sister, my relatives, my friends, for giving birth to me at the first place and supporting me spiritually throughout my life.

Finally, and most importantly, I would like to send my deepest and the most special thanks to my mother, not only for her patience on me but also for her sincerely supports and trust on me all my life, and I want to tell her that:" Thank you mom for everything".

31/03/2016

ETİK İLKE VE KURALLARA UYGUNLUK BEYANNAMESİ

(DECLARATION OF CONFORMITY FOR ETHIC RULES AND PRINCIPLES)

Bu tezin bana ait, özgün bir çalışma olduğunu; çalışmamın hazırlık, veri toplama, analiz ve bilgilerin sunumu olmak üzere tüm aşamalardan bilimsel etik ilke ve kurallara uygun davrandığımı; bu çalışma kapsamında elde edilemeyen tüm veri ve bilgiler için kaynak gösterdiğimi ve bu kaynaklara kaynakçada yer verdiğimi; bu çalışmanın Anadolu Üniversitesi. tarafından kullanılan "bilimsel intihal tespit programı" yla tarandığını ve hiçbir şekilde "intihal içermediğini" beyan ederim. Herhangi bir zamanda, çalışmamla ilgili yaptığım bu beyana aykırı bir durumun saptanması durumunda, ortaya çıkacak tüm ahlaki ve hukuki sonuçlara razı olduğumu bildiririm.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

1.1. Thesis Aims and Objective

Human nature and behavior have long drawn the attention of scholars and researchers given that such concepts have been widely explained and analyzed by many behavioral and psychological studies. Human behavior is generally represented by overt and covert reactions toward various factors. Several studies have investigated the nature of the factors that form this behavior, including the internal physiological or environmental factors such as the social, cultural, economic, climatic, and physical environments. Many studies have also dealt with the reciprocal relationship between various environments and human behavior and have attempted to determine whether this behavior refers to one's behavior alone or is a group behavior that reflects the behavior of people in certain societies. These studies showed that human behavior influences and is influenced by the environment.

Several behavioral theories have been developed throughout the years. These theories interpret and explain the nature of human behavior and its relationship with the surrounding environment in general and the physical environment in particular. In addition, these theories describe how the environment forms and controls human behavior in which the people themselves are the ones who formulate such an environment according to their respective needs. This condition explains the changes in human behavior in different physical environments in spite of the similarities of the other influencing factors, such as social and economic factors. Some environments are classified as sociopetal, whereas others are considered sociofugal. In addition, certain spaces encourage a positive behavior, whereas others lead to a negative one. A built environment influences human behavior according to its nature and characteristics regardless of the type of behavior.

Shopping environment is among the important environments for the human societies that influence their behavior. Humans shop to meet their needs. Several types of shopping environments have emerged, and they vary according to the human needs in each time stage and with the cultural, social, and climatic environments in which they belong. These environments influence the type of human behavior that exists in such environments.

Economic and behavioral studies have stated the most important self and non-self factors that influence and constitute customer behavior considering that many factors, which affect the nature of customer behavior in shopping environments (e.g., self factors), are related to the customers themselves such as personality and education. Some factors are related to the needs and purchasing decision of people, whereas others are relevant to the quality of the exhibited goods. In addition, shopping environment is considered an influencing factor of customer behavior as verified by several studies, which evaluated the effect of the physical characteristics of space on customer behavior, which involves the attracting or avoiding behavior. The internal and external physical characteristics of the shopping space relatively influence the behavior of customers regardless of its nature (i.e., positive or negative) and that color, scent, and music can be considered elements that draw or distract the attention of customers toward the place. The same concept holds true for the rest of the characteristics of a shopping environment, including the design, layout, and syntactic structure.

The influence of the physical characteristics of the shopping environment varies in terms of their nature and ratio according to customers. Such influence also varies from a society to another and from a place to another in forming and identifying customer behavior. This circumstance explains the variations in the types of shopping spaces in various environments according to the different needs and nature of the customer in those areas.

To achieve the best customer-attracting shopping environment, the relationship between the behavior of customers in certain environments and the shopping environment should be studied and analyzed. ***Hence, this study aims to determine the relationship between the customer's behavior and the shopping environment.***

In spite of the wide spread of several types of shopping environments, a number of new types of shopping environment have still emerged in the middle of the last century. These environments are not confined to certain commercial activities, including buying and selling; instead, they include entertaining, cultural, and social activities. Therefore, these environments have been known as shopping centers.

The diversity and various characteristics involved in these environments are considered a magnet that made them expand in many areas, but their emergence in the Middle East in general and in Iraq in particular is only recent as they emerged after the

second millennium. ***This particular emergence constitutes the main research objective, that is, to identify the effect of the syntactic characteristics of shopping centers on customer behavior and the procedures that should be adopted to support the approach behavior and avert the avoidance behavior.***

1.2. Research Framework:

To verify the main research hypothesis, which emphasizes the effect of the structural characteristics of the shopping environment schemes on customer behavior, the following procedures were adopted:

- A comprehensive database was built, and a detailed theoretical framework was established for shopping environment and customer behavior via analysis of the literature and studies in architecture and behavioral fields. Such studies directly or indirectly addressed the issue of the relationship between human behavior and the built environment in general, and customer behavior and shopping environment in particular.
- The vocabulary of both syntactic characteristics of shopping centers and customer behavior and methods of measurement for each one were determined.
- The theoretical framework was applied through a practical study on certain shopping centers. This practical study analyzed the shopping environment and examined the most important syntactic characteristics elements that can affect customer behavior.
- The hypotheses were validated and tested statistically by employing supported statistical methods.
- The results of the practical study were analyzed.
- A set of conclusions were obtained through knowledge framework and practical measures. General recommendations and prospects for future research that are complementary to the research topic were then developed.

1.3. Research Scope

This research focuses on activating positive behavior in customers (approach) and avoiding negative behavior (avoidance) by studying the effect of syntactic

characteristics of shopping center layouts on customer behavior. This research does not address the mechanisms of behavior and the factors involved in its formation, such as cognitive and psychological factors, given that the research focuses on a case study with the same social qualities to avoid the potential effect of different cultures and civilizations on customer behavior, that is, the selected case study comes from Iraqi society only.

1.4. Research Structure

The paper is organized into seven main chapters. *Chapter one* introduces the research and the goal. C*hapter two* reviews historically the shopping environments, their kinds, and the mechanisms through which they have developed. In particular, this chapter analyzes the shopping environments since their conception until now by reviewing the stages of the markets throughout history and how they changed according to human needs and to the development that took place with time. This chapter also explains the type of the sample upon which the research hypotheses will be tested. Shopping centers primarily represent the shopping environment because they are among the modern patterns that have emerged in the middle of the past century and have spread widely all over the world for the characteristics they possess. Shopping centers are not only a commercial environment in which buying and selling take place, but they have become an integrated commercial, entertaining, social, and cultural institution as well.

Chapter three explores and generalizes the relationship between the human, the environment, and behavior. This chapter tackles the concept of human behavior, its types, and how it occurs. In addition, this chapter reviews the environment philosophy in general and the philosophical theories that deal with the relationship between human behavior and environment in particular. The chapter then looks into the nature of the relationship between the built environment, human behavior, and the theories that classify the environments according to the human behavior in which it occurs and the manner through which the built environment defines the nature and kind of the behavior. Chapter three concludes that based on the literature review, an interaction relationship exists between the human behavior and the built environment.

Chapter four analyzes shopping behavior, which is the behavior of customers in a certain physical environment. This chapter particularly identifies the shopping activity,

its philosophy, and the contemporary view of shopping, which changes from a purchasing and selling activity into an entertaining and social activity practiced by humans in shopping environments. To understand the shopping activity and the manner of how it occurs, one should first tackle the human needs and their relationship with shopping and then review the factors that constitute such activity (i.e., human behavior, the shopping environment, and the goods. Chapter four also reviews the subjective and non-subjective factors that affect customer behavior and discusses the nature of the relationship between customer behavior and the physical environment of the market according to the literature.

Chapter five focuses on shopping centers, which are an important modern type of shopping environments that provide entertaining, social, and commercial utilities. This chapter reviews the types of shopping centers, the nature and characteristics of each type, as well as all their activities. The syntactic characteristics of shopping centers, their nature and features, and the extent of their effects on human behavior as concluded by the previous studies are also clarified. In addition, this chapter reviews the most important studies that tackled the relationship between shopping centers and customer behavior in general and the syntactic characteristics of the shopping center layouts in particular. This undertaking is accomplished to identify the variables related to the syntactic structure of shopping centers whose relationship with customer behavior has been cited in previous studies and which will be tested again.

Chapter six selects the research samples represented by the shopping centers in Erbil city in Iraq in accordance with certain conditions adopted by the researcher. The measurement methods for each identified variable are determined depending on the maps and photos to measure the independent variables and on the manual scanning method to measure the dependent variable. SPSS20 is used to analyze the data and determine whether linear regression will be used to obtain the structural characteristics that influence customer behavior.

Following the analysis and discussion of findings, *Chapter seven* formulates the general and special conclusions that explain the research findings, which provide a set of recommendations that may contribute to consolidate the positive attracting behavior in shopping centers and avert the spaces that lead to customer avoidance.

2. HISTORICAL TRANSMUTATION OF SHOPPING ENVIRONMENT

Shopping is one of the activities that have been practiced by humans since the ancient ages. In prehistory, this process was manifested by goods exchange or trade; throughout time, it changed to be a purchase of daily basic needs. Currently, this process has become an entertaining, social, and intellectual activity, in addition to being a purchasing activity. To accomplish this activity, human beings needed a place, which became known as the market or shopping environment. The shopping environment experienced several changes in layout, design, or function because of the development of society and customer behavior. Therefore, the market has always been a mirror of the people's lives because it directly shows the nature of their living and their cultural standards. We identify the stages that shopping spaces have experienced throughout history. In addition, we also discuss changes on the level of the type or the changes in the constructional and functional characteristics because of the cultural and social factors that affected them. In this chapter, the historical development of the market spaces was addressed in a way that suits human needs since prehistory to the modern age.

2.1. Ancient Times Markets

The market represents the first main achievement. Although distinguishing clear markets in these first settlements is impossible, most of them were established around certain spaces that formed the main market space (see figure 2.1) (Bennett, 1962,P.93). Gharipour (2012) states that primitive forms of commercial centers existed in early civilization, such as the Silk Mills in Kashan, Catal Huyuk, Jericho, and Susa (Gharipour, 2012,p.3). According to Coleman (2007), commercial activities started synchronously with the first steps of communication 150,000 years ago. Individuals started to swap goods and services with each other, and their commercial activities took place in the meeting spaces (Coleman, 2007,p.19).

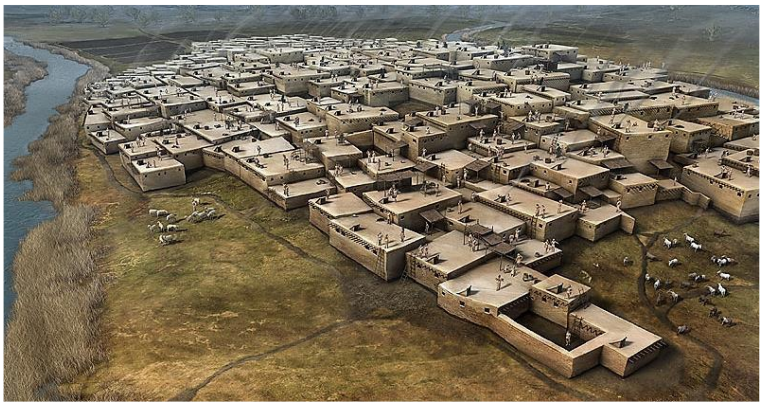


Figure 2.1. *Çatalhöyük, Anatolia 7500-5000 B.C.*

Source: *Taghizadehvahed, 2015,p.12*

2.2. Mesopotamia and Nile Valley Markets

Markets gained great importance in ancient Mesopotamia and Nile Valley. This importance has increased with the growing effectiveness of shopping across the different historical periods (see figure 2.2). Mumford (1961) mentioned the idea of the monopoly of God and the totalitarian economy of the religious authority that kept markets near temples. Temples had a role not only in supporting religious life, but also as storage places for different crops and products(Mumford, 1961,P.89).

Figure 2.2. *1500 B.C., Markets in Egypt*

Source: *Chung, Inaba, Koolhaas, & Leong, 2001,p.43*

2.3. Greek and Roman Markets

The market in the Greek cities (stoa) had an important role in the agora that contained the religious, cultural, and social activities, as well as the functions of the society. Related to structure, the stoa is the first covered shopping center (precinct). Constructed market buildings appeared in Greek cities and were the focal location of the urban texture (Taghizadehvahed, 2015,p.13).

This was also the case in Roman cities, where the city center was kept as a focus for urban life. The Roman forum was a place for different forms of urban activities in addition to markets (Coleman, 2007,p.19).

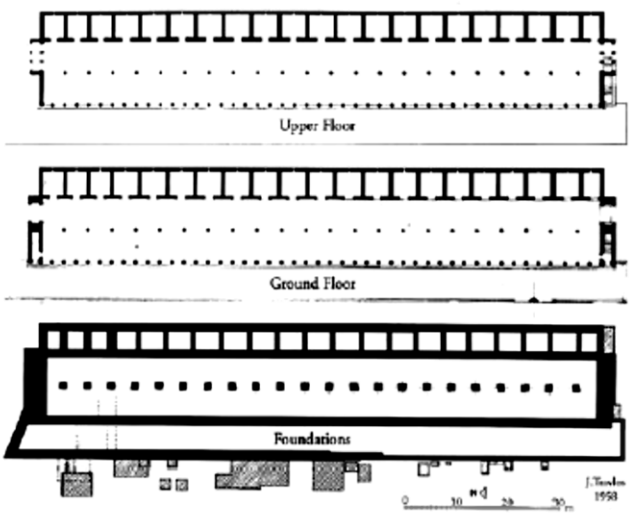


Figure 2.3. *Plans of the Stoa of Attalos, 159–138 B.C.*

Source: *Camp, 2003,p.**33***

2.4. Islamic Period Markets

The French orientalist Louis Massignon distinguished three elements essential in composing Islamic markets. The first is the center of exchange and the financial issues, which involves the Diwans, bankers, tax collection center, house of coinage, and the house of the aedile. The second element is the Caesarea, which represents a group of shops included within a roofed space with an entrance that can be shut. The third element is the group of markets that assemble in the city center (Al-Dewachi, 1989,p.76). In his article on "The structure of the muslim Town", von Grunebaum

(1961) mentioned the issue of dividing the market, mentioning the market lanes that emphasized the issue of merchandise and craft specialization. He also discussed the Caesarea, which he considered the only part of the market that is roofed uniformly and can be closed. For that reason, it was specialized for the trading of precious goods and products (Grunebaum, 1961,p.146).

Meanwhile, Eleanor Sims (1978) distinguished three patterns of the structures apparent in the market of the Islamic traditional city. They include a network of roofed alleys, including a huge building tightly sealed and located in the middle of the market, called the Caesarea and the caravanserai. In addition, a group of public baths is also included because performing religious obligations requires complete cleanliness (Sims, 1978,p.99). Eugen Wirth (1975) saw that the different economic functions of the market were consistent with a different constructional entity; paved alleys were specialized for the retile trading and crafts. Moreover, roofed halls were used for wholesale, as well as for storing and selling precious goods. The Islamic market also included unroofed halls, which had other functions (Wirth, 1975,p.223).

Multiple constructional patterns were included because of the diversity and the multiplicity of the forms of the commercial functions, some of which were specialized to perform pure trading functions such as the Caesarea, market alleys, and some inns. The other parts of the market were for service functions; these parts include public baths and inns used by travelers and merchants.

- **Al Hanout**

A small shopping store for selling particular products; often, the second floor was composed of residential units. They overlooked an open yard and resembled the Greek agora, such as the Al Medina shops (Razaq, 2011,p.14).

- **Qaysariya**

A group of markets consisting of shops for selling specific types of products. Shops were near each other and have external doors locked at night, such as the Baghdad and Fustat markets (Razaq, 2011,p.14). Caesarea represented a pattern of the commercial buildings specialized with dealing with precious goods and necessitated some design procedures such as making entrances. According to von Grunebaum

(1961), Caesarea originally developed from the Roman plaza (Grunebaum, 1961,p.144).While Eleanor Sims regarded it as a structure relevant to the Islamic market (Sims, 1978). The typical plan of the Caesarea comprised a central space for circulation, which was mostly rectangular. The two long sides of the shops and the space of circulation was a hallway with columns. The central space was roofed with vaults or domes that included openings for light. The Caesarea was equipped with gates in its two short sides; these gates were locked on holidays (see figure 2.4.).

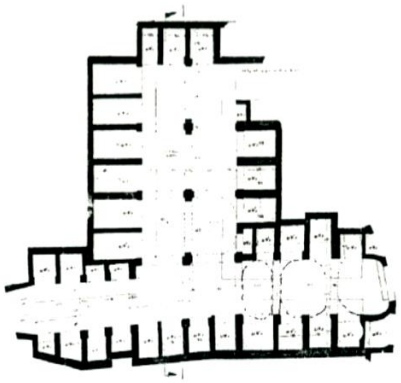


Figure 2.4. *Sebahi Qaysariya in mosul*

Source: *Al-Dewachi, 1989,p.86*

- **Caravanserai**

Large commercial stores owned by one merchant or family selling various kinds of products. Its name comes from a Persian word meaning "commerce," and was places where traders offered their goods. It consisted of buildings that have a rectangular courtyard at their center (see figure 2.5).

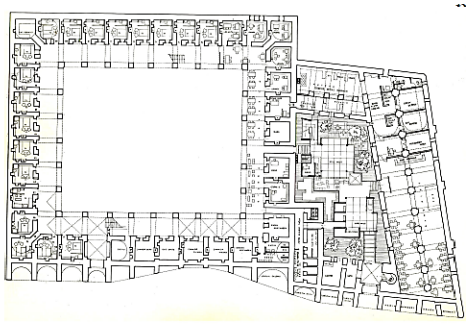


Figure 2.5. *Plan of Rustem Pasha Caravanserai*

Source: *Canitez, Canitez, & Ilhan, 2009,p.219*

It has large openings with arcades, consisting of one or more floor and living rooms in addition to corridors for displaying products(Razaq, 2011,p.14).

- **Khan**

This is also known as houses for caravans established on roads near water sources, aiming to house merchants(Erdmann & Erdmann, 1976,p.166). Khans were established both outside cities and inside cities in the market center and near the baths and mosques(Razaq, 2011,p.15). The Khan was classified into two main types. The first type is located within the urban center and the second is located on the extension of the main commercial roads that connect the cities. The main function of the Khan in the commercial centers is the place in which merchants and travelers stay. Usually, khans consist of two or three floors. The typical plan of the khan is a square or a rectangle with an entrance such as a vestibule, which leads to an internal yard surrounded with a number of rooms (see figure 2.6.). In the upper floor, the rooms are provided with corridors that overlook the courtyard. The upper rooms are used as guest rooms, while the rooms in the ground floor are used as stables and stores or a place for practicing some crafts. The locations of the khans are usually in the edges of the market area and far away from the center(Sims, 1978,p.10).

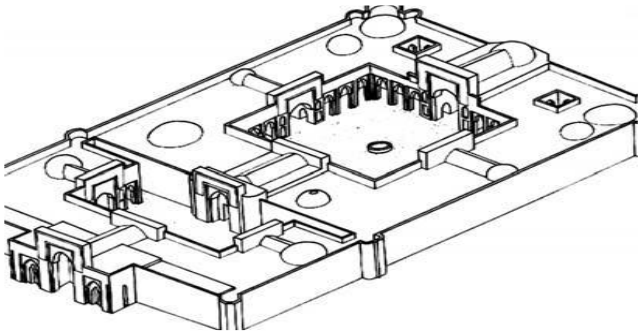


Figure 2.6. *Ashref khan –Iran*

Source: *Hillenbrand, 2004,P.*

- **Covered bazaar**

According to Kocaili (2010), the covered bazaar appeared along the important trade routes because of the continuous flow of foreign goods. The bazaar is considered the basis of the modern day supermarket, flea market, and shopping mall. The covered bazaars consist of shops in vaulted streets closed by doors at each end. The sizes of covered bazaars vary according to the city's importance. In small towns, the bazaar consists of a covered street, whereas in big cities it can occupy kilometers of passageways (Kocaili, 2010,p.28).

According to Geist (1985), the Eastern bazaar is the reference model of the arcade, which has also an inward planning (Geist, 1985,p.4). The most important examples of a covered bazaar is the Kapalıçarşı (Grand Bazaar) of Istanbul. The bazaar is located centrally in the traditional districts, between Nuruosmaniye, Mercan, and Beyazıt, of Istanbul.

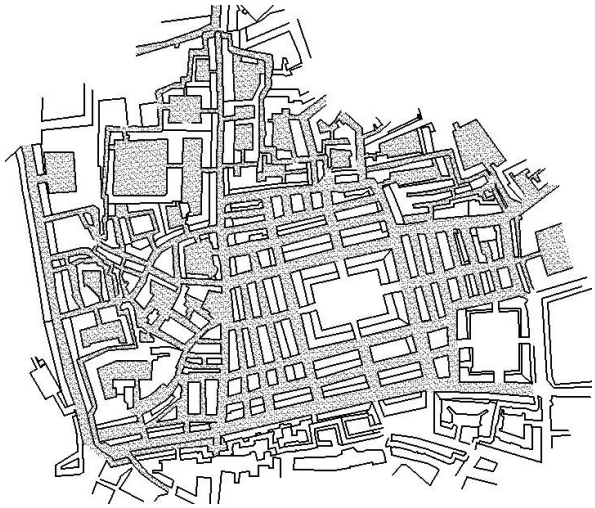


Figure 2.7. *The spatial configuration of Istanbul Grand Bazaar*

Source: *Taghizadehvahed, 2015,P.42*

2.5. Medieval Markets

Europe drifted into 500 years of Dark Ages after the breakdown of the Roman Empire in the 5th century. Building retail places such as the Roman Forum were not repeated in that period. However, trading never ceased and exchange was based on the interchange of goods rather than of money (Taghizadehvahed, 2015,p.17) .

Markets were located in medieval towns near the town hall and the cathedral for establishing the important activities (See figure 2.8.). The importance of markets has never changed despite the various planning systems of the cities (Mumford, 1961,p.353).

2.6. Contemporary Markets

The industrial revolution resulted in significant changes not only in cities, but also on life as a while. The increased use of machines led to numerous changes both socially, intellectually, and culturally; these were accompanied by similar changes in markets through two stages;

Figure 2.8. *Pallazo del Broletto in Como, Italy*

Source: *Taghizadehvahed, 2015,P.17*

- **1st Stage**

This followed the industrial revolution, and involved the establishment of thousands of factories and the increased use of cars as means for transportation accompanied by city growth. The first important event in terms of shopping environment is the emergence of shopping streets as an alternative to a central area that contained traditional markets. The marked began to affect the functional form of the

most circulation axes in the city. In addition, the market became stacked shops along the circulation line starting from the central area toward the suburbs (Gruen, 1965,p.86).

Generally, the shopping streets were organic developments as seen in the high streets, where most of the ground floors of buildings were gradually transformed into shops (Beddington, 1991,p.2). In the 16th century, shopping streets became more established in Italy; by the 17th century, central streets were extended to the north of Europe by stores, coffee shops, and pubs such as Milk Street and Cordwainer Street in London. According to Rubenstein, the shopping street was developed in Europe because of the increase of vehicular traffic in the 18th century(Coleman, 2007,p.26).

- **2nd Stage**

This followed World War II, and was accompanied by increasing technical improvements, purchasing power, and ease of transportation within the city because of the increasing pressures. These pressures were accompanied by a need to find spaces that would help in providing suitable environmental solutions. This has led to two parallel trends (Gruen, 1965,p.4)

- The first trend focuses on customer purchasing power, and attracts and facilitates buying by providing large quantities of products and machines for selling. This led to the emergence of supermarkets that provide various daily products.
- The second trend focuses on individual shopping activity, both socially and advertising. Attraction is conducted by providing a protected environment. Climatically, visually, and psychologically, activities are integrated to create shopping towns. This led to the emergence of planned shopping centers in the United States, which then spread globally. Regional shopping centers also appeared in this period at highway intersections (Abdulla, 1989,p.13).

2.6.1. Contemporary markets types

- **Stock Exchange**

In the late of 16th century, a new type of commercial building appeared in Europe. The exchanges combined various activities, often consisting of commodity

stalls on the ground floor and open stands selling goods on the first floor (Coleman, 2007,p.25).

The first stock exchange building in the world was the Antwerp Stock Exchange, which was established in 1460 in Belgium. Morrison states that, Antwerp was the main commercial center in Northern Europe until the mid-16th century (Morrison, 2003,p.31).

- **Shopping Street**

Lowe and Wrigly described the street as a "consumption landscape," which was important to the experiment of urban life. Shopping streets were established in the 16th century in Italy (See paragraph 2.7).

Figure 2.9. *Antwerp Stock Exchange*
Source: *Taghizadehvahed, 2015,p.19*

- **Market Building and Fair**

In the 19th century, another type of building appeared to house larger markets than the previous ones. Market schemes depended on open courtyards with perimeter arcades lined by stalls and shops, where the first floor was usually used for storage. Later market buildings were affected by large exhibition buildings, and took advantage of developments in glass and iron structures (Coleman, 2007,p.28). Foire St Germain was one of the prominent fairs in the 18th century (see figure 2.10.), which was located near the gates of Paris. It was renowned because it provided luxury goods and

entertainments for visitors, such as dancing in marquees, gambling in saloons, visiting exhibitions, attending performances in theaters, as well as listening to singers and musicians (Coleman, 2007,p.29).

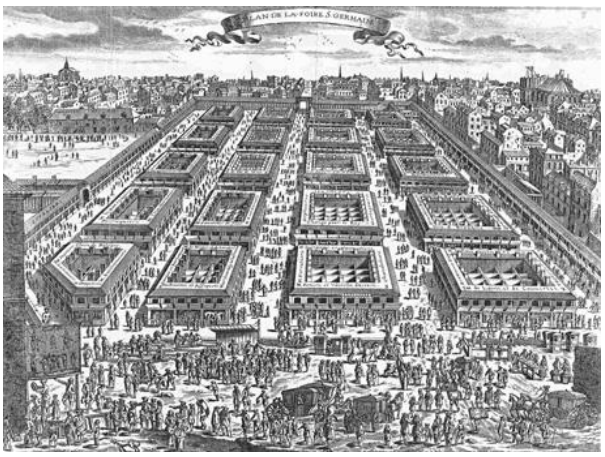


Figure 2.10. *The Foire, St Germain, Paris, France*
Source: *Coleman, 2007,p.29).*

- **Arcade**

Arcades were a milestone in the development of shopping. It was the first European building planned primarily to accommodate a group of shops (Coleman, 2007), and was the main step in the development of the shopping mall. The arcade resembled Middle Eastern covered bazaars; it is an arched or covered pedestrian roadway with shops on each side. It largely used natural lighting, either through side lighting with clerestory windows above the shops, or through top lighting from openings in the roof (Coleman, 2007,p.30).

Arcades were the first types of building roofed with iron and glass, and were taken as a pattern for roofing markets, greenhouses, rail stations, and so on (Salvadori, 1990,p.87). Later patterns had a continuous vaulted glass roof, which influenced designers of multi-use shopping centers in this century (see figure 2.11) (MacKeith, 1986,p.1).

Figure 2.11. *Europe's tallest arcade, Galeria Umberto, Italy (1891)*

Source : C*oleman, 2007,p.22*

- **Department store**

Department stores appeared in the late-18th century, and were the first appearance of magasins *de nouveautes* stores in Paris (Coleman, 2007,p.33). According to Geist (1983), magasins de nouveautes was the upgraded version of the eighteenth-century fashionable shops, which had several rooms and stories that employed many people and offered an integral selection of the goods available in its own business (Geist, 1985,p.39). Magasins de nouveautes established one of the essential trading rules of the department store, "fixed prices for goods" (Coleman, 2007,p33) . Department stores developed between the years 1860–1900 by having an open, metal-framed interior providing natural lighting (see figure 2.11.). However, with the emergence of new shopping centers, the department stores lost their attractiveness (Kocaili, 2010,p.52-54).

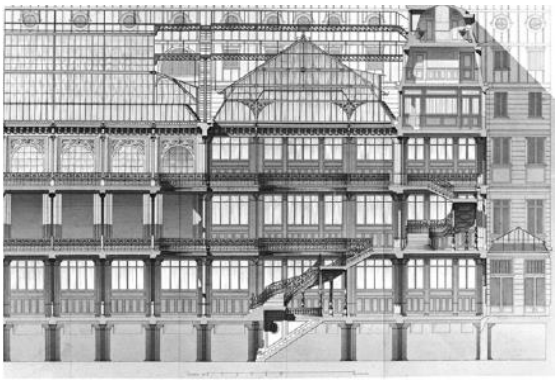


Figure 2.12. *The large, naturally light interior of the Bon Marché department store, Paris, (1876).*

Source: *British Architectural Library, RIBA, Coleman, 2007,p.34*

- **Chain store and supermarket**

According to Pevsner (1976) , the chain store evolved in parallel with the development of the department store, which appeared first in America, then Europe (Pevsner, 1976,p.271). Chain stores emerged at the end of the 19th century because of evolutions in transport systems, railways, and roads. Distribution of goods from the central warehouse to stores networks became easy(Coleman, 2007,p.39). With time, several of the effective department stores and shops turned into chain stores, such as Marks & Spencer in London. As reported by Coleman(2007) , the first chain store company was constructed in London by Henry Walton Smith in 1792 (Coleman, 2007,p.40). In the 1930s, A&P introduced the self-service store idea, which was a pioneer to today's supermarkets.

According to Coleman (2007), the development and success of the supermarkets was aided by new road systems, the manufacturing of food processing and packaging, networks and the stores, and the increase in refrigerators (Coleman, 2007,p.40). In addition, the supermarket had comfortable access to highways and provided free parking areas nearby. The most influential development is the emergence of supermarkets, which rely on high sales and the display of huge amount of products depending on a certain design that facilitates customer circulations (Cottom, 1995,p.64)

The first supermarket was King Kullen opened by Michael J. Kullen, who established the rules of supermarket commerce, in 1930 in New York (see figure 2.13.).

Figure 2.13. *The first supermarket of King Kullen, in 1930- New York*

Source: *Coleman, 2007,p.40*

- **Strip malls and the first unified shopping malls**

Strip malls (also called mini-malls or shopping plazas) developed in the 1920s. They are collections of various stores in the same building, and have the same parking area. The strip mall is generally located at main crossroads in a town and is easily accessed by car. Compared with shopping malls, strip malls have few stores. They are also planned in open-areas, wherein the stores are organized in a row. The Country Club Plaza was the first unified shopping mall, founded by the J.C. Nichols Company in 1922, near Kansas City, USA (Koolhaas, 2001,P.34)

Figure 2.14. *The Country Club Plaza –USA*

Source: *Taghizadehvahed, 2015,P.26*

- **Shopping center**

Shopping centers were physically established after the World War II in the 1951s by Victor Gruen. They were established particularly in the United States to remind citizens of shopping and meeting places, and to restore circulation and dynamics to city centers after the streets became devoid of activity and life. They served as new centers, and worked to be the beating heart for the city and the community (Hill, 1992; Lekagul, 2002,p.21; Northen, 1977,p.7). The huge population increase from cities and suburbs look for fresh air, and in escape from crowd and high population is the main reason behind the establishment of large shopping centers in America that would serve a large number of people through providing parking for private and public cars (Beddington, 1991,p.2). Shopping center design has developed to have various functions including shopping, hiking and wandering, providing food services, cinemas, cafes, sport clubs,

even libraries, and other specialized services. This means that shopping malls have become a special world in itself (Fong, 2003; Maitland, 1990a,p.68).

A number of definitions for shopping centers have been proposed. For example, *John Dawson* defines a shopping center as a group of unified commercial establishments built either outside or inside the city, and exposed to unified commercial and administrative systems depending on trade area that it serves.

Clive Darlow states that need for minimizing the contrast between using the street for shoppers and vehicles created a space for the so-called shopping center, and raised the slogan (Street for Traffic Only). However, *Victor Gruen* indicates that modern shopping centers do not implying the physical aspects peculiarity only, but also cope with cultural, social, and urban needs. It also combines the natural aspects of countryside life with modern city elements, where the need for such spaces created the modern commercial center.

Figure 2.15. *Northland center - Melbourne Australia*

Source: *Redstone, 1973,p.183*

As for *Witerspoon* (1976), the design of commercial center presents one of the few and new constructional patterns that attempt to present a formula for cooperative integration among the components provided by the physical design in an efficient and pleasant form within widely different and various designing capabilities. Successful design is related with the balance among shopper behavior and economic competency of such various parts (Witherspoon, Abbett, & Gladstone, 1976,p.53).

There are various shopping center classifications, and each depends on certain aspects as a base for the classification.

- Classification by adopting the areal criterion: Some specialists divide shopping centers into levels depending on the competition amongst the functions in accordance with the various areas they occupy and to the way they use the land. Three kinds of shopping centers emerged according to this classification; neighborhood, community, and regional . These shopping centers function according to the area and the value of the land (Razaq, 2011,P.25).
- Function classification :This classification divides the functions as a Nucleus, which is conjoined in levels. The lower-level nucleation involves high frequency functions, such as goods shopping centers, which the high-level nucleation involves functions with low frequency to serve a wide commercial area. These eventually are capable of manifesting at least four kinds of functions(Razaq, 2011,P.25) .
- Catchments area classification: The most important among all classifications, as it is the more comprehensive, and depends on catchment area related with the population and the possibilities coming from other areas. Accordingly, shopping centers are classified into;
    - Neighborhood Shopping Center, which are relatively small and based on the supermarkets and provision of various daily services and products, in addition to weekly ones (Northen, 1977,P.3).
    - District Shopping Center, which provide monthly or seasonal services and products.
    - Focused Shopping Centers, which are independently managed and located in previously established shopping sectors. Examples are the Hyper market in France and or the Superstore in Britain (Razaq, 2011,P.26)
    - Auxiliary Shopping Centers, in which shopping is auxiliary and supports other basic activities. They are often located at the basement of a library building or multistoried building, or connected with hotel compounds or circulation systems.
    - Regional Shopping Centers, which are designed to provide various human services where shopping activity is fully integrated. There is a competition

among the various shopping activities and customers are attracted. These are of two types (Gruen, 1965,P.278); Ordinary Regional Shopping Centers, Super Regional Shopping Centers

Ordinary Regional Shopping Centers provide shopping services for regional customers. They are located at highway intersections, and are accessible by cars or general vehicles. These centers provide various types of goods, especially permanent and large-scale goods.

Super Regional Shopping Centers, which are characterized by integrating shopping with other activities like entertainment within the same location. Examples include Dubai mall and Mall of America.

2.7. Conclusion

By reviewing the kinds and types of the shopping spaces throughout history, the changes that occurred in these spaces can be noticed, whether on the level of the emergence or the disappearance of certain types, on the level of changes in the constructional and design characteristics, or on the level of the functional change caused by the economic and technological development. These changes followed the emergence of changes in the nature of human needs. The actual changes that took place were not all radical, because some of them were modulation and modification in the constructional characteristics of these types of markets. For instance, the Greek “stoa,” which is a tiered and adjacent shop, longitudinally appeared once again as “the covered bazaar” in the Islamic era, and emerged in the modern age as the “arcade.” Therefore, the change occurred in the constructional characteristics, such as the physical characteristics of the shopping passageway or the nature of the goods exhibited or the sizes of the stores. The same can be said for inns, which appeared again in the form of shopping centers in their shape in terms of the design and layout, but are different in their constructional characteristics and in the nature of activities and services they offer. The changes that occurred in the market spaces in their different forms are because of the influence of various cultural, social, and intellectual factors affected by the composition of these spaces. Perhaps, one of the most important of these factors that formulated theses spaces is the customer's behavior. Behavior is influenced by many factors, which eventually form human behavior toward the shopping environments. To

understand these effects, one should first comprehend the mechanisms, kinds, and nature of behavior, and the factors that influence it. This will be discussed in the subsequent chapter. Following the development of shopping spaces reviewed in this chapter, the most important change that occurred in shopping environments in the modern age is the emergence of the shopping centers in the middle of the 20th century. This emergence changed the shopping entirely from an environment in which pure commercial activities took place into an environment that also includes various entertainment, cultural, and social activities aside from commercial activities. This kind of market became widespread globally, because it is characterized with elements that meet the needs of most societies and is a unique experience in many countries. The next chapters will focus on shopping centers.

3. HUMAN BEHAVIOR AND BUILT ENVIRONMENT

The preceding chapter defines the concept of shopping centers, the stages they went through, and the changes they experienced since their emergence in ancient and historic times to the modern era. Certain patterns of shopping centers have disappeared such as agora, but new ones have been developed such as shopping streets. Some patterns of shopping centers have maintained their continuity, such as covered bazaars, but changes and modifications affected other patterns and led to the appearance of another type, such as khans, which can be considered the base for some mall patterns. Such changes and transformations of shopping centers are related to many causes and factors, including the economic, cultural, technological, and social factors. In turn, the accompanying changes in society needs, requirements, and potentials affect customer behavior and lead to new behavioral and social patterns that affect the physical structure of the built environment, including shops. Accordingly, the cause and effect between customer behavior and the built environment continues. To understand the nature of such influence as well as the mutual impact between the environment in general and the built environment in particular and human behavior, the subsequent chapter explains human behavior and the concept of the built environment.

3.1. The Human Behavior

Most previous studies posited that people have the same behavior and reactions toward environmental motivations. By contrast, modern theories emphasize the differences in behavioral responses owing to the different personalities, attitudes, values, recognition, motives, ambitions, and abilities of individuals. Human behavior varies, and no single pattern about it can be proposed. Leavitt (1989) classified behavior into three types, namely, goal-oriented, motivated, and caused behavior (see Fig 3.1) (Leavitt, Pondy, & Boje, 1989,p.251).

The concept of human behavior indicates the manner of how individuals behave and how they interact with other people and the surrounding environment. The behavior of people should be understood to forecast, guide, change, develop, and control individuals and group behaviors. The main aspects of human behavior and the factors that affect it are elucidated in the succeeding paragraph.

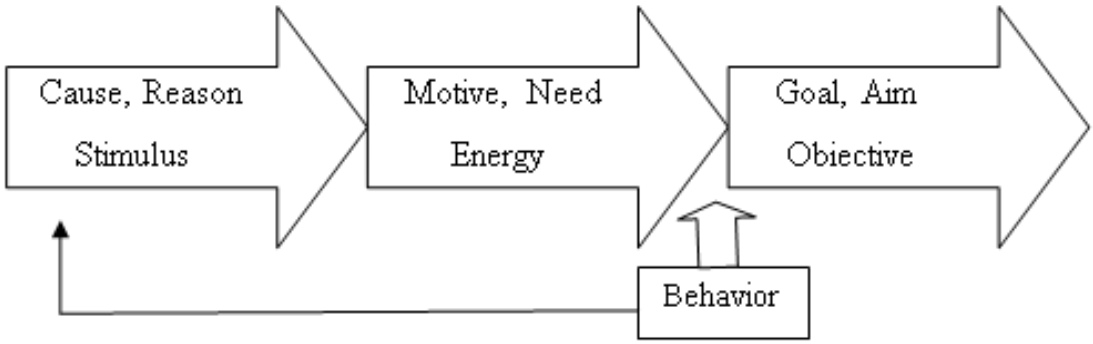


Figure 3.1. *Cause, Motive, Behavior, Goal Model*

Source: *Reisinger, 2008,p.271*

3.1.1. Aspects of human behavior (Mind, body, and spirit)

Huitt (2009) specified that human behavior has three major aspects, namely, mind (human personality), body, and spirit (W Huitt, 2009) (see Fig 3.2).

Personality has three dimensions, including cognition (knowing, understanding, thinking, and acting), affect (attitudes, predispositions, emotions, and feelings), and conation (intentions to act and behave, reasons for doing, volition, and will) (Norman, 1980,p.2; Miller, 1991)

Reisinger (2009) defined cognition as a process of obtaining knowledge and understanding, perceiving, and knowing the process of encoding, storing, processing, and retrieving information from an environment (Reisinger, 2009,p.266).

Affect is a sense caused by emotions or desires such as love and hate or a case of agitation or disturbance within a person's mind (Reisinger, 2009,p.266); it is a feeling or emotion that varies from cognition, thought, or action (W Huitt, 2003).

Conation represents the connection between knowledge and effect on behavior and refers to the intentional and personal motivations of behavior (Huitt, 1999). This dimension is strongly linked with one's will and freedom of choice in which human behavior cannot be explained without understanding such concept(Mischel, 1996,p.215).

