

UNDERSTANDING AND MEASURING NEIGHBORHOOD
ATTACHMENT AND KNOWLEDGE OF CHILDREN IN İSTANBUL

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
URBAN DESIGN IN CITY AND REGIONAL PLANNING

AUGUST 2021

Approval of the thesis:

**UNDERSTANDING AND MEASURING NEIGHBORHOOD
ATTACHMENT AND KNOWLEDGE OF CHILDREN IN İSTANBUL**

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ABSTRACT

UNDERSTANDING AND MEASURING NEIGHBORHOOD ATTACHMENT AND KNOWLEDGE OF CHILDREN IN İSTANBUL

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Master of Science, Urban Design in City and Regional Planning
Supervisor: Assoc. Prof. Dr. Yücel Can Severcan

August 2021, 129 pages

The notion of place attachment starts to develop in childhood. However, the rapid urbanization processes endanger neighborhood knowledge of children and hence their attachment to their environments. The places are transforming quite fast with urbanization practices, but children cannot develop their place knowledge at the same pace. Although there is a growing deal of literature on place attachment of children in urban planning and design, there is a lack of empirical research linking place attachment of children to their place knowledge. This thesis employs a children-centered study approach to understand and measure the place knowledge of children through their cognitive maps and responses to a place attachment survey. It questions whether highly neighborhood-attached children mention a higher number of urban elements (e.g., paths, edges, nodes, districts, and landmarks) in their neighborhoods than lower neighborhood-attached children. To answer this question, the author used secondary data which were collected from 9-11-year-old children in a child-friendly city project in İstanbul. This thesis contributes to the existing literature by demonstrating that place knowledge of children changes according to contextual differences. Moreover, it shows an inverse relationship between place knowledge of children and neighborhood transformation levels. The correlation

between place attachment and place knowledge is discussed. The thesis concludes with a discussion of the study findings for future research and urban design.

Keywords: Place Attachment, Children Drawings, Urban Transformation, Place Knowledge, Cognitive Map

ÖZ

İSTANBULDAKİ ÇOCUKLARIN MAHALLE BAĞLIĞINI VE BİLGİLERİNİ ANLAMAK VE ÖLÇMEK

Demirkol Çakal, Gizem
Yüksek Lisans, Kentsel Tasarım, Şehir Bölge Planlama
Tez Yöneticisi: Assoc. Prof. Dr. Yücel Can Severcan

Ağustos 2021, 129 sayfa

Yere bağıllık kavramı çocuklukta gelişmeye başlar. Ancak hızlı kentleşme süreçleri çocukların mahalle bilgisini ve dolayısıyla çevrelerine olan bağıllıklarını tehlikeye atmaktadır. Kentleşme uygulamalarıyla birlikte mekanlar oldukça hızlı dönüşüyor ancak çocuklar yer bilgilerini aynı hızda geliştiremiyor. Kentsel planlama ve tasarımda çocukların mekana bağıllığı hakkında giderek artan bir literatür olmasına rağmen, çocukların yer bağıllığını onların yer bilgileriyle ilişkilendiren ampirik araştırma eksikliği bulunmaktadır. Bu tez, çocukların bilişsel haritaları ve bir yere bağlanma anketine verilen yanıtlar aracılığıyla yer bilgilerini anlamak ve ölçmek için çocuk merkezli bir çalışma yaklaşımı kullanır. Yüksek derecede mahalle bağıllığı olan çocukların mahallelerinde düşük mahalle bağılı çocuklara göre daha fazla sayıda kentsel unsurdan (örneğin patikalar, kenarlar, düğümler, mahalleler ve işaretler) bahsedip bahsetmediklerini sorgulamaktadır. Yazar, bu soruyu yanıtlamak için İstanbulda çocuk dostu bir şehir projesinde 9-11 yaşındaki çocuklardan toplanan ikincil verileri kullanmıştır. Bu tez, çocukların yer bilgisinin bağlamsal farklılıklara göre değiştiğini göstererek mevcut literatüre katkı sağlamaktadır. Ayrıca çocukların yer bilgisi ile mahalle dönüşüm düzeyleri arasında ters bir ilişki olduğunu göstermektedir. Yere bağıllık ve yer bilgisi arasındaki ilişki tartışılır. Tez,

gelecekteki arařtırmalar ve kentsel tasarım için alıřma bulgularının tartıřılmasıyla sona ermektedir.

Anahtar Kelimeler: Yer Baęlantısı, ocuk izimleri, Kentsel Dnüşüm, Yer Bilgisi, Biliřsel Harita

to Gökhan Çakal and
to Venus, who always greeted me with her exorable eyes...

ACKNOWLEDGMENTS

Without the guidance and help of some special people, this thesis would be impossible to complete at such a time. They contributed in one way or another and provided their valuable assistance.

First and foremost, I would like to express my deepest gratitude to my supervisor, Assoc. Prof. Dr. Yücel Can Severcan, for his endless support, tolerance, guidance, patient, advice, thoughtful insights, trust in me, and for dedicating his vast knowledge, ideas, and quite a lot of time to me. I would like to thank him for always encouraging me to do my best from the first day of my undergraduate life to the last day of my master's life and for all he contributed to me.

I would also like to thank the examining committee members, Prof. Dr. Ela Babalık and Assist. Prof. Dr. Zeynep Eraydın for their valuable criticisms, suggestions, kind interests, patiently enthusiastic time, and contributions to the study.

I owe special thanks to Can Kubin for his indulgence, patience, trust, endless support, and a peaceful atmosphere during thesis research. I also thank my colleagues, especially Ekin Güneş Şanlı and Tuğba Topaloğlu, for their supports, for the brainstorming and pleasant conversations we had together.

I want to show my heartfelt appreciation to Burcu Pınar for her contributions to the thesis process, who has always made an effort to help me achieve the best. She is always there for me in each decision, without a doubt, and always thinks the best for me and always support me endlessly, widens my horizon even from childhood until today. I want to thank my sister Fatma Serttaş for her warm voice and motivation from the day I first opened my eyes to life. I would like to thank for all her support on the last day of the thesis, endless trust in me, and her pure love. I also special thanks to Yağmur Erişen for her continuous support, energy and smile, and encouragement in the thesis process. I also would like to thank Çağrı Özdilek for his

unique ideas, for encouragement, long walking discussions and guidance for my academic career. I owe special thanks to Simgе Reyhan, Pelin Dayan, Gürel Sezgin, Ayça Kocakuşak, and Bilen Deniz Uyar for being with me without question, for their existence, and all their support during thesis preparation. I want to thank all my friends; they are not only friends but part of my family.

I would like to show my deepest gratitude to Dilek Kürkçü for giving me everything as a parent, for her endless encouragement, patience, guidance, motivation, and love. I also thank Selman Demirkol for helping me understand what I really want and for his continuous support and inspiration. I want to show gratitude to Ayşegül Kürkçü for her presence, encouragement, love, understanding, endless support, motivation, guidance, especially on my whole education life.

A special thanks must go to my husband, love, family, my best friend, Gökhan Çakal, who has stood beside me from the very first pages of this thesis until the end. I owe the most special and biggest appreciation to his intelligence, encouragement, support, and guidance, especially during the analysis process of this thesis. Also, I would like to thank him for his positive attitude, tolerance, motivation, being a source of inspiration, and his endless love. It would not have been possible to finish this thesis without his presence and great patience in this period when our lives were completely changed during the thesis process. I am deeply indebted for the presence of Gökhan in my life. Finally, I would also thank PowerLab Team for the opportunities provided for this thesis, interest in my research, and warm atmosphere.

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LIST OF ABBREVIATIONS

ABBREVIATIONS

PK	Place Knowledge
PA	Place Attachment
PS	Place Satisfaction
PD	Place Dependency
PI	Place Identity

CHAPTER 1

INTRODUCTION

Environment and people have been strongly related since the beginning of time, and they have mutually fed each other simultaneously. It will be only possible to consider cities' welfare if nature, the built environment, and people are in harmony. Their combination gives life to settlements, cities, urban or rural contexts. Also, cities' welfare and the social wellbeing of citizens have a strong connection. Burgess et al. (1925) state that "The city embodies the real nature of human nature, and it is an expression of mankind in general and specifically of the social relations generated by territoriality" (p. 9). An important concept that affects people's social wellbeing is a sense of place.

Sense of place and its dimensions (like place knowledge and place attachment) influences human behavior. Put more concretely; the more people feel attached to the place, the more likely they will embrace the place and identify problems or potentials of the physical environment. According to some scholars like Shamai (1991), these will eventually result in greater use of places or motivation to protect or change places.

The notion of place attachment develops throughout childhood (Chawla, 1992; Severcan, 2015). According to Proshansky et al. (1983), the neighborhood, the play area, the school, and the house have an essential role in the child's early socialization, and they have become part of the earliest of a child's learned space-related cognitions. As children spend more time in these environments, their attachment to these places increases (Hay, 1998). Thus, place knowledge is argued to be a requirement for an individual's place attachment (Shamai, 1991).

Planning practices have a crucial role in creating a balance between three concepts; human, nature, and the built environment. These practices find not only a balance

but also shape and manage people, nature, and built areas. The concept of sense of place, which is affected by these three areas' communication, can be measured with planning practices.

1.1 Problem Definition

Children are considered as future citizens, and their place attachment is highly crucial for community development (Ataol et al., 2019). Therefore, planners are responsible for establishing the balance between human nature and the built environment in society and ensure that these three concepts work together. Rapid urbanization, technological changes, and adult-driven planning practices are three of the most critical constraints that prevent children from developing a sense of attachment to the place.

From the beginning of the 2000s, cities were more and more perceived as commodities (Friedmann, 2010; Carlos et al., 2017). Urban transformation projects, serving the neoliberalist system with attracting global capital, change places drastically (Brenner & Theodore, 2010; Akçalı & Korkut, 2014), and by doing so, have started to alter children's perception of place (Chawla, 2001).

One city where such changes in the built environment and children's relationship with their environments can be observed is İstanbul. According to many scholars like Akçalı & Korkut (2014), Kuyucu & Ünsal (2010), Esen and Rieniets (2015), especially since the 2000s, İstanbul has observed extraordinary changes in its urban fabric because of large-scale urban transformation projects. Severcan (2018) discussed how these trends in urbanization altered childhood in İstanbul.

Scholars like Proshansky et al. (1983), Tuan (1980), and Relph (1976) argue that contemporary urban practices have a negative impact on people's rootedness in their physical environments. Accordingly, although no scientific evidence exists yet, one can argue that as children's environments transform, their neighborhood knowledge decreases, so do their neighborhood attachment.

This study aims to test this hypothesis with the help of children's cognitive maps and responses to survey questions.

1.2 Aims and Research Questions

The main aim of this study is, firstly to provide an understanding of the relationship children's neighborhood knowledge, neighborhood attachment, and neighborhood redevelopment, and secondly, to show that there is a correlation between these three concepts. More specifically, this study aims to answer the following questions:

1. Whether and to what extent do the urban redevelopment levels of the neighborhoods that children live in affects their place knowledge?
 - a. Do children refer to different urban elements in different neighborhood contexts?
 - b. Do children refer to more urban elements in neighborhoods that have managed to protect their historic fabric compared to neighborhoods that have been redeveloped more or less significantly?
2. Is there a correlation between children's place attachment and children's place knowledge?

The data produced from a participatory planning study carried out in 2010 were used as secondary data to answer these questions.

The author aims to contribute both the gaps in theory, research, and urban design practice by answering these research questions.

1.3 The Hypothesis of the Study

Under the scope of this thesis, it was hypothesized that urban redevelopment levels affect children's place knowledge. The author intends to find that as urban redevelopment intensifies, children's place knowledge decreases. It was also assumed that children use different numbers of urban elements in their cognitive

maps, which differ from one neighborhood to another. More specifically, it was hypothesized that in more redevelopment neighborhoods, fewer children are referring to urban elements when they are asked to draw their neighborhood maps. Moreover, it was assumed that there is a correlation between children's place knowledge and place attachment.

1.4 Gaps in the Theory and Research

Studies on children and places have gain importance in recent decades. However, to the best of the author's knowledge, there are no quantitative empirical studies aimed at understanding the relationship between children's place attachment and their place knowledge. Additionally, most studies on place attachment measure this construct with person-place relationship constructs like place dependency and place identity and put little emphasis on the role of place knowledge on individuals' place attachment. In other words, although it is defined that the place attachment increases over time as more time is spent in a place (or places) (Kasarda & Janowitz, 1974; Hay, 1998; Kalternborn & Williams, 2002; Lewicka 2011), the measurement of this construct is generally limited to two or three related human-place relationship constructs, which are generally: place dependency, place identity and place satisfaction. Finally, there is a gap in comprehensive studies on place attachment; however, studies do not emphasize place knowledge and their correlation.

Factors that affect people's place attachment were widely analyzed (Jorgensen & Stedman, 2001; Hernandez et al., 2007; Lewicka, 2011). Less is known about children's place attachment (Ataol et al., 2019). Vorkin and Riese (2001) emphasized that children-centered place attachment studies are essential because children's attachment is stronger than adults.

Although place attachment literature illustrates that the social and physical environment is a system that feeds each other simultaneously (Gieryn, 2000),

focused solely on a physical word, the interaction of social and physical aspects of the environment is rarely studied.

Another gap in the literature is that most of the studies that were conducted so far have focused on adults' attachment to recreational and residential areas (see, e.g., Hur, Nasar, and Chun 2010; Kyle, Graefe, Manning, Bacon 2004). The adverse result of urbanization on children's place attachment is not decently investigated in the literature. Few studies designate and link planning practices and place attachment together (some exceptions include Severcan, 2012).

Furthermore, despite the reflections of place attachment caused by physical form introduced by Alexander (2002), there is a deficiency of awareness of how planning is related to place attachment. Therefore, urban designers and planners have limited knowledge about which elements of urban form affect children's place knowledge and place attachment.

Tuan (1977, 1980, 1975) asserted that when individuals determine the geographically and cognitively to place, they tend to develop place attachment. In order to support this perspective, literature should provide research that shows the correlation between place attachment and place knowledge with both theoretical and empirical studies, and this thesis will focus on this correlation.

1.5 Structure of the Thesis

This thesis commences with the introduction of place and concepts. After examining the part of the definition, it concentrates on the importance of place attachment and places knowledge. Their development process and relationship will be explained.

The second chapter focuses on the theoretical framework. The definition of place, its components, and theories about the place are exemplified. Then, place-related concepts and their definition are introduced. Moreover, the correlation between concepts of place-human and the measurement model is explained.

The third chapter concentrated on the method of study site selection process, description of the context, data collection, and analysis tools and techniques. The fourth chapter focuses on results and discussions about research analysis. It also emphasizes the evaluations of outcomes of children's neighborhood drawings according to contextual differences, different transformation levels of neighborhoods, and place attachment and place knowledge correlations. The final chapter briefly summarizes the main findings of the research analysis and remarks on crucial conclusions. The implications of future works and contributions to urban design are also discussed in this chapter.

CHAPTER 2

THEORETICAL FRAMEWORK

This chapter focuses on the theoretical framework to help readers understand the link between place knowledge and attachment and how these two concepts develop starting from childhood. Since this thesis is about place knowledge and place attachment, a definition of the term 'place' is provided in the following sections. Also, components of place and theories that are related to place attachment are explained in detail. Their importance of place attachment and place knowledge, factors that affect these two constructs, their measurement, and their relationship will be introduced.

2.1 Understanding the Notion of Place

The place is a decidedly interdisciplinary concept, and it is difficult to explain it from a single perspective. Therefore, the next part comprehensively focuses on place definition and their concepts.

2.1.1 Place: Its Definition, Importance, and Constitutes

The definition of the concept of place varies in the literature. Lewicka (2011) and Cresswell (2004) introduced a general definition and stated that a place could be defined as a meaningful location. Tuan (1977) stated that the spatial system comprises a million points known as a place, and place emerges when people interact with their surroundings. Interaction of people and place occurs under the framework of location and meaning, and humans are makers of meanings.

Places are a combination of human interpretation and experiences in a physical context (Relph, 1976; Shamai, 1991, Brandenburg and Carroll, 1995; Stedman, 2003). This context can be in different scales like homes or neighborhoods or a country (Shamai, 1991; Low & Altman, 1992). Also, definite and precise scales or frontiers are not a part of the explanation of place. Dimensions of place are not only about physical. To examine definitions of place, one needs to consider location and meaning together. Interpretation and experiences of places can only occur, processing both the physical, mental and social meaning of place together. According to Tuan (1977), spaces turn into places when people give them value, and in this way, physical setting separated from blank or inexperienced spaces.

Places are part of everyday lives. Therefore, place interaction that provides an opportunity for activity and a sense of environmental presence is an essential appliance for humans (Seamon, 2013). Place, which comprises human feelings and their connection, is a center of intention made by experience (Tuan, 1979). Canter (1991) stated that place is also defined as a response of environmental experience and a combination of cognition, affect, and behavior of the people living with it. Additionally, the place which contains lots of signs experiences un-self-consciously (Relph, 1976).

The places are part of an entire world, and feelings embrace them within themselves (Lewis, 1979). Humans mark a place with their feelings giving it value, meaning, and purpose (Tuan, 1979). While unfolding the place, the feeling is one of the imperative definers, and the concept of self has a unique connection with the place. Put more concretely, in literature; it is found in many pieces of research that there is a strong relationship between self and place (Proshansky et al., 1983, Lewis and Brooks-Gunn, 1979); and this affiliation may refuse to accept objectification. In other words, since place contains the concept of self within itself, it can be understood places are highly subjective concepts. Although the meaning of place started from a human mind and grew and gained sense through the physical world, self is one of the important meaning-makers, and it is an inseparable part of the process for place-people relation. Cooper (1974) emphasizes that the nature of self

is disclosed by the environment, which is created from people and people take the feedback given by the environment; even this dynamic and mutual relation alters the people and self.

Wiggings (2012) defined place as a synergistic relationship which means that the fragment is part of the whole. Seamon (2015) stated that place has a connection with other places. Every place is an indispensable and integral part of the whole and has an impact on staying together to places (Seamon, 2012). Seamon (2015) introduced six different place processes: place interaction, place identity, place release, place realization, place creation, and finally, place intensification as synergistic rationality (Seamon, 2013).

Cresswell (2004, p. 2). deliberate that everywhere is a place, and the place is everywhere. With this perspective, places effect area can be found in many subjects, and place meanings vary under three important attributes; physical setting, social-cultural concept, and psychological-symbolic meaning (Stedman, 2003; Moore & Young, 1978; Bourdiou, 1996; Severcan, 2012; Williams & Vaske, 2003; Rajala et al., 2020).

2.1.1.1 Place as a Physical Setting

A physical setting can be an area or specific location or cluster of a system that has character defined by physical features in a precise dimension or scale. The place is a multidimensional scale, and it has uncertain borders. One of the essential roles of the physical environment is to shape forms and arrange boundaries between them to place (Stedman, 2003). Moore and Young (1978) asserted that buildings, people, nature, and landscape elements are major components of physical settings.

Physical settings allow people to reproduce their social and cultural experiences (Eisenhauer et al., 2000). Concepts related to place are emotional expressions, and physical environments help develop emotions that have competence in these concepts, which arise between place and human. The physical setting contributes to

all of these place concepts differently (Stedman, 2003). For example, Stedman (2003) stated that people could be attached to the place's physical amenities and features of the physical world that shape individual and community attachment. It can be understood that physical settings have solid supremacy over place-relevant concepts.

Similarly, each physical setting can embody more than one concept based on the definitions of its own world for each person within the physical setting (Greider & Garkovich, 1994). In other words, every place has a different characteristic feature about physical meaning; this differentiation is also fostered and defined with each people's own perspective differently. This is the potential of physical place, and the place has the power to reveal people's psychological, symbolic, social, cultural experiences (Eisenhauer et al., 2000). Place and human interaction create a cognitive structure related to physical features about the past, present, and future (Severcan, 2012; Proshansky et al., 1983) with the help of the above experiences. The physical place is the most essential and complementary part of the social and symbolic place.

2.1.1.2 Place as a Social Product

Social interaction is an invisible part and substantial factual situation of a social place whose border is determined by the physical setting. Cochrane (1987) stated that place is comprehended more closely social and cultural frame rather than as a physical setting, locus as a meaningful location. In fact, Stedman (2003) detailed that physical and social places foster each other and have a strong connection; also, Eisenhauer et al. (2000) explained that their interaction is mutual.

Shared features of the physical and social place were described by Bourdieu (1996). For instance, the reciprocated externality of fragments explains the physical place, and reciprocated difference of positions explains a social place (Bourdieu, 1996). Put more concretely, a physical place is defined by biophysical features, and it has a

border; similarly, a social place has a frame that is comprised of different situations at the same physical borders.