How knowledge (cognition) and emotion (affect) influence human behavior (conation) should be understood (Bagozzi, 1992,p.191). The mind receives information, conducts action, and affects the behavior throughout the body (Huitt, 2012). Behavioral

studies claimed that body is represented in terms of biological or genetic influences, bodily functioning, and overt behavior (Graham, 2000) .

Huitt (2012) noted that a feedback loop exists between the overt responses (behavior) and the resulting effects on the environment. In addition, each of the biological and spiritual factors affects the functioning and development of the components of the mind (W Huitt, 2012). Other scientists believe that the brain (biological) and mind (psychological) are separate entities (Reisinger, 2009,p.266). Many psychological studies clarified that human beings and their behavior are not limited to the physical elements but also to the spirit, which affects the functioning of the mind , (Reisinger, 2009,p.266). Some psychologists included spirit in their studies such as (Maslow, 1970); in fact, some adopted it a basis of their theories such as (Khavari, 2000).

The spiritual factors include religious affiliation, axioms, personal experiments, and philosophy, working on the growth and development of the human mind and style of thinking, feeling, and making decisions (Reisinger, 2009,p.267). Human behavior is affected by spiritual factors. Huddleston said that spirituality is a basic element for human and society development because it sets a vision of who we are as human beings, why we are, and where we are going (Huddleston, 1993,p.142).

Human behavior has five major components explained below (W Huitt, 2003).

- Cognitive factors; Learning, knowledge, perception, storage, processing, and retrieval of information
- Affective factors; Responsible for the development and modification of perceptions, thoughts, and feeling before and after being processed cognitively
- Conative factors;Direct and manage input and output functioning and are responsible for making decisions, personal motives, and intentions
- Spiritual factors; Explain how one belongs to himself. This component is responsible for one's passive behavior as well as the development of beliefs, experiences, and intuition. These factors show how humans approach the unknown in life and the nature of their association with the sacred.
- Behavioral factors; describe one's overt behavior (output of the individual).

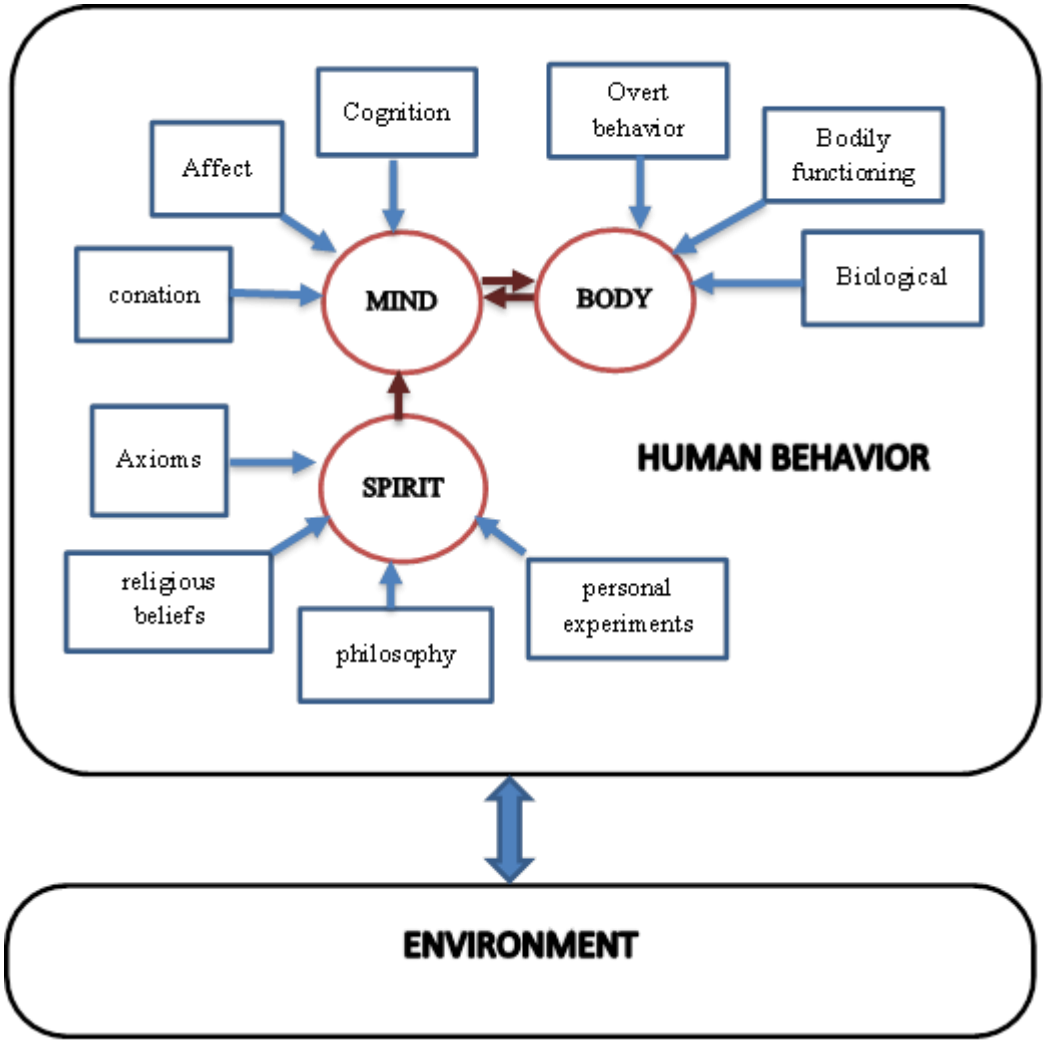


Figure 3.2. *Major Aspects of Human Behavior*

Source*: Researcher depending on Reisinger, 2008,P.267*

3.1.2. Type of Human Behavior

Behavior is an important factor in establishing social interaction and is a result of the continuous and developing process of the mental formation of men and the physical and significant formation of place (Hall, 1974,p.210). Human behavior should be examined to identify the expected reactions in a spatial environment and its effects on the functional and economic performance of men. Behavior is divided into the following types;

- **Overt Behavior**

This type of behavior includes certain actions that engender social interaction (Alexander, 1972,P.77) . Social psychologists have focused on affiliative behavior as a part of overt behavior because it helps achieve the basic needs of men, including security, tolerance, identity, self-actualization, difference, and nurturance.

Affiliative behavior is a positive social interaction in which people interact with one another emotionally and exchange warm feelings (Fadel, 1982,p.62) that can be increased or decreased by making the surrounding either comfortable or not (i.e., making the physical environment pleasant for approaching/interaction to achieve a positive social interaction). When the physical environment is unpleasant, it can create a void and decrease the positive social interaction among people. Russell and Mehrabian (1978) specified that the individual response (R) to environmental stimuli (S) often comes in an emotional approach (O) (see Mehrabian-Russell Model in figure 3.3).

These researchers identified three dimensions of emotional response (PAD), namely, pleasant–unpleasant; aroused–unaroused, and dominant–submissive, escorted by arousal as a direct function of the environmental load or the "information rate" of a setting (Russell & Mehrabian, 1978). These dimensions have been used by several researchers in earlier research (e.g: Hu & Jasper, 2010; Kearney, 2012; McGoldrick & Pieros, 1998; Newman, 2007; Ryu & Jang, 2007; Jang & Namkung, 2009) . Russell and Pratt (1980) claimed that the dominance dimension is irrelevant and that the emotional response can be achieved through the pleasant–unpleasant and aroused–unaroused dimensions (Russell & Pratt, 1980,p311-322).

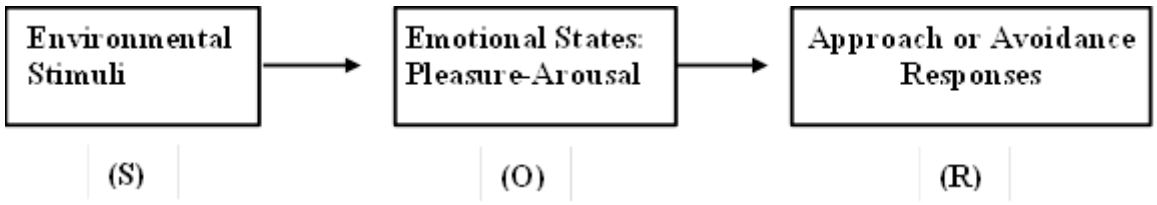


Figure 3.3. *Modified Mehrabian-Russell (SOR) Model*

Source: *Tai & Fung, 1997,p.315*

Mehrabian and Russell (1978) developed the following hypotheses related to affiliative behaviors (see Fig 3.4);

- Approach and affiliative behaviors increase linearly when the environments are pleasant.
- Arousal has an inverted-U shape relationship with approach and affiliation for people who are most responsive at the middle level of arousal.
- Pleasure and arousal are linked with an increased level of arousal that leads to a high level of approach and affiliation in pleasant environments but to a low level of approach and affiliation in unpleasant environments (Amato & McInnes, 1983; Russell & Mehrabian, 1978).

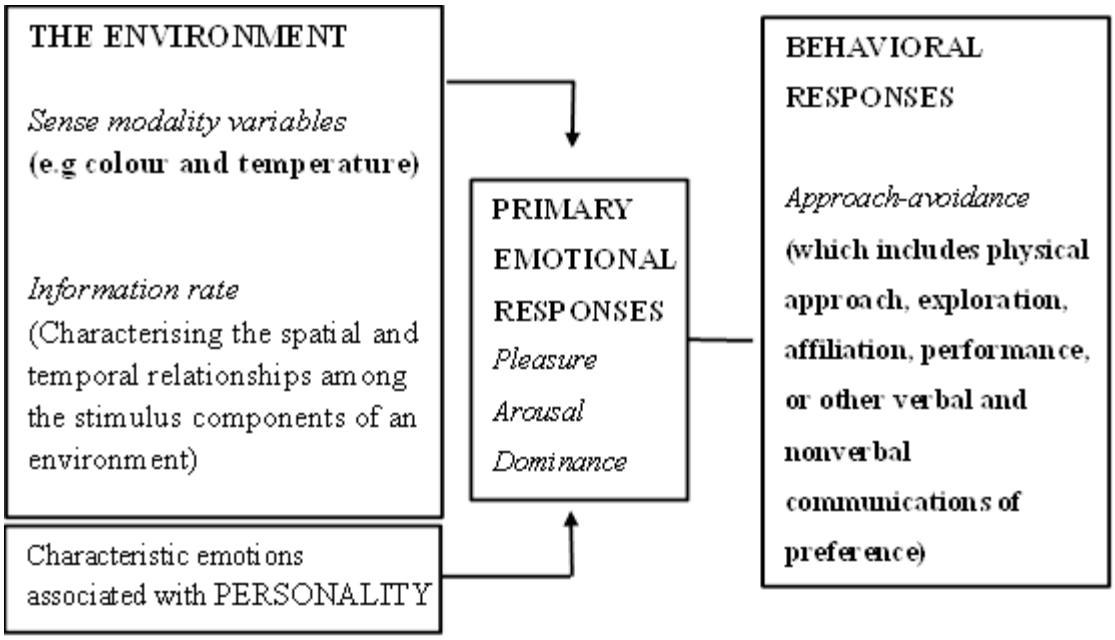


Figure 3.4. *Mehrabian and Russell Model*

Source: *Mehrabian & Russell, 1974,p.8*

- **<u>Covert Behavior</u>**

Covert behavior is the variable that connects the independent (the physical environment) and dependent variables of the overt behavior, and it is the internal power of man that evokes certain kinds of behavior with time. These kinds of behavior are

translated into various levels of covert behavior that consists of mental processes, including the following (Sundel & Sundel, 2004,p.14) ;

- Cognitions; include thinking, expecting, attributing, perceptions, imagining, and beliefs.
- Emotions; include the influence of cognitions, and they in turn influence cognitions.
- Physiological behaviors; include heart rate, blood pressure, pulse rate, and brain waves.

3.2. Environmental Psychology

The majority of the environmental psychologists have examined the relation between environmental motivations and human response. Unlike most scientific fields that focus on scientific theories, environmental psychology lacks one theory that can be applied to all kinds of environment (Gifford, Steg, & Reser, 2011,p.442; McAndrew, 1993). McAndrew (1993) defined environment as a wide term that can be examined using various techniques; hence, it is difficult to be consolidated in one theory (McAndrew, 1993). Veitch and Arkkelin (1995) stated that the various views in explaining the effect of a certain phenomenon are good because they reduce the theories of tunnel–vision and can provide applicable solutions for resolving the applicable difficulties in the methodological application of knowledge and the possibility of developing one theory (Veitch & Arkkelin, 1995,p.16). Veitch and Arkkelin (1995) classified the theories that explain the relation between environment and behavior into geographical determinism, ecological biology, behaviorism, and gestalt psychology. These researchers demonstrated that some of these theories are extensive, some are focused, some lack an experimental basis, whereas others lack data (Veitch & Arkkelin, 1995,p.17).

Despite the wide variety of the environmental and behavioral models posed by behavioral theorists and psychologists, six patterns of the small theories that successfully view the cause and effect between behavior and the physical environment can be concluded, including arousal theory, stimulus load theory, behavioral constraint theory, adaptation level theory, environmental stress theory, and ecological theory.

Adaptation and stimulus are theories that are based on stimulation with the ability to deal with a wide group of social, material, and environmental properties. These theories emphasize the ability of the physical environment factors to motivate one's behavior. The subsequent paragraphs briefly describe these theories.

- **Arousal theory**

Arousal theories indicate how environmental stimulations result in psychologically aroused persons (Aghostin-sangar, 2007,p.18). These theories also illustrate the relationship between one's state of arousal and their behavior. Figure 3.5 shows this relationship, which is usually described as a curvilinear relationship and is called the Yerkes–Dodson Law (Veitch & Arkkelin, 1995,P.19).

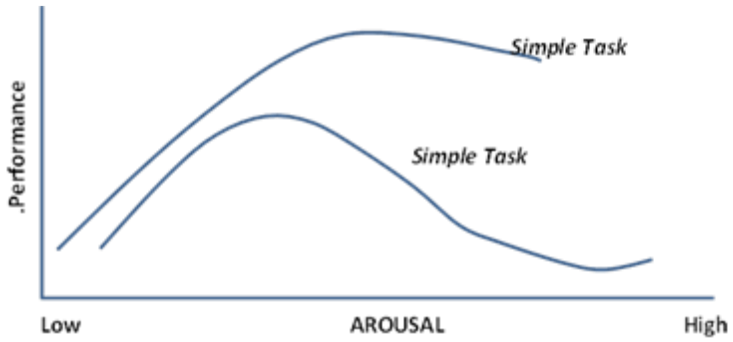


Figure 3.5. *Yerkes Dodson Law – arousal above the optimum leads to a decrease in performance*

Source: *Veitch & Arkkelin, 1995,p.19*

- **Stimulus load theory**

Stimulus load theory conceptualizes the environment as an exporter of sensual information that supplies individuals with psychological stimulation (Aghostin-sangar, 2007,p.20). Stimulation can occur due to simple characteristics such as light, sound, or temperature or complex physical properties, including street land forms, buildings, and the existence of other individuals. Veitch and Arkkelin (1995) posited that these theories are compatible with one's reaction in processing the importance of stimulus based on the notion that people can process environmental stimuli. Thus, the important

stimuli are given due attention, whereas the unimportant ones are neglected (Veitch & Arkkelin, 1995,p.77-78).

- **Adaptation level theory**

This theory focuses on the ability of individuals to adapt to the stimulations in specific environmental contexts without neglecting the strength of the effect of individual differences (Helson, 1964,p.). This theory also emphasizes that the excessiveness or deficiency in environmental stimulation can detrimentally affect one's behavior (Gifford, 2007; Bell, 1996;Veitch & Arkkelin, 1995). This theory stresses that a moderate amount of stimulation is always useful for all. Adaptation level theorists clarified that the relationship between individuals and their behavioral response to the environment consists of two processes, namely, adjustment and adaptation (Aghostin-sangar, 2007,p.22). Individuals either adapt by changing their environment or by changing their responses to the environment (Veitch & Arkkelin, 1995,p.23). In fact, the stimulation levels that vary from individual adaptation levels can often change behaviors and perceptions in special settings.

- **Environment stress theory**

This theory concentrates on the relationship between the environment, one's cognition and emotion, as well as the role of physiology (Bell, 1996). Theorists believe that environmental advantages affect the human senses in which a psychological response to pressure exists when these advantages overrun the best level (Veitch & Arkkelin, 1995,p.141). In addition, this theory asserts that cognitive evaluation is among the psychological responses to environmental pressures (i.e., ability to assess the severity of a situation and cope with the stressor). Accordingly, the importance of pressures is the manner of how one can deal with them (Lazarus, 1966,p.217). Among the most important approaches that make people remember the environment they face and how they support it with settings over time is the formation place that can be part of the sense of place studies (i.e., place attachment, place identity, and place dependence) (Campbell, 1983,p.337-350).

- **Behavior constraint theory**

This theory concentrates on the real or imagined constraints imposed by the environment on individuals as well as on the degree of supposed control possessed by individuals or they intend to posses in the environment (Gifford, 2007; Veitch & Arkkelin, 1995). This theory assumes that the environment can intervene, prevent, and reduce the behaviors of people(Speller, 2006; Veitch & Arkkelin, 1995) . Brehm and Brehm (1981) defined psychological reactance as one's ability to regain control of the environment after the first experience of discomfort and a feeling of loss ability to control the environment (Brehm & Brehm, 1981,p.111).. The learned helplessness can develop if the repeated attempts to control the environment have failed during which individuals begin to feel that their behavior does not affect the environment. Thus, they has no control over their destiny and all what happens to them is outside of their personal control (Aghostin-sangar, 2007,p.21).

- **Perception or cognition theory**

Cognition is "the act or process of knowing in the broadest sense; specifically, an intellectual process by which knowledge is gained from perception or ideas" (Webster's Dictionary). Perception or cognition theory is one of the main theories in psychology, and it concentrates on one's perception or cognition. This theory may differ from those of psychoanalytic view, behavioral view, social cognitive view, and humanistic view because it is not based on science. This particular theory looks into how people perceive the environment according to their learned experiment, cultural differences, and personality traits (Veitch & Arkkelin, 1995,p.112). Cognition theories usually highlight the perception of people toward the environment depending on their experiences as well as personal and cultural differences (Veitch & Arkkelin, 1995,p.113). Gifford (2007) asserted that cognition is how individuals acquire, store, organize, and recall information about places, distances, and arrangements in streets as well as buildings and the great outdoors (Gifford, 2007,p.32).

The brief overview of the theories in the preceding paragraphs demonstrates that adaptation, arousal, and stimulus are theories that are based on stimulation that can deal with a wide group of social, physical, and environmental properties. These theories emphasize the ability of the physical environment factors to motivate one's behavior,

and they are useful in forecasting the negative reactions when motivation is diverted from the optimum level. Arousal and stimulus theories state that the stimulation in individuals has certain limits in responding to the environment and that negative results will emerge when the stimulus is decreased or increased. Adaptation theory confirms the possibility of individual behavior to adapt to the environment motives and undergo modifications through the cause and effect factor. Constraint, stress, and cognition theories emphasize the effect of physical environment on individuals' physiological responses that may differ according to the society as well as the cultural, social, and personal factors. These personal factors vary among individuals and societies because individual differences between people and societies should be considered when forming the environment.

3.3. The Relationship between the Environment and Behavior

In a given place, human behavior depends on the intentions, desires, and goals as well as on behavioral opportunities, directions, and determinants provided by the environment. No general consensus has been reached about the nature of the relationship between the environment and the behavior since the time of the ancient Greeks because some believe that such correlation exists, whereas others disagree. Four theoretical trends can explain the nature of the relationship between the nature of the environment and the human behavior (Lang, 1987,p.100-108).

- Some scholars believe in the *free-will approach* that presupposes that the environment does not influence the behavior, which only depends on personal stimuli, desires, and goals.
- *The possibilistic approach* pivots on the assumption that the environment provides possibilities for the human behavior and gives opportunities for acts that can occur or not.
- The third is *the probabilistic approach* that underlines the role of the stimulus in determining the behavior with an evident influence of the environmental elements and the vital role of the behavioral ambient in forming the context of the event and the activity.

- The final concept on which this research is based is the deterministic approach that supposes that the environment is the basic determinant of the behavior, confirming the cause and effect relationship between them.

Determinisms are divided into three types, namely, environmental, physical, and architectural determinisms. The environmental determinism assumes that sociological, cultural, natural, and genetic environments are the ones that form our values. The physical determinism emphasizes that the characteristics of the material environment determine the nature of the behavior of people. The architectural determinism, sometimes referred to as the environment protection, is the theory of architects, sociologists, and environmental psychologists that determinism considers the built environment as a basic determinant of the sociological behavior. Some theorists argue that a great architecture correspondents to good human conditions (Lang, 1987,p.100-108).

The relationship between the environment and the behavior has been known for a long time in the studies of the environmental and sociological psychology because some believe that a dynamic relationship exists between the environment and the behavior (McAndrew, 1993,p.291). Kurt Lewin (1951) showed that human behavior (B) is not only a function (f) of the personal factors (P) but a function of the environment (E) as well in the location it takes place (Lewin, 1951,p.97). This relationship can be expressed as follows;

$$B = f(P, E) \quad (1)$$

Environmental psychology studies concluded that this relationship proves that the natural and built environments influence human behavior and they can adjust or hamper it (Aghostin-sangar, 2007). The relationship between the environment and the behavior has been investigated by focusing on the physical and the immaterial stimuli of the environment in terms of behavior and emotions (Mehrabian & Russell, 1974).

A number of studies have also looked into the behavioral characteristics that influence the built environment and their potential ability to change the environment or create a new environment that conforms to the nature of that behavior. In this case, the

relationship between the behavior and the environment is reciprocal in terms of influence. The environment influences the behavior and forms it in a manner that it conforms to its characteristics and needs, identifying the nature of the behavior, the manner through which it emerges, and the possibility of making a change that further develops it.

3.4. Spatial Behavior

The aspects of environmental design include various places, activities, and reasons. Urban architecture and design aims to create behavioral places and surroundings to cope with the required activities and behavioral patterns of the place users.One's behavior indicates his/her self-motives and the formal and environmental surroundings in which he/she lives, and it reflects the mental images of the outside world and significance of such images for him/her. Spatial behavior is noticeable and indisputable. Several different theoretical trends can be used to examine the relation between human behavior and the built environment (Lang, 1987,P.97).

The behavioral amendment in examining spatial behavior and the built environment indicates that the individual behavior is indicative of motives and available opportunities in the environment. A number of different theoretical approaches have emerged, including the following;

- **Theory of territoriality**

Territoriality theory is one of the theories that look at spatial organization as a distinctive type of social facts. This theory was developed owing to the etiologists views of human behavior. Such views indicate that certain types of behavior that distinguish mankind are similar in many aspects with those of animals, including territorial behavior. Accordingly, territorial behavior for man is interpreted as an instinctive behavior that stems from a biological origin and it takes a certain model as a result of civilization. This theory has been modified more than once, but it mainly indicates that the space organization by individuals is a result of a universal biological impulse to maintain and defend a certain territory in which others are selectively excluded. This principle can generally be applied to all levels of human communities (Gifford et al., 2011,P.444; Hall, 1990,P.43). The theory presupposes a relation or connection among

socially distinguished communities and their spatial regions. Some scholars (e.g: Greenbie, 1976; O. Newman, 1972) developed the ideas that came in the territorial theory to the designing principles of the physical environment.

However, the logical objection to this theory is that the human behavior toward space is the same in all conditions because it is based on a universal biological motive. Thus, the questions that should be addressed are “How such a theory can explain the basic differences in spatial organization?” and “How can this theory explain a variable factor with invariable one?”

- **Proximity theory**

Some studies on built environment and human behavior have been affected by various scientific fields, such as ethology, behavioral sciences, and psychoanalysis. These studies deal with how human beings are spatially connected with one another when they are with others and how they control space through spatial behavior.

- **Ecological psychology**

A behavioral environment is a stable and interactive structure between the activity and the place, and it consists of the following elements;

- An existing monotonous activity (i.e., existing behavioral pattern)
- An existing environmental pattern that represents the medium through which the activity takes place
- An existing harmonious relation between the activity and the surroundings (i.e., place suitability to the event)
- These elements are connected with a certain period of time(Bechtel, 1977,p.94) .

Such composition indicates that physical surrounding can be for more than one behavior when various behavioral activities or patterns are accomplished in different periods. Individuals occupy various locations in the behavioral environment owing to their different roles. Spatial environment consists of a combined series of behavioral environments correlated with one another to form systems for the activities that reflect the motives, desires, and view of people toward life and the world as well as the mental image they have of the place and the related events.

Bechtel (1977) developed measures for behavior and physical environment based on the basic ideas of environmental psychology to establish the physical boundaries of different behavioral environments and to measure the variations in behavioral patterns . Bechtel (1977) explained that the behavior magnetic points for any community can be defined through the behavior environments that possess the maximum variations in behavioral patterns and people in the space(Bechtel, 1977).

These studies are mainly concerned with the actual behavior in space as a start for establishing the properties of the physical environment. These studies have provided a spatial measure according to the behavior in certain space and comprehensive indicators to measure the variety of human activities in the space.

3.5. Built Environment

The built environment has a basic role in establishing social interaction and regulating relations and social levels among community, individuals, and place, thereby reflecting the nature of social regulations and structures. Given that the community needs, requirements, and potentials continuously change, the forms of material structures of a place change, resulting in new social and behavioral patterns in which the mechanism of the built environment affects human behavior (Hawley, 1950). The community members can achieve the required interaction and determine the suitable means in any of the built environments. Urban environment has an important role in facilitating such interaction and reduce the material and significant costs in addition to providing appropriate social setting to reach the required social organization and interaction.

Several recent studies have confirmed that the design of a built environment can supply opportunities that motivate, discourage, or prevent specific types of behaviors and must not be detached from its relationship with human activities (e.g:Appleyard, 1976; Foster, Giles-Corti, & Knuiman, 2011; Jacobs, 1961; Mehta, 2006).

Built environment theory confirms that the form and content of the built environment heavily influence human behavior and social interaction (Barker, 1968). The effects of the built environment on behavior are considered affordances of its environmental attributes (Barker, 1968). Gibson (1979) asserted that the affordances of the environment are what such environment can offer, provide, or furnish to the

individual (Gibson, 1979). Affordances may be negative (threats) or positive (promises), which collectively characterize the items in the environment relative to organisms (Scarantino, 2002).

The notion of affordances is useful for showing an available option to an individual; the way that a situation lends itself to being used (Gibson, 1979). Based on this circumstance, affordances are a prerequisite to human activity. Nevertheless, the existence of affordances for some activity does not imply that the activity will occur; it only contributes to the potential of that activity (Greeno, 1994). The presence or lack of an arrangement of specific affordances may support or prevent particular human activities (Gibson, 1979). For example, the absence of sidewalks or bicycle lanes along a crowded street with high-speed traffic may decrease one's perceived set of options for active transportation. At the same time, the existence of sidewalks or bicycle lanes may support (or afford) cycling or walking (Kirsh, 1995).

Socially magnate places are inadequate to achieve spontaneous social interaction in which social readiness should exist for such a behavior. The surroundings should comply with individual needs and activities as social interaction takes place actively and spontaneously when various social needs of both the individual and the group are balanced by providing a sense of independence, specificity, and the possibility of choosing the appropriate behavioral pattern and the right place. A coercive environment cannot be an effective social environment. The behavioral needs should be examined and merged with aesthetic aspects to realize the optimum interaction between the physical environment and human and to yield a positive social interaction, not necessarily to be immediately but general within years to develop affiliation properties for society that increases its social interaction. Environment is the area where the interaction between men and the surroundings, including nature, human communities, social orders, and constructions, takes place. The interaction between the environment and individual is continuous, and the relations system has a clear structure that reflects such relation between the individuals and the elements of environment. This structure affects human behavior when individuals realize and assess the environment and express the cultural structure of society, thereby achieving the spatial organization of the environment. Architectural, social, and psychological studies have created several classifications for built environments depending on their relationship with the human

and the nature of human behavior in these spaces. The most important of these classifications are discussed in the subsequent paragraphs.

- **Space characteristics**

Space is used according to the complex rules and preferences, which are not always interesting but are significant in certain situations depending on the humanitarian needs in a physical space. The most important dimensions that affect physical space are personal space, territoriality, and crowding.

Personal spaces are the orientation components and dynamic distances of interpersonal relations (Gifford, 2007). Robert Sommer (1969) clarified that personal space is a zone with invisible boundaries surrounding a person's body into which strangers may not enter (Sommer, 1969,p.26). Gifford (2011) assured that many situational and personal influences interact with preferences for particular interpersonal distances (Gifford et al., 2011,p.444) . For example, the distance needed by a person to talk to his/her family members varies from that he/she needs to talk with a stranger or an official. Gifford assumed that the variations in personal space are connected with age, gender, mental health, and culture (Gifford et al., 2011,p.444). Accordingly,

Personal distance is indefinite; it is affected by many factors, such as cultural, social, and personal factors as well as technology, with different dimensions based on the nature of human behavior.

Territoriality reflects the personalization or marking of object or an area to communicate person or group ownership (Jeffrey & Mark, 1998,p.25). Territoriality indicates primarily to the behavior of individuals and small groups as they seek control over a physical space (Hutchison, 2011,p.233). Gifford (2007) defined territoriality "as a pattern of behavior and experience related to the control, usually by law, custom, and personalization, of physical space, objects, and ideas." (Gifford, 2007).

Crowding is the subjective feeling of having an exceeding number of people around, and it varies from the density, which is the ratio of persons per unit area of a space (Hutchison, 2011,p.234). Crowding is accentuated or ameliorated by personal, social, cultural, and physical factors (Gifford et al., 2011,p.444). Crowding exists in three modes, namely, emotional (usually negative, but positive emotions can emerge),

situational (feeling constrained), and behavioral (activity completion and assertiveness) (Gifford et al., 2011,p.444) .

The concept of crowded space varies depending on many factors (i.e., cultural, social, personal, and physical) that can affect the individual and determine the nature of his/her behavior in space that appears in the form of positive or negative reactions toward space.

- **Space feature elements**

Space feature elements are spatial elements that influence the form or performance of a space. Rapoport (1981) pointed out that one can suppose that a space is a setting system in which specific activities are executed. The elements based on the degree of nonverbal communication with environment and the humans can be classified into fixed, semi-fixed, and non-fixed feature elements (Rapoport, 1983).

Hall (1966) provided definitions for these elements.

- *Fixed elements* hardly and slowly change and are organized by regulations and laws. These elements include streets and buildings at the city level and ceilings and floors at the building level.
- *Semi-fixed elements* can be changed easily and include usable contents of the physical setting, including inner furniture (e.g., such as curtains, plants, etc.) and street furniture and external furniture (e.g., shops' frontages, advertising signs, garden layout, etc.).
- *Non-fixed elements* are relevant to human beings in using the subject space; their activities, their shifting spatial relations, and nonverbal behavior.

- **Sociopetal and Sociofugal Spaces**

For several decades, environmental psychologists have been studying the effect of the built environment on temper problem solving, fierce behavior, and productivity. These experts have examined physically the designs that support social interaction and those that discourage it (Hutchison, 2011,p.442). Humphery Osmond (1959) and Robert Sommer (1969, 1974) introduced the terms sociopetaloid, sociophile, sociopetal, and

sociofugal to describe the spatial qualities in architecture that either gather people together or disperse them (Salehinia & Memarian, 2012,p.8).

Theorists claimed that the social–physical environment have two patterns in general, namely, sociopetal and sociofugal. Sociofugal is the pattern that does not provide gathering areas; hence, social interaction can be avoided. Contrarily, sociopetal is the pattern that provides public or semi-public areas in which individuals can easily and directly meet, thereby enhancing social interaction (Lang, 1987,p.160).

Markets are usually credited with creating sociopetal space, that is, a space designed to ease social contact, inclusivity, and internal identity (Hester, 2010,p.21-44). By contrast, the sociofugal space discourages communication and interaction such as seats placed in long parallel rows (Wiseman, 2009,p.50).

Edward T. Hall (1990) interpreted that a sociofugal space in one culture may be a sociopetaloid space in another (Hall, 1990,p.110). A sociofugal space is not necessarily a bad space just as a sociopetaloid space may not always be good. What is eligible is the presence of elasticity and compatibility between the physical plans of public spaces so that a variety of different spaces exist and people engage in these spaces based on their needs and moods (Kruse, 2003,p.332; Salehinia & Memarian, 2012,p.8).

3.6. Conclusion

The nature of the relationship between the human, the environment, and the behavior as well as the influence of the environment in general and the built environment in particular on human behavior are probably the issues that have preoccupied the scholars with different specializations and have occupied a great deal of environmental, psychological, and architectural studies since the Greek age until today. Studies showed that human behavior has three main aspects through which it interacts with the environment. These aspects are the mind (cognition, affect, and conation), the body (biological, bodily functioning, and overt behavior), and the soul (religious affiliation, axioms, personal experiments, and philosophy). Human behavior can be classified into two types. The first is the covert behavior, which cannot be measured mostly and comprises three types (i.e., cognition, emotions, and physiological). The second type is the overt behavior, which involves a certain act that can be measured. The scholars focused on the affiliative behavior as an important part of the overt

behavior that concentrates on the positive interaction with the others and the environment in addition to the level of response of this behavior in accordance with the nature of the surrounding (i.e., whether attractive and interesting). This condition entails that such behavior influences and can be influenced by the environment. This response has three dimensions, which are pleasant–unpleasant, aroused–unaroused, and dominant–submissive. Despite the wide scope of the behavioral theories that tackled the relationship between the environmental stimuli and the human response, six models are considered the most concentrated ones. Some of these models depend on the stimulation factor and focus on the ability of the environmental elements to stimulate, whereas others rely on the physical environment capability to respond to the physiological characteristics of the individuals, which vary according to the society or the cultural, social, and personal factors. These theories can deal and react with one another. Numerous studies have posited that a built environment is an environment whose mechanism affects human behavior because it contributes to or prevents the emergence of certain types of behavior. The effect of this environment can be positive or negative according to its nature. The nature of individuals and their characteristics, including cultural, social, or personal characteristics (the behavior of individuals), evidently affect the environment formation. Several methodologies that discuss the nature of the relationship between the behavior and the physical environment have been developed. Each of these methodologies has a certain trend. Some methodologies assert that the behavior is similar for individuals and its effect on the space is the same (i.e., the behavior can be determined through the space). Contrarily, other methodologies focus on the spatial relationships and their effects on the behavior, whereas others discuss the variations in behavior according to certain information, including territoriality theory that focuses on the innate behavior of humans toward the built environment, assuming that such behavior is the same for all individuals. Proximity theory tackles the influence of one's relatedness with others in a certain place on his/her spatial behavior. Ecological psychology asserts that more than one behavior may exist in one place according to the social, cultural, and personal characteristics of the individuals. As a result, several classifications of the space have emerged according to the relationship with the human behavior. The positive space encourages the sociofugal and sociopetal communication, and the personal space varies according to the nature of the general or particular

relationship and the crowded and territorial space. The spaces have been classified into fixed, semi-fixed, and non-fixed feature elements owing to their capability to change their characteristics to be harmonious with the behavior. All these spaces have characteristics that differ depending on cultural, sociological, and personal characteristics. Therefore, the built environment, whether internal, external, buildings, or streets, influence and can be influenced by human behavior because they are constituted according to the nature of the human behavior in a certain place and they form the behavior according to their characteristics. The shopping centers, as one of the build environment ingredients, are also influenced by and influence human behavior. Hence, the characteristics of these shopping centers are formed according to the human behavior in their location and they form such behavior. The next chapter discusses the shopping behavior and investigates how it influences the shopping buildings and the extent to which it is influenced by them. The nature and types of this behavior will be examined in addition to the design characteristics of the shopping activities that influence it and the factors that it influences.

4. CUSTOMER BEHAVIOR AND SHOPPING ENVIRONMENT

Shopping is a daily activity practiced by human beings in a physical environment called the shopping environment. Some characteristics of this activity are similar despite the variations in times and places in which this activity takes place. Some other characteristics differ according to a customer's characteristics, such as his or her culture, traditions, and beliefs, as well as according to the characteristics of the shopping environment in which the activity takes place. Shopping is not confined to the process of selling and purchasing, but also includes other social, entertainment, and cultural activities. Bellenger (1977) argues that the need to buy is not the only motive to shop; other psychological, social, and entertainment needs influence this activity. Shopping is different from purchasing because the latter is the result of the need and demand that makes a customer go to a certain store. An intention is formed before purchasing, and this intention is fulfilled by purchasing. As shopping involves all the activities that happen during a shopping trip,it expresses all the material and spiritual factors needed by humans.

Shopping involves a set of factors that interact with one another to determine its nature. The most important of these factors are the customer, the shopping environment, and the goods. These factors interact to form the behavior of the customer, the factors that influence it, and the nature of the spatial shopping characteristics that influence and are influenced by the individual's behavior. This chapter will discuss the concept of shopping, the human needs that influence shopping, the elements that constitute shopping and influence it (the customer and the shopping environment), and the mechanism that affects the behavior of the customers and the shopping environment.

4.1. What is Shopping?

The processes of buying and selling are ancient activities that started when men exchanged goods with one another, an activity that evolved into sale and purchase, and then developed into various business trends in modern times (Gruen, 1965, p.17). According to Coleman, shopping activities shifted from buying goods and products in 1945. For example, in the 1960s and 1970s, shopping became more focused on services, and then in the late 1990s, it focused on the search for experience. Today, shopping

involves collecting ideas—the collection of aspects of the lifestyle or things that contribute to the recovery of individual minds (Coleman, 2007, p.5).

Shopping is different from buying because the latter is a result of the need or demand that drives the customer to a certain shop to buy. In buying, an intention is formed before the action, whereas the shopping philosophy is more comprehensive and includes all activities, starting from the motive of buying to putting out the needs. Shopping is a humanitarian activity driven by inborn motives that exceed the need and demand to be unspecified and self-motivated, which can bring joy to the customer (Beddington, 1991, p.1). Downs (1967) explained three possible results of shopping; goods, information, and recreation (Bloch, Ridgway, & Sherrell, 1989, p.13; Downs, 1967).

From the customer perspective, shopping can either be a boring, routine process or a social pleasure in addition to buying, depending on the design of the shopping environment. Architects should think of shopping as viewed by tourists who arrive in large cities. These tourists frequently go to large markets, which drive them to the city center. Thus, shopping for most people is about looking for comfort, pleasure, and relaxation (Beddington, 1991, p.1). However, Storch[1] thinks that shopping will become the biggest mode of entertainment.

The modern philosophy of shopping is based on multi-purpose trips and on viewing shopping as practicing all the social activities related to buying, recreation, and simple commercial and health services. For Benson (2008), shopping is a way of self-expression and involves a person's location in the world. Although it often occurs in public spaces, it is essentially an intimate and personal experience, such as taste, touch, smell, consideration, and talk. Viewed internally through memory and desire, in addition to searching externally through the stores, shopping is a means of self-expression and is defined as creativity, interaction with others and self, as well as interaction with places and things (Benson, 2008). Psychological studies[2] have confirmed that most of the motives that activate shopping are the result of non-

[1] Gerald Storch is the CEO of Storch Advisors.

[2] In 1999, the New York Times published a study by American psychologists for the benefit of some economic companies in determining a mechanism that will present shopping as a humanitarian so that it may be economically used to achieve the highest sales.

conscious actions controlled by conscious actions directed by intentionality to realize various humanitarian needs.

Bednar (1989) states that shopping spaces are well equipped to contain pedestrian activities, which he classified as necessary, such as walking toward a certain target, stopping, and waiting. These activities take place every time in different conditions. In addition, some activities take place optionally, such as walking and sitting for rest, eating, recreation activities, and so forth; these activities take place when suitable and encouraging conditions are available (Bednar, 1989, p.48). The main characteristics of shopping include the absence of prior and comprehensive planning. They also include non-intentionality, which is dominant in achieving various aspects of the action, where even pre-planned paths often turn to take new avenues in various directions, where the shopping action is found outside the boundaries of full mental control whether in the stimulus or achievement. Accordingly, shopping can be considered a vital activity performed to achieve various needs and desires. These desires are not restricted to physical needs, but also include spiritual ones because they involve social interaction, obtaining information, and pleasure. People shop in various means depending on their nature and the factors influencing them. These factors can be personal, cultural, or social, in addition to the stimuli and effects provided by the shopping environment, which affects customer behavior.

4.2. Contemporary View of Shopping

A modern philosophy of shopping is based on multi-purpose trips, with shopping regarded as practicing activities as a whole, including commercial activities, social activities, cultural activities, entertainment, health services, and various simple services. Therefore, shopping acquires a dynamic and instable concept based on the various human needs and is affected by social concepts. Accordingly, the contemporary concept of shopping is more comprehensive and clear, whereas the concept completely related to commercial factors and financial revenues has moved to a shopping activity that aims to create enjoyment, affect mutual environments to meet human needs, in particular the emotional ones, as well as create emotional feelings and mutuality between the customer and the market space, which is the base for enhancing the exchange of goods (Redstone, 1973, p.17). In addition to shopping being daily and semi-daily routine

work, it is becoming a social pleasure and incorporating another dimension as a family activity (Northen, 1977, p.18).

Shopping units compete with other styles of shopping, such as catalogue purchasing and "e-tailing." In spite of this competition, the methods of electronic shopping may affect the goods that do not need comparison, such as books, music, and general foodstuff. However, the option to go to the market to compare goods in terms of size and appearance always dominates shopper choices (Coleman, 2007, p.14).

Coleman believes that technological advances will not replace traditional shopping activities, similar to when video and TV did not eliminate the existence of cinemas. However, he emphasizes that the influence of the IT-savvy generation (sometimes called "Generation X") should not be overlooked, as these techno-customers will have a significant effect on the future of shopping. IT will combine with traditional shops and will be integrated to the display methods. It will make the shopper become more familiar with prices and styles through the Internet before shopping (Coleman, 2007, p.14). In general, the modern concept of shopping represents comfort, pleasure, and individual renewing of experience (Beddington, 1991, p.1). Beddington stated that comfort is the provision of human needs to achieve comfort through meeting (urgent) human needs. Thus, comfort means the provision of man's needs, which is the aim of shopping center spaces (Gruen, 1973, p.3). The concept of shopping is related to other concepts, including raising the standard of living, creating utilities, creating revenues, and creating products and services (Steele, 1973).

4.3. Shopping and Human Needs

The shopping concept is related to humans, as one of the most important concepts in life is to satisfy various needs. As defined in psychology, human needs or motivation is an extrinsic (external to the individual) or intrinsic (internal) condition that evokes and directs behavior to reach certain purposes to satisfy certain aspects of human life, where behavior does not happen unless it is motivated by a specific need (Reisinger, 2009, p.271). These motives are distributed between two levels (extrinsic and intrinsic) and have variable and dynamic properties, despite being stable in some of the basic biological and psychological needs. According to Vroom (1964), motivation needs three factors; expectancy (result of behavior), instrumentality (action and reaction, e.g.,

success and reward), and valence (attractive or unattractive). Meanwhile, McClelland (1953) believes that motives are affected by the general culture of individuals, because they determine their needs from their cultures. In achieving the desired behavior, human needs must be fulfilled. Herzberg et al (1959) note that, the fulfilment of some human needs does not always result in satisfaction. Sometimes, supplying the lower-level needs of individuals does not motivate them to exert labor; it only keeps them from dissatisfaction. Only providing for higher-level needs can motivate individuals (Herzberg, Mausner, & Snyderman, 2011).

Abraham Maslow categorized human needs as shown in Figure (4.1); physiological needs, safety, belonging, esteem, self-actualization, and cognitive and aesthetic needs in the built environment (Maslow, 1970). Similarly, Steele (1973) proposed six aims or dimensions of the built environment that affect the performance of individuals or groups; shelter and security, social contact, symbolic identification, task instrumentality, pleasure, and growth (Steele, 1973).

Maslow's (1954) and Steele's (1973) notions of human needs in the built environment are possibly nothing but the developments of the Vitruvian concepts of "utilitas" (commodity) and "venustas" (delight) (Mehta, 2006, p.20). In fact, whether or not the built environment supports the desired activities, types of human interaction, and types of human circulation, it can still fulfill most of the stages of human needs (Lang, 1987). Accordingly, the environment that supplies physiological comfort, provides pleasing sensory experience, gives standing types of behavior, and has positive symbolic associations with its users can be considered as a responsive environment (Lang, 1987).

Based on the abovementioned discussion, seven varieties of human needs in shopping malls can be determined. The discussion assumes that eligible shopping centers provide a feeling of safety, a sense of environmental comfort, a sense of physical comfort, a feeling of belonging, and a sense of control on the environment, as well as achieve sensory pleasure and encourage social interaction and communication (Mehta, 2006, p.21).

Furthermore, the first six categories of needs in shopping spaces definitely attract customers and, consequently, create chances to satisfy common and social interaction needs.

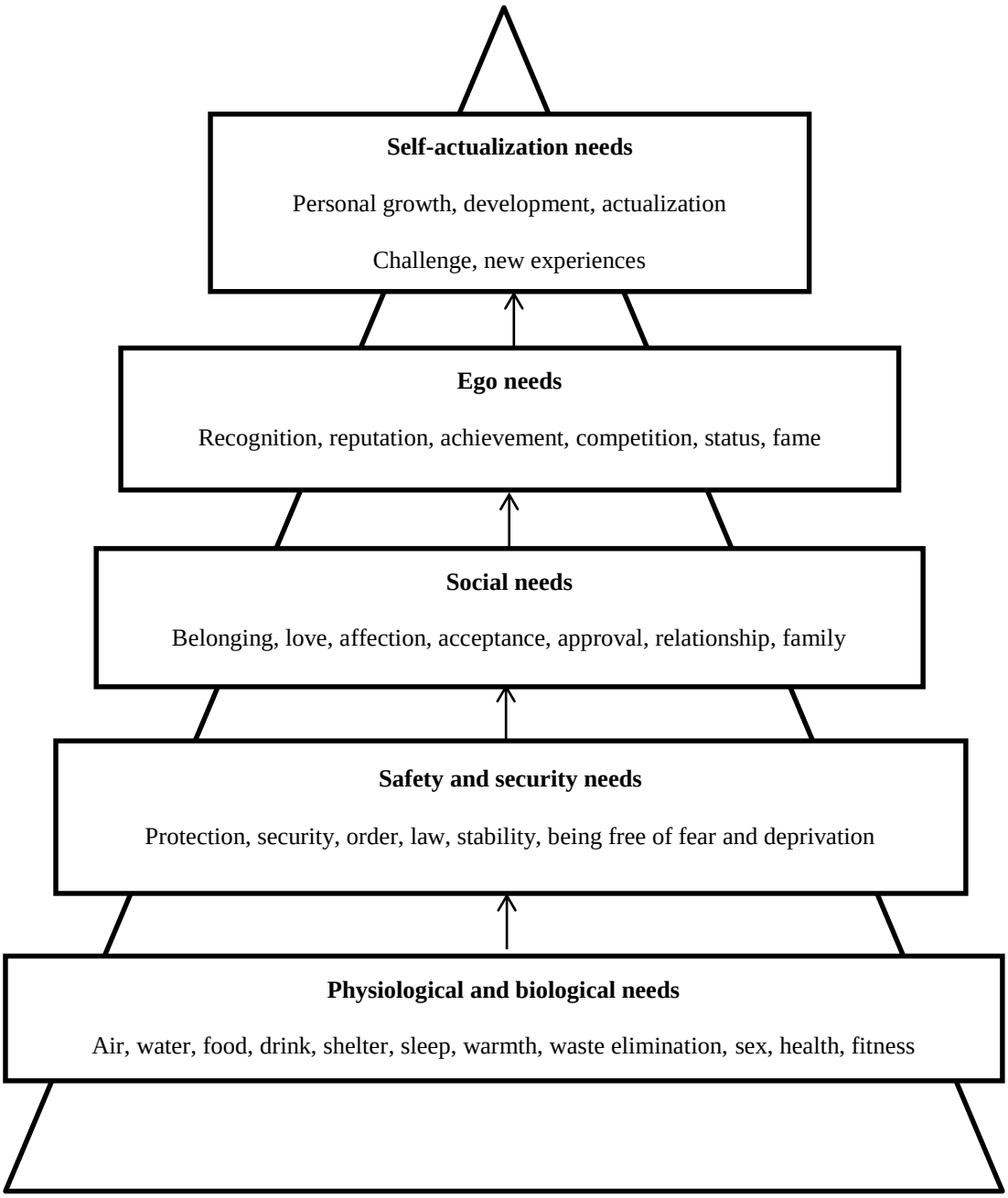


Figure 4.1. *Maslow's Hierarchy of Needs*

4.4. Implementing Importance of Shopping

D. James (1981) pointed out that shopping is creative, whether for the customer or the merchant (Gruen, 1973, p.12). The customer has a list of goods to buy, but this list can end up a different list while the customer reviews the goods offered and makes

the proper budget and selection. This perspective increases the customer's view, enhances judgment, and raises general taste (Gruen, 1973, p.12). As the activity is related to the commercial competition concept aimed to achieve the highest returns, the effects can be clearly seen in directing the customer toward the proper market and goods and directing the merchant toward the best location, the proper goods, and the commercial policy and good advertisement methods to adopt. The result is the increase in competitive level of the seller and the knowledge experience of the customer. With trade being a human achievement resulting from materialistically motivated accumulations (Gruen, 1973, p.13), the merchant is the meeting point between the customer on the one side and the goods and services consumed on the other side, and the market is the medium where this meeting takes place.

However, the success of shopping is based on two elements;

- The first element is the successful performance of the merchant as determined by shopping and represented by comparison and availability to give the customer the ability to compare items among the available options.
- The second element is the availability of the environment, which includes the success of this activity and the flexible nature of realizing the purposes of shopping in a social interaction within a comfortable and safe environment integrated with other activities (Davey, 1986, p. 92).

4.5. Factors Affecting the Stimulation of Shopping

4.5.1. Customer behavior

Consumption is defined as the final use of products and services to meet man's needs and requirements. Customer behavior is the behavior practiced by the customer while he or she searches or uses products, services, ideas, or experiences that are expected to meet his or her needs according to the available purchasing possibilities.

Studies that investigate customer behavior vary, but this behavior can generally be summarized as a human behavior resulting from a continuous and developed process between the mental composition of man and the physical and significant composition of a place. The importance of human behavior is knowing the expected reactions in a place environment, such as the market, and their effect on the functional, economic, and human performance (Hall, 1974, p.210).

Factors affecting customer behavior are classified into two groups; self factors related to the individual and non-self factors related to the environment where the individual lives.

- **Self factors**

- **Perception;** this is the process of forming mental impressions of a certain effect within the customer's knowledge. It depends on the nature of the effects surrounding the individual, his memory, his experience, and his mental ability to sense effects, as well as highlights the effect on the choice of shopping outlets or positions or on moving during axis and the transition from one side to another (Long, 1974, p.83).

- **Needs;** the main motivation for adopting a behavior is to fulfill human needs. Individuals' views of needs and the degree of their importance are often different. The concept of shopping includes spiritual needs as well as physical needs, whereas the procurement process or buying is performed to achieve the necessary specific needs, which explains the difference between need and demand (the concept of needs is discussed in paragraph 4.3).

- **Personality;** this is the internal feelings of the individual. Allport defined personality as an internal arrangement of the psychological and organic systems found within the individual that determine the external behavior and thinking (Santee, 1979, p.142). Personality is affected by two factors. The first is the individual's characteristics and life experience, and the second includes the external effects that have certain obligations. Numerous studies have been conducted on the personal quality that successfully completes the act of shopping, where women considered the best shoppers. Taking into consideration the age and the economic situation, middle-income earners are considered one of the best shoppers (Coleman, 2007, p.255). Meanwhile, those regarded as conservative customers are less acceptable to change in their shopping behaviors (Beddington, 1991, p.13).

- **Attitudes;** Many studies on behavior (and the factors affecting it) assume that attitudes are the major determinant of behavior and that they occur before behavior. They indicate a response for certain effects that lead to certain behaviors and actions. Attitudes "tend to be conceived as the product of a deliberative calculation weighing an individual's beliefs about a behavior with the value they attach to those characteristics" (Darnton, 2008, p.12). Meanwhile, Sears and Auld (1979) believe that individuals' attitudes are built by meanings and values they learn in addition to the sensations they experience (Sears & Auld, 1976, p.243). Lockton (2012) emphasizes that although the design to change an attitude can lead to a change in behavior, the opposite is true, which means that the design to change a behavior can lead to a change in attitude (Lockton, 2012, p.11). According to Lockton (2012), exploring attitudes is achieved by observing behavior or measuring physiological responses to stimuli that determine the attitudes (Lockton, 2012, p.1). For example, shopper behavior shows attitudes on whether to withdraw from a space or rush into it (Beddington, 1991, p.13).

- **Learning;** this factor refers to changes in individual behavior toward response as affected by experience. Individual behavior is acquired through learning, which results from interactions among motives, stimuli, and reactions (Armstrong & Kotler, 2003; Keisidou et al., 2011), and as beliefs and attitudes that affect customer behavior, which are shaped through acting and learning (Armstrong & Kotler, 2003). Psychologists think that man is always learning, and in this context, stimulus and response theory can be applied (Huff, 1966, p.1). Stimulus refers to the inborn needs, whereas response is the reaction to a stimulus. Strengthening the relation between stimulus and direct response is a habit that can be distinguished and used to examine customer behavior.

- **Buying habits;** a distinction must be made between the types of buying behavior and buying habits. A habit is an inclination to an action, which by recurrence has become unprompted, and every customer has private buying habits, whereas buying behavior types represent the design of the behavior of a large segment of customers (Applebaum, 1951, p.173). Buying habits vary, as mentioned above, where they are

related to the social aspects of each country and city. Habits can be different in one city where they are affected by previous behavioral influences that characterize individuals from one another (Gruen, 1965). Buying habits are based on five elements; time of buying, place of buying, manner of buying, person buying, and style of sales promotions (Applebaum, 1951, p.173). Figure (4.2) illustrates these effects. Examining buying habits is of great importance in the success of shopping space because such habits enhance the shopping process. For example, the place of buying determines the place where the customer makes the buying decision and provides good conditions that can affect the customer's decision to buy.

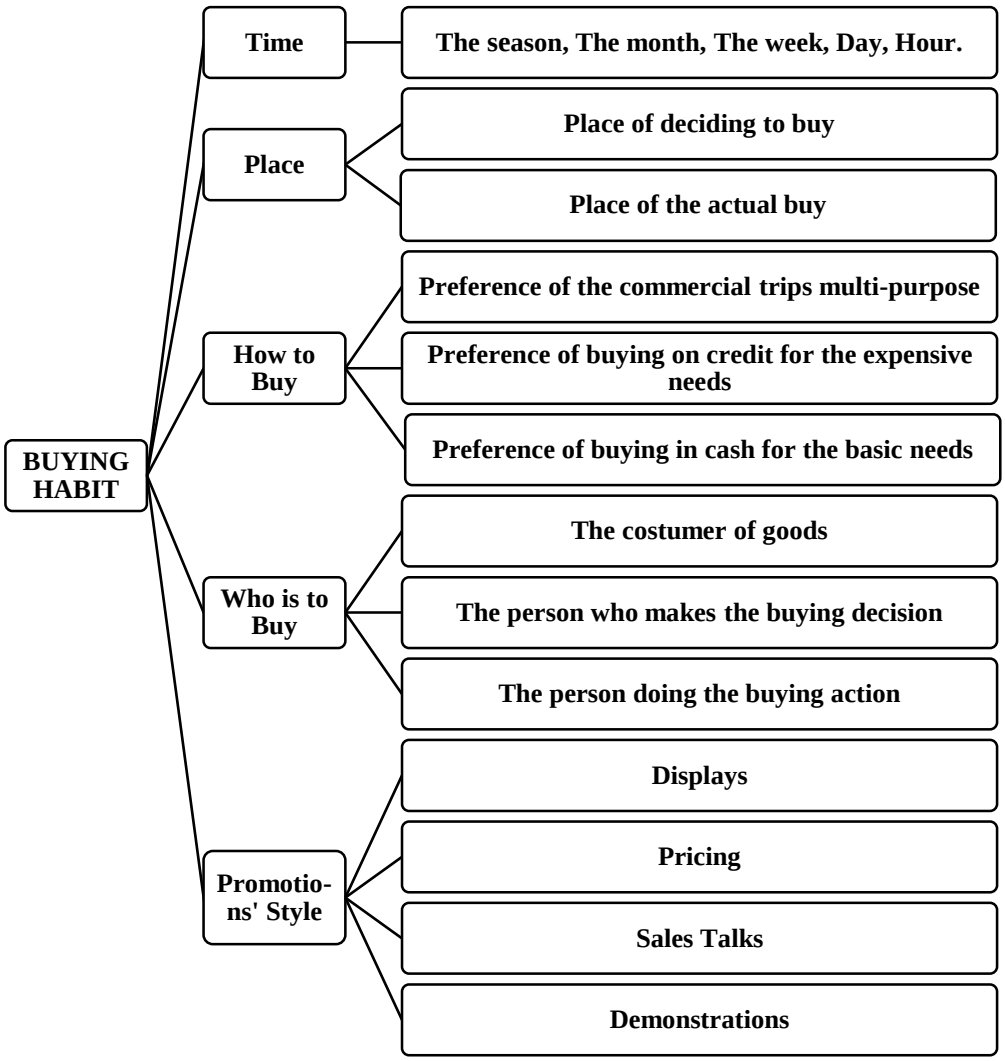


Figure 4.2 *Buying habits*

Source *: researcher*

- **Buying motives;** Motive is the need to satisfy an urgent need. Buying motives differ according to customer perception, where a customer can realize the motives and replaced them with those that are more acceptable in society. Buying motives can be classified into two types (Manikandan & Rajamohan, 2014,p.137).
    - Emotional motives; these motives indicate the purchase of a certain product without consideration of the reasons affecting buying; this act is called impulse buying, such as buying non-basic needs.
    - Rational motives; these motives are based on a conscious justification made before a buying decision is made. Factors affecting buying motives are largely driven by a group an individual belongs to, which can be as small as a family or social clubs or as large as a social layout.

- **Buying decisions;** this refers to an alternative option among other options. Shoppers face selection among many decisions when buying. John Howard provides an explanation for the shopper behavior when shoppers make buying decisions, where this explanation can be applied to one of three situations (Howard, 1973, p. 30);
    - No clear intention as a result of not fixing non-intentional targets. The shopper lacks sufficient information, thus prolonging the shopping period to acquire enough experience before buying[3].
    - The shopper has a certain experience before buying with clear intention. Small effects can result in various reactions and results.
    - Spontaneous response. The shopper has clear intention in buying and the place of shopping. Accordingly, he or she goes to the place.

[3] Some American psychologists conducted a study for some companies on the possibility of finding a mechanism that affects shopping action to be economically used to achieve the highest rate of sales. The results indicate that people are motivated by non-conscious waves that provoke them to shop. Thus, economic thinking examines the possibility of investing new methods for advertising to increase goods marketing (The New York Times, August, 1999).

- **Non–Self Factors**

A collection of non-self influences play an important role in determining the behavioral system of an individual.

- **Social effects**; Humans are social in nature and live within social groups to affect and be affected. The family is the first group that the individual is continuously connected with; indicating that it has an effect on making the buying decision and that family needs should be identified. Humans are also affected by the views of small groups such as friends, colleagues, and neighborhoods. Finally, a customer is influenced by social groups he belongs to and adopts its positions, where the individual's position in any group can be defined in terms of position and role (Yakup & Jablonsk, 2012, pp.64–65).

- **Cultural effects;** Culture is the most essential determinant of a person's wishes and behavior, which differs among society members according to cultural factors, such as religion, beliefs, language, customs and traditions, standards, and judgments. The cultural effect is an extremely important concept in understanding customer behavior (Yakup, Mucahit, & Reyhan, 2011, p.109).

- **Economic effects;** Individual income directly affects expenses, and economic studies on shopping indicate that consumption can be high when income is low, and vice versa. This indication can explain the increase of consumption for poor people as opposed to those who save significantly and accumulate high capitals.

As mentioned in the aforementioned paragraphs, the customer's behavior is affected by many self and non-self factors that determine the nature of the customer and his or her reactions toward the shopping environment. Despite the importance of these factors, this study concentrates on the covert customer's behavior (avoidance behavior and approach behavior), and therefore does not discuss the factors that constitute the behavior, with an emphasis on the importance of these factors.

4.5.2. Goods characteristics

Goods are those displayed in shopping spaces, and they are classified into commodity and services. In turn, commodities are classified into Consumables targeted at the customer directly and productivity which are intermediary in the production of other commodity. Consumables are classified based on various standards, but the main standard of classification is the buying habits and the customer's behavior. They are as follows (Abdulla, 1989, p.28);

- **Convenient goods**

These are goods bought periodically without the need for balancing or paying attention to the difference among them, such as food (they are considered basic daily needs).

- **Shopping goods**

These goods are acquired on the basis of searching for and comparing the alternatives exhibited in terms of their convenience, shape, and characteristics, such as clothes and textiles. A more expensive good implies greater interest in balancing. In general, these goods are regarded as the first kind of goods.

- **Special goods**

The customer makes exceptional efforts to obtain these goods. They are expensive, the ports of their distribution are limited, and consuming them takes a long period of time.

The repetition of the shopping journey to purchase the various goods determines the classification and the distribution ports of these goods. The different social classes and the individuals determine the priority of goods purchase according to their taste, income, and the nature of the expenditure. Therefore, relying on a certain classification to determine the nature of the goods is difficult.

The characteristics of the goods exhibited affect the customer's behavior (whether approach or avoidance) because certain types of goods attract the customers. These goods make the customer seek them wherever they are and eventually creates magnets

in the shopping environments. In the following chapter, the classifications of goods in the shopping environments are discussed to identify the degree of their influence on the customer's approach (this research does not discuss the effect of the economic factors, the prices of the goods, and their quality for the customer, although they are very important but are not included in the scope of this research. Therefore, the focus is only on the types of goods exhibited).

4.5.3. Shopping environment characteristics

In some studies, the consciousness of designing a shopping space to product-specific emotional influences in buyers to maximize the probability of buying is defined as shopping environment (Kotler, 1974). The lineaments of a shopping environment consist of physical and non-physical aspects, such as music, lighting, sound, scent, and furnishings (Liu & Jang, 2009).Three dimensions of the shopping environment exist as outlined by Bitner (1992). The first dimension includes ambient conditions, which refer to the characteristics of the non-physical environment, such as temperature, lighting, sound, music, and scent. They mainly affect the non-visual senses of customers. The second dimension includes spatial layout and functionality, which elucidate the way elements of the spatial layout help in the goal-performance and attainment of customers. The last dimension of shopping environment includes the symbols, signs, and artifacts that provide information to customers through explicit or implied signals that communicate with the customers (Bitner, 1992). Turley and Milliman (2000) suggest other dimensions of the shopping environment in addition to the three dimensions, including the exterior of the building (e.g., architectural style and parking area), decoration variables (e.g., pictures and artwork), and human variables, such as privacy, crowding, and employee factors (Turley & Milliman, 2000). Moreover, Ryu and Jang (2008) suggest a measurement scale for the internal environment called “Dinescape.” The Dinescape scale involves six dimensions: layout, facility aesthetics, lighting, ambience, table setting, and service staff (Ryu & (Shawn) Jang, 2008,p.5).

- **Colors**

Colors are visual elements of a physical environment, attracting customer attention and stimulating emotional responses (Banat & Wandebori, 2012,p.87). They can stimulate thoughts, memories, and experiences (Bellizzi, Joseph A.; Crowley, Ayn E.; Hasty, 1983, p.22). The effect of colors on human behavior and cognitive interpretation provides important guides referring to potential customer reactions (Vilar, Rebelo, Noriega, Teles, & Mayhorn, 2013, p.619). Crowley (1993) concludes that color affects customers' affective tone (evaluation-related affect) and arousal (activation-related affect) (Crowley, 1993, p.60–62).

- **Sound**

According to Mehrabian and Russell (1974), sounds can arouse or distract individuals, depending on the individuals' sensitivity. Sounds are deemed as a nuisance or as pleasant (Mehrabian & Russell, 1974, p.64–65). According to Gifford (2007), Brebner indicates that the mechanisms of hearing are similar physiologically, but differ psychologically according to variables, such as predictability, intensity, and significance of the sound and other attention-attracting factors. As opposed to unpleasant sounds, pleasant music also affects an individual's behavior dramatically (Gifford, 2007).

- **Lighting**

Knez and Kers found that lighting encourages positive effects on emotion and customer behavior (Knez & Kers, 2000, p.827), whereas Wanninayake and Randiwela believe that the customer's choice of shopping is influenced by lighting and layout (Wanninayake & Randiwela, 2007, p.8). A shopping environment with suitable lighting, music, color, and scent motivates the customers to revisit the place in the future (Yoo, Park, & MacInnis, 1998, p. 262). In addition, lighting motivates various seeking behavior and approach behavior among customers (Mohan, Sivakumaran, & Sharma, 2012, p.419).

- **Scent**

Scent positively affects emotion and mood (Chebat & Michon, 2003; Mattila & Wirtz, 2001; Michon, Chebat, & Turley, 2005; M. Morrison, Gan, Dubelaar, & Oppewal, 2011). It also positively affects customer behaviors, such as variety-seeking behavior, social interaction, spending behavior, and staying (Banat & Wandebori, 2012; Chebat & Michon, 2003; Mohan, Sivakumaran, & Sharma, 2012; Zemke & Shoemaker, 2007). Scent has the possibility to conjure nostalgic memories and events (. Therefore, it influences human behaviors in a physical shopping environment.

- **Temperature**

According to Lam, the temperature in a shopping environment greatly affects the customer's buying intention, where extreme temperatures create negative emotions. Unfavorable temperatures lead to dissatisfaction among customers, so they spend less time in a place (Lam, 2001, p.190–197). Many behavioral studies also confirm that arousal is at its minimum when temperatures are moderate (Gifford, 2007), whereas arousal is increased when temperatures increase or decrease. This finding results in a group of changes to behavioral functions (Mehrabian & Russell, 1974).

- **Furnishings**

Furnishings include the objects and materials used within the environment (e.g., paintings, furniture, wall decorations, window coverings, plants, wall decorations, and rugs). They often invoke an emotional response of comfort (Barker, 1968). They may enhance the perceived quality of physical environments and influence customer behavior (Kisang Ryu & Han, 2011).

- **External variables**

The external variables involve the marquee, entrances, storefront, display windows, surrounding area, building architecture, and parking. Grossbart, Mittelstaedt, Curtis, and Rogers (1975) confirm that the external variables positively affect behavior, and specific predispositions are positively related to the responsiveness to external elements in shopping (Grossbart, Mittelstaedt, Curtis, & Rogers, 1975). According to

Turley and Milliman (2000), the exterior part of the environment is worth additional attention because it is the first group of signals usually seen by a customer. For this reason, the rest of the physical environment may not be important if these elements are not managed well. These variables must be pleasing and must stimulate approach behaviors for a shopping environment to be effective (Turley & Milliman, 2000).

- **Layout**

Liu and Jang (2009) indicate that a good layout affects human emotion, cognition, and behaviors positively. They also note that with the proper planning of spatial layout, customers plan to visit the place in the future, increasing the chance for repeat buys and recommendations to others (Liu & Jang, 2009). A good layout also supports variety-seeking behavior among customers (Mohan et al., 2012). In addition, a precise layout of an environment helps customers to find their way and creates a suitable image for the space (Spies, Hesse, & Loesch, 1997). Layout is also a physical environment stimulus that dramatically affects the perception of customers toward persuasion, in addition to color, lighting, and music (Sharma & Stafford, 2000). Bitner (1992) concurs that a careful layout of the physical environment can help customers to find their way, orientate, understand signs, and have the sense of personal control and mastery (Bitner, 1992). Layout is a significant factor that stimulates customers' emotion, cognition, and behaviors. A perfect planning of layout increases the possibility behaviors of customers in one setting.

- **Crowding**

Various studies investigate the effects of crowding on human health and behavior. Crowding and close interpersonal distances increase stimulation (Yildirim, Akalin-Baskaya, & Hidayetoglu, 2007,p.3411). Moreover, some crowded situations can be menacing and harbinger (Dion, 1999, p.52). Hui and Bateson (1991) find that the enhanced perception of personal control in a crowded environment is linked to increased pleasure (Hui & Bateson, 1991, p.182).

In reviewing the physical characteristics of shopping environments and their effects on the customer behavior, the effect of all the factors on customer behavior in

one way or another can be noticed according to the aforementioned discussion. In spite of the importance of these characteristics, this research focuses on studying the effect of layout characteristics on customer behavior, as they have a vital effect on forming the behavior. Most of the studies agree on considering the layout and its syntactic characteristics as the strongest variables that greatly affect the customer's approach to the shopping environment.

4.6. Relationship between the Physical Environment and Customer Behavior

According to several studies on behavior, a set of factors influence the customer's behavior and determine the nature of his reaction toward the shopping environment. These factors (as mentioned earlier) might be subjective, such as the realization, character, need, or attitudes. They can also be non-subjective, such as social or economic factors. For example, Neisser (1976) points out that recognition is connected to all the activities, such as residence, shopping, and cruising, which are practiced by the individual after he perceives the surrounding environment (Neisser, 1976, p.87). This recognition is practiced in accordance with the certain needs of the individual, which lead him to a certain behavior depending on his opportunities in the environment in accordance with the mechanism of the relationship between the behavior and the environment. This phenomenon happens because the behavior domain is directly related to the character and the surrounding topics that provoke a kind of motive, which in turn results in the emergence of continuous tensions until the needs are met. On the one hand, the reactions of individuals toward the shopping environment differ depending on the characters, as each individual possesses certain psychological traits that entail certain responses toward the environment. On the other hand, education influences behavior.

Hall (1990) argues that individuals work on combining their experiences at certain points; they learn through their observations, and this learning eventually affects the things they see (Hall, 1990, p.62). Adding to the attitudes that influence the design, Lockton (2013) indicates that changing the design leads to a change in the attitudes, and this result certainly leads to a change in behavior (Lockton, 2013). The role of values, cultural and social concepts, traditions, and economic factors cannot be ignored in unifying the view of many sectors of society toward the place, their ability to direct the

customer's behavior in the shopping spaces, as well as the influence of these spaces on them. These aspects affect the internal and external characteristics and the material and immaterial characteristics in terms of the customer behavior, which, as mentioned previously, is manifested as attraction or reluctance and the consequent positive or negative behaviors.

In addition, physical environment stimuli can affect humans in several ways. In terms of emotion, physical environment stimuli affect human pleasure and arousal levels. For example, warm colors consisting of orange and red can stimulate customers and make them stressed, whereas cool colors such as blue and purple create a more relaxed environment and reduce the levels of stress of customers (Bitner, 1992). Loud music also attracts people to visit a store but creates disturbing feelings in restaurants. In terms of the effects of atmospheric stimuli on customer behaviors, colors can contribute to customers' intention of visiting a store in the future, and with an appropriate layout of a store, customers are believed to spend more time and money in a shopping center. In addition, lighting, scent, temperature, spatial layout, and social cues (e.g., crowding) have been found to influence customers' emotional states in specific settings (Baker & Cameron, 1996).

In the study of environmental psychology, as mentioned in Chapter Three, Mehrabian and Russell (1974) suggest a model of stimulus–organism response (S-O-R), which explains that environmental stimuli (S) influence the emotional response of organisms (O), which in turn initiates customers' behavioral response (R). In the model, customers have three states of emotional response: pleasure, arousal, and dominance (Liu & Jang, 2009). The influence of the three emotional responses determines the behavior of customers, whether approach behavior or avoidance behavior. Approach behavior consists of intention to stay, explore, and affiliate with others surrounding them, whereas avoidance behavior is defined as escaping and ignoring the communication attempts from others within the environment (Mehrabian & Russell, 1974). By using the model of Mehrabian and Russell, many studies apply environmental stimuli as the forecaster of emotional responses, such as pleasure, arousal, and dominance. The variables are also used as the forecaster for the behavior of customers such as revisit intention, purchasing intention, time at the store, and satisfaction (Figure 4.3).

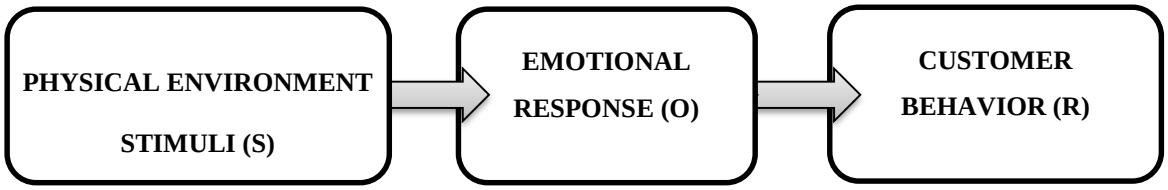


Figure 4.3. *Influence of physical environment According to Mehrabian and Russell model*

Similar to other physical environments, the shopping environment influences the behavioral responses of the customers, and in return, plays a great role in forming the attraction and reluctance factors for the customers toward the shopping environment (Bitner, 1992). Based on all the factors mentioned above, an interactive aspect exists among the physical shopping environments, customer behavior, as shown in Figure (4.4).

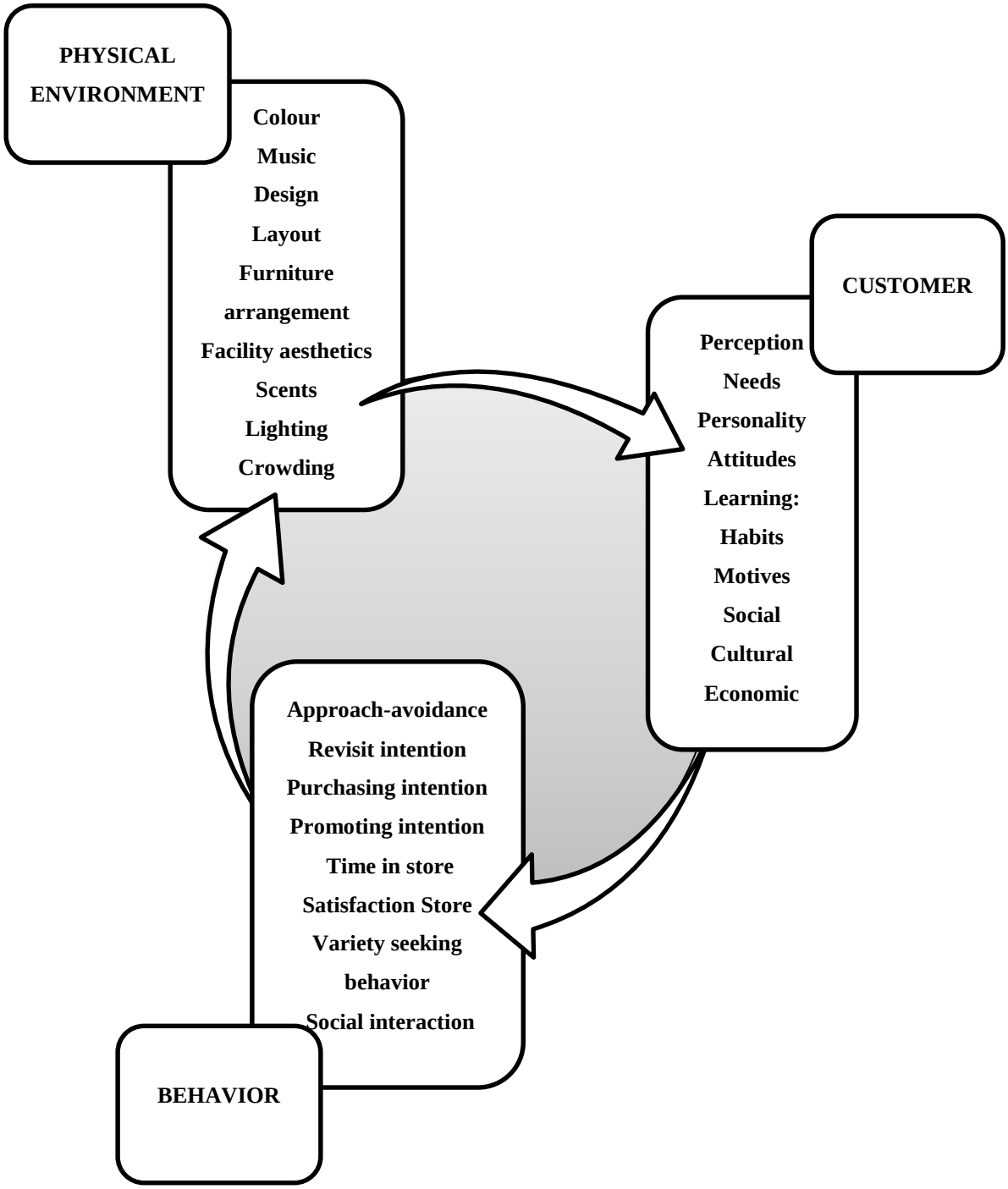


Figure 4.4. *The interactive amongst the shopping physical environment – customer – behavior Depending on the Mehrabian and Russell model*

Source: researcher *Depending on the Mehrabian and Russell model*

4.7. Conclusion

Shopping is a daily activity conducted by man to meet his material and spiritual needs. This activity is not confined to purchasing and selling, but it also involves other economic, social, cultural, and psychological aspects. Therefore, shopping involves all the activities that a customer performs in the physical environment, including the social, economic, entertainment, psychological, or purchasing activities that a customer performs according to his material and spiritual needs. Shopping involves two main bases; the customer who conducts the activity and the physical environment in which this activity occurs. Several elements are essential for the success of this activity, such as the type of goods, the service delivered, the salesmen, and the agents (which are identified in this research as they include economic factors). The customer is influenced by several self and non-self factors affecting his behavior in the physical environment. Through literature and the behavioral theories reviewed in general in Chapter Three, as well as the customer's behavior and the physical environment reviewed in this chapter, this study finds that the customer's behavior includes each behavior shown by the customer in the shopping environment, whether approach behavior or avoidance behavior. The physical characteristics of the shopping environment, as indicated by literature, consist of a group of variables, including the intangible variables such as temperature and sound, and the external ones such as parking areas and walls. Other variables are internal, such as decorations, colors, and layout. Other elements are also related to humans, such as crowdedness, and all these factors influence the customer's behavior and determine its nature. The focus of this research is on the syntactic characteristics of the shopping center layouts, without dealing with the rest of the environment factors. In addition, the research will deal with the customer communication scale to denote the degree of pleasure in the shopping environment and the extent of its success in terms of attracting the customers.

5. SYNTACTIC CHARACTERISTICS OF SHOPPING CENTERS AND CUSTOMER BEHAVIOR

The previous chapter discussed the factors that influence customer behavior and the impact of physical characteristics of shopping environments on customer behavior in terms of either approach behavior or avoidance behavior. Several studies have indicated many physical characteristics of the shopping environment that affect customer behavior. One of these characteristics is the syntactics of layout, which will be the focus of this chapter. As shown in Chapter II, the types of shopping environments have varied throughout time. Despite this variation, the greatest change occurred in the 1950s, when new types of shopping environments, namely, shopping centers, emerged. These shopping centers included commercial shops; entertainment areas such as arcades or cinemas; and cultural and social meeting spots such as restaurants and cafés. Given the importance of this type of shopping environment, this chapter discusses the syntactic characteristics of the shopping center layout and the nature of its relationship with customer behavior. Four main axes are investigated. The first axis addresses the types of the facilities in the shopping center and their effect on increasing the customer approach. The second axis deals with the types of shopping center layouts and the activity degree of each pattern in terms of customer approach. The third axis discusses the syntactic characteristics of shopping center layouts and the effect of each characteristic on customer behavior and circulation. The fourth axis investigates the previous studies that addressed the relationship between the shopping environment and customer behavior in an attempt to consolidate the variables to be used in the practical study.

5.1. Shopping Center Facilities

The multiplicity and variety of shopping center facilities are related to the integration of three or more facilities with material revenue (Witherspoon et al., 1976, p.47) within a physical formation that allows for a multi-purpose shopping journey. Multiplicity depends on the potential of positioning by controlling the type of activity and the potential of its articulation. The single activity has a potential that can be manifested by individual efficient performance. By integrating with the other facilities, this activity can fulfill total efficiency through assembly perception, mutual support, and

influencing and getting influenced (Darlow, 1972, p.130). This process is conducted to enable non-excessive competition, which may lead to inverse results in accomplishing the main goal; this goal is characterized by increasing the flow of customers and visitors to the shopping centers (Northen, 1977, p.41). The main facilities that form the internal environment of the shopping center are detailed below.

5.1.1. Commercial facilities

Commercial facilities, which are represented by purchases and selling, are a primary factor in the concept of shopping because these facilities activate other facilities. Malls dominantly affect customers through their general space, which makes people perceive the market as a symbolic dimension of an open place, which is the center of various human facilities (Beddington, 1991, p.26). Furthermore, commercial facilities are the main point of transition for humans, generate public human circulation towards the special space (i.e., the shops), and have the potential to create excitement and variety through businesses activities and different spatial sizes (the characteristics of the commercial shops will be discussed later) (Maitland, 1990, p.61). In addition, such facilities form and support other facilities, especially the social ones, by generating the interaction and the necessary attraction to achieve the positive aims that make the project succeed economically by providing financial resources and returning capital (Witherspoon et al., 1976, p.41). Commercial facilities with differently sized spaces, from large shops to small shops, provide enjoyment in the shopping center compared with other facilities (Coleman, 2007, p.334).