Stedman (2003) discoursed physical setting prepares a base for the social place. As mentioned in former sentences, place creates a border for social interaction answering as a social place. Besides, place as a social product (Eisenhauer et al., 2000) is defined by people and their interactions. It can also be understood that place and people outline one another (Cochrane, 1987). Put more concretely, the meaning of place is affected both by individuals or communities; simultaneously, individuals or communities are affected by the meaning of place (Stedman, 2003). For example, Scannell and Gifford (2010) emphasized that social bonds are engrained in place and grow to place meaning with the help of social interaction.

The social character of the place is grounded on communication with others and carries the sense of interpersonal (Rajala et al., 2020). In other words, a social place is where the communal interaction takes place. Kasarda & Janowitz (1974) stated that the more people interact with others in a specific place, the more they feel attached to that place. Social interaction can embrace friendship, family, partnership, commonship, etc. Similarly, Tuan (1991) alleged that common activity or rituals creates a strong social interaction and help to develop attachment. According to this interaction, the meaning of social place can be perceived differently from one person to another. Not only interaction or common communication with others but one of the place concepts was defined by Proshansky et al. (1983) as a place identity described as self-socialization in the physical world. Therefore, the social place can differ for individuals or for the community. Additionally, many scholars like Low & Altman (1992) stated that people are attached to places due to their social characteristics.

2.1.1.3 Place as a Symbolic Meaning

The symbol has the power to convert the value to become an expression, demonstrate visible which is intangible, adapt immaterial to the solid; therefore, the symbol as a communication tool and reconciliatory that creates an intersection between people and place interaction (Monnet, 2011). The symbol can be an expression that symbolizes an idea, actions, memory, sign, physical objects or creates a bridge between past and future. In accord with Taylor and Spencer (2004), an advocate of communality and countrywide awareness is the main characteristic of the symbolic place. A symbolic place can be buildings or streets or public spaces that can concreate social interaction. Moreover, it is widespread that communal authorities create symbolic places understood by every person (Monnet, 2011). However, that can be perceived differently from one person to another. Additionally, the meaning of symbolic place can be perceived differently over time by people who experience it (Kostof, 2018).

While describing topophilia, Tuan (1974) stated that the world of the meaning is carried by place. Meaning is formed by people who experience the place. They define places with their physical character, experiences, and interpretations. While individuals are interpreting place, they symbolize the physical characters of places. Symbolic meanings are shaped with the help of diverse experiences, and meanings convert into different human-place concepts (i.e., place dependency, place attachment, place satisfaction) by individuals who experience the symbolic place (Stedman, 2003). In literature, it is also stated that people are attached to the place due to its symbolic meaning (Stedman, 2003; Tuan, 1977; Brown & Raymond, 2007).

2.1.2 Theories That Explain Human and Place Relationships

Examining the relationship between humans and their environments are of interest to researchers from social sciences (such as geography, psychology, sociology, and

anthropology) and spatial design (such as urban design, landscape architecture, architecture, interior architecture, city, and regional planning). The unbreakable bond between humans and the environment has started to be emphasized again with the development of environmental studies (Mumcu et al., 2019). In this section, the author will review some theories that examine human-place relationships.

2.1.2.1 The Behavior Setting Theory

Behavior Setting Theory was revealed from Barker (1968, 1976), and this theory covers the subsystem that provides foreseeable behavior patterns and parts of the whole environmental area. It is also defined in a time and space relation as a unit of an ecological system that contains vital and inseparably bonds between behavior and physical setting (Barker, 1976). Apparent, observable, and perceivable units of the environmental area include a set of behavior events is provided by the behavior episodes (Barker, 1968). Users of behavior settings are temporal, but the physical location is permanent (Scot, 2005). Moreover, managing the individual's behavior is not about individual' personality; it is the physical setting itself (Mumcu et al., 2019), however; behavior setting is not merely a place but a cluster of interactions (Mumcu et al., 2019; Moore & Cosco, 2007). Behavior setting has two essential mechanisms: first, human behavior relation with object or environment, and the second is about time and space with certain frontiers (Perkins et al., 1988, Barker, 1976). According to Popov and Chompalow (2012), dynamic and interbedded structure characters contain different actions, bounded and visible patterns, and a specific boundary in time and space relation defines and forms behavior setting. Furthermore, behavioral setting data includes how users act within the setting, not what they think about their environment, how they evaluate their environment (Bechtel, 1982).

2.1.2.2 The Theory of Affordance

In what manner of agent (animal, human, or machine) and material items or settings interact refers to possibilities are demonstrated by the affordance (Norman, 1989). Gibson (1979) introduced the theory of affordance. Affordances are the opportunities provided for living beings by a specific physical context. There is a two crucial feature; first agent and environment are inseparable of a whole; second without any mental process, an agent can perceive the information in the environment directly (Mumcu et al., 2019). This definition, supported by Heft (1989, 2001) and continued with an ecological and psychological perspective, stated that humans are dependent on the environment, and affordance is an asset of a physical setting. Gibson (1977, 1979) also argued that affordances are facts that are composed of both environment and behavior. In other words, affordance embodies coordination of the environment and agent's behavior (Withagen & Michaels, 2005). Environmental features support characteristics of the agent, and one of the critical features is compatibles (Mumcu et al., 2019). For instance, a child can enter a tiny space; this is called affordance; however, an adult could not fit for that space due to his or her physical features and that space provided by the environment (Fajen & Turvey, 2003).

Chemero (2003) added that affordances are relations; behavior is the central part of affords, and the environment provides behavior for living things. Affordances reveal intersection points of user and environment (Moore and Cosco, 2007). The relationship between the properties of the environment and the agent's abilities defines an affordance (Norman, 1989). Besides their relationship, affordances make actions possible (Norman, 1989). According to individuals' perceptions and actions, the environment provides affordance, which holds opportunities or constraints (Kyttä, 2003, 2004, 2018; Gibson, 1979; Mumcu et al., 2019). The affordances of place are perceived with habits and orientation also locates in the human's body (Degnen, 2016). Correspondingly, humans tend to stay longer in a place, and robust attachments are developed to it as they observe affordances provided by the environment (Severcan, 2012).

Both Gibson and Barker consider discussed the intersection of the human environment with users to describe human behavior and place interaction.

2.1.2.3 The Theory of Human Needs

The built environment is an area that is constructed by and for humans. The built environment's components are formed according to human needs. Maslow (1943) provided definitions and structures of human needs from strongest to weakest, and these are demonstrated as a hierarchical organizations. The first, most robust need of Maslow's human needs is physiological needs which are people's elementary requirements for a living such as air, food, or shelter. The second of all is safety needs like mental and physical health or personal security. The third one of Maslow's human needs is love and belonging needs, which people foster themselves with families, friends, beloved ones, or membership love. Esteem is the next human need, and it creates satisfaction about a self that other people provide. Components of esteem can be respect, status, or relatives. The final one is about self-actualization, in which people have a desire to push forward and develop themselves about art or education or self-development (Maslow, 1943). Many scholars have developed this model in the last few decades based on Maslow's human needs expressions. Because of this, a 'human needs' system was designed as a hierarchical base, and Max-neef, Elizalde, and Hopenhayn (1991) provided a new perspective and stated that every human need has interaction and correlation under two focal topics: axiological and existential. Axiological is divided into four parts: having, doing, and interacting; existential separated as nine sections composed of subsistence, protection, affection, understanding, participation, idleness, creation, identity, freedom (Max-neef et al., 1991). Additionally, McClure and Bartuska (2007) gathered human needs around two key subjects: social and physical. Subsistence, reproduction, security, and bodily protection are subsections of physiological needs; as well, protection from social dysfunction of insult, protection from anxiety and the need to belong, and self-realization are subdivisions of social and psychological needs (Bartuska, 2007). This

human needs level includes six hierarchical levels based on Maslow's human needs definition and detailed. These human needs refer to and help to create a built environment according to each one. Cities, landscapes, rooms, or relevant concepts are a cluster of the environment; additionally, physical environments comprise and offer a surface, a volume, or lines that contribute to the character of the built environment developed regarding human needs (Khan and Sharma, 2017).

The built environment is fostered and shaped by human needs. According to Khan and Sharma (2017), a built environment creates a connection between nature and the human environment; human needs are addressed by it; everything is complete, organized, and sustained in a built environment by people, and it has an impact on the context of the whole environment. Environmental problems can occur since human behavior is interpreted with a powerless cognitive observation (Mahmoud, 2018). It can be understood that human designs the built environment and interventions should become in accordance with human needs; therefore, people discover and find connection with it (Seckin, 2010). This connection creates a symbolic meaning perceived by humans, and it turns into emotional expressions to place as a place attachment (Lamprecht, 2016). For example, people tend to stay longer where their needs are met; since the concept of place attachment increases over time, there is a linear relationship between meeting human needs and place attachment. More precisely, as the built environment addresses human needs, people develop a stronger attachment to place (Giuliani, 2003), and Relph (1976) indicates place attachment is one of the human needs which is highly essential.

2.1.2.4 An Umbrella Concept on Human-Place Relationships: Sense of Place

Sense of place is an interdisciplinary concept that gathers a growing interest, especially in the last decades, in many fields such as environmental psychology, city planning, urban studies, health, sociology, architecture, and so on. As a part of the needs of humans, people need a place; they develop a sense for it, and sense of place

becomes a complementary part of human natures (Seamon, 1980; Tuan, 1977). Additionally, the notion of the place was defined as an evocative of location (Lewicka, 2011) in previous sections, composed of individuals' interpretations of it. A sense of place is formed under these interpretations.

The connection between humans and place embodies and reveals the sense of place. This construction comprises perceptions that develop in relation to the people's self and the specific location (Tuan, 1974; Eisenhauer et al., 2000). Sense of place cannot exist without this connection and association. According to Relph (1976), Shamai (1991), and Tuan (1977), a sense of place is fostered by symbolic meanings of place that cover myths, denotations, rituals, cultural values. Besides symbolic and social construction, Stedman (2003) emphasizes physical attributes' importance for the sense of place. Relph (1976) indicates that a sense of place occurs in the location where it has perceptible and distinctive characters. Sense of place consists of diverse components, including human behavior, the physical setting, and psychological process (Stedman, 2003). Progression is shaped by the influence of the physical amenities on the symbolic meaning that development forms a sense of place, and the construction of a sense of place is formed as long as physical setting, amenities, and character exist (Stedman,2003).