5.1.2. Ancillary facilities

To achieve the highest variety for the multi-purpose shopping journey, several facilities are distinguished in the shopping center environment. The presence of these facilities supports mutual interaction and attempts to create a unified integral environment for several human facilities aside from economically supporting the center (Darlow, 1972, p.129). Recently, the rate of assembling entertainment facilities with commercial facilities has increased in an attempt to lengthen the visit period and to make the visit a full-day visit. Contemporary society supports increased entertainment time and having meals out. Entertainment facilities strengthen the relationship and the

connection with enjoyment and the "feel good factor," which in turn encourages expenditure (Coleman, 2007, p.325). The potential of including ancillary facilities in shopping centers depends on the nature of the center, its size, funding capability, location characteristics, and the priority of the facilities in accordance with the human needs in the area (Beddington, 1991, p.37). Ancillary facilities are detailed as follows.

- **Social facilities**

Social facilities are a basic pillar of shopping centers. These facilities retain the image of the traditional city market, where shopping takes place alongside meetings and gatherings and various human facilities are practiced (Northen, 1977, p.10). The success of the shopping center is associated with how it becomes part of society, and it is done by achieving an influential market environment where people perform their activities. Social facilities occupy a large and influential area (Maitland, 1990, p.152). In addition, this activity is associated with several spaces such as node spaces, which are related to the concept of creating absolutely free areas for pedestrians who mostly occupy the stable and dynamic joints within the center. These joints are connected with pedestrians in the detailed design treatments in their formation and in the possibility of their prevalence in the various facilities. These facilities include summer and winter gardens and the grand halls of gathering, which have become gravitating sites within the shopping center and significantly affect customer attraction.

- **Catering facilities**

Catering facilities are considered an essential and substantial part of any grand or even middle-sized shopping center (Scott, 1989, p.72). In addition to their functional role, these facilities have become magnet points for customers to encourage customers to spend more time in the shopping center, thus increasing their dwell time (Wajeeh & Abbas, 2010, p.189). Shopping centers have a wide variety of catering facilities, including cafés, snack restaurants, and dining restaurants and bars; thus, meals range between snacks and heavy meals. The nature and the size of the catering facilities usually depend on the size and the location of the center; including all these catering facilities is unnecessary (Coleman, 2007, p.8).

- **Cultural facilities**

Libraries, research centers, and art galleries represent cultural facilities. Computer centers, information systems, and Internet shops and communication centers as specialized parts of the shopping center can also be added (Cottom-Winslow, 1995, p.89).

- **Leisure and entertainment**

These facilities strengthen the links in the project and the shopping activity because they represent a vital magnet point. Therefore, people of all ages willingly visit the shopping center and enjoy its facilities (magnet points are addressed in detail in a subsequent section). These facilities include areas for children, games spaces, and internal zoos (Witherspoon et al., 1976, p.51), as well as the cinema and different show halls. These facilities are operational throughout the day and late into the night, thus allowing increased operating hours for the shopping center (Northen, 1977, p.76).

- **Sports facilities**

These facilities are represented by different types of open and closed sports fields.

- **Ancillary services**

Ancillary services include simple therapeutic centers, financial and banking institutions, and post office services.

A single shopping center may involve all or some of the facilities mentioned previously based on the importance of the shopping center, its size, and the area it serves. Each of these facilities has its own effect on customers and their approach to the shopping center. The degree of influence varies according to the needs of customers, and these needs vary from one person to another. Therefore, the degree to which the shopping center attracts customer increases with the increase in variety and multiplicity of shopping facilities through which the center can meet the needs of the customer. These facilities can turn the shopping environment into a multi-purpose environment where customers meet all their needs and experience fun.

5.2. Public Circulation Space

Circulation space constitutes the shopping center layout, and it helps determine the success of the shopping building. This space establishes the circulation of pedestrian footfall and the Vertical circulation of customers between shops, and determines if customers can easily move between all the facilities. The layout can adopt different geometric types from a simple linear type to a complex geometry (see Figure 5.1) (Coleman, 2007, p.329).

The design of public circulation spaces directly affects the visual and sensual relationship among moving persons, the third dimension, the physical organization of space, and the function of the shopping center. Circulation space also determines the character of the shopping center, thus significantly affecting customers' behavior and their qualitative memories of the place. Layouts in closed shopping centers include the following types:

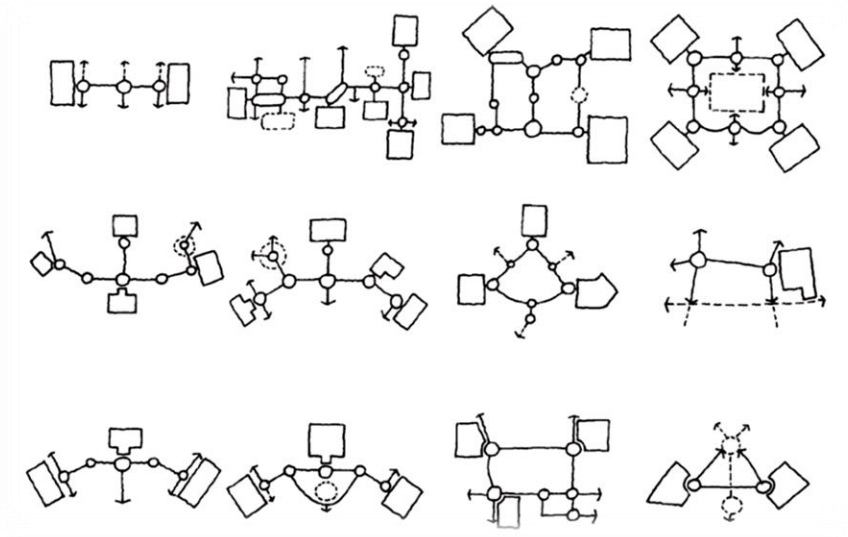


Figure 5.1. *Types of the layouts in closed shopping center*

Source*: Coleman, 2007,p.330*

- **<u>Linear Arrangements</u>**

This arrangement is the simplest system of planning, and it is also called dumbbell, linear, or gun barrel mall. In a linear arrangement, circulation path extends between two magnet points, and shops are distributed along the path.

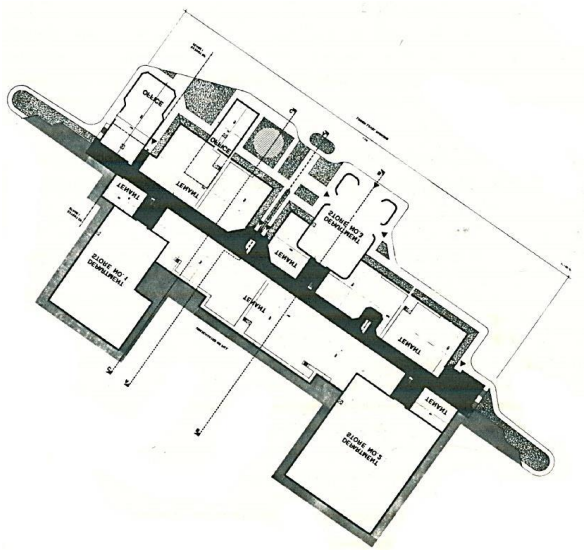


Figure 5.2. *Santa Anita fashion Park- California- America. As an example of the linear extension of the mall*

Source :*Redstone, 1973 ,P. 201*

A linear mall is characterized by a linear extension (see Figure 5.2), which implies a simple parallel circulation for customers to review all the shopping facilities by visual stops that encourage them to slowly pass various stages within the path to arrive at the end (Northen, 1977, p.45). This type is used in most designs to help people find places and easily direct circulation.

The linear type is considered an attractive type for customers because of its easy access and clarity aside from the visual effects that it provides. However, this type becomes boring when the mall is longer than the acceptable length.

- **Central Type**

This type is characterized by an internal and dominant space (internal yard) represented by the area in which the stores are gathered. Activities for music shows may be present, or the area may be used as an open café or car show. The main yard is used to overcome the monotony resulting from the lengthy passage. The main yard represents the internal environment and the connecting joint of all the activities that make customers feel like being in an open space of traditional cities and being able to freely practice human activities without restriction. The central type encourages continuity of

circulation through the frontage and a return to the starting point without retracing steps. The circular system does not necessarily necessitate using the physical form of circle as it comprises three or more angles (see Figure 5.3) (Coleman, 2007, p.342). Although an inclined line is more spontaneous than a straight one, Grillo found that pedestrians prefer straight circulation to perpendicular circulation (Grillo, 1975, p.38). Curved planning is characterized by achieving enjoyment and by increasing views, particularly in open areas, in sequence rather than in a straight line that focuses on one area within the unit of distance. The degree of closure in a curved passage is greater than that in a straight passage. In a curved passage, changing scenes is possible through circulation because each part is related with the one following and the whole within one unit (Coleman, 2007, p.342). Circular dimensions depend on a horizontal organization in a single or double ring. Visitors are encouraged to move from one anchor shop to another by providing sufficient clarity to continuously attract circulation using distinctive distances among strategic points (Coleman, 2007, p.342). This type provides the opportunity of equal participation for all customers within one space and overcomes the negative aspects of long transitional distances among activities. However, the central type can imply a feeling of centrality and a feeling of human diminution toward the dominance of measure, particularly when varying perpendicular levels of the center are used (Maitland, 1990, p.49).

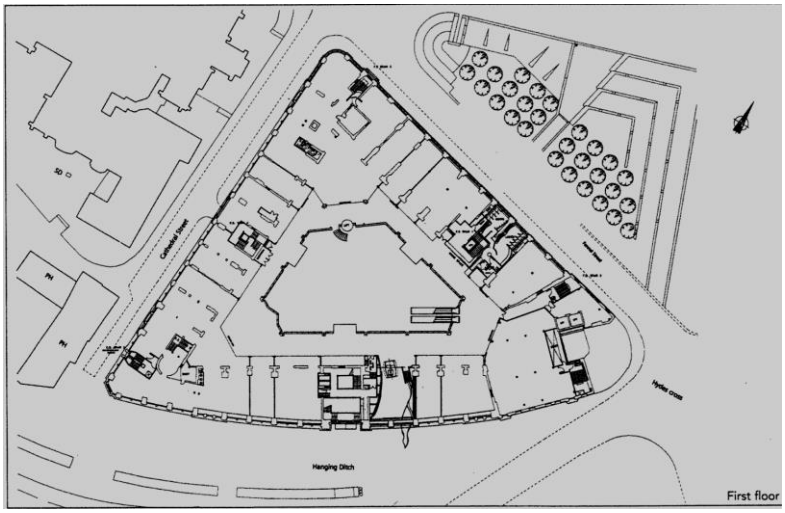


Figure 5.3. *Triangle Shopping Centre, Manchester*

Source : *Broto, 2006,p.103*

Research shows that the central type provokes a feeling of centrality, especially in a multi-story shopping center. However, this type provides the renewal advantage to the shopping center because customers need not take the same way to return to the starting point. Therefore, new views can consistently elicit continuous walking from customers.

- **Indirect Mall**

This type provides optimum solutions to the disadvantages of longitudinal extensions of circulation using sudden changes in direction, adding exciting elements to avoid monotony and weariness, and using passages in Z, L, I, and T shapes to introduce variety (Figure 5.4) (Alasady, 2008, p.36).

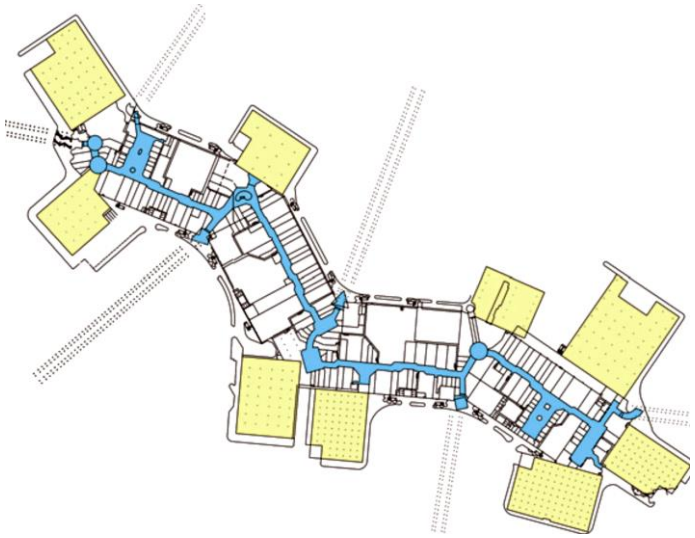


Figure 5.4 *A mega mall forms , Florida, USA (1990–1999)*

Source: *Coleman, 2007,p.130*

The indirect type attempts to address the considerable length by breaking the visual extension. However, the application of this type is usually not clear. Therefore, the indirect mall does not motivate customers to walk in it unless magnet points are present that urge customers to continue walking in this type of mall.

- **Hybrid Type**

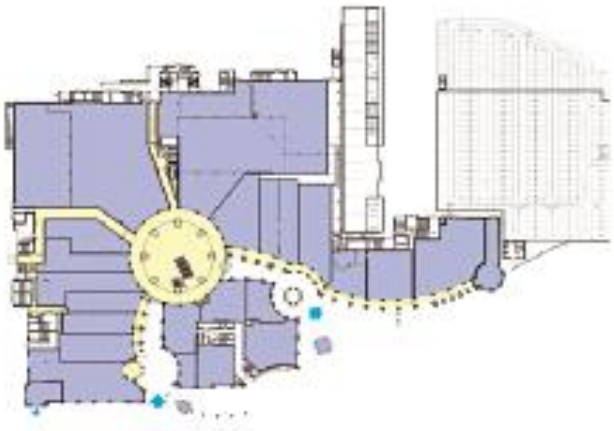
This type merges together the linear and the central types, either individually or mutually. The positive aspects of both types are included, and the negative aspects are

excluded. This type is also characterized by the high flexibility of addressing the formal composition of the center by two main basic patterns:

- Linear type with various courtyards (Figure 5.5).
- Central type with various malls (Burns, 1959, p.60).

The hybrid type has several varieties that vary according to the design and the size of the shopping center. The degree of customers' approach varies according to their characteristics and needs.

a. Linear type with various Courtyards



b. Central type with various linear malls

Figure 5.5. *Model of shopping center explain Hybrid Type*

Source: *Coleman, 2007*

Several types of shopping center layouts differ in the degree of their influence on customer behavior. The degree of layout effectiveness is affected by the syntactic characteristics of the mall, in which the types can be characterized by their use or not according to the degree of attraction or the effectiveness of the syntactic characteristics that can be affect customer behavior.

5.3. Syntactic Characteristics of the Mall

The design of a shopping center aims to facilitate the smooth circulation of pedestrians in relation to the syntactic space. An intuitive design relies on the design of facility patterns (commercial, recreational, and service) related to circulation lines (malls), entrances, customer behavior, and customer objectives. The syntactic space of shopping depends on two types of uses. The primary use is basic, which is the first magnet point for visitors. It includes distinctive or large shops that support the secondary use (i.e., small shops) (Bently, Alcock, Murrain, McGlynn, & Smith, 1985, p.30).

One of the methods for establishing good pedestrian flow is controlling the position of generators of footfall, which are strong retail areas where the most footfalls occurs. Such generators can include anchor stores, MSU stores, and other attractive spaces (e.g., catering and strategic elements) related to access and vertical circulation. Thus, generators should be carefully positioned to encourage the use of all parts of the shopping environment (Coleman, 2007, p.340). The following section discusses the syntactic characteristics of the shopping center.

5.3.1. Entrances and exits

The physical clarity of entrances and exits and their relation to the main circulation are vital for pedestrians to recognize the shopping center because they contribute to directing customer circulation. Bentley (1985) introduced the effect of access point design on directing circulation, which he called permeability (Bently et al., 1985, p.12-13). The entrance is the link and the joint of transfer between two parts because it represents the end of the outer environment elements and the beginning of the internal environment. It also represents the point of the external indication and the preliminary element of influence of the shopping center. Therefore, entrances have

special importance for shopping centers because they dominate the level of the external environment, but the internal elements do not appear. Thus, these elements have power in terms of alluding to the hidden items of the shopping center, and they attract and motivate the receiver to enter and undergo the shopping experience. The entrances of the center should be apparent and clear because they are a transit zone from outside to inside; if unclear, they become a barrier to the attraction of customers to the center (Maitland, 1990b, p.51).

Most studies have emphasized the effective role of the shape of the entrance in terms of attracting customers to the shopping center and encouraging them to enter. Although the present study emphasizes the influence of this role, it also stresses the importance of the effect of the number and the positions of the entrances on customer behavior and on the degree of mall attraction.

5.3.2. The mall

Malls are dynamic spaces that motivate circulation with an unstable, longitudinal, and lacy nature (Rapoport, 1977, p.247). The type of shopping center layout of the mall, which is the successor of commercial streets, is the basic expression in the planning and design of shopping malls. However, the layout of a mall is different from that in commercial streets, which are characterized by transition and circulation. Malls have short and narrow hallways, not commercial ones. The mall comprises individual or a series of paths from the main or side malls. These paths can be stable with various widths or heights. The mall is externally open to courts or plazas to form main attraction places in the center (Beddington, 1991, p.21). In general, the mall design should be intimate to customers and mitigate the surroundings through the internal and comfortable environment by providing visual attractions for customers in shops and other entertainment areas (Redstoe, 1973, p.68). The mall should label shopping areas to prevent customers from being confused. Double and symmetric designs confuse customers and make them unable to recognize the main features. The design should give customers the ability to distinguish shopping center entrances and exits by identifying spaces and impairing importance. These considerations aid in the determination of the type of main plan, which includes the Y shape, cross plan, and dumbbell plan (Beddington, 1991, p.21).

The present current study indicates that the mall should be designed as an area with certain importance within the shopping center because it represents the main part of the center, where customers are distributed among many activities (thus influencing customer behavior). An effective design should ensure ease of circulation and influx among shops. Spaces should influence customer behavior through the design characteristics.

Length and Width of the Malls;

This aspect includes circulation spaces in the floor plan, higher floors, and overlooking the floor plan through a gallery. A horizontal public circulation space comprises vertical circulation elements. The lateral frontages, aside from showing sides of the shopping path as attractive elements, create strong relationships between both sides. Therefore, the space should be lateral and narrow to facilitate walking customers to view everything without crossing from one side to another; such a dynamic is preferred by customers and shop owners (Darlow, 1972, p.68). Lengths of circulation space are determined by the types of layout. Space knots can be used to organize and calculate the total lengths of horizontal circulation space. Thomas (1990) suggested that the maximum length of a mall should be 200–250 m; if this length is exceeded, the mall can become boring and tiresome. In general, the maximum limit of window shopping length varies among the projects (Coleman, 2007, p.349). Width of circulation space is determined by providing circulation in front of frontages and allowing circulation continuity. The total width ratio of the path reveals the possibility of circulation between both sides of the shopping path when considering if a design should cope with customer circulation (Beddington, 1991, p.20). A study was made to identify customer objectives, tendencies, and nature of circulation within shopping centers. This study found that the width of marketing paths, which is 12 m, is determined by the possibility of attracting customers. According to Beddington (1991, p.20), the width of a shopping paths should be 5–6 m (Figure 5.7), and the maximum width of a marketing path should be 13–15 m in stopping and sitting areas (Witherspoon, Abbett, Gladstone, & Institute, 1976, p.58). When designing pedestrian shopping spaces, the focus should be in the middle area of circulation, which should encourage and motivate circulation from one

side to another. The success of a shopping center relies on the frontage in relation to public space, and it should not exceed 12 m in width.

The mall is one of the most important elements of a shopping center because it is considered the cornerstone of the center and is the generator of circulation. The present research agrees with the majority of studies that have emphasized the importance of mall length and width in terms of increasing customer approach to a shopping center. The degree of influence varies according to the difference in characteristics. For instance, most studies have argued that the great length of malls could cause customer avoidance. A similar principle applies to the width of the mall; the narrower it is, the more attractive it will be because it provides a feeling of affiliation. In addition, the visual clarity that it offers enables control of both sides of the mall. This research stresses the necessity of studying the effect of length and width of the mall on customer behavior so that a suitable length and width can be determined and the mall can become attractive to customers.

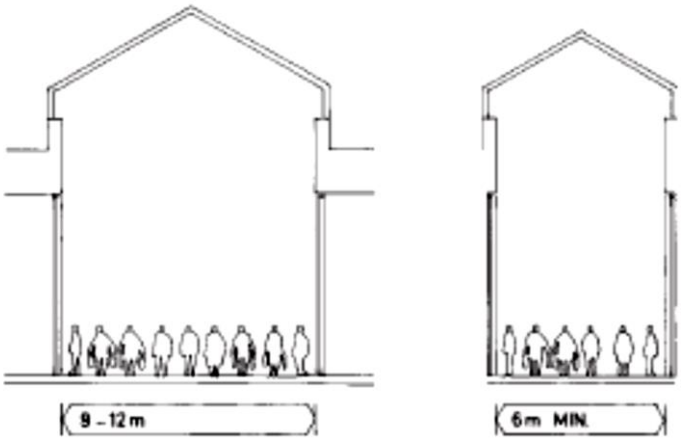


Figure 5.6. *mall width dimensions: primary routes 9–12 m; secondary routes 6 m minimum*
Source: *Coleman, 2007,p.346*

5.3.3. The shop unit

Shops are considered the main element of shopping centers. The variety and multiplicity of shop units in shopping centers add attraction and encourage customers, thus eliciting customer visits. Shop units in a commercial market vary from small to large shops with multiple departments. The type, size, and number of units in a market are determined on the basis of economic studies on the characteristics of the location

and populations that the shopping center serves (Darlow, 1972, p.88). The shops must provide convenience in terms of customers' circulation inside the shop. The distribution plan inside the shop should be characterized by considerable flexibility to accomplish this goal.

- **Type of business**

Northern (1984) presents two types of shopping trips. The first type comprises trips for obtaining a domestic supply of food, magazines, cleaning materials, and toiletries, among others. The second type comprises occasional trips for obtaining fashion goods, shoes, electrical equipment, jewelry, and furniture. Determining the percentage of these two types of shopping trips forms the core of shop policy. The type of business and its position in the mall should be studied carefully to sustain the interest of customers and attract them to the shopping center. Beyard and O'Mara (1999) found that one type of position could be appropriate for one business and inappropriate for another, and that status in relation to a thorough composition is important. Fong (2005) emphasized that consideration should be given to the compatibility of the shop's business. The rule is that compatible shops (depending on the type of goods) must be clustered, whereas incompatible ones must be dispersed. A general guidance classifies shops by type of business as follows:

- Food shops: grains and their products, desserts, pastries, restaurants and cafés, spice shops, and so on.
- Fashion and clothing: textiles and shoes, garments, clothing, and sports apparel and equipment.
- Domestic items: furniture, textiles, mattresses, home tools, and electrical appliances (Abdulla, 1989, p.67).
- Specialty shops: jewelry shops, goldsmiths, bookstores, toys, flowers, pet shops, photography equipment shops, and so on (Fong, 2005, p.104).

One of the success elements for shopping centers is the degree of variety of shops because, although most customers prefer to purchase all that they need in one place, they also prefer to choose from different shops. Thus, visitors favor the centers with variety because they can move from one shop to another to fulfill their physical and psychological requirements. Therefore, variety in shopping activity is considered a vital

element in shopping because variety provides a vast domain of goods and services within the market (Alasady, 2008, p.39). Studies have focused greatly on the element of variety and have considered it as one of the attraction indicators for the shopping centers.

The size of the shops and its potential effect on customer behavior are emphasized because shop area influences customers' perception on the importance and effectiveness of the shop visited. Therefore, this study emphasizes examining shop area to determine the optimum size for customers to influence their behavior and encourage them to visit the shopping center.

- **Frontage**

The design of the frontage is important and influential in the optical domain of circulations because its represents the largest portion of customers' cone of vision (based on an average height of 170 cm). Therefore, frontages should be organized by considering the angles of sight and the direction of circulation and by increasing the surface area of the goods shown to visually enrich the space (Alasady, 2008, p.49). The frontage represents the first step of the selling process because it is the first stimulus to attract customers. Therefore, shop owners focus primarily on increasing the size of the glass frontage and reducing the construction structure to increase the quantity of the goods shown. Lance Wright criticized modern transformations that resulted in a state of confusion for the pedestrians' line of sight because of the large openness of frontages (Figure 5.8). Frontages become nothing but a huge horizontal surface of glass, and they do not possess the attraction power of old small shops, which provide a chance to examine the goods by other senses by eliciting entry and showing the goods inside, not outside (Beddington, 1991, p.49:50).

Figure 5.7. *Double height shop and frontage, The Liberty, Romford, UK (2003)*

Source*: Coleman, 2007,p.296*

A visual element that affects customer behavior is the shop frontage because it attracts customers to the shop and eventually affects the approach of customers to the mall. Shop owners should be motivated to focus on the frontages of their shops. Therefore, variety and multiplicity should be incorporated in the style of addressing frontages. This study also emphasizes the significance of the shop frontage area and the need to study the possibility of a relationship between the shop frontage area and customer behavior.

5.3.4. Magnets

Magnets have an important role in providing the design characteristics to the shopping center. They also help identify the type and the shape of pedestrian circulation through their strong correlation with entrances and dynamic and stable joints. Magnets organize pedestrian flow in the different horizontal and vertical directions in all parts of the shopping center. Magnet points represent the elements with flexible potency not determined by stable features. They have the characteristics of specialty and discretion to the center and the identification of its image. Magnets may be represented by social

adhesion in an attempt to achieve an internal social environment (Scott, 1989, p.69). Magnet points can double the value of the shopping center, and they constitute its hub because they are part of the shopping journey. Their importance comes from being local social meeting points in addition to being a destination for tourists. Therefore, the evaluation of these attracting spaces represents a key element in designing shopping centers; the opportunity to create a destination for customers can be considered a reward when designing shopping environments (Coleman, 2007, p.7). Magnets are not confined to commercial activities such as hypermarkets, department stores, and multiple stores. Rather, they can also be represented by sports activities, such as skating rinks (Figure 5.10), restaurants, cafés, soft drink booths, theaters, and so on, which are all considered magnet points that attract visitors of the shopping center (Wajeeh, 2010, p.186)

Figure 5.8. *Ski resort in Emirates Mall*
Source: *Wajeeh & Abbas, 2010,p.187*

- **Positioning of magnet points**

Circulation inside a modern shopping center is the main element on which a successful design is based. The pattern of circulation ensures customer circulation toward sections of the shopping center and prevents the formation of dead areas. Circulation occurs by connecting sections of the shopping center that are graduated on the basis of size and importance relative to the entrance and magnet areas. Entrances

generate customers from directions that can only be controlled by various magnet points to regulate their circulation. They maintain the main concept of the basic design of the shopping center to ensure passage of customers through the center sections (Darlow, 1972, p. 16). The influence of magnets on the pattern of circulation is related to their number and position in the mall.

The following positioning of magnet points in the mall should be followed:

- **One Magnet Point:** One main magnet point in the shopping center can harmonize customer circulation regardless of having one or multiple entrances. Six positions for various magnet points in the mall can be established in relation to the entrance of the shopping center (Figure 5.11).

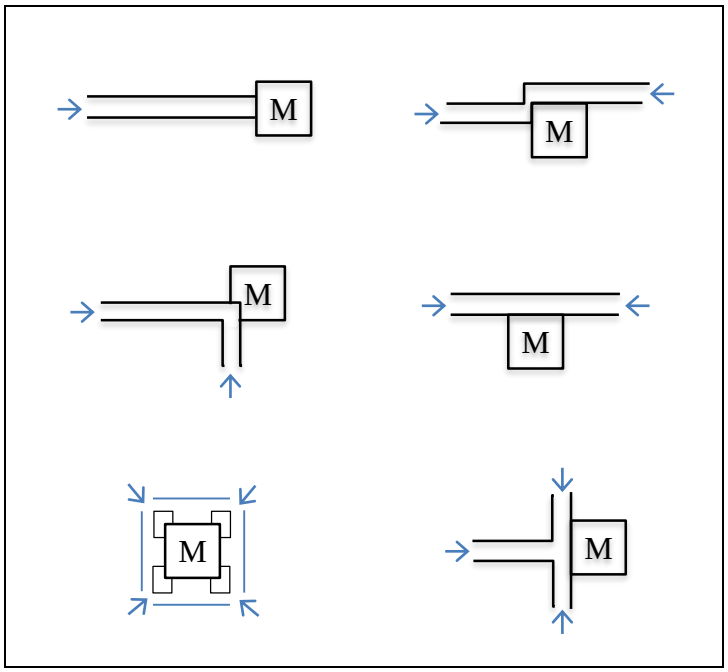


Figure *5.9*. *Six positions for various magnate points in the mall*

Source*: Alasady, 2008,p.44*

- **Two Magnet Points**: Circulation in such a shopping center is not harmonized except for the equal effect of two magnet points and similar relationships among entrances of the shopping center and positions of the magnet points. Many instances for the types of circulation patterns that include two magnet points can be distinguished (Figure 5.12).

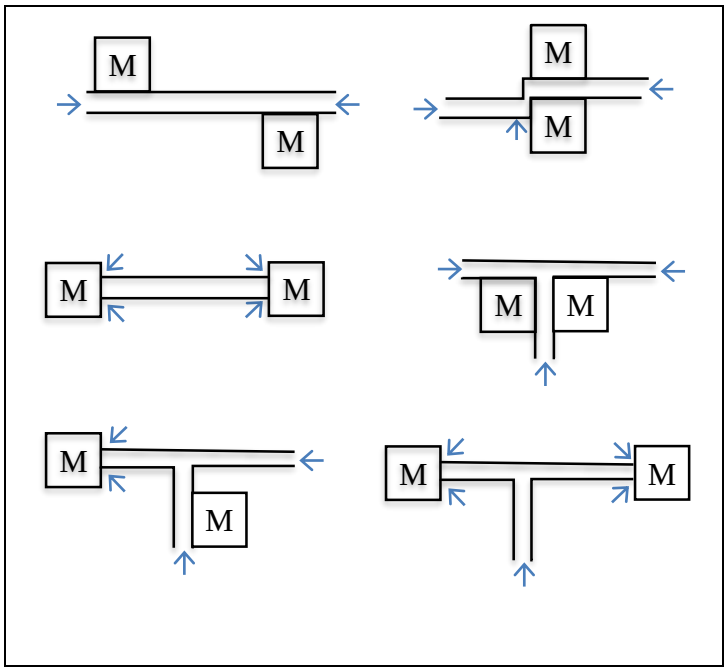


Figure 5.10. *Six positions for various magnate points in the mall*

Souce : *Alasady, 2008,p.44*

- **Three Magnet Points**: This pattern is used in large shopping centers with multiple entrances. Circulation without magnet points is not harmonized. The designer selects more than two magnet points to control customer circulation to reach the optimum condition, in which all sections of the shopping center share the same density of customer circulation. Three optimum conditions of three magnet points positions in large shopping centers can be distinguished (Figure 5.13).

- **Multi-magnet Points:** A large commercial center with commercial, leisure, and administrative activities can be an integrated compound, but its main internal circulation can be difficult to control. Accordingly, magnet activities are used to direct the main circulation to form the designer intention as shown in Figure 5.14, which indicates the effect of magnet points on directing the patterns of internal circulation in modern shopping centers.

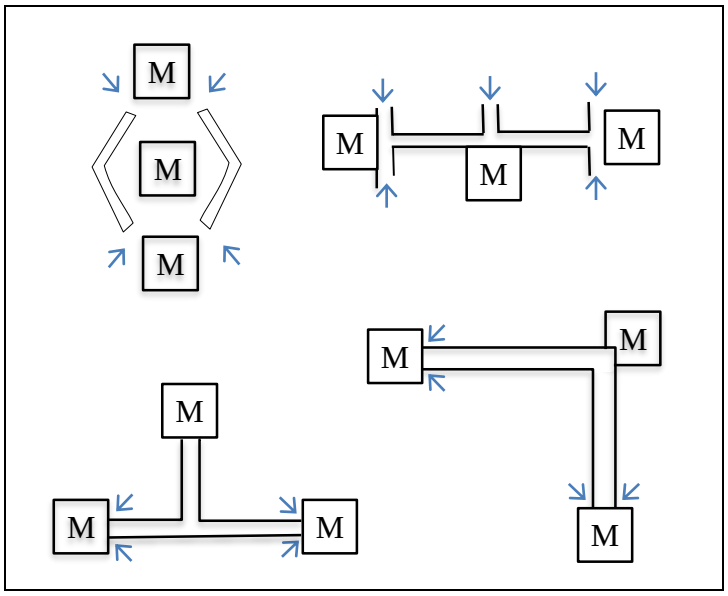


Figure 5.11. *Four positions for various magnate points in the mall*

Source*: Alasady, 2008,p.44*

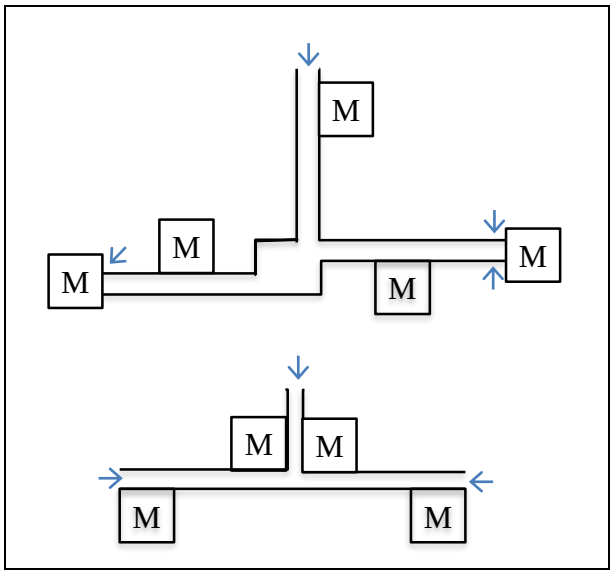


Figure 5.12. *Multi magnate points in the mall*

Source: *Alasady, 2008,p.44*

The current study corresponds to most studies that emphasize the importance of magnets in the shopping center and their potential positive impact on customer behavior if they are suitably situated and projected. The locations and amount of magnets considerably affect customer behavior. Moreover, the literature asserts that the magnet

concept should not be confined to hypermarkets, department stores, and multiple stores but should also include all spaces that include various entertaining activities, such as restaurants and cinemas (refer to the paragraph on shopping center facilities).

5.3.5. Node spaces

Node spaces can be used to lead or identify layout angles or destinations (Figure 5.1b) or even to contain the meeting of adjoining circulation (Figure 5.1c). Node spaces can be used to position elements of Vertical circulation (Figure 5.1e) and to regulate circulation spaces to identifiable areas and limits and extensions of the frontage (Coleman, 2007, p.340).

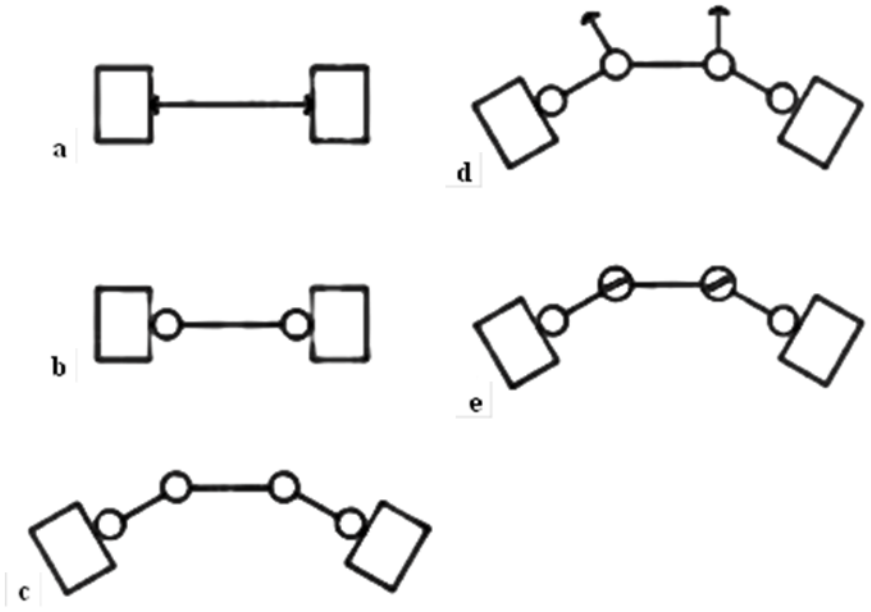


Figure 5.13. *Linear arrangements: a) simple dumb-bell between two anchors') dumb-bell with nodes ; c) nodes used to change angle; d) nodes to receive other routes; e) nodes including vertical circulation*

Source*: Coleman, 2007,p.342*

- **<u>Free node spaces</u>**

Free node spaces are stable spaces with different shapes that provide a sense of rest and stopping destination. These spaces are related to places such as yards and are

assigned to be stopping areas to be used for sitting and chatting (Redstone, 1973, p.51). They encourage visual exploration from one single place and serve as a stage for individuals to increase the degree of dynamism for the space (Figure 5.9). A successful shopping area for pedestrians is the one that is dependent on the design of pedestrians' circulation as a series of stable (nodes) and dynamic (malls) spaces. These spaces overlap and interpenetrate with each other to form the whole. Layout enables the organization of shops with different sizes and the gradation of the mall in a measurement that conforms to the frontage. Layout provides the freedom of design for each space independently, thus contributing to place identification. Therefore, pedestrian circulation becomes a series of various and identified places for individuals, and it connects to the axes of circulation in accordance with the spatial relationships (Gibberd, 1967, p.140).

Nodes are important in shopping centers because they are regarded as meeting spots, which increase the attraction of the shopping center. Thus, studying the node characteristics is necessary in terms of the location, number, and degree of influence on customer behavior whether it is approach or avoidance.

Figure 5.14. *One of the several node spaces , Thailand, Bancgkok*

Source: *Wajeeh, 2010,p.235*

- **Vertical Circulation**

Successful implication of vertical circulation is one of the keys that empower multi-levels shopping centers as marketing activities are positioned on high value land. In multi–levels plans, vertical circulation, equally to horizontal one, should be taken into consideration within the total layout to encourage customers to pass equally through all the shops. Vertical circulation positioning should achieve balance between the activation of footfall and providing them with satisfactory means to move among the various levels. Position of vertical circulation will make the visitors complete their circulation in one level before moving to the other one. Vertical circulation position should be clear, visible and readable to allow for the visitors to stop leisurely and to see where to change level. It should also be positioned satisfactory, suitably and strategically within harmonized and familiar spaces (Coleman, 2007,p.353).

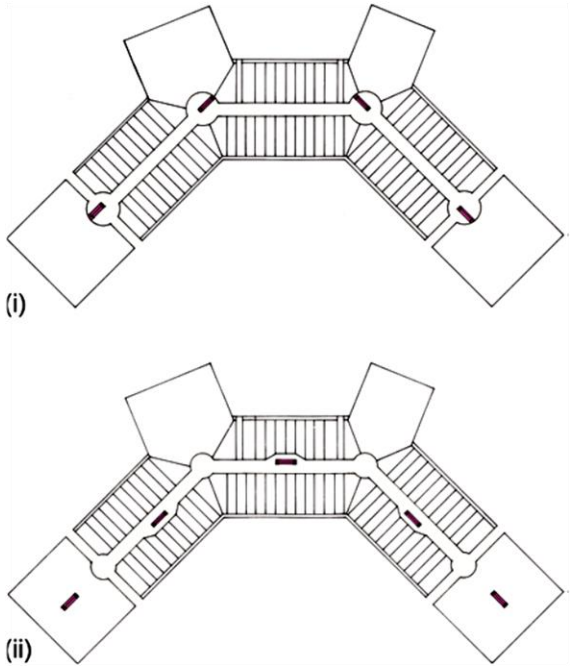


Figure 5.15. *Vertical circulation (i) Escalators located in the node spaces; (ii) escalators located in the malls*

Source*: Coleman, 2007, p.352*

Vertical circulation can be facilitated in various ways. More than one type can be merged, such as stairs and escalators, to solve the problem of horizontal and vertical circulation within the shopping mall. Ramps and sloping areas are also used in case of

slight differences. Travelators are used when there is a need for moving a large number of trucks vertically, and they usually close to supermarkets, restaurants, and furniture shops. Elevators are always needed to move strollers and wheelchairs. The most important patterns of Vertical circulation are reviewed as follows:

- **Stairs:** Stairs that are distinguished in a public circulation space are suitable for moving visitors between levels, and they are acceptable for shopping activities. Stairs can be positioned more flexibly than can escalators, and thus it serves as an alternative. Escalators are sometimes deliberately kept away from node spaces to allow the space to be more pleasurable and to be used for public seating. Several factors are considered when designing stairs in shopping malls: riser height, allowance for individuals passing beneath them, and suitable dimensions to ensure comfortable circulation. Stairs should not be optical obstacles. Various forms of stairs motivate designers to create distinguished plans for shopping malls (Coleman, 2007, p.353:354).
- **Ramps:** Free ramps and inclined floors in general spaces are careful ways to move through certain heights. They can be used to connect two different levels in an internal space, at an external level such as the entrance way, and at internal floor levels. Free ramps help to form a careful change of level and separate circulation spaces from seating areas. A public circulation space can be positioned on a sloping path overlooked by frontage despite special actions and additional costs, such as in a festival place (Coleman, 2007, p.354).
- **Escalators**: Escalators were first used in shopping centers 100 years ago, and they are among the primary means to move large numbers of people between levels in a shopping mall. Escalators are usually positioned in node spaces of a public circulation space to enable customers to complete their journey before changing floors. They can be positioned in department stores despite the negative implications because the shopping mall should be kept consistently open to enable the remaining recreational activities to be penetrated. Escalators should be positioned carefully to ensure transparency and vision of shops and circulation in the public circulation space. Thus, escalators should be positioned in the middle of paths, within knots, or within large stores (Coleman, 2007, p.356). Escalators provide an aesthetic view by attracting customer views toward the higher levels.

However, they are expensive and require considerable space (Beddington, 1991, p.100).

- **Travelators:** Travelators are similar to escalators. They are mechanical means to move customers vertically except that they have flat ground instead of stairs. They are also taller and need a lower bench than escalators. Travelators should be positioned near activities that use pushcarts so that people need not drag their carts along the shopping malls. The main feature of travellators is that they can be used to easily move large amounts of goods bought by customers as well as strollers (Redstone, 1973, p.53). Visually, travellators usually require more public space, and thus they restrict vision. They are also less flexible and need more area than do escalators. Accordingly, they must be arranged in parallel pairs for practical and logical reasons (Coleman, 2007, p.360).
- **Elevators:** Elevators are consistently recommended because they occupy less area than do slopes and stairs, and require less operating cost. They also meet most customers' needs because elevators are both faster and connect to more levels than do escalators. Some shopping malls have elevators inside glass towers to show circulation to present visual impact (Beddington, 1991, p.101). Elevators should be positioned in strategic areas to create balance in distributing footfall circulation among the various levels of the shopping mall, thus urging customers and visitors to visit all the shops before using elevators. Elevators can be traditionally positioned at the end of the center or be free standing in the middle of the circulation space. Elevators must be positioned with care to ensure that frontages are not concealed (Coleman, 2007, p.360).

The various Vertical circulation elements are the only means to move to different floors, and thus they strongly affect customer behavior and determine the direction of the circulation. This study argues the need to consider the positions and the number of Vertical circulation elements to entertain customers so that they can spend more time in the shopping center and visit regularly.

5.4. Interior Circulation in the Shopping Center

The internal space of a shopping center has two main activities: commercial shopping activity and circulation activity through circulation axes that connect space entries and commercial foci. Circulation is the characteristic of permanent human action in the internal environment of shopping centers, and it is related to various functions and activities that start at the entry. Here, customers show a clear variance in requirements, needs, and behavior based on their purpose inside the shopping center (Davidoff, 1980, p.40-41). The internal design of large shopping centers is largely based on the process of designing circulation paths and the accompanying visual enjoyment that is free of circulation while performing shopping activities. The attempt to achieve circulation fields is the event presented by shopping centers to create an active and entertained shopping environment. In addition, shopping centers attempt to create enjoyable shopping journeys that motivate customers to stay for long periods using elements of excitement and encouragement toward repetitive factors to achieve positive efficiency of the economic factor (Gruen, 1965, p.147). Circulation design depends on place positioning for implicit spaces (stable and unstable) that are interrelated with each other to form the whole. Thus, customers' circulation is through a variable series of spaces related to a certain achievable purpose.

- **Pedestrian flow**

People are characterized by certain behaviors that are independent from the mechanical nature of machines. The internal environment is the main domain that contains this circulation pattern. Circulation is a characteristic of permanent human function in the shopping center in general and the internal environment in particular, where circulation is related to various functions and activities initiated at the entrance joint. Customers show a clear variance in requirements, needs, and behavior in accordance with existence purposes in the center, that is, shopping, social activities, and entertainment (Alasady, 2008). Internal factors of the center generate new desires for customers, and they are different from the main objectives that motivate them to increase the center to affect shopping circulation. Customers' circulations have various forms and patterns that are affected by different factors that determine appropriateness

or non-appropriateness of general circulation plans for internal spaces in the shopping center. These factors are summarized as follows (Northen, 1977, p.44):

- Entry joints coordinate circulation influx toward the internal environment of shopping centers, where the beginning of the main circulation path that connects the space parts is fixed.
- Distance length among activities negatively affects customer ability to complete the shopping journey. A greater distance between various activities corresponds to higher monotony and fatigue for customers, thus making the shopping journey inefficient.
- Balance in activity positioning is obtained by dividing circulation joints by positioning preferable magnet activities for all customers in magnet areas. Commercial activities and recreation activities decrease circulation weight and the accompanying fatigue.
- Impact elements within circulation paths, such as variation within the surrounding frontages, internal form impacts, and detailed architectural treatments, decrease walking long distances within the center by adding psychological and shopping support elements to complete the journey (Gruen, 1965, p.59).

5.5. Previous Studies

The shopping environment, in all its syntactic types, has caught the interest of many researchers. Thus, many studies have addressed the syntactic types of the shopping center and the nature of its relationship with different elements, including the economic, cultural, climatic, layout, design, and behavioral elements. Many studies have considered shopping centers as one of the modern types of shopping environment that emerged in the middle of the 20th century. These shopping centers include commercial activities and entertainment, social, and cultural activities in their design. The behavioral aspects are perhaps the most important aspects discussed by previous studies on shopping centers that are relevant to the present study. These aspects have appeared in many studies addressing the effect of built environment characteristics on customer behavior. (Appendix A) summarizes the environmental characteristics that influence customer behavior and identify the characteristics addressed by each study. (Appendix B) presented the studies that examined the effect of layout types and their

syntactic characteristics in shopping centers on customer behavior. Some studies have focused on the effect of the differences in layout types on customer behavior, such as that of Ahmet Verdil. This study selected four malls in Istanbul and examined the relationship between circulation density and syntactic space of layouts. The researcher conducted a space syntactic analysis for the shopping center using space syntax. The study concluded that the syntactic space of layout types in shopping centers affect circulation density because the locations characterized by the highest integration are those with high circulation density. Kong's study (2013) focused on the relationship between the syntactic space of two types of shopping centers and the amount of sales. The study also investigated the relationship between the integration points identified through space syntactic analysis using the space syntax program, the diversity of the shops, and the locations of the various activities. Moreover, the study showed that frontages greatly affected increasing the size of sales. The relationship among the independent variables was examined. The independent variables are density and distance from the shop to the entrance, size, activity of the shop, clarity, and easy access, all of which were measured by the space syntax program. The dependent variable was represented by high or low sales. Many studies have also examined the relationship between customer behavior and the location of the shops in shopping centers, size, diversity of goods, specialization, internal layout of the shops, and their location in relation to entrances and exits. These studies include those of Dawson (1983) and Baker (1998) (Table 5.2). Brown (1992) studied the effect of both the attraction points and the clarity of entrances and exits, as well as the length of the paths, the locations of vertical circulation, and the specialization on customer behavior. He concluded that the long distance negatively affects customers, whereas well-planned attraction spots, escalators, and entrances and exits positively influence customer behavior and the nature of customers' circulation. Fong argued that the effect of the main passages that end with attraction spots is different from that of the secondary passages on the streaming of circulation. Furthermore, the space syntactic analysis of the layout types is considered an effective means to predict the density of circulation streaming as attractive shops enhance prediction strength. Ngai's study (2007) identified the main elements by conducting an analysis on the level of rent and tax expenses aside from pedestrian flow. This study addressed the material characteristics such as design

and layout of a shopping center, the distribution of shops with regression models, and the immaterial features such as high quality of the product, trademarks, and commercials tested by the fuzzy expert system. In his study, Ngai analyzed the shopping center on three levels. The first level one was in the aspect of the shopping center as a whole, the second level was in the aspect of floors, and the third level was in the aspect of certain points selected by the researcher. In these points, the flow of pedestrians was determined as the dependent variable. The independent variables that are located within three sight circles around a point (30, 20, and 10) were calculated. These variables were the length of the passage, width, attractive shops, escalator distance, cul-de-sac distance from the point, and number of shops within that circle for each commercial type. Previous studies have been conducted on shopping centers, their general physical characteristics, and the specific syntactic characteristics. These studies focused on the effect of the syntactic characteristics on the sales average and considered pedestrians flow as an independent variable. They also discussed behavior inside shops. Others determined the effect of shop locations, their diversity, and their size in shopping centers on customer behavior. Studies also addressed the effect of syntactic characteristics or the effects of layout types on customer behavior. However, no study has included all the variables of the effect of syntactic characteristics of the shopping center layout on customer behavior. These variables are practically addressed in this research.

5.6. Variables

Previous studies have focused on the relationship between the physical characteristics of shopping centers and customer behavior in general, and on the relationship between the characteristics of the internal syntactic layout of shopping centers and customer behavior in particular. The variables studied have been identified by previous studies. In this section, the variables to be studied and analyzed in this research are identified to meet the research objective, which is to investigate the effect of the syntactic characteristics of the internal layouts of the shopping centers on. A set of variables has been identified in the previous literature discussed in earlier chapters. These variables are represented by the variables of the syntactic characteristics of the

internal layouts of shopping centers. The dependent variable representing customer behavior was identified as shown in Table 5.3.

Table 5.1. *Dependent and independent variables table.*

	variable	Symbol
Dependent Variable		
	Pedestrians Flow	HD
Independent Variable		
Malls	1- Mall Length	LM
	2- Mall Width	WM
	3- The Break in The Mall	BM
Shops	4- Density of Shops	DS
	5- Retail Composition	RC
	- Clothing And	RC1
	- Domestic Items	RC2
	- Electronics Items	RC3
	- Varieties	RC4
	6- Frontage Area	FM
	7- Shop Area	AM1,AM2,AM3,AM4, AM5,AM6
Nodes	8- Entrances	
	- No. of Entrance	EM
	- Positioning of Entrance	EP1,EP2,EP3
	9- Vertical Circulation	PM
	- No. of Vertical Circulation	PC
	- Positioning of Vertical Circulation	PC1,PC2,PC3
	10- Nodes	
	- No. of Nodes	NM
	- Positioning of Nodes	NP1,NP2,NP3,
	11- Magnets	
	- No. of Magnet Points	MM
	- Magnets Positioning	MP1,MP2,MP3

Source: researcher

6. THE CASE STUDY

The variable related to the syntatic characteristic of shopping center layouts was deduced from the findings presented by previous studies and from the analysis stipulated in the earlier chapters of this paper. This chapter identifies the studied sample and explains the procedures employed to measure the dependent and independent variables in this research. In addition, the hypotheses are tested, and the mechanisms used to analyze the values to obtain the research findings are discussed.

6.1. Empirical Hypotheses

This study aims to evaluate the relationship of customer behavior with the syntactic characteristics of shopping center layouts using a methodological technique and to test the following hypotheses;

- Mall length affects customer behavior.
- Mall width influences customer behavior.
- The number of shops in malls affects customer behavior.
- Different types of goods influence customer behavior;
    - Specialty shops affect customer behavior
    - Domestic items shops influence customer behavior.
    - Fashion and clothing shops do not affect customer behavior.
    - Electronics and computer shops do not influence customer behavior.
- Shop area significantly affects customer behavior.
- The number of mall entrances affects customer behavior.
- The position of these entrances is inversely related to customer behavior.
- The position of escalators influences customer behavior.
- The number of nodes affects customer behavior.
- Magnets influence customer behavior.
- The position of the magnets affects customer behavior.
- The break in the shopping frontage affects customer behavior.
- The area of the frontage influences customer behavior.
- Customer behavior in malls can be predicted through the mall's syntactic characteristics. In general, malls can be classified according to their syntactic

characteristics, which in turn influence customer behavior into approach malls with considerable pedestrian flow and avoid those with poor or no pedestrian flow.

6.2. The Study Sample

Shopping centers widely exist all over the world and are considered a prominent feature of most countries. However, shopping centers are considered new in the Middle East in general and in Iraq in particular. Malls emerged and began to spread in Iraq only after the second millennium, and Erbil is the pioneer city in this respect. Various types of shopping centers have been established in Erbil, and they are greatly accepted by the public because this city is characterized by many features that assist in the emergence and continuous success of such centers. This research analyzed only the cases of selected shopping centers. The following set of criteria was considered to determine the research sample.

- The locations of malls should be designed according to a thorough layout and design bases and should have a clear organizational principle. These malls should depend on their organizational framework on a single or multi-level layout.
- The malls should have all the axes demanded by the study, including the design and syntax characteristics.
- The samples should represent shopping centers with a variety of layout types and should have a reasonable degree of variations in terms of the syntax characteristics.
- This criterion enabled the study to compare the effects of the syntax characteristics of different malls to obtain objective and universal findings.
- The malls should be situated in various areas of the city and should not be in certain close areas.

6.3. General Description of the Selected Shopping Centers

Five shopping centers in Erbil were identified according to the criteria, meeting all or most of the research requirements, which are not repeated in terms of the design method. The subsequent subsection briefly describes the selected shopping centers (see figure 6.1).

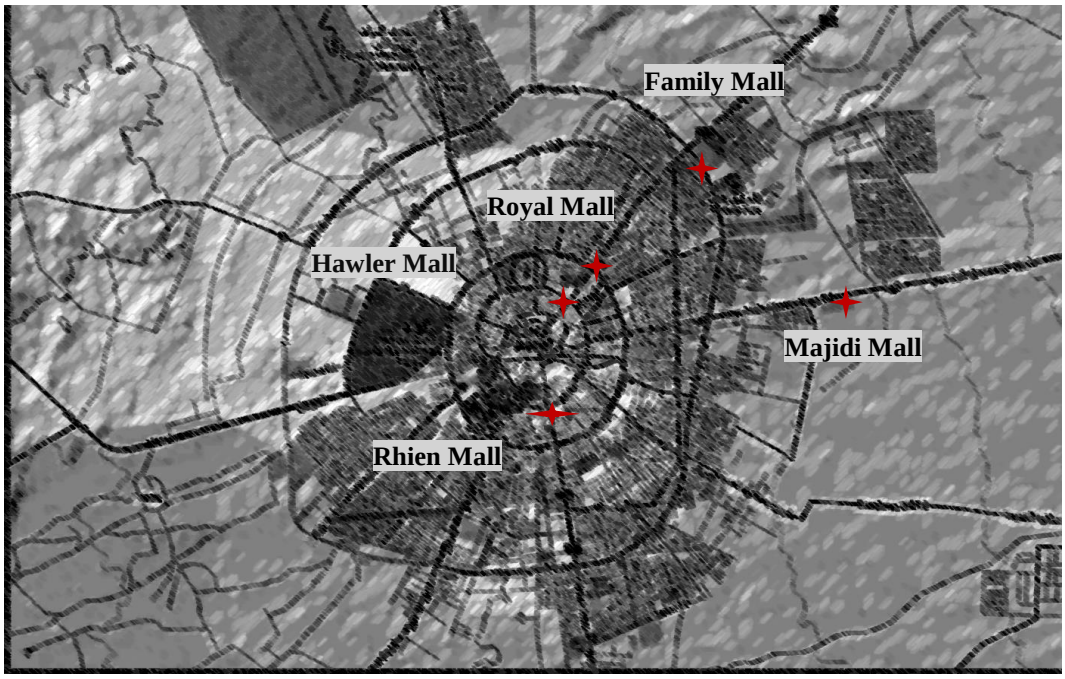


Figure 6.1. *The master plan of erbil city/Iraq and the selected models of Shopping Centers*

- **Rain Mall**

Rain Mall was constructed in 2008 at the center of Erbil city with an area of 1200 m2 as shown in Figure (6.2). The mall has a parking lot with a capacity of 500 cars and includes 75 shops distributed in two floors. The second floor of the mall features a game hall, a cinema, and numerous cafés. The shopping center overlooks a 60-m width street and is surrounded by branch streets. The mall has two main entrances in which one connects the mall from the main street and the other is located in the opposite side. The mall has a net type design, which varies from the rest of the samples whose shops are distributed on both sides of the main passages. The Rain Mall is characterized by its specialization in terms of goods.

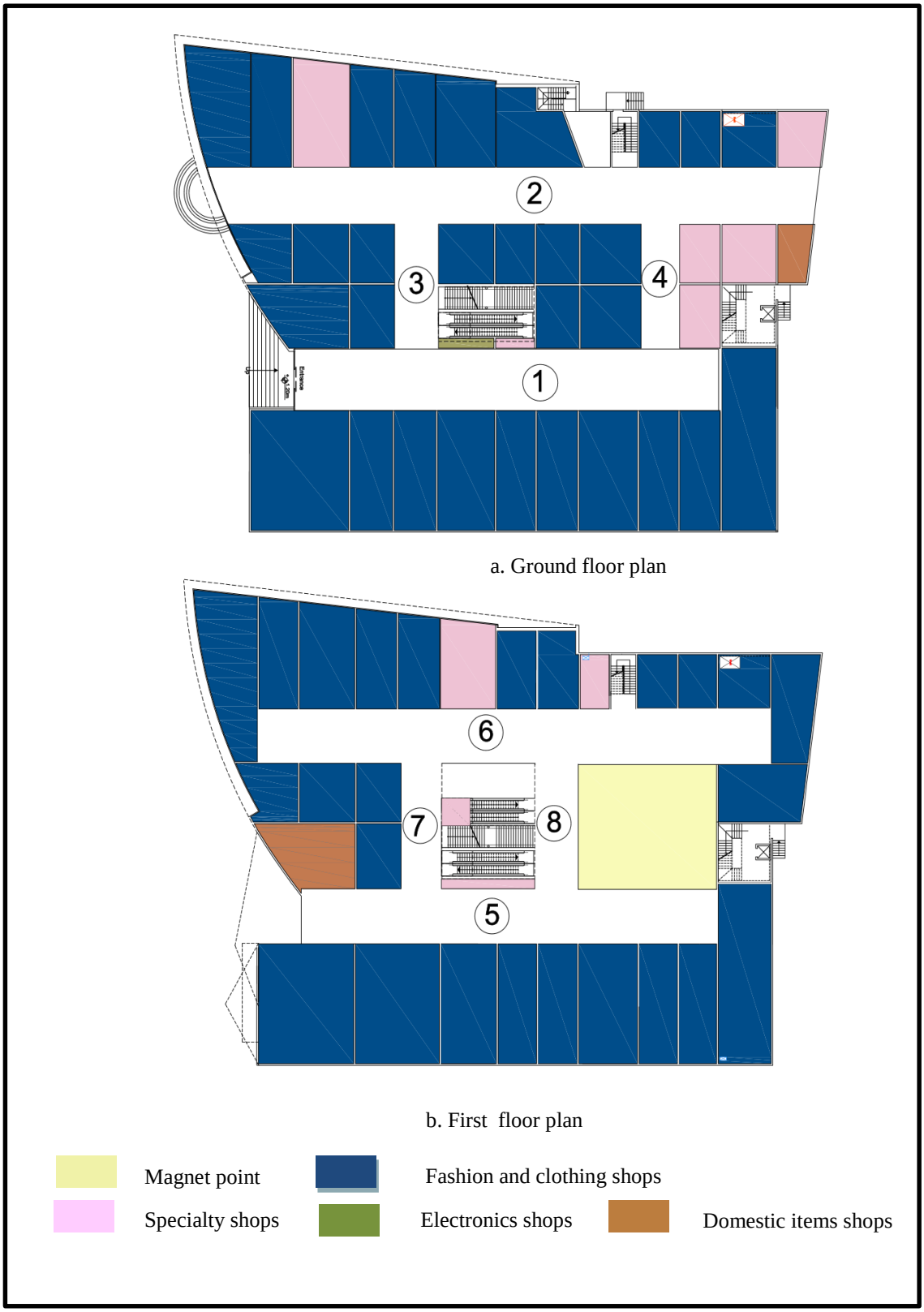


Figure 6.2. *Rhein Mall*

Source: *Researcher based on maps taken from the Municipality of Erbil city*

- **Hawler Mall**

Hawler Mall is one of the oldest shopping centers constructed in Iraq. Located in the city of Erbil, this mall consists of three floors with 183 shops, a supermarket, and nodes for small cafés. The shopping center is stationed on two streets, particularly in the main and secondary streets. This mall is different from the rest of the shopping centers included in the sample because of its design; most of its shops are small and specialized.

- **Family Mall**

Constructed in 2010 in the middle part of Erbil, Family Mall is regarded as one of the grand shopping centers in Iraq that is neighbored by an amusement park (Figure 6.4). In particular, this mall is located on four streets, and its entrance overlooks the main street (St. 100).

In addition to an anchor shop, this center has 130 shops distributed in two floors, and they come in various sizes and offer a wide variety of goods. The mall also has a number of restaurants, a cinema, and a library, which are all considered magnets besides the nodes used as gathering points and open cafés. The total area of this shopping center is 120,000 m^2 with a built area of 48,000 m^2 and an extension area of 16,000 m^2. This mall has a parking basement and an external parking area.

- **Royal Mall**

Royal Mall is located in the heart of Erbil city surrounded with four streets, two of which are main streets (Figure (6.5)). The total area of this mall, which consists of six floors, is 1,500 m^2. The basement floor includes an anchor shop and a café. The ground, the first, and the second floors include 70 shops that come in various sizes and offer numerous services. The third and fourth floors have a game hall, restaurants, and cinema halls. Inaugurated in 2012, the mall has a car park with a capacity of 400 cars and has three main entrances.

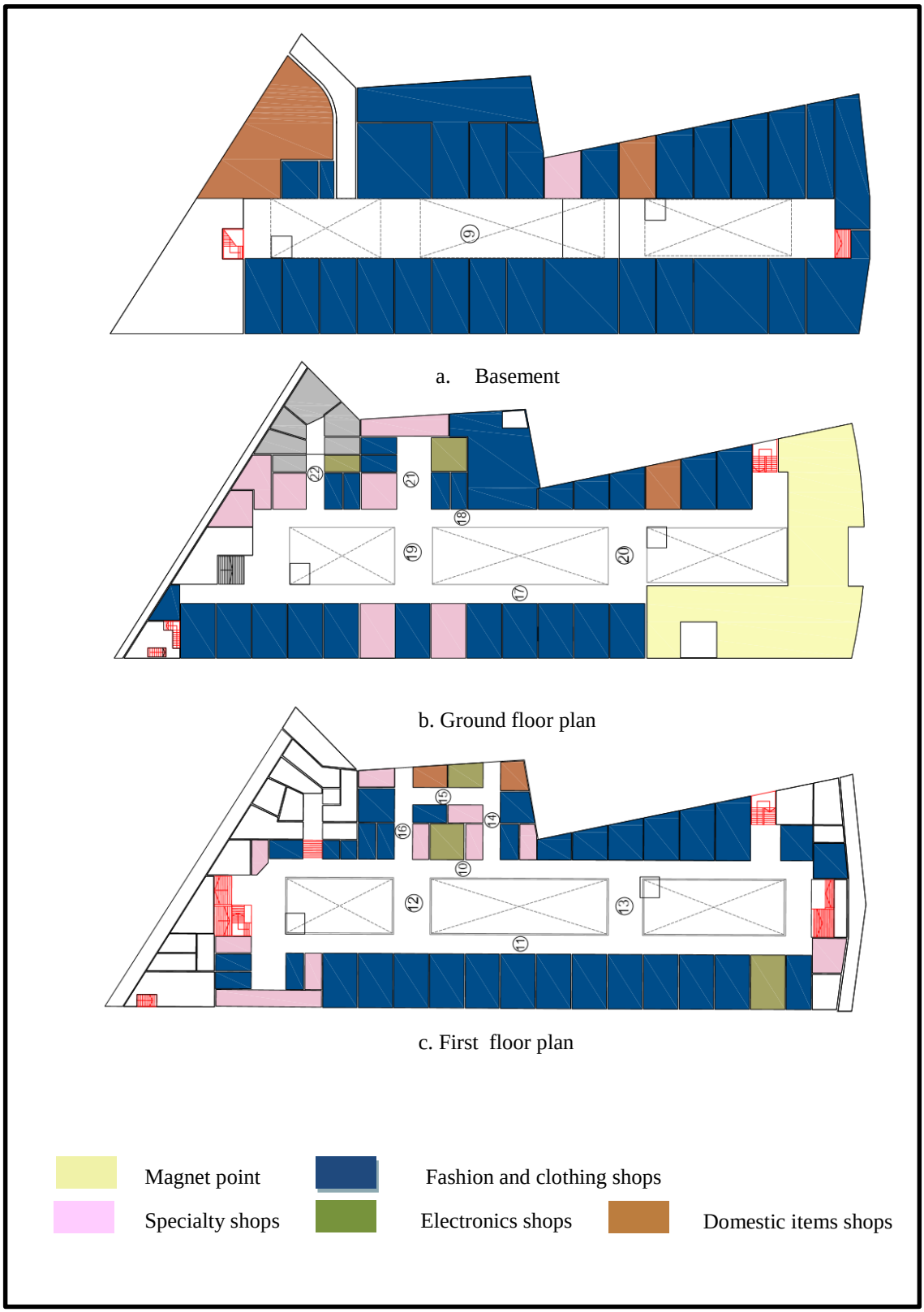


Figure 6.3. *Hawler Mall*

Source: *Researcher based on maps taken from the Municipality of Erbil city*

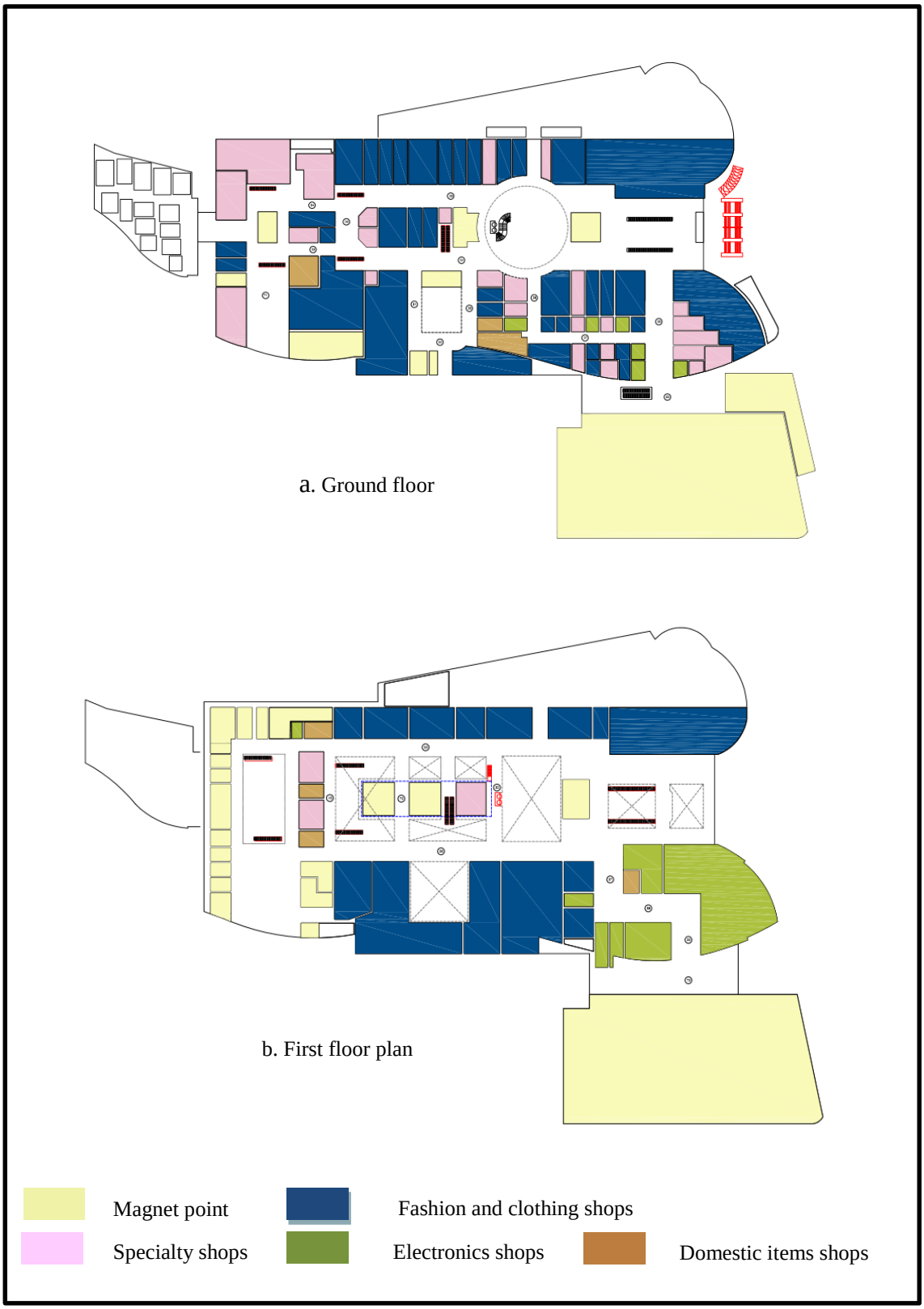
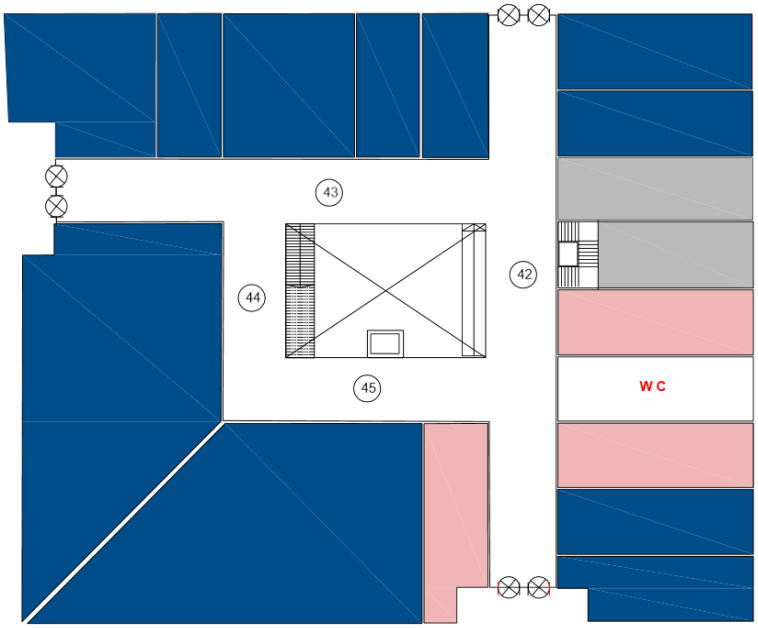
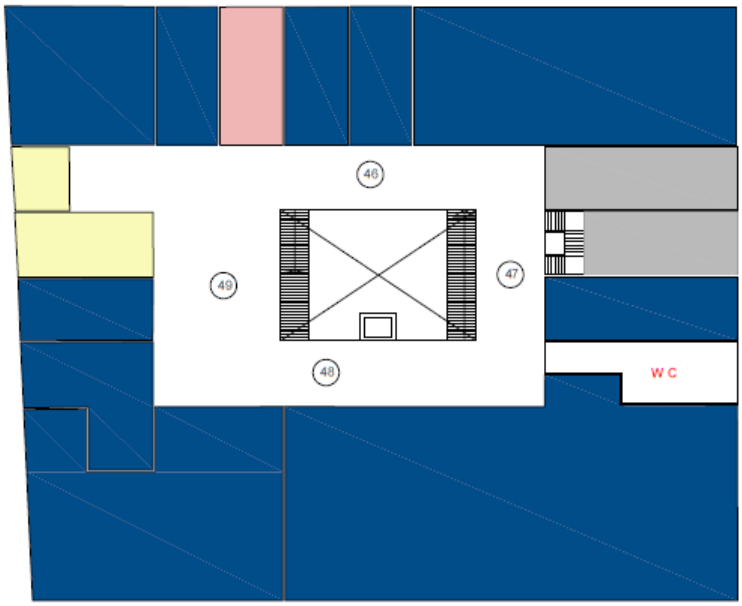


Figure 6.4. *Family Mall*

Source: *Researcher based on maps taken from the Municipality of Erbil city*



a. Ground floor



b. First floor plan

Magnet point

Fashion and clothing shops

Specialty shops

Electronics shops

Domestic items shops

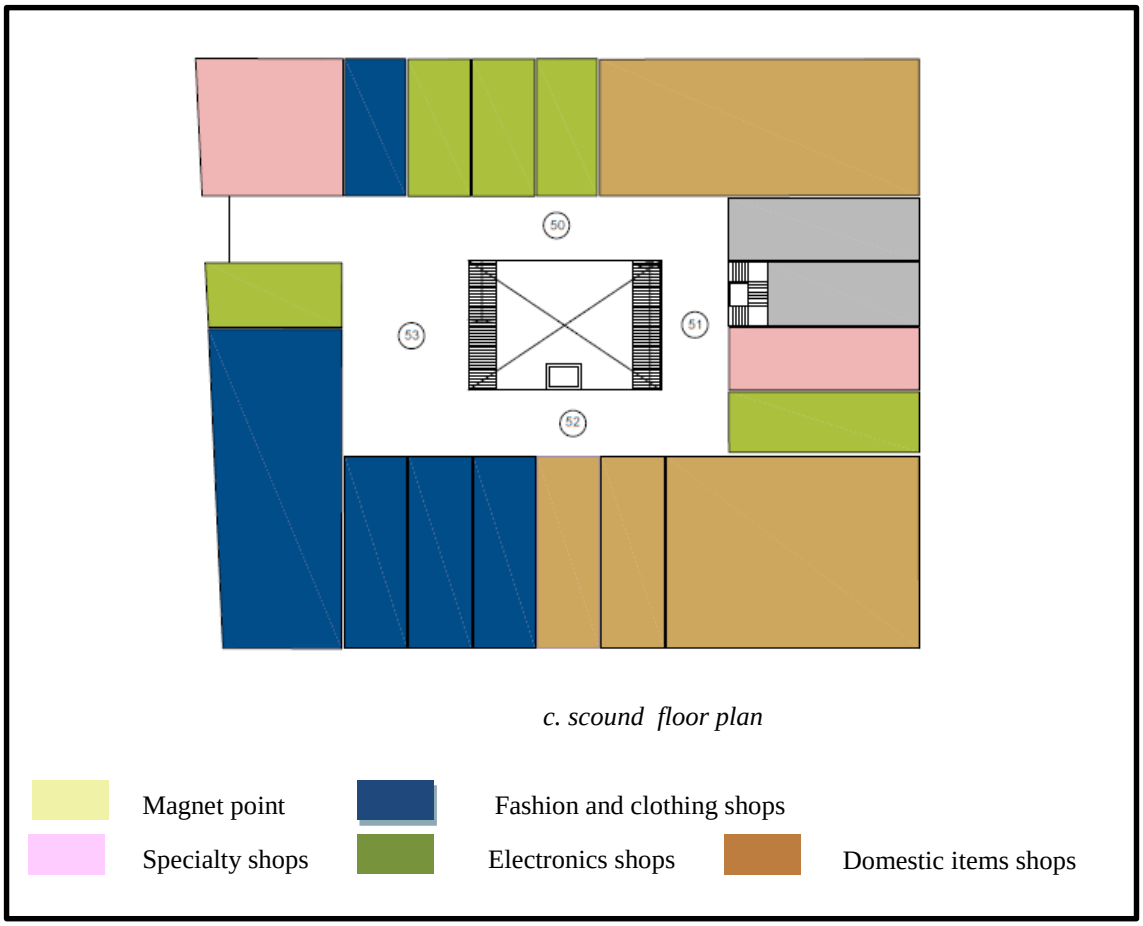
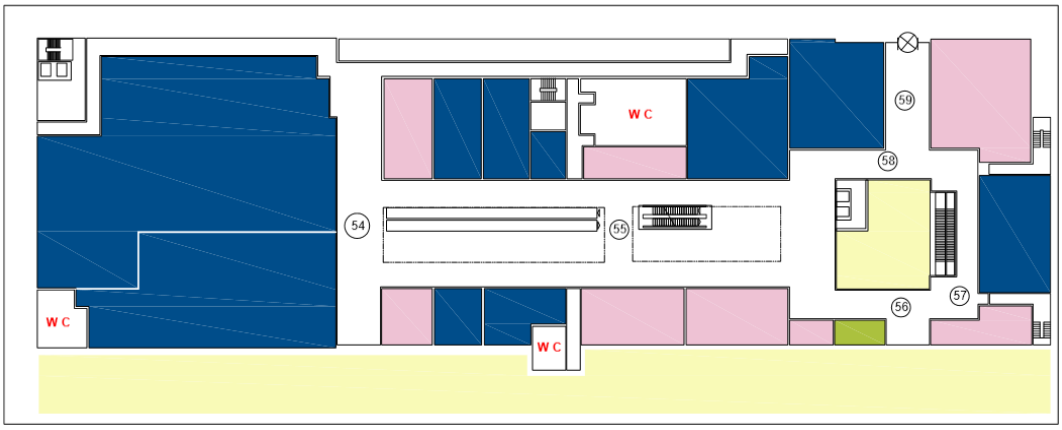


Figure 6.5. *Royal Mall*

Source: *Researcher based on maps taken from the Municipality of Erbil city*

- **Majdi Mall**

Majdi Mall is a grand shopping center in Iraq surrounded by branch streets. This mall was opened in 2009 and is located on the main street that connects the city center with the suburbs (Figure (6.6)). The mall has a 42,000-m^2 car park with a capacity of 2000 cars and comprises three floors. The ground and the first floors of the mall have 67 shops that come in various sizes and sell a wide variety of goods in addition to a supermarket in the ground floor, which is an important attraction point (magnet) of the shopping center. The last floor has restaurants, cinema theaters, and a game hall. The shopping center has a total area of 120,000 m^2, a built area of () m^2, and a green zone area of 3,000 m^2. The mall has three entrances; two are on the ground floor, and one is on the first floor.



a. Ground floor

b. First floor plan

Magnet point

Fashion and clothing shops

Specialty shops

Electronics shops

Domestic items shops

Figure 6.6. *Majdi Mall*

Source: *Researcher based on maps taken from the Municipality of Erbil city*

6.4. Measurement of the variables

The syntax characteristics (independent variables) of the shopping center designs vary in terms of their degree of influence on customer behavior. These characteristics are expressed by the pedestrian flows (dependent variables). The method for measuring each dependent and independent variable is explained in the succeeding subsections.

- **The Mall**

The mall is considered the cornerstone of any shopping center because the shops and the different entrances are distributed on its sides. Fong (2005) mentioned that the spatial design of malls always aims to balance the circulation along the shopping center to achieve balanced levels of circulation and obtain the maximum benefit (Fong, 2005,p.). The variables of the syntax characteristics of the mall are demonstrated in addition to the methods through which they are measured.

- **Width of the Mall (WM);** WM indicates the nature of the circulation and the extent to which the functional components are correlated on both sides as well as the customer's comprehension of them. Studies determined that the optimal value of WM ranges from 4 m to 12 m. Increasing WM distracts the customer and losses the relatedness between the two sides of the mall, which eventually decreases customer attraction. This variable was obtained by measuring the distance between the two sides of the mall based on maps (see figure 6.7).

Figure 6.7. *Pictures describes how width of the mall is measured*

Source: *Researcher*

- **Length of the mall (LM);** Thomas (1990) demonstrated that the acceptable and customer-attracting maximum LM between two magnets varies between 200 and 250 m (Ngai, 2007,p.43). This variable was measured as an independent variable by calculating the distance between the beginning and end points in each shopping mall.

Figure 6.8. *Pictures describes how length of the mall is measured*

Source: *Researcher*

- **The Break in Shopping activities (BM);** BM is the distance from the mall that is empty or occupied by a non-commercial activity. This break reduces the coherence of mall institutions as well as the attraction of shopping centers. This variable was determined by calculating the total lengths of the frontages that are not occupied by a commercial activity in the mall (see figure 6.9).

Figure 6.9. *Picture explain the concept of The Break in Shopping Frontage*

Source: *Researcher*

- **Commercial shops**

Shops are considered the main characteristic of shopping centers and are always around the mall to form the shopping center. These outlets are regarded as important elements that draw the attention of customers. The success and coherence of shops and shopping centers can be evaluated depending on the extent of the attracted customers. The variables related to shops are measured qualitatively, not quantitatively (Ngai, 2007,p.30). Dawson (1983) discussed that the variables related to shops are represented by the number of shops, including each kind of retail shop and the area of the commercial unit (Dawson, 1983).

Figure 6.10. *simple of commercial shops –royal mall*

Source: *Researcher*

- **Number of shops (SM);** SM was measured by calculating the number of commercial shops located on both sides of the mall.

- **Area of shops (AM) ;** AM was measured by calculating the dimensions of the shops located on both sides of the mall. In particular, this variable was identified by multiplying the shop's length by its width. The shops were then divided into six categories according to the area: AM1: 0–60 m2; AM2: 61–120 m2; AM3:121–200 m2; AM4: 201–350 m2; AM5: 350–750 m2; AM6: 751– m2.