Sense of place is about perception and experiences within the place creating by human beings. This perception and experiences turn into emotions that people detect. It should not have to be positive; according to Tuan (2013), a sense of place can result in a negative experience such as fear feeling insecure. For example, positive emotional bonds of these experiences are termed topophilia by Tuan (1974), negative emotional bonds of place experiences are named topophobia (Relph, 1985). As mentioned before, a specific location or area or physical features are not enough to reveal in alone a sense of place (Relph, 1976). Physical settings should work together with human experience to discuss the existence of a sense of place. Place experience becomes an entire sensual experience with the help of place experience completed all five senses (Sell, 1984; Shamai, 1991). Experience of place is vital for a sense of place, according to Relph (1976), to extract the spirit of the place. Seamon (1980,

2012, 2013) indicates a sense of place is a phenomenological experience. This experience can be perceived as a logical equation; people's emotional experience and place can be perceived as factors of the equation, and without one of them, it is not possible to talk about the sense of the place. Additionally, place experience contributes to individuals' ride in the universe (Manzo, 2005).

Jorgensen and Stedman (2001) defined sense of place as components that cover mental connotations: cognitive, affective, and conative reactions. Cognitive refers to the perception of self and place mainly combine with beliefs; emotions are elements of affective responses about the feelings, senses in the direction of places, conative means to behavioral intention.

It was stated in the definition of space that this term could contain multidimensional scales. Also, according to Lewicka (2010), a sense of place can be developed from various ranges of scales that arrange from a small-scale place (room, building, streets, or homes) to a broad-scale place (city, country, or bioregional scale). Eanes, Robinson, and Silbernagel (2018) researched a physical and social sense of place changed by scale. As reported by them, a social sense of place is stronger on a micro-scale; on the other hand, the biophysical sense of place is stronger on a macro-scale (Eanes et al., 2018). The differences in the sense of place do not only change according to scale. Also, there is a variation in users' level of sense of place. For example, Shamai (1991) stated that different individuals develop a diverse sense of place's level, even in certain times and spaces. Understanding and analyzing the different levels of sense of place, Hay (1998) developed a model about users' residential lengths and their effect of sense of place. Development of sense of place divided into five-part as regarding user type from least to most intense level: superficial, partial, personal, ancestral, cultural (Hay, 1998). Relph (1976) evaluated levels of sense of place according to their depths, providing seven developmental stages. The depths of levels are shaped regarding modes of insideness (feeling at home) and outsideness (feeling stranger). Furthermore, Shamai (1991) enhanced diverse levels of sense of place (SoP) in line with their intensity. This model was divided into four levels by Shamai (1991), and these are deficiency of SoP,

knowledge of a place, belonging of place, and finally attachment to place. Levels that exist SoP are also divided into two subscales for each level with a total of six levels. To exemplify, belonging to a place is about knowledge of presence positioned in place and belonging to place; attachment to a place which covers feeling attached to a place and identifying through the place purposes; commitment to place composed of the meaning of involvement in a place and sacrifice for a place (Shamai, 1991). Thus Shamai introduced seven levels of sense of place that include all six having a sense of place and not having a sense of place.

Vitruvius (1991) propound that each architectural structure or physical entity should include some qualities about *utilitas*, *firmitas*, and *venustas* (Khan & Sharma, 2017). At this point, *utilitas* means utility about the functionality of the object, or structure, or physical setting. Considering physical structure as a place in this frame, it should have to serve human behavior to have utility. So it can be stated that *utilitas* have a strong relationship with human behavior. Furthermore, Seamon (1980) introduced the concept of 'place-ballet.' It should be understood first body helps to emerge humans' movement and behaviors at specific times and given space (Seamon and Nordin, 1980; Lewicka, 2011). Thus, place-ballet is the sum of all connections of body-ballet and the several time-space routines ingrained in location (Seamon and Nordin, 1980). Lewicka (2011) stated that existential insideness (Relph, 1976) is one of the results of place-ballet. In other words, according to Seamon (1980, 2012, 2015) and Lewicka (2011), a sense of place occurs with body-ballet and space-time practices.

2.1.2.4.1 Concepts Related to Sense of Place

As argued by Shamai (1991), sense of place is the sum of a number of related concepts, including place dependency, place identity, place satisfaction, place attachment, place knowledge.

2.1.2.4.1.1 Place Dependency

Stokols and Schumaker (1981) defined place dependency that several possibilities are provided by physical units for people's activities, and towards their aims as parts of human needs, thus under this framework, place dependency is formed. The explanation of place dependency is also unfolded by Jorgensen and Stedman (2001), Lewicka (2011), and it is a perception that covers the meaning of behavioral benefits provided by a physical setting instead of other places. In other words, it is a selectness made behaviorally compared to alternatives (Jorgensen and Stedman, 2001). Additionally, bonds are created instrumentally with the help of people-place interactions in place dependency (Lewicka, 2011; Stedman, 2003).

According to Smaldone (2005), place dependency occurs when people consider a place's quality and evaluate the other place's quality according to the functionality (please see Vitruvius, 1991) of a place. Then people appraise, which is an advantageous position. Also, Ujang and Zakaria (2015) stated that this is the main principle of urban design, so place dependency strongly impacts this field.

2.1.2.4.1.2 Place Identity

Many scholars like Proshansky et al. (1983), Stedman (2003), Relph (1976), Lewicka (2011) emphasize the contribution of physical settings to the development of human psychology and their connection about self. Proshansky, Fabian, and Kaminoff (1983) presented the definition of place identity as self-socialization with the help of the physical environment. Humans associate themselves with physical settings, and feelings emerge from them; also, this association creates a symbolic meaning that explains who people are (Brown et al., 2015).

According to Proshansky et al. (1983), the physical environment evokes thoughts about environmental past, personal beliefs, ideas, future expectations, or socio-cultural values, and all of them are associated with personal cognitions without being aware of it. Thus, these place identity develops regarding these cognitions.

Correspondingly, Proshansky et al. (1983) stated that place identity develops when one talks and thinks about a particular place. All of these actions create bonds between people and place. As describing their bonds by Tuan (1977), he stated that these bonds are influential and have the power to shape and impact people's identity in some way.

Place identity is defined as a personal construction (Proshansky et al., 1983). This construction has some components about individual's distinctiveness, continuity about themselves, self-efficiency, and finally, self-esteem (Rajala et al., 2020). More precisely, place identity is the identification of people with the place (Severcan, 2012).

Relph (1976) detailed the definition of place identity and indicated differences in meaning between identity with place and identity of place. Identity with a place is the part of the insideness concept defined by Relph (1976), including the sense of unselfconscious (Seamon, 2012) and deep emotions about a physical setting. Likewise, it contains place attachment or desire of participation or commitment. On the other hand, the identity of place refers to that people create values with their first experiences and intentions about the physical setting.

Besides the connection and awareness of self and place, Uzzel, Pol, and Badenas (2002) emphasize place identity's impact on community awareness. They asserted this effect is not one direction; the community also has an effect on place identity.

2.1.2.4.1.3 Place Satisfaction

Satisfaction address the needs of psychological, physical, social, and cultural (Proshansky et al., 1983). Also, the definition of place satisfaction is formed under this frame. Place satisfaction is an attitude toward a physical setting (Stedman, 2003), and it contains the judgment of the values of the physical setting in accordance with the needs of individuals. Opportunities of services or properties, which are identified as a process of subjective evaluation of individuals, explain place satisfaction (Chen, Dwyer, and Firth, 2014; Chen, Dwyer, 2018). Individuals evaluate physical settings

considering their attributes: public space, fresh air, etc. (Hur, Nasar, and Chun, 2010). This evaluation can result as a positive: liking a place or negative: disliking of place (Stedman, 2003).

Several scholars like Stedman (2003) and Chen, Dwyer, and Firth (2014) asserted a correlation between place attachment and place satisfaction. Moreover, place satisfaction can be perceived as a predictor (Chen et al., 2014) and integrative part of place attachment (Stedman, 2003).

There is a similarity between place satisfaction and place attachment; however, place attachment includes the concept of self, and this discrimination causes it to be understood place attachment is broad and has a deep connection rather than other concepts (Chen et al., 2018). In addition, Stedman (2002) used as a measurement to place satisfaction as a complementary part of place attachment (Chen et al., 2018).

2.1.2.4.1.4 Place Attachment

Place attachment can be interpreted as a part of several disciplines and complementary concepts (Low and Altman, 1992). Emotional ties between people and place comprise place attachment (Low and Altman, 1992; Lewicka, 2011); these bonds can be composed of positive emotional expressions (Low and Altman, 1992). In addition, according to Scannell and Gifford, (2010), place attachment can be perceived as two main associations of people: as an individual or social factors and place: as physical, social, and symbolic.

2.1.2.4.1.5 Place Knowledge

Place knowledge manages human behavior, and it shapes within the framework of elements of physical settings (Moran, 2017). Place knowledge is defined as a unique experience raised from interpretations of the physical world. Human needs

knowledge of place in order to move or travel in environmental space which they experience (Jansen-Osmann, Fuchs, 2006) especially new environments (Ishikawa and Montello, 2006).

Concepts of place attachment and place knowledge will be elaborated further in the following sections of the thesis.

2.2 Place Attachment and Place Knowledge

In this section, the author will review the concepts of place attachment and place knowledge in detail and discuss their importance, development, and relationship.

2.2.1 Place Attachment

The description of attachment is a bond between people with other entities (Brody, 1981), and reaching or sustaining this bond with physical entities or other people. In addition, the desire to being with them led to attachment behavior (Bowlby, 1982). More precisely, this sort of desire to the physical setting creates to emerge attachment toward it. Thus, place attachment occurs with the help of sensual bonds (Lewicka, 2011; Low and Altman, 1992). Attachment is defined as an important human behavior (Bowlby, 1982); therefore, these bonds toward a meaningful space are a complementary part of human needs about people-place interactions. According to Seamon (2012), the outcome of phenomenological experiences with place evokes emotions in people and helps to born of invisible and subjective bonds. These bonds between specific physical settings and individuals or the community and behavioral commitment (Pretty et al., 2003) create and shape place attachment (Seamon, 2013).

There is a rising interest, and researches about place attachment are broad in literature. Place attachment is an interdisciplinary concept and can be part of studies about environmental studies, geography, sociology, psychology, planning, architecture, interior design, etc. Moreover, it differs not only about study fields but

also about its structure composed of multifaced concepts (Scannell and Gifford, 2010). Put more concretely, Scannell and Gifford (2010) suggested that extents of place attachment are multidimensional, encompassing person, place, and psychological processes.

2.2.1.1 Person Aspect of Place Attachment

A person is one of the supplementary parts of the multidimensional structure of place attachment. Scannell and Gifford (2010) and Severcan (2015) stated that place attachment appears within individual or community levels. Personal memories, past, present, and future expectations, ideas, several thoughts, interpretations (Proshansky et al., 1983), personal awareness, milestones are definers of individual-level of place attachment (Scannell and Gifford, 2010). It is declared that place experience is a personal trip in the world (Manzo, 2005) in the previous section: 'An Umbrella Concept on Human-Place Relationships: Sense of Place.' Community-level place attachment can be subjective and at the same time includes an objective framework from people (Hummon, 1992). In other words, it is objective due to it envisioned a common impression; it is still subjective because community level of place attachment is represented a group of people. One of the important features of this level is formed under symbolic meaning (Low and Altman, 1992; Hummon, 1992). In addition, shared meanings include historical or religious aspects (Scannell and Gifford, 2010). Hay (1998) mentioned that place attachment of people varies according to the user type, and he concluded five different user levels which also categorize persons of place attachment.

2.2.1.2 Place Aspect of Place Attachment

A place is another central and vital part of the place attachment framework. According to Scannell and Gifford (2010), place differs under two scope, physical and social. A place aspect of place attachment is defined under two concepts:

physical and social. A natural or built environment identified as a physical place attachment (rootedness) diverges according to size, scale, qualities, densities, proximities, or characteristics (Lewicka, 2011; Scannell and Gifford, 2010). Social place attachment is divided into two social arenas and social symbol, and it is explained as a social tie with the place and can contribute to the socialization process, common sense (Pretty et al., 2003), and relationships with others (Scannell and Gifford, 2010). According to Scannell and Gifford (2010), lifestyle and sociodemographic factors (Hunter, 1974; 2012) can impact social place attachment. Also, as place defining has various dimensions from a room to country (Lewicka, 2011; Shamai, 1991), physical and social place attachment also differs by place scales from micro to macro-scales (Scannell and Gifford, 2010; Hidalgo and Hernandez 2001). In literature, there are researches about different scales of place attachment that cover home, neighborhood, city, country, and regional attachment (Lewicka, 2011). Some scholars like Hidalgo and Hernandez (2001) compared social place attachment and physical place attachment and found that social place attachment strength is higher than physical place attachment. While searching for this comparison, they also asserted attachment levels according to the place scale. On the other hand, Uzzell et al. (2002) advocated that social and physical attributes shape attachment to place together.

2.2.1.3 Mental Process of Place Attachment

The psychological process of sense of place has three-component: cognitive, affective, and conative reactions (Brown and Perkins, 1992; Jorgensen and Stedman, 2001; Low and Altman, 1992). Scannell and Gifford (2010) used these concepts as a cognitive, emotional, and behavior while defining the place attachment's mental process. They asserted that place attachment is born with people-place interaction through an extension of psychological response. The place assists and sustains individuals' self (Hay, 1998), and cognitive responses generate a connection with self and evoke some meanings (Scannell and Gifford, 2010). It can be understood

that the psychological process of attachment to place has an impact on self-concept. Beliefs, perception, memory, knowledge (Proshansky et al., 1983), schemas, meaning have an effect on cognition. Responses related to emotional expressions reveal the affective factors of the psychological process of place attachment (Scannell and Gifford, 2010; Low and Altman, 1992). These expressions are influenced by feelings (love, pride, gladness, pleasure, happiness), people's current moods, etc. (Scannell and Gifford, 2010). People having a place attachment toward a specific place would desire not to choose another location (Giuliani, 2003). The last component of the mental process is behavior or conative responses. Behavior reaction occurs via actions making real by human movement. For this aspect, many scholars like Gibson (1979), Heft (1989;2015), Lewicka (2011), Fajen and Turvey (2003) associated the theory of affordance with behavior reactions of place attachment. Opportunities are ensured by a place known as Gibson's theory, and they are perceived according to compatibleness with human movement. People's initial experience with the world is by moving objects or things and movement in space (Johnson, 2007). Moreover, defining the concept of place-ballet, Seamon (1980) emphasizes the importance of human movement, which emerges from the body and shapes human behavior. Scannell and Gifford (2010) divided place attachment behavior into two: proximity-maintaining: want to stay close to the place and reconstruction of place: want to preserve the meaningful location. These two tendencies can be considered a positive attitude toward a place, and this positive position is composed of solid emotions that are perceived by means of a feature of place attachment (Hidalgo and Hernandez, 2001).

Considering all definitions of the psychological process of place attachment, it can be stated that these responses have a strong relationship with some people-place concepts. For example, the descriptions of cognition responses with place identity have various similarities about personal attitudes or beliefs. Affect responses can be associated with place dependency, such as making a comparison.

2.2.2 Place Knowledge

According to Cresswell (2004), the place provides the first experience to comprehend, perceive, and finally know the world. Knowledge is defined as a relation by Zagzebski (2017). Individuals touch reality with cognitive way, and this position called knowledge has a high degree of worthwhileness (Zagzebski, 2017). Numerous types of knowledge are found in the literature, and environmental knowledge is one of them. This concept is associated with unique experiences attained with interpretations of a physical entity. These interactions can occur directly through knowledge of the environment or indirect way, which is knowledge about the environment (Gibson, 1979, Seamon, 2012). It is also understood as a tacit form of knowledge (Gibson, 1979; Seamon, 2012). This form includes in its definitions about learning by doing (Boiral, 2002). Thus experience and interaction are a crucial part of it which also shapes environmental knowledge.

2.2.2.1 Knowledge About the Environment

Environmental knowledge is divided into three sections: locational, limitational, and social (Rockman, 2003). Locational knowledge includes the physical qualities of an area or points (Rockman, 2003) and sums up descriptions spatially. Golledge (2004) used spatial knowledge as a wayfinding tool, and recent researches generally focus on these instrumental features about spatial knowledge.

A specific environment's knowledge is determined under five subsections: routes, meaningful locations (place), paths, counties, and coordinate setting by Kuipers (1978). The importance of this definition is emphasizing the concept of place as a part of environmental knowledge. Although route, path, regions, coordinate, or place are examined equally together as a part of environmental knowledge by Kuipers (1978), Siegel and White (1975) detailed route, landmark, and configurations as a complementary part of spatial knowledge.

2.2.2.2 The Notion of Place Knowledge

Place knowledge is associated with knowledge about physical settings, people's movement, obtaining and storing information for a similar or different place to finding a route or way and move, and all of them happen effortlessly (Kuipers, 1978). Put more precisely, place knowledge is obtaining information directly or indirectly experience from a point or location, area, and gathered Put more precisely, place knowledge is obtaining information directly or indirectly experience from a point or location, or area. Also, it can include gathered pieces of communication shaped by physical features, environmental observation, discovering, accessibility, image, or sense of place. Additionally, it can be affected by evaluation differences or similarities regarding other places. Moreover, place knowledge can occur unconsciously that is the consequence of everyday movement with the habits of body directions (Seamon, 1977). Put more concretely, Hart (1979) stated that place knowledge embraced by past experiences impacts and shapes new place experiences. Thus, knowledge and behavior are indispensable to place knowledge and are highly integrated (Hart, 1979). As people move in an environment, they have exposed some physical or social knowledge of the place every day. For example, as reaching home or work or using geographical tools such as maps, individuals try to interpret physical settings and are exposed to spatial knowledge (Ishikawa and Montello, 2006). Dennis et al. (2009) stated that spatial, visual, and historical knowledge systems are a connection that is created by everyday place knowledge.

According to Golledge (2004), accurate and comprehensive spatial knowledge does not reveal instantly; place knowledge emerges in the ongoing process from the beginning to the end of the wayfinding experience and even after it. Thus it can be stated that experiences and interactions foster place knowledge. Severcan (2015) found a correlation between participation in place-making activities (including field trips, design-built activities like gardening, and street art) and place knowledge. In other words, place-making activities have a constructive impact on place knowledge.

Defining the level of sense of place, Shamai (1991) and Relph (1976) emphasized that there should be cognitive knowledge about a place from the least to the most intense level, then the presence of this knowledge reveals a sense of place. (Seamon, 2012). In other words, it is only possible to discuss people-place concepts in line with the existence of place knowledge.

2.2.3 The Importance of Place Attachment and Place Knowledge

Relph (1976) and Tuan (1974) reported that a sense of place is a complementary part of human needs. It is understood that components of the sense of place contribute to human needs such as attachment, security, belonging, which are fulfilled with the experience of place. Proshansky et al. (1983), Low and Altman (1992), Jorgensen and Stedman (2001) stated that place attachment contributes to self-development, providing survival and safety, purpose, and self-continuity, sense of belonging (Giuliani, 2003; Scannell and Gifford, 2010). In this point, place attachment and place knowledge have similarities. In other words, place knowledge has an impact on people's self-development process as place attachment does. Place knowledge develops people's behavioral attitudes such as problem-resolving, movement arrangements, perceptual indications gathering from the physical area (Wiener, 2009). Additionally, Manzo and Perkins (2006) stated that since people have a tendency to find, stay, connect and protect the area when they have a sense of place, and mentioned emotions generate urges to act. To exemplify, individuals have disposed to participate in local planning practices with the help of affective bonds to place (Manzo and Perkins, 2006). Besides of importance of place knowledge about the self or individuals tendencies, thirteen benefits of place attachment are introduced by Scannell and Gifford (2017). Benefits are shaped around various mental processes: remembrance, belonging, relief, optimistic feelings, motion sustenance, reliance, self-progress, self-determination, enjoyment, aesthetics, interaction with landscape, practical assistances, confidentiality by Scannell and Gifford (2017).

Researches about place attachment and place knowledge are highly interdisciplinary and differentiated impact on various fields. The focus is generally on spatial, sociological, and psychological aspects of place attachment and knowledge in literature. More precisely, the spatial aspect of place attachment researches conducted with a participatory planning model to discover and improve the physical quality of place, communities, managing movements, living standards, activity involvement, and the urban area's dynamics (Kyle et al., 2004; Manzo and Perkins, 2006; Dennis et al., 2009, Schulz et al., 2005). Schulz et al., 2005 highlighted the importance of place knowledge to planning interventions that design human life. Many scholars like Schulz et al. (2005), Lynch (1960), Relph (1976) focus on spatial activities and locational symbols in their place attachment researches. On the other hand, the psychological aspect of place attachment researches generally focuses on individual-based studies (Williams and Vaske, 2003; Jorgensen and Stedman, 2001; Low and Altman, 1992, Scannell and Gifford, 2010). Disaster, mobility, immigration, community, environmental psychology is included in the study of place attachment (Brown and Perkins, 1992; Bogaç, 2009; Giuliani et al., 2003; Scannell and Gifford 2010). Critical differences between spatial and psychological aspects of place attachment studies are that spatial one concentrates on community-based examinations; on the other hand, psychological aspects focus on individual-based studies (Manzo and Perkins, 2006).