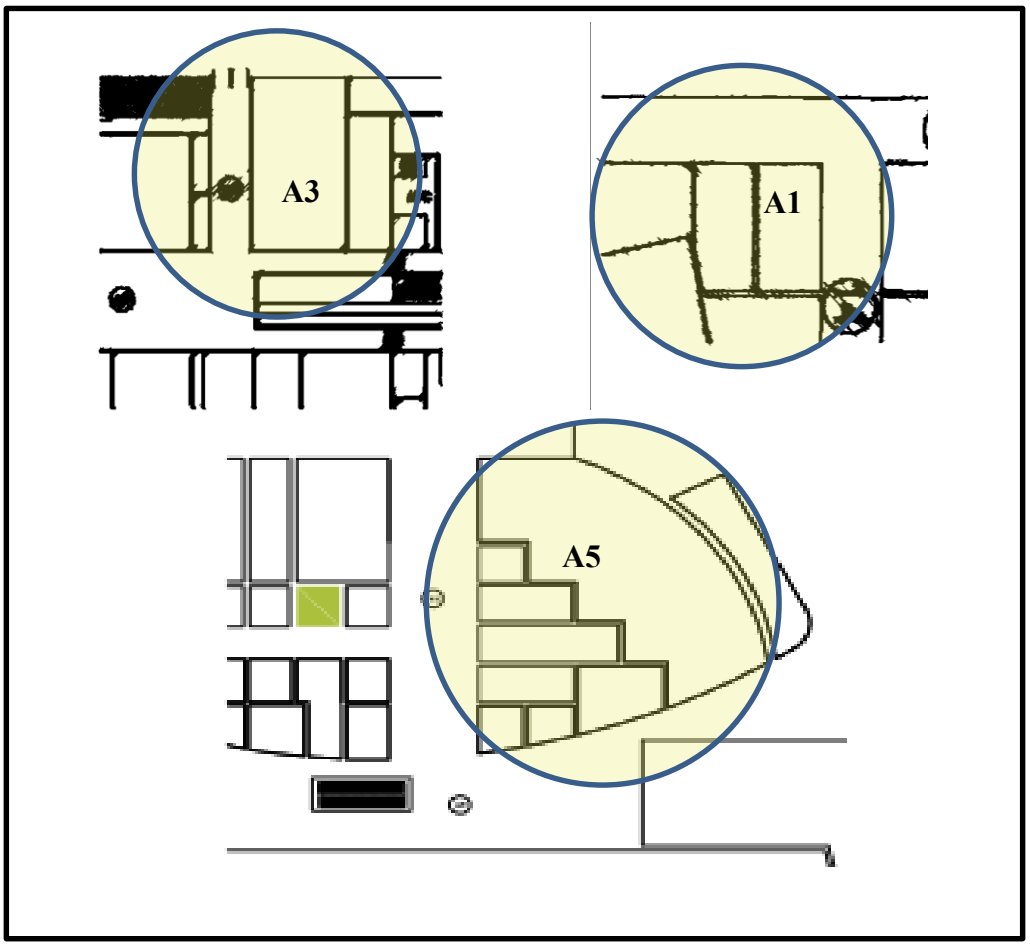


Figure 6.11 *Sample of Shops Area*

Source: *Researcher*

- **Business type (RC);** RC refers to the shops that specialize in certain goods. Business types can be classified as follows:
    - Fashion and clothing shops (RC1) sell textiles and shoes, garments, apparel, sports clothing, and equipment (see figure 6.11).

Figure 6.11. *Fashion and clothing shop- rhian mall*

Source: *Researcher*

    - Electronics shops (RC2) sell mobiles, computers, and electronic accessories (see figure 6.12).

Figure 6.12. *Electronics Shop – family mall*

Source: *Researcher*

- Domestic items shops (RC3) market furniture, textiles, mattresses, home tools, and electrical appliances (see figure 6.13).

Figure 6.13. *Domestic itemsshop- family mall*

Source: *Researcher*

- Specialty shops (RC4) offer jewelry, goldsmith, books, toys, flowers, pets, and photography equipment (see figure 6.14).

Figure 6.14. *Specialty shop – hawler mall*

Source: *Researcher*

- **The frontages (FM);** FM was measured by calculating the total area of the frontages of shops in the mall (see figure 6.15)

Figure 6.15. *Samples of shops frontages*

Source: *Researcher*

- **Nodes**

Node spaces were used to identify a certain angle, to include a meeting point for the projection of the vertical circulation elements and the projection of the entrances and exits, or to leave the node space free. The subsequent paragraphs describe the \ relevant variables of Nodes.

- **Entrances (EM);** Ngai (2007) stated that the entrances and exits in shopping centers influence the shopping journey and attraction of customers. He argued that the entrances should be positioned in such a way that they can encourage and influence the visitors to wander all over the shopping center (Ngai, 2007,P.44). Browes emphasized that the entrances should be far enough to motivate the customers to go around and check out all shops in the shopping center and stay for a long time. The variables related to the entrances of malls and the mechanisms through which they were measured are discussed below;
  - Number of entrances (EM): This numerical variable was measured by calculating the number of the entrances located in each mall.
  - Position of the entrance (EP): This variable was measured by calculating the percentage of the entrance distance from the center of the mall.

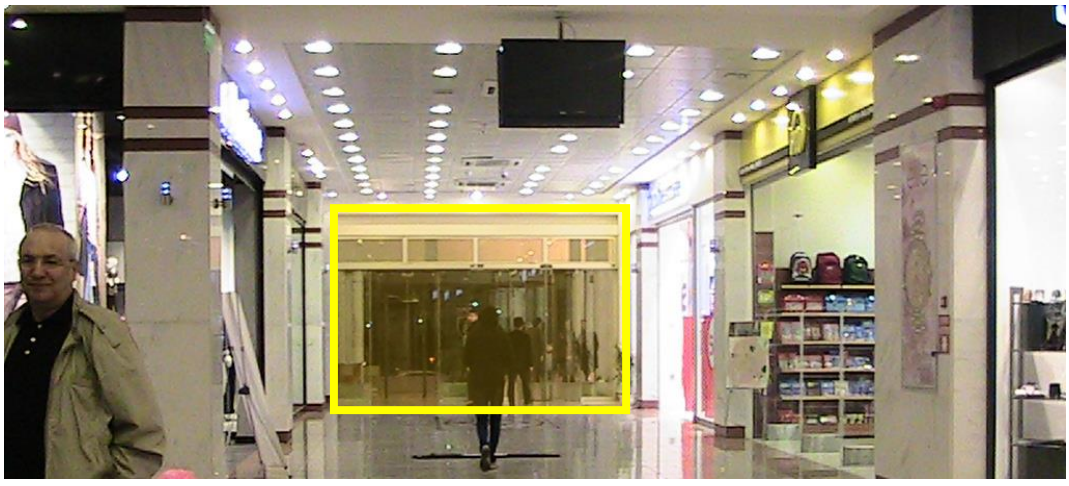


Figure 6.16. *One of the entrances of the Royal Mall*

Source: *Researcher*

- **Vertical circulation (V):** The distribution of visitors in shopping centers at different levels was determined through the reasonable distribution of the vertical circulation elements represented by elevators and escalators. Ngai (2007) posited that the attraction of multi-levels should be balanced by providing a balanced pedestrian flow on all floors of the shopping center. Brown (1992) specified that the suitable position and convenient situation in each floor should be provided through enough means of vertical transport to help increase visitor attraction. Two variables for the Vertical circulation were used, and their effects on customer behavior were determined.

    - The number of Vertical circulation elements: A numerical mechanism was adopted to measure this variable by calculating the elements of the Vertical circulation in the mall.
    - Position of the Vertical circulation elements (VP): The percentage of the distance of the variable from the mall center was determined to measure the position of the Vertical circulation elements whether in the escalators or elevators in the mall.

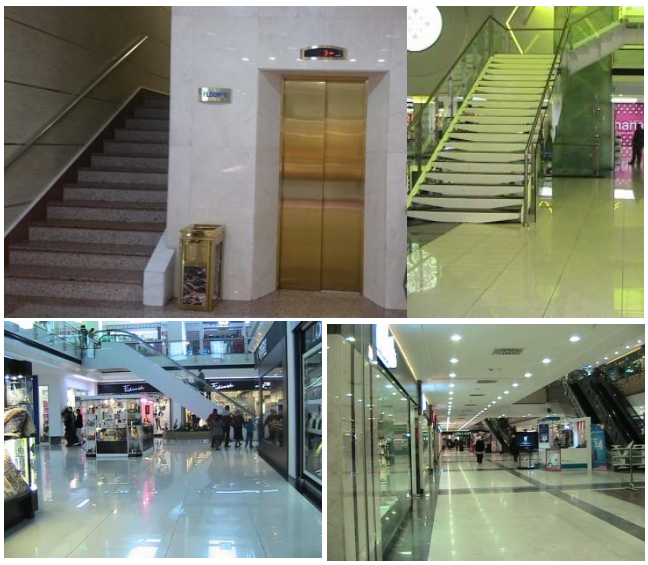


Figure 6.17. *Vertical circulation*

Source: *Researcher*

- **The free node (N);** Coleman (2007) discussed that nodes can be considered concentration points that lead visitors from one place to another (Figure (6.18)). Nodes create communication points inside the shopping center where central activities are held (Alexander, 1977), and they are magnets that preserve the circulation flow (Ozdemir, 2005). In this study, the variables related to nodes were measured to test their relationship with customer behavior.
    - Number of nodes (NM): This variable was measured by calculating the number of nodes in the mall.
    - Node position (NP): This variable was determined through a mathematical method, which calculates the percentage of node distance from the mall.

Figure 6.18. *Free node -family mall*

Source: *Researcher*

- **<u>Magnet points</u>**

Magnets include the entertainment areas, restaurants, and anchor stores in malls, among others. This study regarded restaurants, closed cinemas, theaters, cafeterias, supermarkets, anchor stores, MSU stores, and game halls in shopping centers as magnet points. Two magnet variables were measured.

- Number of magnets (GM): GM was measured by calculating the number of magnets in the mall, whether they are restaurants, game halls, or cinemas.
- Position of magnets (GP): GP was identified by obtaining the percentage of magnet distance from the center of the mall.

Figure 6.19. *Different types of magnets*

Source: *Researcher*

- **<u>Pedestrians Flow (PF):</u>**

Certain procedures are needed to measure and examine customer behavior at shopping centers. One of these methods is the measurement of pedestrian flow density that assesses customer behavior as indicated by attractiveness or negligence, which is an indicator of visitor preference for certain sites. Visitors usually express such preference through their circulation density in these sites. To examine the effect of the structural

properties of shopping centers (independent variables) on customer behavior, the pedestrian flow density was measured as a variable that indicates customer behavior (dependent variable).

Various methods can be applied to measure pedestrian flow density in shopping centers.

- Photographic Filming: Pedestrian flow size is measured by taking pictures in certain sites and by calculating the number of customers.
- Video Recording of Pedestrian Flow: Pedestrian circulation is recorded through cameras distributed over certain points of the shopping center. Computer software is used to transfer video recordings into computer formats to obtain graphics on pedestrians flow (i.e., density and direction).
- Mechanical means: These mechanisms include monitoring systems such as photo-electric cells or pressure pad mats, which are usually placed at mall entrances.
- Manual scanning method.

The first three methods are usually expensive and need owner permission; hence, this study adopted manual scanning methods. Through this procedure, the number of people passing through the shopping passage within certain time periods was calculated based on the following considerations:

- Human flow density was determined during the time periods 16:00–17:00 PM, 17:00–18:00 PM, and 18:00–19:00 PM. The average of the numerical values for each long period was calculated to identify the human flow density.
- Fridays, Saturdays, and holidays were not included in the period between 15th January 2014 and 15th February 2014
- To confirm the results accuracy, manual scanning was conducted within the period from 28th August 2014 to 28th September 2014 and from 25th May 2015 to 15th June 2015 in which the difference was low and can therefore be excluded.

Figure 6.20. *Pedestrians Flow*

Source: *Researcher*

6.5. Research Approach

The analysis of this study has two main elements. The first is the use of the regression model to identify the major independent variables that influence customer behavior and the second is to analyze the relative importance of shopping malls to identify the malls that are more important and more effective than their counterparts.

6.5.1. Procedures Used in Analysis

The numerical values in Table (6.1) were analyzed through multiple linear regression after the independent and dependent variables were confirmed from previous studies and after the methods that measure each variable were reviewed to realize the study purpose and establish the structural properties of shopping center plans that affect customer behavior. SPSS20 software was used to determine the independent variables that affect the dependent variable. The relative values for the variable that affects the

shopping paths, which are attractive for customers, were selected. The subsequent paragraphs explain the methods used in the analysis.

- **Multiple Linear Regression Method**

This is an advanced statistical method that ensures the accuracy of assumption to obtain reliable research findings through the optimum use of data and to determine the cause relations among variables. Multiple linear regression is a mathematical equation that expresses the relation between two variables and assesses the previous values and predicts future ones. This method is also a regression of the dependent variable (Y) of many independent variables (i.e., X_1, X_2, … X_k); thus, it is used to predict many independent variables that affect the dependent variable.

Linear regression models are generally expressed as follows:

$$Y = \alpha+\beta_1 X_{i1}+ \beta_2 X_{i2}+\ldots. + \beta_k X_{ik}+ \xi_i \quad (6.1)$$

$$Yj = \alpha + \beta 1 x 1 j + ... + \beta k \; xk \; j + uj, \; j = 1, ..., n, \quad (6.2)$$

Where:

- Y is the dependent variables.
- X_i, are the independent variables.
- ξ_i are the residual terms (disturbance or error term), assuming to be normally distributed.
- βi are the model parameters (i.e. coefficient) to be estimated.
- The α is the intercept, accounting for the effect of the unconditional expectations of the model variables.

Table 6.1: *Variable values*

T	LM	WM	EM	GM	GV	GP1	GP2	SD	RC1	RC2	RC3	RC4
1	56.0	7.0	1	0	0	0.70	0.73	17	15	1	0	1
2	73.0	7.0	2	0	0	0.74	0.76	21	17	2	0	2
3	14.0	5.0	0	0	0	0.71	0.74	4	3	0	0	1
4	14.0	5.0	0	0	0	0.70	0.73	4	2	2	0	0
5	56.0	7.0	0	1	1	0.82	0.72	12	11	0	0	1
6	63.0	7.0	0	1	1	0.63	0.64	18	15	0	0	3
7	14.0	5.0	0	0	0	0.60	0.90	4	2	0	0	2
8	14.0	5.0	0	1	1	0.00	1.11	1	0	0	0	1
9	96.0	6.0	1	1	0	0.75	0.37	32	29	3	0	0
10	96.0	3.0	2	0	0	0.46	0.87	19	16	0	1	2
11	96.0	3.0	2	0	0	0.76	0.82	22	19	0	1	2
12	12.0	6.0	0	0	0	0.70	0.73	0	0	0	0	0
13	12.0	6.0	0	0	0	0.70	0.73	0	0	0	0	0
14	15.0	2.5	0	0	0	0.70	0.73	5	3	1	1	0
15	12.0	2.5	0	0	0	0.70	0.73	4	2	0	2	0
16	14.5	2.5	0	0	0	0.70	0.73	5	3	0	2	0
17	75.0	3.0	0	1	1	1.00	0.63	13	12	0	0	1
18	90.0	3.0	0	1	1	1.00	0.71	15	11	1	0	3
19	12.0	6.0	0	0	0	0.70	0.73	0	0	0	0	0
20	12.0	6.0	0	1	0	0.70	0.73	0	0	0	0	0
21	12.0	6.0	0	0	0	0.70	0.73	5	2	0	2	1
22	15.0	3.0	0	0	0	0.70	0.73	3	1	0	0	2
23	156.0	9.0	1	2	1	0.35	0.78	20	16	0	0	4
24	156.0	9.0	1	3	1	0.38	0.35	15	10	0	0	5
25	12.0	6.0	0	0	0	0.70	0.73	4	2	0	0	2
26	44.0	12.0	0	0	0	0.70	0.73	10	3	0	3	4
27	42.0	5.0	0	0	0	0.70	0.73	13	5	0	4	4
28	30.0	6.0	0	0	0	0.81	0.55	7	3	1	0	3
29	28.0	6.0	0	1	1	1.00	0.56	5	1	3	0	1
30	28.0	6.0	0	1	1	1.00	0.56	3	2	1	0	0
31	28.0	6.0	0	1	1	1.00	0.56	1	1	0	0	0
32	60.0	12.0	0	2	2	0.00	1.00	7	2	2	3	0
33	18.0	6.0	0	1	3	1.00	0.70	4	2	1	0	1
34	18.0	6.0	0	1	3	1.00	0.70	3	1	0	0	2
35	126.0	7.0	0	3	3	0.41	1.00	10	8	1	0	1
36	130.0	7.0	0	3	3	0.40	1.00	7	5	1	1	0
37	24.0	12.0	0	0	0	0.70	0.73	7	2	3	2	0
38	31.0	12.0	0	0	0	0.70	0.73	4	0	1	3	0
39	16.0	12.0	0	0	0	0.70	0.73	2	0	0	1	0
40	34.0	6.0	0	0	0	0.67	0.69	4	0	2	0	2
41	34.0	6.0	0	1	1	0.88	0.71	1	0	0	0	1
42	56.0	6.0	2	0	0	0.70	0.73	6	4	0	0	2
43	39.0	6.0	1	2	2	0.92	1.06	5	5	0	0	0
44	19.0	6.0	0	0	0	0.70	0.73	2	2	0	0	0
45	20.0	6.0	0	0	0	0.79	0.81	2	1	0	0	1
46	48.0	6.0	0	1	1	1.00	0.78	6	5	0	0	1
47	13.5	6.0	0	0	0	0.63	0.66	1	1	0	0	0
48	42.0	6.0	0	0	0	0.60	0.64	3	3	0	0	0
49	13.5	12.0	0	1	1	0.89	0.71	2	2	0	0	0
50	54.0	6.0	0	0	0	0.79	0.81	6	1	1	3	1
51	13.5	6.0	0	0	0	0.63	0.66	1	0	0	0	1
52	42.0	6.0	0	0	0	0.60	0.64	8	4	3	1	0
53	13.5	12.0	0	1	1	0.70	0.73	2	1	0	1	0
54	28.0	4.8	1	1	1	1.00	0.70	4	2	0	0	2
55	50.0	6.0	0	1	1	1.00	1.10	11	8	0	0	3
56	15.0	3.0	0	2	1	0.00	0.40	3	2	0	0	1
57	18.0	4.8	0	1	0	0.82	0.59	2	1	0	0	1
58	15.0	3.0	0	1	0	0.70	0.73	2	2	0	0	0
59	12.0	4.8	1	0	0	0.70	0.73	1	1	0	0	0
60	18.0	4.2	1	0	0	0.70	0.73	2	1	0	0	1
61	24.0	11.4	0	0	0	0.63	0.66	7	4	1	0	2
62	38.4	2.5	0	0	0	0.70	0.73	6	4	0	0	2
63	38.4	2.5	0	0	0	0.70	0.73	5	4	0	0	1
64	5.8	2.0	0	0	0	0.79	0.81	0	0	0	0	0
65	14.0	4.8	0	0	0	0.75	0.78	1	1	0	0	0
66	14.0	3.0	0	0	0	0.70	0.73	1	1	0	0	0
67	10.4	9.0	1	0	0	0.70	0.73	2	1	0	0	1
68	14.0	4.8	0	0	0	0.68	0.71	3	1	0	0	2
69	14.0	3.0	0	0	0	0.70	0.73	3	3	0	0	0

T	NM	NP1	BL	VM	VP1	VP2	VP3	DA	A1	A2	A3	A4	A5	A6	HD
1	0	0.51	17.0	0	0.53	0.24	0.19	303.28	6	11	0	0	0	0	150
2	0	0.44	29.8	1	0.33	0.32	0.28	378.30	18	3	0	0	0	0	160
3	0	0.50	15.0	1	0.50	0.25	0.20	66.60	4	0	0	0	0	0	30
4	0	0.51	9.0	0	0.53	0.24	0.19	86.40	4	0	0	0	0	0	9
5	0	0.46	34.7	0	0.50	0.30	0.07	247.50	2	7	3	0	0	0	110
6	1	0.13	42.3	1	0.32	0.08	0.24	298.20	14	4	0	0	0	0	109
7	1	1.00	18.6	0	0.64	0.40	0.44	55.80	4	0	0	0	0	0	5
8	1	1.00	35.8	1	0.00	0.30	1.55	3.00	1	0	0	0	0	0	30
9	1	0.00	18.5	2	1.00	-0.23	-0.50	604.80	5	25	2	0	0	0	250
10	2	1.00	110.0	4	1.00	0.44	0.75	270.00	18	1	0	0	0	0	230
11	2	1.00	94.0	3	1.00	0.44	0.31	282.00	22	0	0	0	0	0	240
12	0	0.51	3.0	0	0.53	0.24	0.19	0.00	0	0	0	0	0	0	0
13	0	0.51	3.0	0	0.53	0.24	0.19	0.00	0	0	0	0	0	0	0
14	0	0.51	0.3	0	0.53	0.24	0.19	86.40	5	0	0	0	0	0	2
15	0	0.51	0.4	0	0.53	0.24	0.19	76.00	4	0	0	0	0	0	1
16	0	0.51	0.3	0	0.53	0.24	0.19	86.40	5	0	0	0	0	0	4
17	1	0.61	83.4	2	0.69	0.08	-1.23	240.00	13	0	0	0	0	0	138
18	1	0.87	110.0	3	1.00	0.33	-0.58	249.60	13	1	1	0	0	0	140
19	0	0.51	32.0	0	0.53	0.24	0.19	0.00	0	0	0	0	0	0	0
20	0	0.51	32.0	0	0.53	0.24	0.19	0.00	0	0	0	0	0	0	14
21	0	0.51	6.0	0	0.53	0.24	0.19	90.00	5	0	0	0	0	0	1
22	0	0.51	6.0	0	0.53	0.24	0.19	48.00	4	0	0	0	0	0	1
23	2	1.00	130.0	3	1.00	0.00	0.18	600.00	2	12	1	4	0	1	497
24	2	1.00	175.0	4	1.00	0.00	0.19	441.00	1	5	0	2	0	2	500
25	0	0.51	18.0	0	0.53	0.24	0.19	96.00	4	0	0	0	0	0	16
26	0	0.51	29.0	0	0.53	0.24	0.19	258.00	7	1	0	1	0	1	160
27	0	0.51	10.0	0	0.53	0.24	0.19	262.20	12	0	1	0	0	0	19
28	1	0.00	11.0	0	0.41	0.08	-0.07	171.00	3	1	1	1	0	0	7
29	1	0.00	37.0	0	0.38	0.21	-0.24	114.00	3	1	1	0	0	0	2
30	1	0.00	28.0	0	0.38	0.21	-0.24	9.00	0	0	1	1	0	1	2
31	1	0.00	46.0	0	0.38	0.21	-0.24	102.00	0	0	0	0	0	1	2
32	0	0.82	102.0	1	0.43	0.02	1.15	159.00	6	1	0	0	0	0	134
33	0	0.39	11.0	0	0.47	0.40	-0.11	114.00	1	1	1	0	0	1	40
34	0	0.39	17.0	0	0.47	0.40	-0.11	96.00	0	1	1	0	0	0	40
35	1	1.00	126.0	2	1.00	0.13	0.36	411.00	0	2	2	4	0	1	300
36	1	1.00	174.0	1	1.00	0.13	0.42	306.00	0	1	1	2	1	2	305
37	0	0.51	24.0	0	0.53	0.24	0.19	144.00	2	2	2	1	0	0	3
38	0	0.51	24.0	0	0.53	0.24	0.19	186.00	1	2	0	2	0	1	3
39	0	0.51	24.0	0	0.53	0.24	0.19	90.00	0	0	0	1	0	1	3
40	0	0.59	47.0	2	0.76	0.16	0.07	114.00	2	2	0	0	0	0	38
41	0	0.44	72.0	0	0.49	0.34	0.01	39.00	0	0	1	0	0	0	7
42	0	0.51	58.5	1	0.54	0.24	0.18	174.30	0	8	0	0	0	0	145
43	1	0.91	39.0	2	0.15	0.97	1.08	169.50	0	3	2	0	0	0	100
44	0	0.51	26.0	0	0.53	0.24	0.19	72.00	0	0	0	0	2	0	32
45	0	0.32	32.5	1	0.00	0.44	0.44	54.00	0	1	0	0	0	1	32
46	0	0.25	55.6	1	0.00	0.53	0.20	117.00	0	5	0	1	0	0	95
47	0	0.67	41.2	1	1.00	0.07	-0.04	18.00	0	1	0	0	0	0	4
48	0	0.12	37.3	2	0.19	0.00	0.03	84.00	0	0	0	2	0	0	50
49	0	0.44	40.0	0	0.49	0.34	0.00	69.00	0	1	0	0	0	0	4
50	0	0.32	46.8	1	0.00	0.44	0.44	161.40	0	4	1	1	0	0	89
51	0	0.67	41.2	1	1.00	0.07	-0.04	34.50	0	1	0	0	0	0	3
52	0	0.12	34.0	2	0.19	0.00	0.03	92.10	0	6	1	1	0	0	54
53	0	0.51	33.7	0	0.53	0.24	0.19	90.00	0	1	0	0	0	0	4
54	1	0.39	16.0	0	0.47	0.40	-0.11	114.40	2	0	0	1	1	0	160
55	2	1.00	26.0	3	0.00	1.00	0.72	235.00	5	5	1	0	0	0	230
56	1	0.00	18.7	1	0.80	-0.63	0.38	66.00	2	1	0	0	0	0	5
57	1	0.00	20.0	1	0.28	0.15	0.02	60.00	1	1	0	0	0	0	7
58	0	0.51	18.7	0	0.53	0.24	0.19	35.40	0	2	0	0	0	0	5
59	0	0.51	9.6	0	0.53	0.24	0.19	63.00	0	1	0	0	0	0	15
60	0	0.51	9.6	0	0.53	0.24	0.19	51.84	0	0	2	0	0	0	17
61	0	0.67	50.0	1	1.00	0.07	-0.04	82.50	0	4	1	0	0	0	23
62	0	0.51	50.0	0	0.53	0.24	0.19	108.16	1	2	0	0	0	0	50
63	0	0.51	50.0	0	0.53	0.24	0.19	117.00	0	3	2	0	0	0	50
64	0	0.32	18.6	2	0.00	0.44	0.44	0.00	0	0	0	0	0	0	13
65	0	0.40	32.7	1	0.23	0.35	0.33	20.80	0	1	0	0	0	0	5
66	0	0.51	28.0	0	0.53	0.24	0.19	20.50	0	0	1	0	0	0	4
67	0	0.51	18.0	0	0.53	0.24	0.19	51.20	0	1	1	0	0	0	23
68	0	0.55	22.0	1	0.66	0.20	0.13	51.20	1	1	0	0	0	0	13
69	0	0.51	20.0	0	0.53	0.24	0.19	33.00	1	1	0	0	0	0	2

6.5.2. Relative Importance of the Mall

The multiple linear regression equation yields the best relation that explains and measures customer behavior through a set of variables that describe the underlying characteristics of shopping center layouts. To determine the degree of importance of malls, beta weight can be used for each statistically significant independent variable. This regression coefficient shows the effect of one unit of independent variable on the dependent variable and represents the standard of preference in terms of the importance between the independent variables in interpreting the dependent variable and in explaining the importance of a certain mall compared with its counterparts. The methodology described below was adopted to calculate the digital value and determine the importance indicator.

- The digital values of the independent variables were changed into a ratio scale.
- The relative importance indicator for each value of the variables was determined using the relationship;

$$RV=BW*VV\% \quad (6.3)$$

Where:

- RV: relative importance of variable
- BW: beta weight of variable
- VV%: The relative value of the variable

The value of the indicator for each mall was acquired using the algebraic summation of the values of the relative importance of the variables:

$$RVN=RV_1+RV_2+RV_3+\ldots\ldots RV_n \quad (6.4)$$

6.5.3. Analyzing the results of the Multiple Linear Regression

- The variable (HD) was introduced as a dependent variable, and the variables (LM, WM, EM, GM, GV, GP1, GP2, SD, RC1, RC2, RC3, RC4, NM, NP1, NP2, NP3, BL, VM, VP1, VP2, VP3, FA, AM1, AM2, AM3, AM4, AM5, AM6) were introduced as independent variables.

- The lost values in the variables (GP1, GP2, NP1, NP2, NP3, VP1, VP2, and VP3) were dealt with using statistical functions.
- The stepwise method was adopted to determine the multiple linear regressions for the variables.
- The hypothetical values were employed to determine the F value ranging from 0 to 5 for entry and 1 for removal.
- Table (6.2) shows that the correlation coefficient (r) is 0.980, the coefficient of determination (r2) is 0.960, and the adjusted R-square is 0.952. Hence, the independent variables can interpret 95.2% of the change in the dependent variable, and the remaining 0.048 is attributed to other factors (For more details see Appendix c).

Table 6.2. *Model Summar*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.980[q]	.960	.952	23.870521
Predictors: (Constant), LM, NP1, AM2, EM, VP1, RC4, AM5, GM, AM3, AM4, GP2				

- Table (6.3) indicates the high significance in the variation analysis for the test (f) and asserts the high strength of explanation for the multiple linear regression model from a statistical point of view (For more details see Appendix d).

Table 6.3. *ANOVA*

Model	Sum of Squares	df	Mean Square	F	Sig.
	770302.458	11	70027.496	122.898	.000[r]
	32478.701	57	569.802		
	802781.159	68			
Dependent Variable: Hp Predictors: (Constant), LM, NP1, AM2, EM, VP1, RC4, AM5, GM, AM3, AM4, GP2					

- Table (6.4) demonstrates that the independent variables are statistically significant according to t test at the significance level of $p<0.05$ (For more details see Appendix e). The linear regression equation can be obtained using the unstandardized beta as follows;

$$\boldsymbol{HDi} = 28.158 + 1.665LMi + 119.477NP1i + 5.575AM2i + 26.535EMi - 62.589VP1i + 10.246RC4i + 28.510\ AM5i + 20.364\ GMi - 10.532\ AM3i + 15.683AM4i - 108.205GP2i$$

Table 6.4. *Coefficients*

Model		Unstandardized Coefficients		Sta. Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	28.158	33.532			
	LM	1.665	.191	.535	8.697	.000
	NP1	119.477	26.123	.303	4.574	.000
	AM2	5.575	1.045	.193	5.337	.000
	EM	26.535	6.680	.135	3.972	.000
	VP1	-62.589	19.532	-.156	-3.204	.002
	RC4	10.246	3.066	.115	3.342	.001
	AM5	28.510	10.320	.076	2.763	.008
	GM	20.364	5.096	.149	3.996	.000
	AM3	-10.532	4.629	-.070	-2.275	.027
	AM4	15.683	4.759	.121	3.295	.002
	GP2	-108.205	48.491	-.137	-2.231	.030
Dependent Variable: Hp						

- The analysis results in Table (5) show that the independent variables affect the dependent variable. Nonetheless, these variables classified into five groups exert varying effects on the dependent variable.

- **The first group**

This group involves the variables that yield a powerful effect on the dependent variable; hence, they have the highest beta value among all independent variable groups and include the following;

- **LM** comes first in terms of the effect on circulation density, with a beta weight of .535 and a direct relationship. Thus, LM positively affects customer behavior.
- **Position of the nodes (NP1)** is second with a beta weight of .303. When the node is far from the center of the mall, the customer is increasingly attracted to the mall.
- The variable of **the shops with an area of A2** is third with a beta weight of .193 and a direct relationship. Thus, the increase in the number of stores with relatively small areas increases the attraction of the customer to the mall.

- **The second group**

This group includes the independent variables that affect the dependent variable to a certain degree and a relative weight smaller than that of the first group.

- The analysis results show that **the position of the Vertical circulation elements (VP1)** affects the circulation density in the mall with a beta value of −.156 and an inverse relationship. When the position of the Vertical circulation elements is close to the center of the mall, it strongly and positively affects customer behavior.
- **GM** is second in this group with a beta value of −.149 and with a direct relationship. The increase in the magnets in malls increases the circulation density and improves the attracting behavior.
- The results show that **the position of magnets** influences circulation density with a relative weight of −.137 and an inverse relationship. When the magnets are close to the center of malls, they increasingly draw the attention of customers.
- **EM** comes fourth in this group with a relative weight of .135 and a direct relation. This finding indicates that the increase in the number of entrances increases the magnet power of malls.

Table 6.5. *Variables Entered/Removed*

Model	Variables Entered	Variables Removed	Method
1	LM	.	Stepwise (F-to-enter <= .050, F-to-remove >= .100).
2	NP1	.	Stepwise (F-to-enter <= .050, F-to-remove >= .100).
3	AM2	.	Stepwise (F-to-enter <= .050, F-to-remove >= .100).
4	RC2	.	Stepwise (F-to-enter <= .050, F-to-remove >= .100).
5	NM	.	Stepwise (F-to-enter <= .050, F-to-remove >= .100).
6	AM6	.	Stepwise (F-to-enter <= .050, F-to-remove >= .100).
7	EM	.	Stepwise (F-to-enter <= .050, F-to-remove >= .100).
8	VP1	.	Stepwise (F-to-enter <= .050, F-to-remove >= .100).
9	RC4	.	Stepwise (F-to-enter <= .050, F-to-remove >= .100).
10	AM5	.	Stepwise (F-to-enter <= .050, F-to-remove >= .100).
11	GM	.	Stepwise (F-to-enter <= .050, F-to-remove >= .100).
12	.	NM	Stepwise (F-to-enter <= .050, F-to-remove >= .100).
13	.	RC2	Stepwise (F-to-enter <= .050, F-to-remove >= .100).
14	AM3	.	Stepwise (F-to-enter <= .050, F-to-remove >= .100).
15	AM4	.	Stepwise (F-to-enter <= .050, F-to-remove >= .100).
16	.	AM6	Stepwise (F-to-enter <= .050, F-to-remove >= .100).
17	GP2	.	Stepwise (F-to-enter <= .050, F-to-remove >= .100).

- **The third group**

This group manifests the independent variables that affect the dependent variable with a weight that is less than the one in the two previous groups.

- **A4**, which represents the shops with an area of 201–350 m^2, ranked first this group with a beta value of .121 and a direct relationship. This variable positively affects the attracting behavior of malls.

- **The specialty shops variable (RC4)** comes second with a beta weight of 0.115 and a direct relationship. Specialty shops influence the circulation density and attracting behavior of malls. When the number of shops of a certain type is high, the mall increasingly becomes magnetic.
- **AM5**, which includes the shops with an area of 350–750 m^2, comes third in this group with a beta weight of 0.075 and a direct relationship. The increase in the number of shops of this kind improves the attracting behavior of malls.
- **AM3**, which represents the shops with an area of 121–200 m^2, comes last in this group with a beta weight of −0.070 and an inverse relation. The existence of such shops negatively affects customer behavior.

- **The fourth group**

The result of the multiple linear regression analysis shows that some of the variables that appeared as influential variables at first with the employment of increasingly influential variables were excluded from the equation (i.e., NM, RC2, and AM6). These variables influence customer behavior, but they are related to other independent variables that significantly influence customer behavior. This case is the reason why such variables were excluded from the equation.

- **The fifth group**

WM, GV, GP1, SD, RC1, RC3, NP2, NP3, BL, VM, VP1, VP3, and AM1 were not included in the formulation of the multiple linear regressions model. However, this undertaking does not indicate the insignificant importance of such variables in explaining the change in the dependent variable represented by the circulation density.

6.6.5. Analyzing the results of the relative significance for the mall

The malls included in the study were classified into three groups according to their significance.

- The first group; including the (6,8,9,10,11,17,18,23,24,35,36,55,56,57) Malls, has the highest level of significance and the highest relative values (table 6.6). These

malls are attractive in the shopping center because they have the highest portion of variables that affect customer behavior as shown in the figures (6.21).

- The second group has a pyramidal medium level of significance and has medium relative values in terms of magnets. These malls, including the (1,2,3,7,28,29,30,31,32,40,42,43,44,45,46,47,48,50,51,52,54,61,64,65,68) Malls, relatively possess a magnetic power because they have less positive significant variables compared with the first group as shown in the figures (6.21).
- The third group has the least significance level because they are less important given that they have the least number of significant variables that influence customer behavior and are regarded as avoidance malls. This group includes the (4,5,12,13,14,15,16,19,20,21,22,25,26,32,33,34,37,38,39,41,44,53,58 ,59,60,62,63,66,67,69) Malls as shown in figure (6.21).