2.2.4 Development of Place Attachment and Place Knowledge and the Relation of These Two Concepts

According to Jorgensen and Stedman (2001), place attachment develops when people's needs are addressed. In order to meet their needs, people need to be aware of their needs and the environment that can respond to them. Only if it comes to knowledge about a place; individuals could develop a sense of it.

According to Severcan (2012), place attachment develops with three factors: individual (e.g., age, gender, income), socio-cultural (e.g., parental influences), and

place-making activities. Additionally, Lestari and Sumabrata (2018) practiced an analytic and comprehensive categorization about place attachment affected factors. Demographic, family, physical, social, economic factors were emphasized by a number of researches on place attachment (Lestari and Sumabrata, 2018; Hummon, 1992; Chawla, 1992; Lewicka, 2011; Brown and Perkins, 1992, Seamon, 2015). The categorization is organized around these five main factors. Demographic factors include age, personal finance, residential length, being a property owner; factors shaped under the framework of physical are a form of structure or place, accessibility, hybrid system, qualities, facilities; social factors are sorted wanting to live together, possibilities of social relations, involvement desire; economic factors contain affordability, availability of work, fertile terrestrial (Lestari and Sumabrata, 2018). It can be stated that the components of physical factors that affect place attachment are highly associated with place knowledge.

Siegel and White (1975) stated that place knowledge develops through time and space relation with an accumulation of gathered information about the environment. Additionally, Siegel and White (1975) introduced phases of spatial knowledge and stated that it comes into existence according to time; further, they detailed spatial knowledge under three stages: active, perceptual, and symbolic. Spatial knowledge as an active refers to awareness of physical things by seeing or recognizing with quickly such as landmark; perception related to the spatial representation (methodological way) and contain senses and interpretations such as maps or route drawing; symbolic is about communication, estimating, and computing such as surveying (Siegel and White, Jansen-Osmann et al., 2007). Golledge (2004) emphasized the importance of points, lines, and areas on place knowledge. Moreover, Spatial knowledge is divided into two processes: acting in the physical world is about procedural spatial knowledge, and a person's wayfinding is defined as declarative spatial knowledge (Sorrentino et al., 2019).

There are similarities in the development process based on space and time relation between place knowledge and place attachment. The correlation between residential length and place attachment is found in the literature (Hay, 1998; Vorkinn and Riese,

2001; Kasarda and Janowitz, 1974). According to Vorkinn and Riese (2001), place attachment is a dynamic concept that can be changed according to time. Again, place knowledge develops depending on time and direct experience of place, shaping place knowledge (Jansen-Osmann, Fuchs, 2006; Gibson 1979). In addition to their similarities, there are studies in the literature about their contributions to each other. To exemplify, Severcan (2015) found a strong correlation between place attachment and social place knowledge (i.e., knowledge about who the neighbors are, who the shop owners are, and so on).

The place knowledge and place attachment, which changes and develops according to time, consists of different levels. According to Siegel and White (1975), place knowledge develops through processes and stages were ranged from first to last: identifying landmarks, finding routes, and surveying metric information. Low and Altman (1992) introduced four continuum periods to occur and sustain place attachment. These periods contain biological, environmental, psychological, and social processes (Low and Altman, 1992; Hay, 1998). Severcan (2012) introduced four different levels of place attachment: not having, low, high, and deep place attachment which has a strong relation with Shamai's sense of place levels. Chen, Dwyer, Firth (2014) asserted six levels of place attachment; place identity, place dependency, social bonding, attachment place memory, and place expectation. The initial four dimensions are associated with attitudinal scopes; the last two are related to interactional extents (Chen et al., 2014).

The development of children's place attachment has been examined in numerous studies. Ataol et al. (2019) stated that studies of children's place attachment are generally conducted between six and twelve age. Chawla (1992) stated that children tend to visit outdoor activities that offer practical opportunities to observe or research their movement in an environment. Children's place attachment reveals individual and environmental connections (Proshansky et al., 1983). They improve positive and negative emotions about the environment from the beginning of their life, and at that time, feelings can occur unconsciously (Jack, 2010); after primary school, children develop spatial knowledge about their neighborhood and explore their surroundings

(Siegel and White, 1975). Children's place attachment is fostered by children's place experiences that occur repeatedly and directly with the contribution of social meaning created by children and others (Jack, 2010).

2.2.5 Measurement of Place Attachment

According to Williams and Vaske (2003), it is essential to generalize between components that create every dimension respectively rather than generalize places, individuals, or extents, in order to precisely measure place attachment. Moreover, instead of focusing only on a specific place to measure place attachment for individuals, one person's place attachment for different kinds of places should be evaluated (Williams and Vaske, 2003). Also, place attachment measures range from micro-scale to macro-scale (Vorkinn and Riese, 2001, Hidalgo and Hernandez, 2001).

Tools of place attachment measurement were accumulated within a social and physical framework (Brehm et al., 2013, Jorgensen and Stedman, 2001, Stedman, 2003), affecting individuals' psychological process (Scannell and Gifford, 2010) framework in literature. According to Lewicka (2011), the physical features of a place can be measured with size, type, density level, or GIS measurement. However, individual or social factors of place attachment contain the complexity of understanding, conceiving, and interpreting by users.

Place attachment is measured with different factors generally well-defined with place-people concepts in the literature. More precisely, Stedman (2003) focuses on place satisfaction in his research to measure place attachment. Kyle et al. (2004) highlighted the importance of place identity rather than place dependency. However, one of the researches about place attachment was measured with place dependency and emphasize that place identity harms the developmental contribution (Bricker, 1998). Additionally, Williams and Vaske (2001) examine place attachment with place dependency and place identity together. Severcan (2012) emphasizes the

importance of place identity, place dependency, and place satisfaction to understand and measure place attachment. Also, Severcan (2012) asserted that these three types of people-place concepts are complementary parts of place attachment.

2.2.6 Measurement of Place Knowledge

According to Barber et al. (2009), spatial knowledge measurement is composed of two measurement types; subjective and objective. Dodd et al. (2005) asserted that an individual's own ideas, interpretations, cognitions about the physical world shaped place knowledge; on the other hand, objective one stored in people's memory, and it is about precise information and organizations.

Spatial knowledge contains two different types of information; survey knowledge and procedural knowledge (van Dijk et al., 2001). Survey knowledge or landmark knowledge can be measured by setting recognition, and wayfinding practices include quantitative information or direction or distance qualities about physical settings (Qiu et al., 2020). In a basic definition, Configurational knowledge includes a comparison of positions (de Goede and Postma, 2015; Qiu et al., 2020). Qiu et al. (2020) stated that spatial knowledge could be measured comprehensively, overarching, and precisely with configurational and survey knowledge.

Many types of research hold the cognitive maps used as an instrument to understand the individual's place knowledge in literature (Weisberg et al., 2014; Ishikawa and Montello, 2006; Kuipers, 1978; Uzzell et al., 2002; Golledge, 1992; Brown et al., 2015). Cognitive maps were defined as a knowledge representation of place by Kuipers (1978). Thus, it is understood that it can be used as a measurement tool to understand individuals' knowledge about their experienced places. In other words, cognitive maps are a suitable instrument to measure an individual's place knowledge.

2.2.7 Correlation of Place Attachment and Place Knowledge

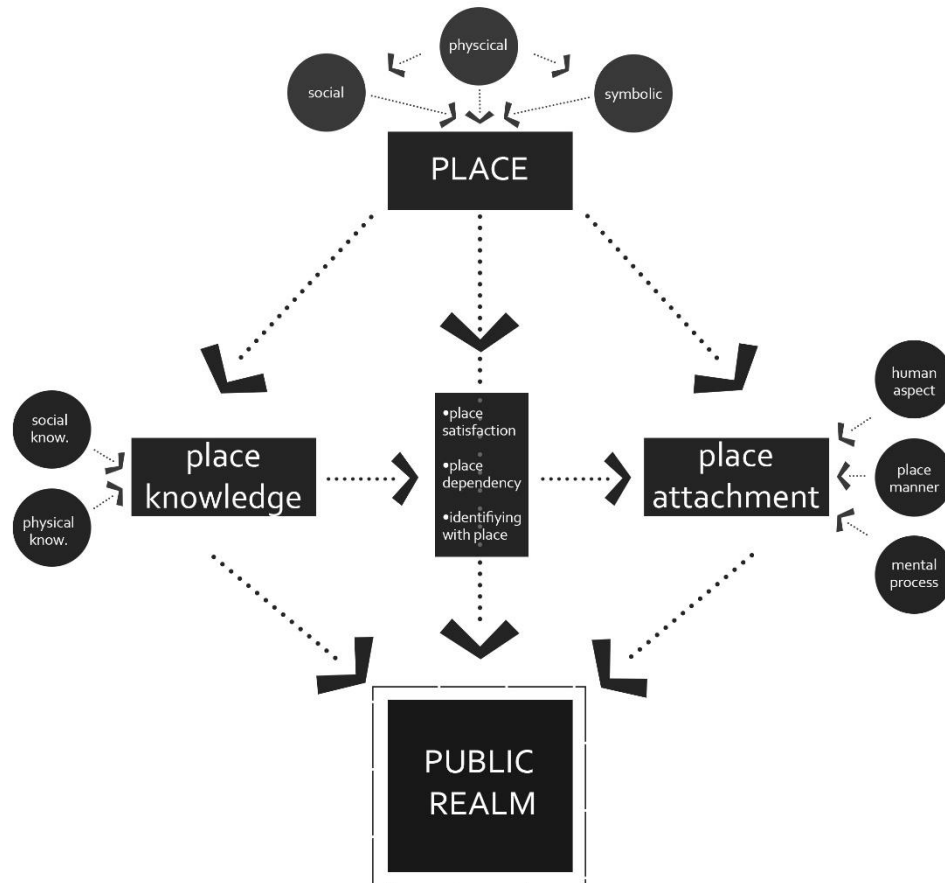


Figure 1: Correlation of place attachment and place knowledge (prepared by the author)

The place was defined as an interaction of human and meaningful location under the framework of physical, social, and symbolic meaning. These meanings shape place knowledge which is also influenced by social and place denotation. Human place concepts can only emerge with the existence of place knowledge. For example, individuals should know first about one thing, then interprets it according to their perception obtained by knowledge. This perception can include liking or disliking, or self-cognition, or the process of selection, among others, according to

advantageous. This aspect points to some basic human space concepts like place dependency, place satisfaction, and identifying with a place, and these perceptions are what actually constitutes the place attachment. It was mentioned that place attachment is also affected by factors formed by personal aspects such as individual and social factors, physical manner, and psychological process, including cognitive, conative, and affective (Scannell and Gifford, 2010). Finally, the accumulation of all of the place concepts making a connection between place and public realm creating solid influences.