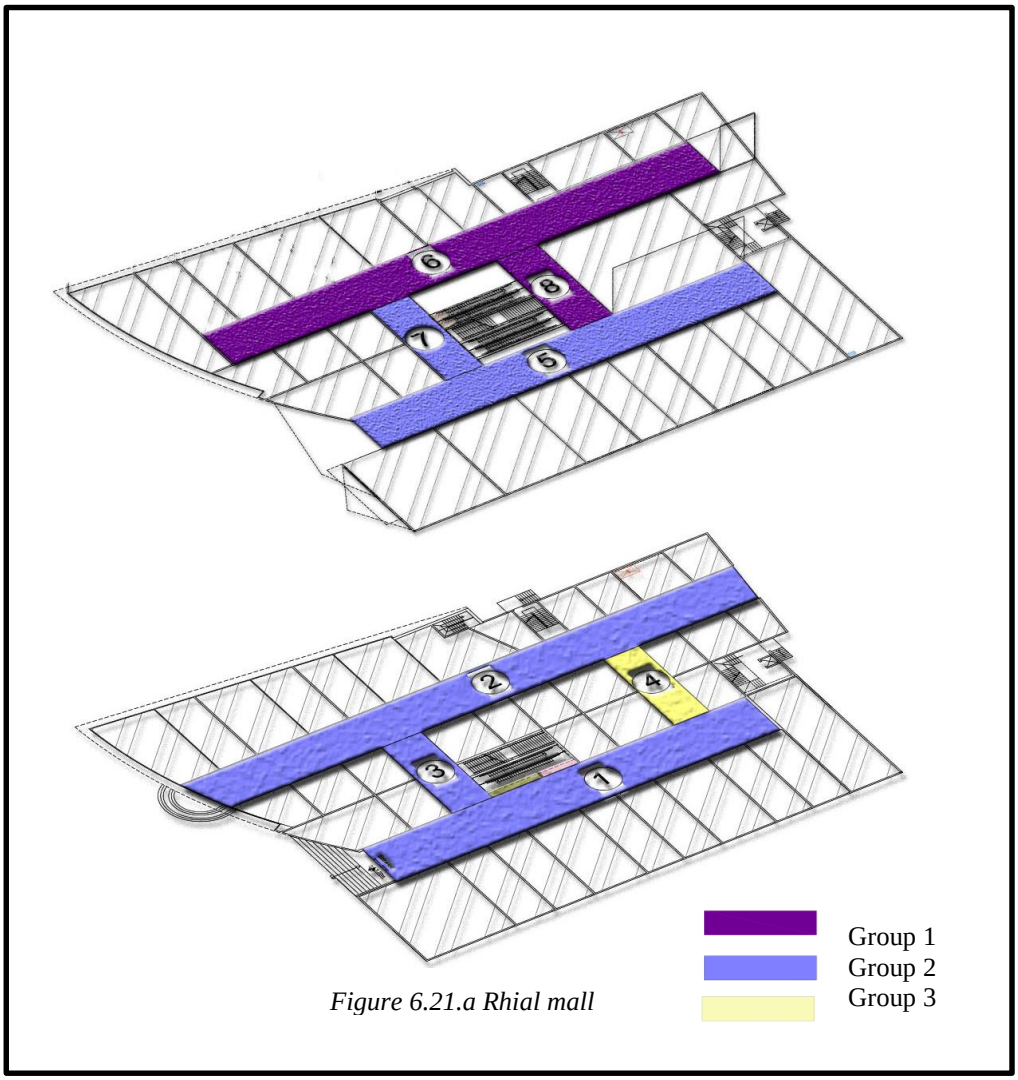


Figure 6.21.a Rhial mall

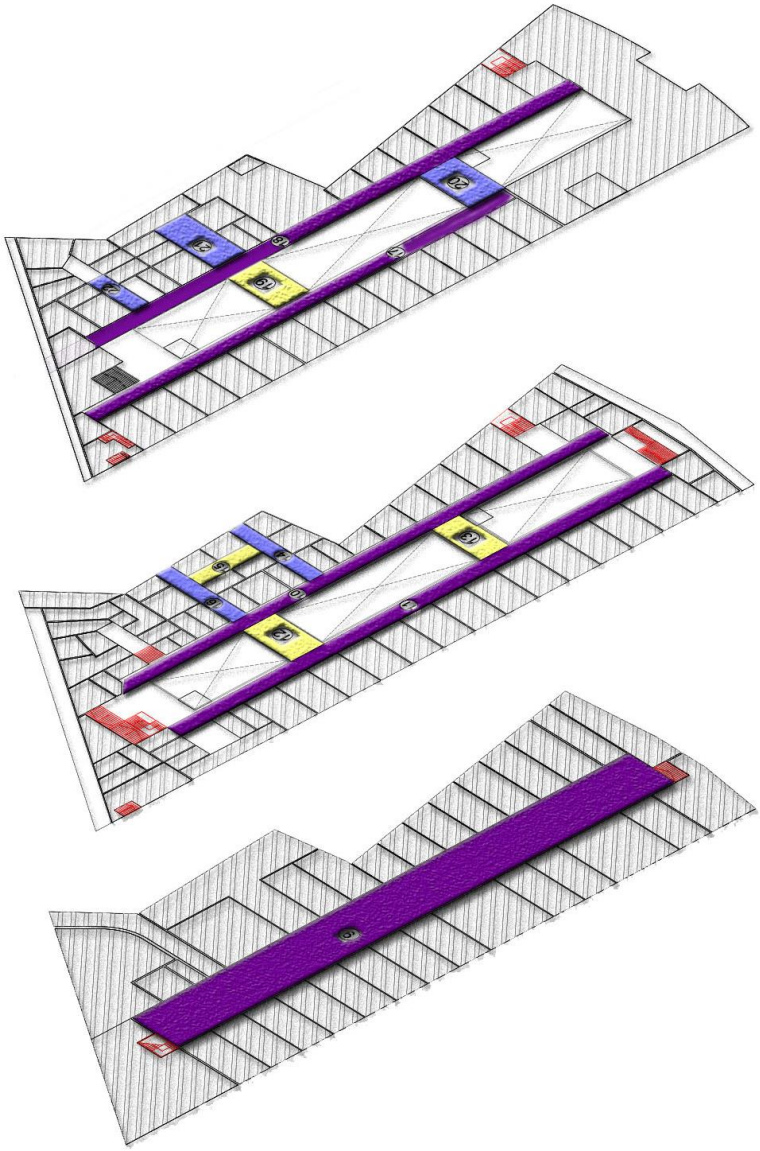


Figure 6.21.b hawler mall

Group 1
Group 2
Group 3

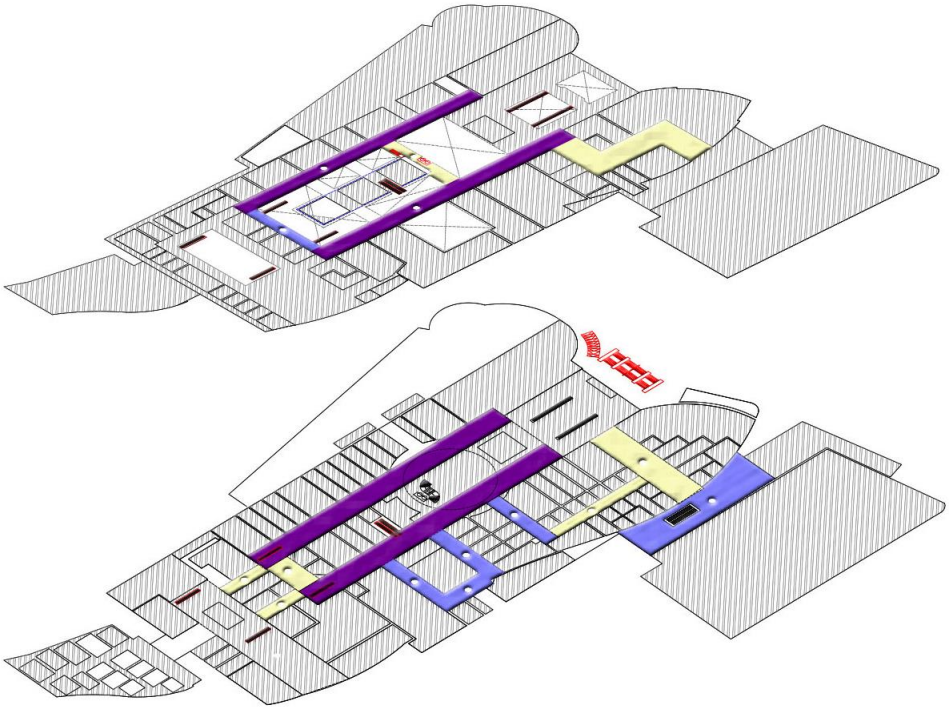


Figure 6.21.c family mall

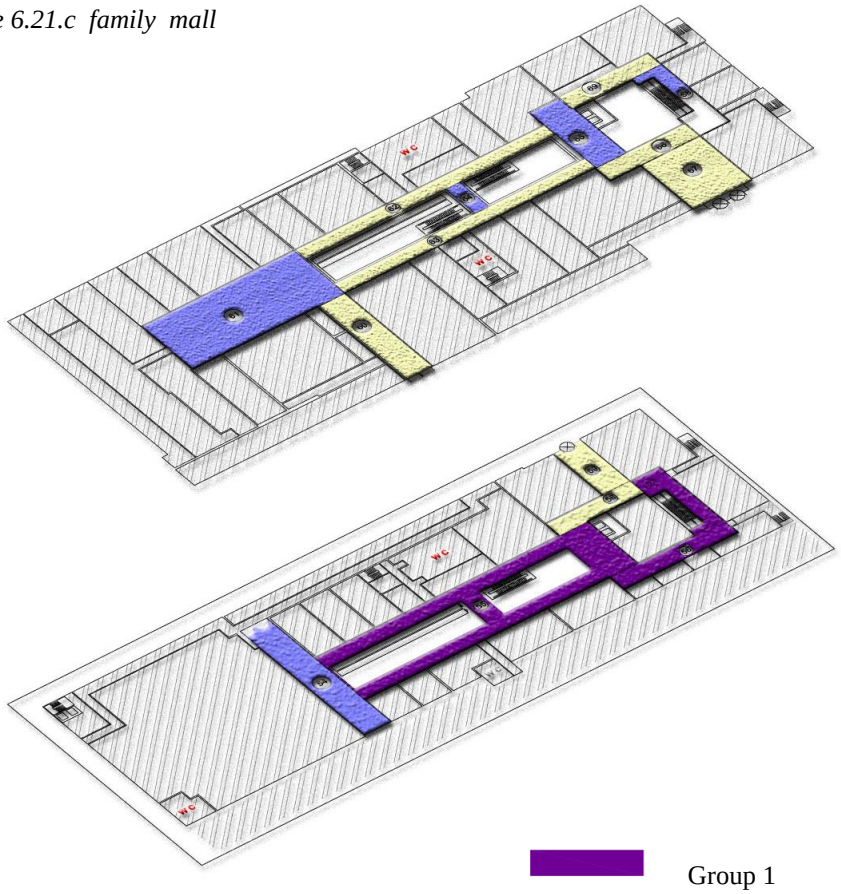


Figure 6.21.d Majidi mall

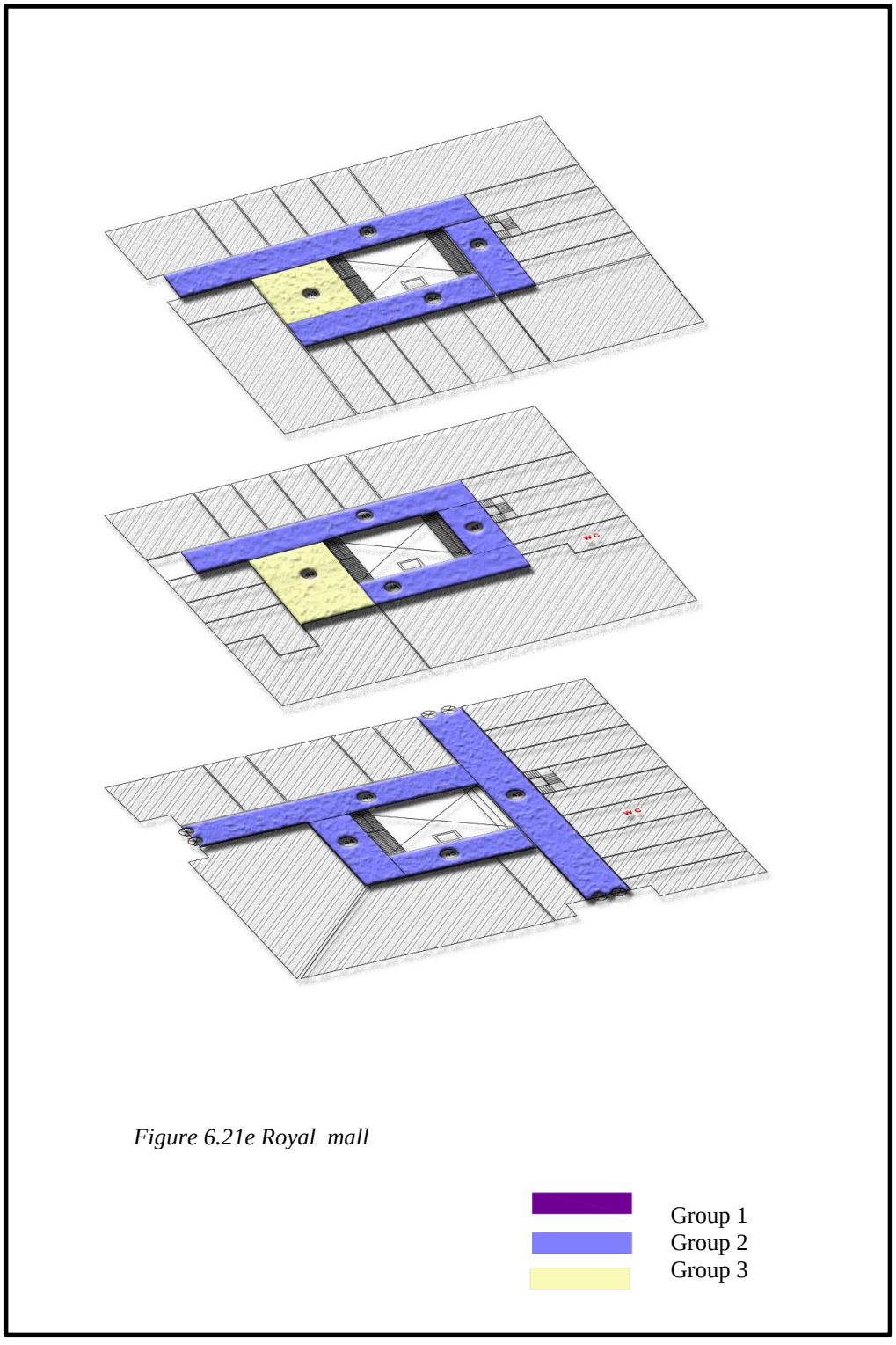


Figure 6.21e Royal mall

Figure 6.21. *The relative significance for the mall*

Table 6.6. *The Results of The Relative Significance For The Mall*

T	LM %	BL M	EM %	BE M	MM %	BG M	GP 2%	BG P	RC 4%	BR C	NP 1%	BN P1	VP 1%	BV P1	A2 %	BA 2	A3 %	BA 3	A4 %	BA 4	A5 %	BA 5	SU M
1	2.161	6.156	5.882	5.794	0	5		0	1.351	5.155		0		0	7.971	6.538	0	0	0	5	0	5	38.644016
2	2.817	6.507	11.76	6.588	0	5		0	2.703	5.311		0	1.926	4.949	2.174	5.42	0	5	0	5	0	5	48.774366
3	0.54	5.289	0	5	0	5		0	1.351	5.155		0	2.929	4.922	0	5	0	5	0	5	0	5	45.366427
4	0.54	5.289	0	5	0	5		0	0	5		0		0	0	5	0	5	0	5	0	5	40.289022
5	2.161	6.156	0	5	2.703	5.403		0	1.351	5.155		0		0	5.072	5.979	9.677	4.323	0	5	0	5	42.015761
6	2.431	6.301	0	5	2.703	5.403		0	4.054	5.466	1.197	5.038	1.86	4.95	2.899	5.559	0	5	0	5	0	5	52.71789
7	0.54	5.289	0	5	0	5		0	2.703	5.311	9.428	5.303		0	0	5	0	5	0	5	0	5	45.902833
8	0.54	5.289	0	5	2.703	5.403		0	1.351	5.155	9.428	5.303	0	5	0	5	0	5	0	5	0	5	51.15013
9	3.704	6.982	5.882	5.794	2.703	5.403		0	0	5	0	5	5.858	4.844	18.12	8.496	6.452	4.548	0	5	0	5	56.067448
10	3.704	6.982	11.76	6.588	0	5		0	2.703	5.311	9.428	5.303	5.858	4.844	0.725	5.14	0	5	0	5	0	5	54.167765
11	3.704	6.982	11.76	6.588	0	5		0	2.703	5.311	9.428	5.303	5.858	4.844	0	5	0	5	0	5	0	5	54.02791
12	0.463	5.248	0	5	0	5		0	0	5		0		0	0	5	0	5	0	5	0	5	40.247733
13	0.463	5.248	0	5	0	5		0	0	5		0		0	0	5	0	5	0	5	0	5	40.247733
14	0.579	5.31	0	5	0	5		0	0	5		0		0	0	5	0	5	0	5	0	5	40.309666
15	0.463	5.248	0	5	0	5		0	0	5		0		0	0	5	0	5	0	5	0	5	40.247733
16	0.56	5.299	0	5	0	5		0	0	5		0		0	0	5	0	5	0	5	0	5	40.299344
17	2.894	6.548	0	5	2.703	5.403		0	1.351	5.155	5.782	5.186	4.061	4.892	0	5	0	5	0	5	0	5	52.184119
18	3.473	6.858	0	5	2.703	5.403		0	4.054	5.466	8.171	5.263	5.858	4.844	0.725	5.14	3.226	4.774	0	5	0	5	52.747565
19	0.463	5.248	0	5	0	5		0	0	5		0		0	0	5	0	5	0	5	0	5	40.247733
20	0.463	5.248	0	5	2.703	5.403		0	0	5		0		0	0	5	0	5	0	5	0	5	40.650436
21	0.463	5.248	0	5	0	5		0	1.351	5.155		0		0	0	5	0	5	0	5	0	5	40.403138
22	0.579	5.31	0	5	0	5		0	2.703	5.311		0		0	0	5	0	5	0	5	0	5	40.620477
23	6.02	8.221	5.882	5.794	5.405	5.805		0	5.405	5.622	9.428	5.303	5.858	4.844	8.696	6.678	3.226	4.774	16	6.936	0	5	58.977128
24	6.02	8.221	5.882	5.794	8.108	6.208	9.24	3.734	6.757	5.777	9.428	5.303	5.858	4.844	3.623	5.699	0	5	8	5.968	0	5	61.548143
25	0.463	5.248	0	5	0	5		0	2.703	5.311		0		0	0	5	0	5	0	5	0	5	40.558544
26	1.698	5.908	0	5	0	5		0	5.405	5.622		0		0	0.725	5.14	0	5	4	5.484	0	5	42.153831
27	1.621	5.867	0	5	0	5		0	5.405	5.622		0		0	0	5	3.226	4.774	0	5	0	5	41.262881
28	1.158	5.619	0	5	0	5		0	4.054	5.466	0	5		0	0.725	5.14	3.226	4.774	4	5.484	0	5	46.483597
29	1.08	5.578	0	5	2.703	5.403		0	1.351	5.155	0	5		0	0.725	5.14	3.226	4.774	0	5	0	5	46.0502
30	1.08	5.578	0	5	2.703	5.403		0	0	5	0	5		0	0	5	3.226	4.774	4	5.484	0	5	46.23894
31	1.08	5.578	0	5	2.703	5.403		0	0	5	0	5		0	0	5	0	5	0	5	0	5	45.980746
32	2.315	6.239	0	5	5.405	5.805	26.69	1.343	0	5		0	2.538	4.932	0.725	5.14	0	5	0	5	0	5	48.459241
33	0.695	5.372	0	5	2.703	5.403		0	1.351	5.155		0		0	0.725	5.14	3.226	4.774	0	5	0	5	40.843756
34	0.695	5.372	0	5	2.703	5.403		0	2.703	5.311		0		0	0.725	5.14	3.226	4.774	0	5	0	5	40.999162
35	4.862	7.601	0	5	8.108	6.208	26.69	1.343	1.351	5.155	9.428	5.303	5.858	4.844	1.449	5.28	6.452	4.548	16	6.936	0	5	57.218723
36	5.016	7.684	0	5	8.108	6.208	26.69	1.343	0	5	9.428	5.303	5.858	4.844	0.725	5.14	3.226	4.774	8	5.968	25	6.9	58.163846
37	0.926	5.495	0	5	0	5		0	0	5		0		0	1.449	5.28	6.452	4.548	4	5.484	0	5	40.807563
38	1.196	5.64	0	5	0	5		0	0	5		0		0	1.449	5.28	0	5	8	5.968	0	5	41.887687
39	0.617	5.33	0	5	0	5		0	0	5		0		0	0	5	0	5	4	5.484	0	5	40.814311
40	1.312	5.702	0	5	0	5		0	2.703	5.311		0	4.479	4.881	1.449	5.28	0	5	0	5	0	5	46.173137
41	1.312	5.702	0	5	2.703	5.403		0	1.351	5.155		0		0	0	5	3.226	4.774	0	5	0	5	41.034212
42	2.161	6.156	11.76	6.588	0	5		0	2.703	5.311		0	3.138	4.916	5.797	6.119	0	5	0	5	0	5	49.090402
43	1.505	5.805	5.882	5.794	5.405	5.805		0	0	5		0	0.901	4.976	2.174	5.42	6.452	4.548	0	5	0	5	47.348608
44	0.733	5.392	0	5	0	5		0	0	5		0		0	0	5	0	5	0	5	50	8.8	44.192244
45	0.772	5.413	0	5	0	5		0	1.351	5.155		0	0	5	0.725	5.14	0	5	0	5	0	5	45.708149
46	1.852	5.991	0	5	2.703	5.403		0	1.351	5.155		0	0	5	3.623	5.699	0	5	4	5.484	0	5	47.732315
47	0.521	5.279	0	5	0	5		0	0	5		0	5.858	4.844	0.725	5.14	0	5	0	5	0	5	45.262555
48	1.621	5.867	0	5	0	5		0	0	5		0	1.116	4.97	0	5	0	5	8	5.968	0	5	46.805351
49	0.521	5.279	0	5	2.703	5.403		0	0	5		0		0	0.725	5.14	0	5	0	5	0	5	40.821257
50	2.084	6.115	0	5	0	5		0	1.351	5.155		0	0	5	2.899	5.559	3.226	4.774	4	5.484	0	5	47.087818
51	0.521	5.279	0	5	0	5		0	1.351	5.155		0	5.858	4.844	0.725	5.14	0	5	0	5	0	5	45.41796
52	1.621	5.867	0	5	0	5		0	0	5		0	1.116	4.97	4.348	5.839	3.226	4.774	4	5.484	0	5	46.934675
53	0.521	5.279	0	5	2.703	5.403		0	0	5		0		0	0.725	5.14	0	5	0	5	0	5	40.821257
54	1.08	5.578	5.882	5.794	2.703	5.403		0	2.703	5.311		0		0	0	5	0	5	4	5.484	25	6.9	44.469675
55	1.929	6.032	0	5	2.703	5.403		0	4.054	5.466	9.428	5.303	0	5	3.623	5.699	3.226	4.774	0	5	0	5	52.677609
56	0.579	5.31	0	5	5.405	5.805	10.68	3.537	1.351	5.155	0	5	4.686	4.875	0.725	5.14	0	5	0	5	0	5	54.822698
57	0.695	5.372	0	5	2.703	5.403		0	1.351	5.155	0	5	1.627	4.957	0.725	5.14	0	5	0	5	0	5	51.026229
58	0.579	5.31	0	5	2.703	5.403		0	0	5		0		0	1.449	5.28	0	5	0	5	0	5	40.992079
59	0.463	5.248	5.882	5.794	0	5		0	0	5		0		0	0.725	5.14	0	5	0	5	0	5	41.181706
60	0.695	5.372	5.882	5.794	0	5		0	1.351	5.155		0		0	0	5	6.452	4.548	0	5	0	5	40.86951
61	0.926	5.495	0	5	0	5		0	2.703	5.311		0	5.858	4.844	2.899	5.559	3.226	4.774	0	5	0	5	45.983891
62	1.482	5.793	0	5	0	5		0	2.703	5.311		0		0	1.449	5.28	0	5	0	5	0	5	41.383266
63	1.482	5.793	0	5	0	5		0	1.351	5.155		0		0	2.174	5.42	6.452	4.548	0	5	0	5	40.916103
64	0.224	5.12	0	5	0	5		0	0	5		0	0	5	0	5	0	5	0	5	0	5	45.119738
65	0.54	5.289	0	5	0	5		0	0	5		0	1.339	4.964	0.725	5.14	0	5	0	5	0	5	45.39322
66	0.54	5.289	0	5	0	5		0	0	5		0		0	0	5	3.226	4.774	0	5	0	5	40.063215
67	0.401	5.215	5.882	5.794	0	5		0	1.351	5.155		0		0	0.725	5.14	3.226	4.774	0	5	0	5	41.078274
68	0.54	5.289	0	5	0	5		0	2.703	5.311		0	3.849	4.897	0.725	5.14	0	5	0	5	0	5	45.637173
69	0.54	5.289	0	5	0	5		0	0	5		0		0	0.725	5.14	0	5	0	5	0	5	40.428877

7. CONCLUSIONS

This section sheds light on the conclusions reached by this study, which presents the relationship between the syntactic characteristics of the shopping center spaces and customer behavior. Furthermore, it identifies the most important elements relevant to the syntactic characteristics in which a direct influence exists on customer behavior and the degree of attraction or avoidance. This finding further contributes in determining the procedures through which the designer can increase the efficiency of the shopping center and possibly create more enjoyable and attractive shopping spaces for customers.

The following is a review of the main conclusions reached by this study:

- **First Group ; The Mall**

  Mall length

The study proved that a strong positive relationship exists between mall length and customer behavior, that is, a longer mall is more attractive to customers. This result corresponds with the hypothesis of the research and with many studies, which emphasized the importance of mall length and its influence on customer behavior (Alasady 2008; Fong 2003, Thomas 1990). The visual effect of long malls attracts customers because they provide visual pleasure and a feeling of continuity and diversity. Moreover, long malls imply that they are important malls and that they offer multiple choices that are attractive to customers. Long malls also encourage customers to walk through them in search of their desires. Such malls further imply that they are rich and varied unlike short malls with no sufficient visual dimension. Short malls mostly imply that they are limited and poor in terms of content, especially when they lack other stimuli that could add to their attractiveness.

Mall width

Mall width showed an insignificant effect on customer behavior. This finding is in contrast to the research hypothesis that the mall width is inversely related to its attractiveness. This finding does not correspond with the findings of various studies, such as those conducted by Alasady (2008), El-Adly (2007), Turley and Milliman (2000), Beddington (1991), and Thomas (1990), but it corresponds with Ngai (2007).

One of the most important possible reasons is the absence of relative differences among mall widths of shopping centers. By contrast, the influence of width is more obvious in commercial streets and open shopping areas, which have a large width. Extreme width in commercial streets results in visual distraction and lack of control over the two sides of the mall according to several studies. Conversely, this finding does not correspond with the shopping centers because several factors affect the mall's lack of width, such as limited area and extra cost.

- **Break length in Shopping activities**

Break length has no positive or negative significant effect on customer behavior in this study. This finding is contrary to the findings of Abdulla (1989), who confirmed the negative effect of increasing the break length, because the break length may be effective in shopping environments that rely on commercial activity. However, the case is different in shopping centers with areas that have no commercial activity. The same argument is true when the area is considered a break area, which can be occupied with entertainment and social activities, or can be nodes or Vertical circulation nodes. Furthermore, the break distances can be a visual contact area between the floors. Therefore, their effect will be different from that in commercial streets or other shopping environments with purely commercial activities.

- **Second Group; The shop**

Shop area

Shop area is one of the factors that affect customer behavior, that is, the size of a shop has a significant effect on the customer's attraction or avoidance of the shopping space. This finding corresponds with the research hypothesis and with many studies that emphasized the importance of determining the shops' sizes to strengthen the performance of the shopping center, such as Ngai (2007), Fong (2005), and Dennis (2005). The present study showed that relatively small shops with areas that range between 60–120 m^2 are considered attractive shops. Furthermore, they have a positive effect on the density of customers' circulation in the shopping space, whereas shops with an area of 12–180 m^2 are regarded as avoidance shops and have a negative effect

on the density of customers' circulation. Conversely, relatively large shops (600 m^2 and more) stimulate the positive interaction of customers, albeit at a lower degree than the relatively small shops. The extremely small shops had no significant effect on customer behavior. The current research argues that the small shops' significant effect occurs for several reasons, the most important of which is that such shops are frequently specialized and offer certain types of goods. This finding corresponds with the nature of the customer, who prefers shops that offer him the goods he needs with clear and varied choices. Furthermore, the relatively small shops provide an opportunity for other shops in the mall and eventually provide a better opportunity for the customer to compare the exhibited goods, especially when these goods are of the same type. Small shops frequently depend on exposure of their goods, thereby allowing the customer to see all the exhibited goods and offering an enjoyable and exciting experience. Such opportunity further motivates the customer to continue his shopping journey in search of what may satisfy his needs. Conversely, medium-sized shops negatively affect customer behavior mainly because of the absence of a clear identity. These shops are neither different from the small shops nor similar to the relatively large ones with various goods. The latter provides the customer with rich choices and can meet all his needs, consequently attracting him to this type of shop and making such shops his preferred places for future visits. Therefore, the existence of these shops in the mall is an added attraction for customers.

Shop Business type

The study showed that some types of shops affect customer behavior, considering that specialty shops increase customers' attraction to these shops. This finding corresponds with the study of Fong (2005). However, the other shop types showed no effect on customer behavior. The specialty shops' importance lies in the excitement they add to the mall, especially when they offer valuable products apart from the exhibited goods, such as jewelry, perfumes, and watches. Given that shopping centers mainly feature clothing stores, the presence of specialty shops is a refreshing change, and its distinction is attractive to customers.

Shop frontages

The findings showed no significant effect of the frontages on customer behavior. This finding does not correspond with the research hypothesis, which confirmed the positive effect of the area of the shop frontages on customer behavior. Furthermore, this finding does not correspond with many previous studies, such as Fong (2003), that confirm the importance of the frontages in attracting customers. Frontages are a non-significant variable, yet this does not mean that this variable is unimportant, because frontages are considered the attracting factors in shopping centers. The importance of the frontages and their effect on customer behavior may appear in the degree of variety, the method by which goods are exhibited, but not in increasing the area of these frontages. Given that the research addresses the area of the frontages, the area of the frontages can be considered to have no positive or negative significant effect on customer behavior.

- **Third Group**

Magnet point

Results showed the positive effect of the magnets on customer behavior. More magnets correspond to increased attractiveness of the space to customers because the magnet points entail adding economic, entertainment, and social activities to the shopping space other than commercial activities. As a result, customers will spend more time in the shopping center, and shopping centers can then expect customers to visit again in the future. In this research, movie theaters, restaurants, play areas, and cafés were employed as magnets. They all affected customer behavior significantly, thereby suggesting that one or more of these activities in any mall will attract customers. The attraction power of the mall increases when the magnet points are positioned in the middle of the mall. The positive effect decreases at the extremities of the mall where the mall loses part of its attractiveness.

Nodes

Results showed that the position of the nodes has a significant effect on customer behavior. When the nodes are far from the mall center and closer to the extremities,

customers will be more inclined to keep walking in these malls. This finding may be explained by the nature of these nodes, which represent stable points used as stations for interaction. Furthermore, they are considered resting spots and circulation points from and to the mall. Therefore, they are regarded as magnets, which imply the promise of a comfortable space for the customer as he walks in the mall. This suggestion stimulates the customer to spend time in the mall, especially when he knows that he will have a place to rest. Thus, these nodes represent a magnet from which a customer sets out or returns. Furthermore, these nodes encourage visual exploration, thereby serving as an additional magnet for the mall's extremities. Hence, the findings of the research correspond with the initial hypothesis that the nodes have a significant effect, as well as with the study of Redstone (1973).

Vertical circulation elements

The position of Vertical circulation elements help to determine the nature of customers' behavior, given that these elements connect the various floors and facilitate vertical transfer between levels. Therefore, most studies, such as Ngai (2007), stressed the importance of these elements. The current study confirmed the importance of the Vertical circulation elements to customer behavior. When the element is located in the middle or close to the center, it will be a stimulating factor to attract the customer, which encourages him to slow down and enjoy viewing the displays in the mall. This position further allows him to see where he can move to another level. The positioning of these elements in the center encourages the customer to enter the mall from various directions. This positioning enables displays to attract the customer and motivates him to stay for the longest time. The attraction decreases when elements are far from the mall center, because the customer then will be prompted to move to where he can transfer to other levels. This position may prevent him from enjoying the goods in the mall, especially when he enters from the direction close to the position of Vertical circulation elements.

As mentioned earlier, the syntactic characteristics of the shopping environment can be concluded, in one way or another, to affect customer behavior. This influence varies according to several factors, including the customers' nature according to the society in which they live. Hence, this influence and effect vary with the syntactic

characteristics. Most studies emphasized the vital role of the shopping centers and the progress they achieved in the world of economics and design. For the first time in the history of shopping environments, these centers brought commercial activities together with cultural, social, and entertainment activities in one environment. Hence, the shopping center has become a cultural, entertainment, and educational environment, apart from being an environment for commercial trade. The center notably includes restaurants, cafés, play areas, cinemas, theaters, and libraries in addition to the shops. Therefore, the shopping center can be a gravity pole per se when it suits the nature of the customer and when it possesses the elements that stimulate positive behavior. The procedures and the methods to increase attractiveness in shopping centers in general were identified by the results of this study. The effectiveness of the malls was increased particularly to attract customers, which will eventually improve the performance of the shopping center and provide an entertaining atmosphere. The following measures may help to control the attractiveness or the avoidance of the Iraqi customer depending on the results obtained by the practical study on shopping centers in Erbil, Iraq:

- Focused attention should be given to malls when designing shopping centers, and attempts should be made to avoid frequently repellent short malls. A longer mall is considered best for shopping; a mall length of more than 90 m is preferred for customers to consider the mall an attractive one.
- Attention should be given to the importance of the shopping centers' entrances. These entrances should be positioned carefully because they play a key role in increasing the customers' attraction to these malls. These entrances should be easily accessible because they are the gates through which the customer enters the shopping environment. Therefore, their position highly influences the reaction of the customer to the center. Furthermore, the malls in which the entrances are located will be the focus and interest for the customer.
- The shop area should be given attention, and undesired areas should be avoided. Relatively small shops (61–120 m^2) are attractive because they frequently meet the needs of customers. Thus, the focus should be on these small shops, which should be distributed in attractive areas. The large shops (>250 m^2) are important because they contain a variety of goods, which is why they are preferred by customers.

Therefore, these shops are located in the center of malls, where they serve as effective magnets.

- Medium-sized shops (12–200 m^2) are avoided by customers, thereby affecting the performance of the mall. They are undesirable to customers because they are not distinct, that is, they are unlike small, customized shops, which meet customers' immediate needs, and large ones, which offer excitement and enjoyment). Therefore, the medium-sized shops should be avoided to ensure an attractive mall.
- Specialty shops increase the attraction power of the mall. Thus, focusing on this type of shops is preferred because they attract customers and enhance the liveliness and variety of the mall, thereby making it an interesting place. Specialty shops should constitute at least 20% of the total number of shops to ensure that the mall offers variety and enjoyment. Conversely, domestic item shops can have a negative effect to a certain degree. Thus, they should constitute only 5% of the total number of shops.
- Nodes in the mall increase the mall's attractiveness because they provide inspiration to the customers as social meeting spots or resting areas given that they represent the starting points for the customer. The position of these nodes has a significant influence on the mall's attractiveness. When these nodes are far from the middle of the mall, they become more attractive because they motivate the customer to walk in that mall and to enjoy the shopping experience. Therefore, the nodes need to be designed carefully. Their position should not be less than 0.8 from the middle of the mall (see Chapter VI for the paragraph on calculating node position). These nodes should be positioned attractively and effectively because they represent the attractive visual foci of the mall.
- Nodes of the Vertical circulation elements are an important attraction point to the customer because they enable him to move between various levels. Therefore, their position in the mall is important. These elements become more attractive the closer they are to the mall center. The position of stairs helps attract the customer to walk and enjoy in these malls before he considers moving vertically. To increase the effectiveness of the mall, the Vertical circulation elements should be located no more than 0.2 from the middle of the mall (see Chapter VI for the paragraph on calculating the position of Vertical circulation elements).

- The magnet points and their position have an effect on the mall because the mall's attractiveness increases when these magnets are close to the center, and the mall becomes less attractive when the magnets are close to the extremities. In this case, the mall becomes less attractive than the magnet itself. Thus, at least one magnet point should be positioned to increase the attraction power of the mall. The second magnet point (if it exists) should be positioned closer to the center of the mall, thereby supporting the mall's attractiveness.

- **Recommendations**

By reviewing the conclusions in this study, the importance of the syntactic characteristics, and their role in affecting customer behavior, this research presents the following key recommendations:

- The positive and the negative effects of some syntactic characteristics of the shopping center layouts represented by the length of the mall, entrances, magnets, the positions of the Vertical circulation elements, position of the nodes, shop area, and the type of the goods should be considered to design attractive shopping spaces. Careful attention should be given to these elements in the future to build shopping centers that meet customers' needs while simultaneously providing enjoyable and attractive spaces. Attempts should be made to prevent creating spaces characterized with avoidance.
- The problems of some shopping spaces may be mitigated by avoiding certain syntactic characteristics. Particular mitigation measures or additional changes are possible depending on the findings of this research related to the syntactic characteristics, which effectively influence the positive behavior of the customer.
- Emphasis should be given to the significance of studying customer behavior in determining the form and the nature of the shopping centers in a way that creates a suitable, attractive, and interesting environment. This approach will reflect on the center performance and increase visits. This research can be used in identifying and investigating the syntactic characteristics that can influence customer behavior positively and benefit from them.
- This study focused on testing the hypothesis on Iraqi customer behavior and the degree to which it is influenced by syntactic characteristics of shopping centers.

Furthermore, this study aimed to test the effect of changing the social environment on customer behavior and its relationship with the syntactic characteristics. The research recommends conducting a comparative study on the countries in the region to explore the change in the effect degree and effect type of syntactic characteristics on customer behavior caused by his changing social and cultural environment.

- This research further addressed the effect of the syntactic characteristics of shopping center layouts on customer behavior. However, it did not address the effect of other shopping environment factors, such as lighting, color, and exterior decoration, on customer behavior. Thus, this research suggests discussing these factors in future research.
- This research is interested in studying the covert behavior of the customer, which is expressed in the conduct of approach behavior and avoidance behavior. Furthermore, it did not address cognitive and physiological influences on customer behavior in the shopping environment. Accordingly, this research suggests studying the cognitive characteristics of the shopping environment and their influence on customer behavior.

REFERENCES

Abdulla, Nahith Taha (1989). Analytical study of shopping ribbons structure in Mosul city. Techonolgy- Iraq.

Alasady, F. R. H. (2008). Integrative control of the inner environment in major shopping centers. Baghdad- Iraq.

Al-Dewachi, M. H. (1989). Urban renewal of mosuls traditional suqs. Mosul-Iraq.

Alexander, M. (1972). Designing interior environment. New York: Harcourt brace jovanovich.

Amato, P. R., & Mcinnes, I. R. (1983). Affiliative behavior in diverse environments: A consideration of pleasantness, Information rate, and the Arousal-Eliciting quality of settings. Basic and Applied Social Psychology, 4(2), 109–122.

Applebaum, W. (1951). Studying customer behavior in retail stores. Marketing, 16(2), 172–179.

Appleyard, D. (1976). Planning a pluralist city : Conflicting realities in ciudad guayana. Cambridge Mass.: Mit Press.

Armstrong, G., & Kotler, P. (2003). Marketing : An introduction. Upper saddle river nj: Prentice Hall.

Babin, B. J., Hardesty, D. M., & Suter, T. A. (2003). Color and shopping intentions: The intervening effect of price fairness and perceived affect. Journal of Business Research, 56(7), 541–551.

Bagozzi, R. P. (1992). The self-regulation of attitudes, intentions, and behavior. Social Psychology Quarterly, 178–204.

Baker, J., & Cameron, M. (1996). The Effects of the service environment on affect and consumer perception of waiting time : An integrative review and research propositions. Journal of the Academy of Marketing Science, 24(4), 338–349.

Banat, A., & Wandebori, H. (2012). Store design and store atmosphere effect on customer sales per visit. 2nd International Conference on Business, Economics, Management andBehavioral Sciences, 84–89.

Barker, R. (1968). Ecological psychology concepts and methods for studying the environment of human behavior. Stanford Calif.: Stanford University Press.

Batı, U. (2007). The social semiotics of shopping centers as consumption cathedrals: the sample of ‘forum bornova shopping center. Uluslararası Insan Bilimleri Dergisi, (1303-5134), 1–17.

Bechtel, R. (1977). Enclosing behavior. Stroudsburg Pa.: Dowden Hutchinson & Ross.

Beddington, N. (1991). Shopping centres : Retail development, design, and management. Oxford [England] ,Boston: Butterworth Architecture.

Bednar, M. J. (1989). Interior pedestrian places. New York: Watson-Guptill.

Bell, P. (1996). Environmental psychology. Fort Worth: Harcourt Brace College Publishers.

Bellizzi, Joseph A., Crowler, Ayn E., & Hasty, Ronald W. (1983). The effects of color in store design. Retailing, 59(1), 21–45.

Bennett, R. M. (1962). Planning shopping center for pedestrians. inJ. S. Hornbeck (Ed.), Stores and shopping centers (Pp. 92–94). New York: Mcgraw-Hill.

Benson, A. (2008). To buy or not to buy : Why we overshop and how to stop. Boston: Trumpeter.

Bently, I., Alcock, A., Murrain, P., Mcglynn, S., & Smith, G. (1985). Responsive environments. Architectural Press, London: First Published 1985 Reprinted 1987, 1992, 1993, 1994, 1997, 1998, 1999,2001,2003,2005.

Bitner, M. J. (1992). The impact of physical surroundings on customers and employees. Journal of Marketing, 56(2), 57–71.

Björkqvist, N. (2015). The shop-in-shop concept case study kari aukia oy. Applied Sciences.

Bloch, P. H., Ridgway, N. M., & Dawson, S. A. (1994). The shopping mall as consumer habitat. Journal of Retailing, 70(1), 23–42.

Bogovic, A., Mihanovic, M., Jokic-Begic, N., & Svagelj, A. (2013). Personal space of male war veterans with posttraumatic stress disorder. Environment and Behavior.

Brebner, J. (1982). Environmental psychology in building design. Elsevier Science Ltd (July 1982)

Brehm, S., & Brehm, J. (1981). Psychological Reactance : A theory of freedom and control. New York: Academic Press.

Broto, C. (2006). New shopping malls. (W. George & M. Rojals, Eds.) (illustrate). Links, 2006.

Brown, S. (1992). Tenant mix, tenant placement and shopper behaviour in a planned shopping centre. The Service Industries Journal, 12(3), 384–403.

Camp, J. M. K. (2003). The Athenian agora. The American School of Classical Studies At Athens in Collaboration With The Packard Humanities Institute.

Campbell, J. M. (1983). Ambient stressors. Environment and Behavior, 15(3), 355–380.

Canitez, T., Canitez, I. S., & Ilhan, N. (2009). Edirne historical center : Evolution and preservation values. Trakia Journal of Sciences, 7, 215–220.

Chebat, J. C., & Michon, R. (2003). Impact of ambient odors on mall shoppers' emotions, cognition, and spending: A test of competitive causal theories. Journal of Business Research, 56(7), 529–539.

Chebat, J. C., & Morrin, M. (2007). Colors and cultures: Exploring the effects of mall d??cor on consumer perceptions. Journal of Business Research, 60(3), 189–196.

Choudhury, A., Alam, M. I., & Islam, S. (2014). Customers' Attitude towards shopping malls : A Study on bashundhara city shopping mall, 2012(15).

Coleman, P. (2007). Shopping environments: Evolution, planning and design. UK: Elsevier Science & Technology Books.

Cottom, M. (1995). Architecture and technology : The best of environmental design. Glen Cove NY: Pbc International.

Cox, K.(1964). The responsiveness of food sales to shelf space changes in supermarkets. Marketing Research, 1(2), 63–67.

Cox, K. (1970). The effect of shelf space upon sales of branded products. Marketing Research, 7(1), 55–58.

Crowley, A. E. (1993). The two-dimensional impact of color on shopping. Marketing Letters, 4(1), 59–69.

Darlow, C. (1972). Enclosed shopping centres. London: Architectural Press.

Darnton, A. (2008). GSR behaviour change knowledge review: overview of behaviour change models and their uses. Government Social Research Unit, London.

Davidoff, L. L. (1980). Introduction to psychology. Mcgraw-Hill Inc., Us; 2nd Revised Edition Edition (Mar. 1980).

Dawson, J. (1983). Shopping centre development. London: Longman.

Dennis, C. (2005). Objects of Desire: Consumer behaviour in shopping centre choices. New York: Houndmills, Basingstoke, Hampshire ; New York : Palgrave Macmillan, 2005.

Dennis, C., Newman, A., Michon, R., Josko Brakus, J., & Tiu Wright, L. (2010). The mediating effects of perception and emotion: Digital signage in mall atmospherics. Journal of Retailing and Consumer Services, 17(3), 205–215.

Dhruv Grewal, Julie Baker, Michael Levy, G. B. V. (2003). The effects of wait

expectations and store atmosphere evaluations on patronage intentions in service-intensive retail stores. Retailing - J Retail, 79(4), 259–268.

Dion, D. (1999). A theoretical and empirical study of retail crowding. E - European Advances in Consumer Research, 4, 51–57.

Downs, A. (1967). A theory of consumer efficiency. Social Issues in Marketing : Readings for Analysis.

Dubé, L., & Morin, S. (2001). Background music pleasure and store evaluation: Intensity effects and psychological mechanisms. Journal of Business Research, 54(2), 107–113.

El-Adly, M. I. (2007). Shopping malls attractiveness: A segmentation approach. International Journal of Retail & Distribution Management, 35(11), 936–950.

Elgalali, O. A. (1978). Design factors influencing pedestrian movement patterns. British Columbia.

Erdmann, K., & Erdmann, H. (1976). Das anatolische karavansaray. Jahrhunderts. (Berlin).

Fadel, R. (1982). Social interaction as a determinant in the design of the arab city. The Arab City: Its Character and Islamic Cultural Heritage, 62–70.

Fong, P. (2003). What makes big dumb bells a mega shopping mall?. Proceedings of The 4th International Space Syntax .

Fong, P. (2005). A study of store location patterns inside enclosed shopping environments. 5th International Space Syntax Symposium, 103–116.

Foster, S., Giles-Corti, B., & Knuiman, M. (2011). Creating safe walkable streetscapes: Does house design and upkeep discourage incivilities in suburban neighbourhoods? Journal of Environmental Psychology, 31(1), 79–88.

Garg, A. K., & Steyn, S. (2015). The ideal tenant mix and shopping centre size for the proposed thatchfield convenience centre. International Journal of Business and Management, 10(1), 243–257.

Garip, E. (2009). Examining consumers spatial behavior in retail stores in the framework of Space Syntax. Istanbul Teknik Üniversitesi

Geist, J. F. (1985). Arcades: the History of a Building Type.

Gharipour, M. (2012). The Bazaar in the islamic city: design, culture, and history on jstor. American University in Cairo Press.

Gibberd, F. (1967). Town design. New York: Praeger.

Gibson, J. (1979). The ecological approach to visual perception. Boston: Houghton Mifflin.

Gifford, R. (2007). Environmental psychology : principles and practice. [Place of Publication Not Identified]: Optimal Books.

Gifford, R., Steg, L., & Reser, J. P. (2011). Environmental psychology. in Wiley-Blackwell Iaap Handbooks of Applied Psychology (Pp. 440–470). Graham, G. (2000). Behaviorism. Retrieved September 1, 2015, From Http://Plato.Stanford.Edu/Entries/Behaviorism/

Greenbie, B. (1976). Design for diversity : planning for natural man in the neo-technic environment : an ethological approach. Amsterdam ;New York: Elsevier Scientific Pub. Co.

Greeno, J. G. (1994). Gibson's affordances. Psychological Review, 101(2), 336–342.

Grillo, P. J. (1975). Form, Function, and Design.

Grossbart, S. L., Mittelstaedt, R. A., Curtis, W. W., & Rogers, R. D. (1975). Environmental sensitivity and shopping behavior. Journal of Business Research, 3(4), 281 – 294.

Gruen, V. (1965). Shopping towns, usa : the planning of shopping centers, by victor gruen and larry smith. New York: Reinhold Pub. Corp.

Gruen, V. (1973). Centers for the urban environment survival of the cities. New York,: Van Nostrand Reinhold Co.

Grunebaum, G. E. Von. (1961). "The structure of the muslim town" Islam: Essays in the Nature and Growth of a Cultural Tradition. American Anthropologist (Vol. 57). Longman.

Hall, E. T. (1974). Meeting man's basic special need in artificial environment (Designing). Pennsylvania, USA.

Hall, E. T. (1990). The Hidden Dimension (Reprint, R). Anchor Books, 1990.

Hawley, A. (1950). Human ecology : a theory of community structure. New York: Ronald.

Herzberg, F., Mausner, B., & Snyderman, B. B. (2011). The motivation to work. transaction . Originally Published :New York Wiley 1959.

Hester, R. (2010). Design for ecological democracy. Cambridge Mass. London: Mit Press.

Hill, D. R. (1992). Sustainability, Gruen,Victor, and the cellular metropolis. Journal of

the American Planning Association, 58(3), 312–326.

Hillenbrand, R. (2004). Islamic architecture: form, function, and meaning (illustrate). Columbia University Press, 2004.

Hosseini, Z., & Jayashree, S. (2014). Influence of the store ambiance on customers' behavior—apparel stores in Malaysia. International Journal of Business and Management, 9(10), 62–69.

Hu, H., & Jasper, C. R. (2010). a Revisit of the theoretical model of store image and its application to chinese consumers. Journal of International Consumer Marketing, 22(2), 81–93.

Huddleston, J. (1993). Perspectives, purposes, and brotherhood: a spiritual framework for a global society. S. Bushrui, I. Ayman, & E. Laszlo, Transition to a Global Society, 142–150.

Huff, D. (1966). A Programmed solution for approximating an optimal retail solution, Land Economics, 42(3), 293–303.

Hui, M., & Bateson, J. E. G. (1991). Perceived crowding on control and and consumer the effects choice of the experience. Journal of Consumer Research, 18(2), 174–184.

Huitt, W. (1999). Conation as an important factor of mind. educational psychology interactive. Retrieved September 1, 2015.

Huitt, W. (2003). The Affective system: educational psychology interactive. Retrieved August 25, 2015.

Huitt, W. (2009). A systems approach to the study of human behavior. Educational Psychology Interactive.

Huitt, W. (2012). A systems approach to the study of human behavior. Educational Psychology Interactive. Retrieved September 10, 2015.

Hutchison, E. D. (2011). Dimensions of human behavior: person and environment. SAGE Publications; 4th edition (September 29, 2010)

Jacobs, J. (1961). The death and life of great American cities. New York: Vintage Books.

Jang, S. (S), & Namkung, Y. (2009). Perceived quality, emotions, and behavioral intentions: application of an extended mehrabian-russell model to restaurants. Journal of Business Research, 62(4), 451–460.

Jeffrey, P., & Mark, G. (1998). constructing social spaces in virtual environments: a

study of navigation and interaction. Workshop on Personalised and Social Navigation in Information Space, 24–38.

Kearney, T. (2012). Incorporating environmental stimuli into the service profit chain in a retail grocery context : a structural equation modelling approach . Dublin Institute of Technology

Keisidou, E., Sarigiannidis, L., & Maditinos, D. (2011). Consumer characteristics and their effect on accepting online shopping, in the context of different product types. International Journal of Business Science and Applied Management, 6(2), 31–51.

Khavari, K. (2000). Spiritual intelligence : a practical guide to personal happiness. New Liskeard Ont.: White Mountain.

Kirsh, D. (1995). The intelligent use of space department. British Dental Journal, 73, 31–68. Retrieved From 73, 31–68

Kocaili, B. E. (2010). Evolution of shopping malls: recent trends and the question of regeneration. Çankaya University.

Kong, E. M., & Kim, Y. O. (2013). Examination of spatial characteristics influencing sales by tenant types in shopping malls. in Proceedings of the Ninth International Space Syntax Symposium, (Pp. 1–17). Seoul.

Koolhaas, R. (2001). Crystal palace, harvard design school guide to shopping. Harvard Design School. Kotler, P. (1974). Atmospherics As a Marketing Tool. J Retailing, 49(4), 48–64.

Kotzan, J. A., & Evanson, R. V. (1969). Responsiveness of drug store sales to shelf space allocations. Marketing Research, 6(4), 465–469.

Kruse, H. (2003). Social Interaction, the arrangement of interior space, and racetrack renovation. Journal of Sport & Social Issues, 27(4), 330–345.

Lam, S. Y. (2001). The Effects of store environment on shopping behaviors. Na - Advances in Consumer Research, 28, 190–197.

Lang, J. (1987). Creating architectural theory : The role of the behavioral sciences in environmental design. New York: Van Nostrand Reinhold Co.

Larson, J. S., Bradlow, E. T., & Fader, P. S. (2005). An exploratory look at supermarket shopping paths. International Journal of Research in Marketing, 22(4), 395–414.

Lazarus, R. (1966). Psychological stress and the coping process. New York: Mcgraw-Hill.

Leavitt, H. J., Pondy, L. R., & Boje, D. M. (1989). Readings in managerial psychology. University of Chicago Press.

Lekagul, A. (2002). Toward preservation of the traditional marketplace: a preference study of traditional and modern shopping environments in Bangkok, Thailand. Virginia Polytechnic Institute and State University

Lewin, K. (1951). Field theory in social science. New York: Harper.

Li, C. (2010). A facility layout design methodology for retail environments. Pittsburgh.

Lindsay, J., M. (2015). Environmental stimulation and environmental psychology | psychology today. Retrieved September 14, 2015.

Liu, Y., & Jang, S. (Shawn). (2009). The effects of dining atmospherics: an extended mehrabian-russell model. International Journal of Hospitality Management, 28(4), 494–503.

Lockton, D. (2012). Attitudes, Meaning, Emotion and Motivation in design for behaviour change. Ssrn Electronic Journal, 1–15.

Lockton, D. (2013). Design with intent for environmental & social.

Mackeith, M. (1986). The history and conservation of shopping arcades. Mansell, London.

Maitland, B. (1990). The new architecture of the retail mall. New York: Pearson Education Ltd.

Manikandan, K., & Rajamohan, A. (2014). Consumer's need for uniqueness in buying small cars. Journal of Management Policies and Practices 2(1), 135–146.

Maslow, A. H. (1970). Motivation and personality. New York: Harper & Row.

Massicotte, M. C., Michon, R., Chebat, J. C., Joseph Sirgy, M., & Borges, A. (2011). Effects of mall atmosphere on mall evaluation: Teenage versus adult shoppers. Journal of Retailing and Consumer Services, 18(1), 74–80.

Mattila, A. S., & Wirtz, J. (2001). Congruency of scent and music as a driver of in-store evaluations and behavior. J Retailing 2001;77, 273–289.

Mcandrew, F. (1993). Environmental psychology. Pacific grove calif. Brooks/Cole.

Mcgoldrick, P. J., & Pieros, C. P. (1998). Atmospherics, pleasure and arousal: The influence of response moderators. Journal of Marketing Management, 14(1-3), 173–197.

Mehrabian, A., & Russell, J. A. (1974). An approach to environmental psychology. the Mit Press.

Mehta, V. (2006). Lively streets: Exploring the relationship between built environment and social behavior. University of Maryland.

Michon, R., Chebat, J. C., & Turley, L. W. (2005). Mall atmospherics: The interaction effects of the mall environment on shopping behavior. Journal of Business Research, 58(5), 576–583.

Miller, A. (1991). Personality Types, Learning Styles and Educational Goals. Educational Psychology, 11(3-4), 217–238.

Mischel, W. (1996). From good intentions to willpower. The psychology of action, Gollwitzer, P.,&Bargh, J. (Eds.)., Guilford, New York, pp. 197–218.

Mohan, G., Sivakumaran, B., & Sharma, P. (2012). Store environment's impact on variety seeking behavior. Journal of Retailing and Consumer Services, 19(4), 419–428.

Morrison, K. (2003). English shops and shopping: an architectural history. Paul Mellon Centre, UK.

Morrison, M., Gan, S., Dubelaar, C., & Oppewal, H. (2011). In- store music and aroma influences on shopper behavior and satisfaction. Journal of Business Research, 64(6), 558–564.

Moye, L. N. (2000). Influence of shopping orientations, selected environmental dimensions with apparel shopping scenarios, and attitude on store patronage for female consumers. Virginia Polytechnic Institute and State University.

Mumford, L. (1961). The city in history: Its origins, its transformations, and its prospects. New York: Harcourt, Brace & World,.

Na'ama, J. M. (2007). The impact of color of inner - Spaces in shopping activity of trade - buildings. Technology-Iraq.

Neisser, U. (1976). Cognition and reality : Principles and implications of cognitive psychology. San Francisco: W.H. Freeman.

Newman, A. J. (2007). Uncovering dimensionality in the servicescape: Towards Legibility. The Service Industries Journal, 27(1), 15–28.

Newman, O. (1972). Defensible space : Crime prevention through urban design. New York: Macmillan.

Ngai, L. K. (2007). The determinants of shopping centre performance: A regressive-expert system. Hong Kong.

Norman, D. A. (1980). Twelve issues for cognitive science. Cognitive Science, 4(1), 1–32.

Northen, R. (1977). Shopping centres : A developer's guide to planning and design. Reading, College of Estate Management

Ozdemir, A. (2008). Shopping malls: Measuring interpersonal distance under changing conditions and across cultures. Field Methods, 20(3), 226–248.

Ozdemir, A. (2005). An exploratory study of interpersonal distances and perceived spaciousness and crowding in four shopping malls across two cultures. North Carolina. State University.

Penn, A. (2005). The complexity of the elementary interface: Shopping space. Proceedings 5th International Space Syntax Symposium, 1–18.

Pevsner, N. (1976). A History of building types (A. W. Mellon Lectures in the Fine Arts). Princeton Univ Pr.

Pons, F., Laroche, M., & Mourali, M. (2006). Consumer reactions to crowded retail settings: Cross-Cultural differences between north america and the middle east. Psychology & Marketing, 23(7), 555–572.

Ramlee, N., & Said, I. (2014). Review on atmospheric effects of commercial environment. Procedia - Social and Behavioral Sciences, 153, 426–435.

Rapoport, A. (1977). Human aspects of urban form : Towards a man-environment approach to urban form and design. Oxford ;New York : Pergamon Press,.

Rapoport, A. (1983). The meaning of the built environment : A nonverbal communication approach. Beverly Hills ; London ;New Delhi: Sage Publications.

Razaq, A. S. A. W. A. (2011). Rehabilitating historical path of suq al-shorgah in baghdad. Baghdad.

Redstone, L. (1973). New dimensions in shopping centers and stores. New York: Mcgraw Hill.

Reisinger, Y. (2008). International tourism: Cultures and behavior. Phd Proposal. Linacre House, Jordan Hill, Oxford OX2 8DP, UK

Russell, J. A., & Mehrabian, A. (1978). Approach-Avoidance and affiliation as functions of the emotion-eliciting quality of an environment. Environment and Behavior, 10(3), 355–387.

Russell, J. A., & Pratt, G. (1980). A Description of the affective quality attributed to environments. Journal of Personality and Social Psychology, 38(2), 311.

Ryu, K., & (Shawn) Jang, S. (2008). Dinescape: A scale for customers' perception of dining environments. Journal of Foodservice Business Research, 11(1), 2–22.

Ryu, K., & Han, H. (2011). New or repeat customers: How does physical environment influence their restaurant experience?. International Journal of Hospitality Management, 30(3), 599–611.

Ryu, K., & Jang, S. S. (2007). The Effect of environmental perceptions on behavioral intentions through emotions: The case of upscale restaurants. Journal of Hospitality & Tourism Research, 31(1), 56–72.

Salehinia, M., & Memarian, G. (2012). Sociopetaloid of architecture space ; synthesis and synomorphy of humane-physical factors. International Journal of Architectural Engineering & Urban Planning, 22(1), 7–19.

Salvadori, R. (1990). Architect's guide to paris, Butterworth Architecture, UK.

Santee, R. T. (1979). Commitment to Self-Identification: A sociopsychological approach to personality. Human Relations, 32(2), 141–158.

Scarantino, A. M. (2002). Affordances explained. Philosophy of Science, 70(5), 949–961.

Scott, N. K. (1989). Shopping centre design. Van Nostrand Reinhold.

Sears, D., & Auld, R. (1976). Design and attitudes to the environment. Environment and Planning B: Planning and Design, 3(2), 237–246.

Sharma, A., & Stafford, T. F. (2000). The Effect of retail atmospherics on customers' perceptions of salespeople and customer persuasion: An empirical investigation. Journal of Business Research, 49(2), 183–191.

Sims, E. (1978). Trade and travel: Markets and caravansary. in G. Michell (Ed.), Architecture of the Islamic World - Its History and Social Meaning (Thames And, Pp. 80–111). London.

Singh, H., & Prashar, S. (2014). Anatomy of shopping experience for malls in mumbai: A confirmatory factor analysis approach. Journal of Retailing and Consumer Services, 21(2), 220–228.

Smith, P., & Burns, D. J. (1996). Atmospherics and retail environments: The case of the "Power Aisle." International Journal of Retail & Distribution Management, 24(1), 7–14.

Smith, P. C., & Curnow, R. (1966). "Arousal Hypothesis" and the effects of music on purchasing behavior. Applied Psychology, 50(1), 255–256.

Sommer, R. (1969). Personal space the behavioral basis of design. Englewood Cliffs N.J.: Prentice-Hall.

Spangenberg, E. R., Crowley, A. E., Henderson, P. W., Spangenberg, E. R., Crowley, A. E., & Henderson, P. W. (1996). Improving the store environment : do olfactory cues affect evaluations and behaviors ?. Marketing, 60(2), 67–80.

Spangenberg, E. R., Sprott, D. E., Grohmann, B., & Tracy, D. L. (2006). Gender-Congruent ambient scent influences on approach and avoidance behaviors in a retail store. Journal of Business Research, 59(12), 1281–1287.

Speller, G. (2006). A Place of my own. Green Places, (23), 18 – 21.

Spies, K., Hesse, F., & Loesch, K. (1997). Store atmosphere, mood and purchasing behavior. International Journal of Research in Marketing, 14(1), 1–17.

Steele, F. (1973). Physical settings and organization development. Reading Mass.: Addison-Wesley Pub. Co.

Summers, T. A., & Hebert, P. R. (2001). Shedding some light on store atmospherics: Influence of illumination on consumer behavior. Journal of Business Research, 54(2), 145–150.

Sundel, M., & Sundel, S. S. (2004). Behavior change in the human services: Behavioral and cognitive principles and applications. Sage Publications.

Taghizadehvahed, N. (2015). A Comparative study of covered shopping spaces: Covered bazaars, Arcades, Shopping malls. Middle East Technical University.

Tai, S. H. C., & Fung, A. M. C. (1997). Application of an environmental psychology model to in-store buying behaviour. The International Review of Retail, Distribution and Consumer Research, 7(4), 311–337.

Teller, C., & Reutterer, T. (2008). The evolving concept of retail attractiveness: what makes retail agglomerations attractive when customers shop at them?. Journal of Retailing and Consumer Services, 15(3), 127–143.

Turley, L. ., & Milliman, R. E. (2000). Atmospheric effects on shopping behavior. Journal of Business Research, 49(2), 193–211.

Veitch, R., & Arkkelin, D. (1995). Environmental psychology : An interdisciplinary perspective. Englewood Cliffs N.J.: Prentice Hall.

Verdil, A. (2009). Transformation of space behavior relation: A case study of shopping centers in Istanbul. Space Syntax Symposium, 1–12.

Vida, I., Obadia, C., & Kunz, M. (2007). The effects of background music on consumer responses in a high-end supermarket. The International Review of Retail, Distribution and Consumer Research, 17(5), 469–482.

Vilar, E., Rebelo, F., Noriega, P., Teles, J., & Mayhorn, C. (2013). The influence of environmental features on route selection in an emergency situation. Applied Ergonomics, 44(4), 618–627.

Vouk, R. (2005). Exploring the relationships between store patronage motives and

purchasing outcomes for major shopping trips in the croatian, 56(9), 634–657.

Wajeeh, S. M. (2010). Multi-Sensory Responsive Architecture. University of Technology-Iraq.

Wajeeh, S. M., & Abbas, S. S. (2010). The role of multi sensory responsive architecture in forming distinctness images at interior spaces. The Iraqi Journal of Architecture, 6(19-20-21), 363–383.

Wakefield, K. L., & Baker, J. (1998). Excitement at the mall : Determinants and effects on shopping response. Retailing, 74(4), 515–539.

Wanninayake, W. M. C. B. (2007). The impact of visual merchandising on consumer store choice decisions in sri lankan supermarkets. In 7th Global Conference on Business & Economics, Isbn (Pp. 1–18).

Wirth, E. (1975). Zum problem des bazars (Suq, Çarsi). Der Islam; Zeitschrift Für Geschichte Und Kultur Des Islamischen Orients, 52(0021-1818), 203–260.

Wiseman, K. (2009). Reframing the urban food system through the promotion of urban ecological planning perspectives at the village market, winnipeg. University of Manitoba.

Witherspoon, R., Abbett, J. P., Gladstone, R. M., & Institute, U. L. (1976). Mixed-Use Developments: New Ways of Land Use.

Yakup, D., & Jablonsk, S. (2012). Integrated approach to factors affecting consumers purchase behavior in poland and an empirical study. Global Journal of Management and Business Research, 12(15).

Yakup, D., Mucahit, C., & Reyhan, O. (2011). The impact of cultural factors on the consumer buying behaviors examined through an impirical study. International Journal of Business and Social Science, 2(5), 109–114.

Yalch, R. F., & Spangenberg, E. (1993). Using store music for retail zoning. Advances in Consumer Research, 20, 632–636.

Yildirim, K., Akalin-Baskaya, A., & Hidayetoglu, M. L. (2007). Effects of indoor color on mood and cognitive performance. Building and Environment, 42(9), 3233–3240.

Yoo, C., Park, J., & Macinnis, D. J. (1998). Effects of Store characteristics and in-store emotional experiences on store attitude. Journal of Business Research, 42(3), 253–263.

Yuo, T. S.-T., Crosby, N., Lizieri, C. M., & Mccann, P. (2003). The Management of positive inter-store externalities in shopping centres: Some empirical evidence. in

the european real estate society 2003 (Pp. 1–22). Helsinki, Finland.

Zemke, D. M. V, & Shoemaker, S. (2007). Scent across a crowded room: Exploring the effect of ambient scent on social interactions. International Journal of Hospitality Management, 26(4), 927–940.

APPENDICES

APPENDIX (A) : *Previous Studies*

	Shop layout	Product categories	Sound	scent	Colour	lighting	Frontage	Temperature	Furnishings	External Variables	Crowding	Personal space	layout	Aesthetic
Cox (1964)	■													
Smith & Curnow (1966)			■											
Kotzan & Evanson (1969)	■	■												
(Elgalalı, 1978)												■		
(Bellizzi, Crowler, & Hasty, 1983)					■									
(Dawson, 1983)												■		
(Hui & Bateson, 1991)			■	■	■	■		■			■	■		
(Bitner, 1992)	■	■	■	■	■	■	■	■	■	■	■	■		
(Yalch & Spangenberg, 1993)			■							■				
(Crowley, 1993)					■									
(P. Smith & Burns, 1996)	■													
(Spangenberg et al., 1996)			■											
(Wakefield & Baker, 1998)												■		
(Yoo, Park, & MacInnis, 1998)	■		■			■		■				■		
(Moye, 2000)	■		■											
(Mattila & Wirtz, 2001)			■	■										

	Shop layout	Product categories	Sound	scent	Colour	lighting	Frontage	Temperature	Furnishings	External Variables	Crowding	Personal space	layout	Aesthetic
(Summers & Hebert, 2001)						■								
(Dubé & Morin, 2001)			■											
(Babin, Hardesty, & Suter, 2003)					■	■								
(Dhruv Grewal, Julie Baker, Michael Levy, 2003)			■											
(Chebat & Michon, 2003)				■										
(Michon et al., 2005)				■										
(Ozdemır, 2005)												■		
(Larson, Bradlow, & Fader, 2005)	■													
(Michon et al., 2005)			■	■								■		
(Penn, 2005)	■													
(Vouk, 2005)	■													
(Pons, Laroche, & Mourali, 2006)											■			
(Spangenberg, Sprott, Grohmann, & Tracy, 2006)				■										
(Batı, 2007)										■				
(Chebat & Morrin, 2007)					■									
(Wanninayake, 2007)	■					■								
(Ngai, 2007)													■	
(Na'ama, 2007)					■									
(A. J. Newman, 2007)					■									
(Vida, Obadia, & Kunz, 2007)			■											

	Shop layout	Product categories	Sound	scent	Colour	lighting	Frontage	Temperature	Furnishings	External Variables	Crowding	Personal space	layout	Aesthetic
(Verdil, 2009)													■	
(Ozdemir, 2008)												■		
(Oakes, S., and North, A.C. Variety,2008)											■			
(Teller & Reutterer, 2008)													■	
(Garip, 2009)	■													
(Parsons,2009)				■										
(Li, 2010)	■													
(Ojuok, 2010)													■	
(Dennis, Newman, Michon, Josko Brakus, & Tiu Wright, 2010)														
(Massicotte, Michon, Chebat, Joseph Sirgy, & Borges, 2011)	■													
(Banat & Wandebori, 2012)	■	■	■	■	■	■	■	■	■					
(M. Morrison et al., 2011)			■	■										
(Kearney, 2012)				■	■	■							■	
(Mohan et al., 2012)			■	■	■	■	■						■	
(Bogovic, Mihanovic, Jokic-Begic, & Svagelj, 2013)												■		
(Ramlee & Said, 2014)	■	■	■	■	■	■	■	■	■	■	■	■	■	
(Singh & Prashar, 2014)	■	■	■	■	■	■	■	■	■	■	■	■	■	
(Hosseini & Jayashree, 2014)			■	■										
(Björkqvist, 2015)												■		■
(Garg & Steyn, 2015)													■	

APPENDIX (B) : *Previous Studies*

	Magnet point	No. shop	Type of business	Frontage	Shop area	mall	Vertical circulation	Free node spaces	Entrances	layout
(Elgalali, 1978)				■						
(Dawson, 1983)		■	■			■				
(Northern,1984)	■		■							
(Brown, 1992)	■		■			■	■		■	
(Wakefield & Baker, 1998)			■		■					
(Fong, 2003)	■	■		■	■					
(Yuo, Crosby, Lizieri, & Mccann, 2003)		■	■		■					
(Fong, 2005)			■							■
(Teller & Reutterer, 2008)	■	■	■		■					
(Ngai, 2007)	■	■	■		■	■			■	■
(Verdil, 2009)										■
(Ojuok, 2010)		■	■		■					
(Kong & Kim, 2013)	■		■	■	■				■	
(Choudhury, Alam, & Islam, 2014)	■		■							
(Garg & Steyn, 2015)		■	■		■					

APPENDIX (C) : Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.942[a]	.888	.886	36.709935
2	.948[b]	.898	.895	35.185558
3	.954[c]	.910	.905	33.412161
4	.959[d]	.920	.915	31.731545
5	.962[e]	.926	.920	30.702024
6	.965[f]	.931	.925	29.837758
7	.967[g]	.936	.929	29.038422
8	.970[h]	.940	.932	28.247465
9	.972[i]	.944	.936	27.498909
10	.974[j]	.949	.940	26.511356
11	.976[k]	.953	.944	25.721619
12	.976[l]	.952	.943	25.839556
13	.974[m]	.950	.942	26.195240
14	.977[n]	.954	.946	25.280894
15	.979[o]	.958	.949	24.428686
16	.978[p]	.956	.948	24.675788
17	.980[q]	.960	.952	23.870521

a. Predictors: (Constant), LM
b. Predictors: (Constant), LM, NP1
c. Predictors: (Constant), LM, NP1, A2
d. Predictors: (Constant), LM, NP1, A2, RC2
e. Predictors: (Constant), LM, NP1, A2, RC2, NN
f. Predictors: (Constant), LM, NP1, A2, RC2, NN, A6
g. Predictors: (Constant), LM, NP1, A2, RC2, NN, A6, EN
h. Predictors: (Constant), LM, NP1, A2, RC2, NN, A6, EN, VP1
i. Predictors: (Constant), LM, NP1, A2, RC2, NN, A6, EN, VP1, RC4
j. Predictors: (Constant), LM, NP1, A2, RC2, NN, A6, EN, VP1, RC4, A5
k. Predictors: (Constant), LM, NP1, A2, RC2, NN, A6, EN, VP1, RC4, A5, GN
l. Predictors: (Constant), LM, NP1, A2, RC2, A6, EN, VP1, RC4, A5, GN
m. Predictors: (Constant), LM, NP1, A2, A6, EN, VP1, RC4, A5, GN
n. Predictors: (Constant), LM, NP1, A2, A6, EN, VP1, RC4, A5, GN, A3
o. Predictors: (Constant), LM, NP1, A2, A6, EN, VP1, RC4, A5, GN, A3, A4
p. Predictors: (Constant), LM, NP1, A2, EN, VP1, RC4, A5, GN, A3, A4
q. Predictors: (Constant), LM, NP1, A2, EN, VP1, RC4, A5, GN, A3, A4, GP2

APPENDIX (D): *ANOVA*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	712490.665	1	712490.665	528.703	.000b
	Residual	90290.495	67	1347.619		
	Total	802781.159	68			
2	Regression	721071.607	2	360535.803	291.219	.000c
	Residual	81709.553	66	1238.024		
	Total	802781.159	68			
3	Regression	730216.947	3	243405.649	218.033	.000d
	Residual	72564.213	65	1116.373		
	Total	802781.159	68			
4	Regression	738340.139	4	184585.035	183.322	.000e
	Residual	64441.021	64	1006.891		
	Total	802781.159	68			
5	Regression	743396.459	5	148679.292	157.731	.000f
	Residual	59384.700	63	942.614		
	Total	802781.159	68			
6	Regression	747583.067	6	124597.178	139.951	.000g
	Residual	55198.092	62	890.292		
	Total	802781.159	68			
7	Regression	751344.133	7	107334.876	127.290	.000h
	Residual	51437.027	61	843.230		
	Total	802781.159	68			
8	Regression	754906.003	8	94363.250	118.262	.000i
	Residual	47875.156	60	797.919		
	Total	802781.159	68			
9	Regression	758165.949	9	84240.661	111.401	.000j
	Residual	44615.210	59	756.190		
	Total	802781.159	68			
10	Regression	762015.745	10	76201.574	108.418	.000k
	Residual	40765.415	58	702.852		
	Total	802781.159	68			
11	Regression	765069.863	11	69551.806	105.126	.000l
	Residual	37711.297	57	661.602		
	Total	802781.159	68			
12	Regression	764055.565	10	76405.556	114.434	.000m
	Residual	38725.595	58	667.683		

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
12	Total	802781.159	68			
13	Regression	762295.915	9	84699.546	123.434	.000
	Residual	40485.245	59	686.191		
	Total	802781.159	68			
14	Regression	765711.991	10	76571.199	119.807	.000
	Residual	37069.169	58	639.124		
	Total	802781.159	68			
15	Regression	768765.800	11	69887.800	117.112	.000
	Residual	34015.359	57	596.761		
	Total	802781.159	68			
16	Regression	767465.279	10	76746.528	126.042	.000
	Residual	35315.881	58	608.894		
	Total	802781.159	68			
17	Regression	770302.458	11	70027.496	122.898	.000
	Residual	32478.701	57	569.802		
	Total	802781.159	68			

a. Dependent Variable: HD

b. Predictors: (Constant), LM

c. Predictors: (Constant), LM, NP1

d. Predictors: (Constant), LM, NP1, A2

e. Predictors: (Constant), LM, NP1, A2, RC2

f. Predictors: (Constant), LM, NP1, A2, RC2, NN

g. Predictors: (Constant), LM, NP1, A2, RC2, NN, A6

h. Predictors: (Constant), LM, NP1, A2, RC2, NN, A6, EN

i. Predictors: (Constant), LM, NP1, A2, RC2, NN, A6, EN, VP1

j. Predictors: (Constant), LM, NP1, A2, RC2, NN, A6, EN, VP1, RC4

k. Predictors: (Constant), LM, NP1, A2, RC2, NN, A6, EN, VP1, RC4, A5

l. Predictors: (Constant), LM, NP1, A2, RC2, NN, A6, EN, VP1, RC4, A5, GN

m. Predictors: (Constant), LM, NP1, A2, RC2, A6, EN, VP1, RC4, A5, GN

n. Predictors: (Constant), LM, NP1, A2, A6, EN, VP1, RC4, A5, GN

o. Predictors: (Constant), LM, NP1, A2, A6, EN, VP1, RC4, A5, GN, A3

p. Predictors: (Constant), LM, NP1, A2, A6, EN, VP1, RC4, A5, GN, A3, A4

q. Predictors: (Constant), LM, NP1, A2, EN, VP1, RC4, A5, GN, A3, A4

r. Predictors: (Constant), LM, NP1, A2, EN, VP1, RC4, A5, GN, A3, A4, GP2

APPENDIX (D) : *Coefficients*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-28.711	6.521			
	LM	2.935	.128	.942	22.994	.000
2	(Constant)	-45.974	9.058			
	LM	2.788	.135	.895	20.714	.000
	NP1	44.879	17.047	.114	2.633	.011
3	(Constant)	-52.962	8.942			
	LM	2.533	.156	.813	16.257	.000
	NP1	62.607	17.332	.159	3.612	.001
	A2	3.780	1.321	.131	2.862	.006
4	(Constant)	-44.643	8.983			
	LM	2.589	.149	.831	17.344	.000
	NP1	51.276	16.937	.130	3.028	.004
	A2	4.629	1.289	.160	3.590	.001
	RC2	-14.216	5.005	-.111	-2.840	.006
5	(Constant)	-44.341	8.692			
	LM	2.350	.178	.754	13.221	.000
	NP1	52.005	16.390	.132	3.173	.002
	A2	4.912	1.253	.170	3.919	.000
	RC2	-12.564	4.895	-.098	-2.567	.013
	NN	18.667	8.060	.107	2.316	.024
6	(Constant)	-45.138	8.456			
	LM	2.140	.198	.687	10.805	.000
	NP1	57.004	16.095	.144	3.542	.001
	A2	5.686	1.269	.196	4.480	.000
	RC2	-11.935	4.766	-.093	-2.504	.015
	NN	19.820	7.851	.113	2.525	.014
	A6	20.598	9.499	.088	2.169	.034
7	(Constant)	-43.754	8.255			
	LM	2.045	.198	.656	10.339	.000
	NP1	53.842	15.735	.136	3.422	.001
	A2	5.241	1.253	.181	4.183	.000
	RC2	-10.888	4.665	-.085	-2.334	.023
	NN	17.839	7.698	.102	2.317	.024
	A6	25.723	9.557	.110	2.691	.009

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
7	EN	16.099	7.623	.082	2.112	.039
8	(Constant)	-35.046	9.026			
	LM	2.113	.195	.678	10.831	.000
	NP1	62.924	15.899	.159	3.958	.000
	A2	5.321	1.220	.184	4.363	.000
	RC2	-10.347	4.545	-.081	-2.277	.026
	NN	17.405	7.491	.099	2.324	.024
	A6	26.480	9.304	.113	2.846	.006
	EN	16.812	7.423	.086	2.265	.027
	VP1	-31.135	14.736	-.078	-2.113	.039
9	(Constant)	-38.881	8.979			
	LM	2.000	.198	.642	10.116	.000
	NP1	63.563	15.480	.161	4.106	.000
	A2	5.419	1.188	.187	4.561	.000
	RC2	-8.207	4.543	-.064	-1.807	.076
	NN	14.891	7.392	.085	2.014	.049
	A6	28.418	9.105	.121	3.121	.003
	EN	16.816	7.226	.086	2.327	.023
	VP1	-31.442	14.347	-.079	-2.192	.032
	RC4	6.862	3.305	.077	2.076	.042
10	(Constant)	-40.286	8.677			
	LM	1.961	.191	.629	10.250	.000
	NP1	64.140	14.926	.163	4.297	.000
	A2	5.730	1.153	.198	4.968	.000
	RC2	-7.649	4.386	-.060	-1.744	.086
	NN	14.828	7.127	.085	2.081	.042
	A6	27.064	8.797	.115	3.076	.003
	EN	16.577	6.968	.084	2.379	.021
	VP1	-33.020	13.848	-.083	-2.384	.020
	RC4	8.098	3.230	.091	2.507	.015
	A5	26.661	11.392	.071	2.340	.023
11	(Constant)	-42.792	8.499			
	LM	1.798	.200	.577	8.970	.000
	NP1	63.817	14.483	.162	4.406	.000

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
11	A2	5.674	1.119	.196	5.070	.000
	RC2	-6.717	4.278	-.053	-1.570	.122
	NN	9.163	7.400	.052	1.238	.221
	A6	23.071	8.735	.098	2.641	.011
	EN	22.246	7.257	.113	3.066	.003
	VP1	-31.138	13.464	-.078	-2.313	.024
	RC4	10.076	3.266	.113	3.085	.003
	A5	25.886	11.058	.069	2.341	.023
	GN	12.853	5.982	.094	2.149	.036
12	(Constant)	-43.537	8.517			
	LM	1.855	.196	.595	9.460	.000
	NP1	63.294	14.543	.160	4.352	.000
	A2	5.507	1.116	.190	4.934	.000
	RC2	-6.968	4.292	-.054	-1.623	.110
	A6	22.095	8.740	.094	2.528	.014
	EN	24.358	7.086	.124	3.438	.001
	VP1	-31.200	13.526	-.078	-2.307	.025
	RC4	11.071	3.180	.124	3.481	.001
	A5	25.776	11.108	.069	2.320	.024
	GN	15.492	5.615	.114	2.759	.008
13	(Constant)	-47.715	8.231			
	LM	1.768	.191	.568	9.243	.000
	NP1	68.747	14.344	.174	4.793	.000
	A2	5.169	1.112	.179	4.650	.000
	A6	23.168	8.835	.099	2.622	.011
	EN	26.078	7.102	.133	3.672	.001
	VP1	-32.362	13.693	-.081	-2.363	.021
	RC4	12.468	3.104	.140	4.017	.000
	A5	26.685	11.247	.072	2.373	.021
	GN	16.648	5.647	.122	2.948	.005
14	(Constant)	-45.020	8.028			
	LM	1.807	.185	.580	9.745	.000
	NP1	69.327	13.846	.176	5.007	.000
	A2	5.836	1.111	.202	5.253	.000

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
14	A6	21.037	8.576	.090	2.453	.017
	EN	23.906	6.919	.122	3.455	.001
	VP1	-32.949	13.217	-.082	-2.493	.016
	RC4	12.038	3.001	.135	4.011	.000
	A5	25.377	10.869	.068	2.335	.023
	GN	18.477	5.507	.135	3.355	.001
	A3	-11.038	4.775	-.073	-2.312	.024
15	(Constant)	-44.673	7.759			
	LM	1.616	.198	.519	8.167	.000
	NP1	70.507	13.389	.179	5.266	.000
	A2	6.022	1.077	.208	5.593	.000
	A6	13.247	8.974	.056	1.476	.145
	EN	27.366	6.858	.139	3.990	.000
	VP1	-30.464	12.819	-.076	-2.377	.021
	RC4	12.734	2.916	.143	4.366	.000
	A5	25.116	10.503	.067	2.391	.020
	GN	19.551	5.342	.143	3.660	.001
	A3	-12.114	4.638	-.080	-2.612	.011
	A4	11.896	5.259	.092	2.262	.028
16	(Constant)	-44.729	7.838			
	LM	1.658	.198	.532	8.375	.000
	NP1	68.974	13.484	.175	5.115	.000
	A2	5.786	1.076	.200	5.380	.000
	EN	26.553	6.905	.135	3.845	.000
	VP1	-29.086	12.914	-.073	-2.252	.028
	RC4	12.768	2.946	.143	4.334	.000
	A5	25.856	10.598	.069	2.440	.018
	GN	21.402	5.246	.157	4.080	.000
	A3	-13.059	4.640	-.086	-2.815	.007
	A4	14.875	4.905	.115	3.032	.004

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
17	(Constant)	28.158	33.532			
	LM	1.665	.191	.535	8.697	.000
	NP1	119.477	26.123	.303	4.574	.000
	A2	5.575	1.045	.193	5.337	.000
	EN	26.535	6.680	.135	3.972	.000
	VP1	-62.589	19.532	-.156	-3.204	.002
	RC4	10.246	3.066	.115	3.342	.001
	A5	28.510	10.320	.076	2.763	.008
	GN	20.364	5.096	.149	3.996	.000
	A3	-10.532	4.629	-.070	-2.275	.027
	A4	15.683	4.759	.121	3.295	.002
	GP2	-108.205	48.491	-.137	-2.231	.030

a. Dependent Variable: HD