2.3 Children's Place

Every human being in the world has experienced a childhood era inevitably; thus, the childhood era is part of humanity. Children understand their surroundings as the concept of a place to their first exploration of the world. Hart (1979) stated that every child's environmental discovery starts in childhood worldwide.

Chawla (1992) asserted that places should provide some qualities such as social affiliation, security, and belonging, creative expression, and exploration for child users. Kollar and Farley (2019) expanded these qualities, adding some themes like emotional responses and natural environments. More precisely, security and belonging are about children's emotional wellness levels. Creative exploration and expression allow to form children's environmental awareness and supporting freedom for their spaces. In this way, children talk, laugh, dream, and solve the problems in their environments (Koller and Farley, 2019). The place provides interaction with children and their surroundings and also among other children, so the socialization process and social relationship is an inevitable part of a place. Thus social affiliation is one of the essential features of children's places. Environments of children should provide an atmosphere that feeds their emotional growth to enhance and fulfill children's emotional states. The natural environment also is one of the complementary parts of environmental exploration; it has an additionally positive impact on children's creative exercise and activities. For example, they

explain themselves freely and play without restrictions and being watched (Chawla, 2007; Ataol, 2019). In the presence of all these themes, the place attachment in the children appears (Chawla, 1992; Ataol et al., 2019; Koller and Farley, 2019).

According to Severcan (2018), children's place preferences and use change with respect to social, cultural, spatial, and individual aspects such as age, gender, and income level. Additionally, age, gender, or income level affected the choice of places and preferred and used places change according to every context depending upon cultural, individual, social, or spatial situations (Severcan, 2018). Moreover, children prefer places like more natural to provide a space that allows for socialization, more security, and a place where they have a chance to freely move (Chawla, 2007, Sancar and Severcan, 2010, Severcan, 2018).

Many scholars have introduced children's places (Chawla, 1992; Min and Lee; 2006; Cele, 2006; Castonguay and Jutras, 2009; Sancar and Severcan, 2010). It was found that parks, playgrounds, streets, alleys, service and retail places, spaces near to children's homes are most like places preferred by children, according to Castonguay and Jutras (2009). In order to understand the relationship between place and children, several studies were conducted by scholars. There are many child-centered methods in the literature, and drawings, photography, diaries, activities, child-led interviews, surveys, discovering surroundings with walking are notable ones. To measure children's place attachment and place knowledge these methods were used in several place-based types of research with children. For example, Hart (1979) conducted a study that emphasizes the importance of landscape exploration, understanding nature, place embracement process for children. The accessibility of environmental sources and play areas was defined as a child-friendly environment's main character by Moore (1979; 1978). Sancar and Severcan (2010) found how the place choices of children in rural and urban areas changed using a participatory photography model in Bodrum Peninsula, Turkey, and also they indicated children have less tendency to feel free and restricted moving area in changed their previous places by tourism-led transformation. They also found that public spaces like streets, houses, natural areas (like gardens, forests, and beaches), and commercial areas that serve the public

interests (like traditional coffeehouses and grocers) were the most liked and used places of children in all contexts, even though these places are used at different levels from one neighborhood context to another. Moreover, Dennis et al. (2009) keynoted that a participatory photography model is helpful for the child-centered method measuring the effect of place on children's health in Madison, Wisconsin. The participatory photography model and place drawing as a cognitive map are the most preferred methods to measure children and place relationships. Heft (1989) emphasized the importance of opportunities provided by the environment, known as Gibson's affordance theory, and children's cognitive maps were studied under this perspective. Cele (2006) also exemplified children's places measuring their place knowledge with interviewing, drawing, photography, and walking activities. Çakırer-Özservet (2019) emphasized how urban transformation affects children's places and understands children's perspectives about urban places, using children's cognitive maps. It was found that drawing differentiated among children who have accessibility to use natural and public spaces and children who could not reach a place. The main importance is that children could not develop a sense of a transformed area that lost total historical traces in Beyoğlu, İstanbul. Moran (2017) evaluated children's spatial knowledge using their route drawings to understand the walkability and wayfinding abilities. Lehman-Frisch et al. (2012) have worked on children's cognitive maps in Paris's gentrified neighborhoods that have undergone an urban transformation. The most interesting aspect of their work was the information given by children about drawing forms. It was emphasized that the ability to draw is very subjective and suggested that it should not be evaluated according to its quality. But the interesting point is that it was attributed the neighborhood to a body in plan-like drawings and claimed that their drawings, which are sketchy, reflect a relationship between the child and the neighborhood (Lehman-Frisch et al., 2012). Beneker et al. (2010) again used children's drawings to understand their visual representation of their cities in four different countries, and they presented similarities and differences of drawings among participants of four countries. Severcan (2015) conducted a study in İstanbul that combines various

planning and design activities with a high number of child participants. It was found that involving different types of place activities enhances children's emotional statements and feelings about the place (Severcan, 2012; 2015).

Public spaces allow children to learn their human rights (Mitchell, 2003); they only learn to become a part of a whole when they can access these areas. In addition, children's places are highly crucial for urban planners and designers to understand children themselves as citizens, becoming a part of society, and playing an active role in the world (Ataol et al., 2019). It was found that there is a positive correlation between children's liked places and the use of public places (Min and Lee, 2006). Because place attachment is crucial for human needs, children's place should fulfill the level of emotional statements, provide opportunities so that children choose, among others, and self-development. In the absence of place attachment for children, many mental problems can occur with the highest probability (Mitchell, 2003).

It was discovered the definitions of place some theories about human place relations, into the notion of the place concept with a theoretical overview in this chapter. Also, it was introduced place attachment and knowledge according to their meanings, importance, development process, measurement types, and correlation. Finally, children's place in accordance with the mentioned theoretical framework was explained. Considering the contributions of the presented theories to the evaluation process of the thesis, the concepts mentioned in this chapter are included in order to interpret comprehensively and more precise analysis results.

CHAPTER 3

METHOD

This chapter introduces the methodology of the research. It starts with the selection of case areas. Then, the chapter focuses on the selection of the participants from the selected cases. Finally, it explains the data collection tools and data analysis methods.

3.1 Background Information

This thesis focuses on research that was conducted in İstanbul, a unique location with a rooted history and rich socio-cultural and physical values. It is one of the places that has been experiencing large-scale immigration and urban transformation practices. Especially since the early 2000s, these urban transformations gained speed. The city dynamics of İstanbul that have changed in this way have prepared a suitable environment and basis for the research field.

The data of the thesis were retrieved from the advisor of this thesis, Yucel Can Severcan. They were collected as part of Severcan's Ph.D. thesis study between the years 2010 and 2011 (see Severcan, 2012). As mentioned by Severcan (2012), the data collection process was financially supported by 2 European Union grants, aiming to create Istanbul a child-friendly city. In this thesis, the author asked unique questions that were not presented elsewhere before about children's place knowledge and its relations to neighborhood transformation levels and also the correlation with place attachment.

3.2 Site Selection

Every context is unique and has different characteristic features due to its geographical discrepancy. Although each city can be defined as unique, İstanbul is a sui generis city in terms of its locational position, cultural and historical background, population, ecological values, topography, economic development, urban fabric, and sociologic structure. It can be stated that the location of İstanbul help to led to other important characteristic features. The lands of İstanbul are located on both continents as a Europe and Asia, and İstanbul is one and the only metropolis in the world having this particular location. Since it has such features about the strategic position, in each and every era, İstanbul has become an attractive point for the empires, states, humans, and also target of political or economic decisions. İstanbul also contains the most imperative transit route, the transportation line, and the central ports.

İstanbul has a rooted history. It has a history of about 3,000 years of settlement and 1,600 years of capital past. The city has hosted the Byzantine, Roman, and Ottoman Empires and the state of Turkey. With all of its hybrid and mixed systems and internal and external city dynamics, İstanbul has always become an attractive point and has a structure that fascinates people to itself. In the last few decades, İstanbul is one of the cities with the highest population in Europe, like in 2010 and still in 2020 (TÜİK, 2021). Thus, the pressure of urbanization is also too high. As mentioned before, İstanbul is the target of social-political, economic, planning decisions; therefore, declared pressure had caused an urban transformation in many places of İstanbul. As Akkar, Ercan (2013) stated, İstanbul has been subjected to the urban transformation process severely and has experienced many problems about gentrification and displacement for the last few decades.

This thesis focuses on the historical but transforming neighborhoods of İstanbul. The data were collected from six of thirty-nine neighborhoods in İstanbul province in 2011 and used in the scope of this thesis research as secondary data. These data have been adopted as the primary data of this thesis. Three neighborhoods were from Kağıthane District (Merkez Neighborhood, Talatpaşa Neighborhood, and Çeliktepe

Neighborhood), one from Beyoğlu District (Galata Neighborhood), one from Üsküdar District (Ayazma Neighborhood), and one from Fatih District (Cibali Neighborhood). All of these chosen neighborhoods had been experiencing urban redevelopment practices by the time the data were collected but at different levels (see Severcan, 2018). Different factors affected their selection process, including the promises provided by the Mayors of the districts to the project staff before the initiation of the project activities (Severcan, 2012). However, one of the most influential factors that affected the site selection process was the historical character of the contexts.

Based on an assessment of the changes in traditional public spaces, historical heritage, traditional commercial land uses, and appearance of massive commercial developments and gated communities, the six neighborhoods were later grouped under three categories based on their level of urban redevelopment. The least redeveloped neighborhoods were Cibali and Ayazma, the somewhat redeveloped neighborhoods were Merkez, Talatpasa, and Galata, and the most redeveloped neighborhood was Celiktepe (Severcan, 2018). Every neighborhood in the scope of the research is examined in detail in the next section.

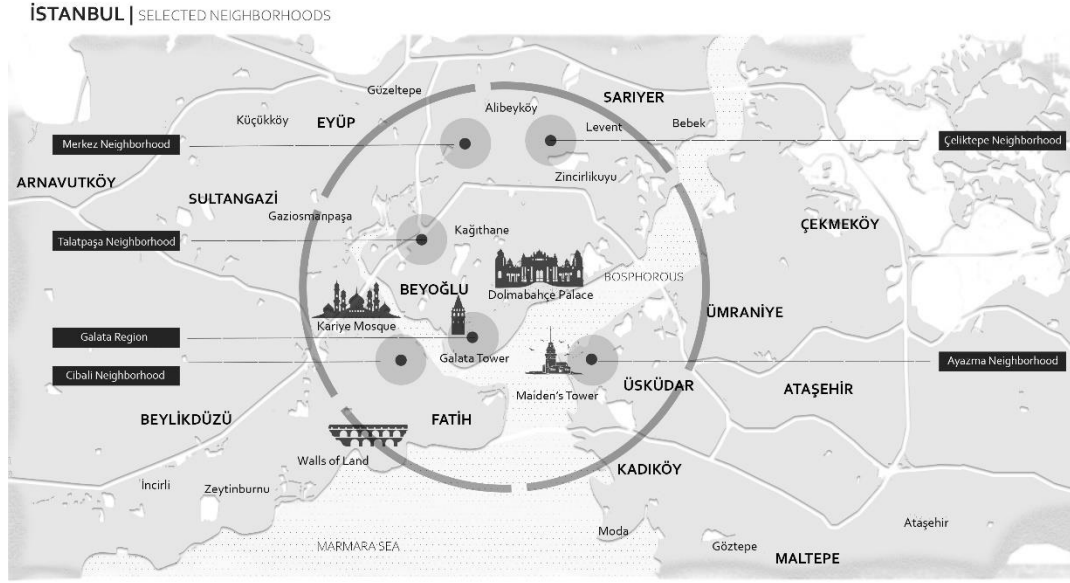


Figure 2: İstanbul and the selected neighborhoods

3.2.1 Beyoğlu District: Galata Region

Beyoğlu is located on the west side of İstanbul, known as a European continent and one of the historical districts of İstanbul. It is possible to find historical traces in most points of Beyoğlu. It reflects a unique and antique architectural pattern and old town

dynamics. To illustrate, İstiklal Street locates in Beyoğlu, and it was shaped as in European city design after the Christians' occupation in the region. Moreover, Galata Tower, built in the sixth century, has been an attractive point and landmark for centuries. According to Erbas (2018), Galata was known for its exclusive green structure fed by fertile lands. Galata witnessed some of the most important events of İstanbul. For example, the historical earthquake occurred in 1509 in the Galata region, and it was called the little apocalypse. İstanbul contains many fault lines, and Galata is one of these risky regions in the past and today.



Figure 3: Old urban fabric of Galata
(Source: www.serifyenen.com.tr)



Figure 4: Redeveloped Galata
(Source: www.pixabay.com)

Besides its ancient historical character, Beyoğlu also has a significant cultural, social, or economic aspect, and also Galata region is used for a trade center being as a port or land in İstanbul (Erbas, 2018). Mixed functional uses, the presence of different social groups, its development as an essential point of cultural and social activities are just a few of the values that enrich the identity of Galata. For example, Turks, French, Italians, Germans, or Greek people have used the Galata region as a home (Dursteler, 2005). The Galata region, which has such intense experiences both tangible and intangible, has become the target of urban regeneration practices with the pressure of urbanization over time. The decisions of urban transformation were also affected by the high crime rate, corruption, risk of natural disaster (i.e., earthquake), and degenerate in this region at the end of the twenty century. Therefore, the Galata area has been exposed to some implementation by urban regeneration practices. Galata region has been subjected to gentrification by urban regeneration projects; additionally, this area has been the place that experienced a rate of gentrification in İstanbul (Severcan, 2012). Among the six chosen neighborhoods, Galata was selected as the fifth most affected and changed area from the urban transformation practices in İstanbul (see Severcan, 2018).

3.2.2 Fatih District: Cibali Neighborhood

Istanbul has tremendous traces remaining from a history rooted from b.c. to the present, and Fatih District, located in the European continent, is witnessing this rich history. Fatih is located in the historical peninsula of the city and hosted the administrative buildings of a variety of empires, including Byzantine, Roman, and Ottoman.



Figure 5: Old urban fabric of Cibali (Source: www.eskiistanbul.net)



Figure 6: Redeveloped Cibali (Source: www.ekdergi.com)

The Cibali Neighborhood is located in Fatih, situated at the southern gate of the Golden Horn, one of the places that have witnessed all these historical values. This region has worth for both historical and industrial values (Selen and O'Neil, 2017). Ottoman Turks, Rum from Byzantium, and Spanish Jews have stayed in Cibali Neighborhood (Akyazıcı and Işık, 2018). Migration from rural to urban areas was born to demand for the new residential stock. Residential needs, rapid urbanization, shanty settlement, building with financial concerns, and an urban disaster like the big İstanbul fire harmed the unique historical structure of Cibali (Severcan, 2012). Additionally, the urban transformation was inevitable for Fatih district since

becoming a part of an earthquake region like the Galata area. Unfortunately, urban transformation practices made in İstanbul in recent years have contributed to this loss. In the region, not only physical and purposeful but also a social transformation is observed with this loss. For example, Severcan (2018) indicates the importance of increasing the high crime rate after the physical deterioration of Cibali. After the deterioration process, İstanbul Municipality has prepared many transformation projects for the Capital of Cultural Heritage in Europe; then, the redevelopment process started to gain speed there in Cibali. Although numerous residents were relocated by force, Cibali was one of the least affected during the urban transformation process among the six chosen neighborhoods (Severcan, 2012; 2018).

3.2.3 Uskudar District: Ayazma Neighborhood

Uskudar is one of the most important centers of İstanbul. It is located in the Anatolian part of İstanbul (Asia Continent), and Bosphorus surrounds the west side of this district. The history of Uskudar was rooted in b.c., and its significant role was being a port. Thus, it can be stated that Uskudar was one of the most central transportation points for inhabitants. Additionally, Uskudar witnessed several architectural structuring and implementations, especially in the Ottoman era. However, in the last fifty years, rapid urbanization has deteriorated Uskudar, and its effect is very destructive for both social and physical aspects (Kivilcim and Duran, 2015).

Ayazma is one of the important historical neighborhoods of Uskudar. The name of the neighborhood comes from sacred water (holy water). Many unique architectural monuments and buildings were designed and implemented in the Ottoman period in this neighborhood (Elif et al., 2014).



Figure 7: Old urban fabric of Ayazma
(Source: www.uskudarmahallesi.com)

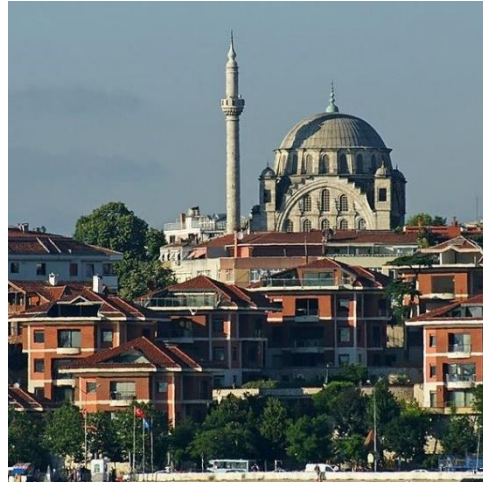


Figure 8: Redeveloped Ayazma
(Source: www.flickr.com)

The migration from rural areas to İstanbul, and thus to Uskudar (including to Ayazma), have led to the high population and insufficiency of the residential, commercial, and social facilities. New constructions as a result of the urban transformation process from historical fabric to new housing typologies have started to change the way people perceive Ayazma. However, according to Severcan (2018), among the six chosen neighborhoods, Ayazma was considered as one of the two least transformed contexts since one can still see a well-preserved urban fabric and historical land uses (e.g., traditional commercial establishments) in the area.

3.2.4 Kağıthane District: Merkez, Talatpaşa, and Çeliktepe Neighborhoods

The European continent of İstanbul is a host for Kağıthane District accompanied by the valley. The name is coming from in its functions that this place has become a home to paper warehouses which means Kagit-hane, and the elements of surrounding

forests have long become a product of this industrial environment. In history, this district was known as a recreation place for inhabitants and offered users rich green structures, wooden areas, and stream. Many people living in old İstanbul have described Kağıthane as having a pastoral atmosphere and its unique landscape elements. In Ottoman Era, several pavilions were located in Kağıthane with magnificent orchards; however, the landscape was brutally harmed by one of the disruptive rebels. After the 1950's the migration from rural to urban cause to deficiency of housing stock; therefore, squatter houses were home for the working-class (Severcan, 2012). Over time, due to Kağıthane's central location, rapid construction process, and the pressure of the increasing population, Kağıthane could not escape the effects of rapid urbanization and urban transformation projects.

Merkez Neighborhood has become a slum area during the illegal housing period, and many historical traces that remained from many civilizations were disappeared. In the last two decades, urban transformation projects have affected old structures and urban fabric and changed differently. Today, although a few places protected and used somehow, such as brought Daye Hatun Mosque back to İstanbul as a commercial hub, gated communities can be observed in Kağıthane Merkez, ancient trading areas, and old pattern of the urban areas have about to evaporate (Severcan, 2012, 2018). According to the one comprehensive study examining the redevelopment level of six different neighborhoods in İstanbul, the Merkez region in Kağıthane is the mid-range affected neighborhood as a fourth among the other six (Severcan, 2018).



Figure 9: Old urban fabric of Merkez
(Source: www.arkeolojikhaber.com)



Figure 10: Redeveloped Merkez
(Source: www.hasbahcegazetesi.com)

Talatpaşa neighborhood is one of the oldest industrial regions in İstanbul; thus, it is a home for the working class. This neighborhood was used as an administrative center of İstanbul, and still, one of the old palaces is used for the municipal hall in Talatpaşa (Severcan, 2018). In the middle of the 20th century, there were several migrations from Anatolia to this area, providing numerous job opportunities. It has been one of the places where it is inevitable that Talatpaşa will return to the slum area in a short time. Today various projects are waiting to be built which provide gated communities. According to Severcan (2012, 2018), among the six chosen neighborhoods, Talatpaşa is the third most transformed historical neighborhood.



Figure 11: Old fabric of Talatpaşa
(Source: www.ozkandeger.blogspot.com)



Figure 12: Redeveloped Talatpaşa
(Source: www.wikipedia.org)

Çeliktepe neighborhood is a central position in Kağıthane, and it is a place that cannot resist the urban transformation caused by the rising population attracted by industrial opportunities in the middle of the twentieth century. The uncontrolled development of Çeliktepe has caused the urban transformation process experienced by inhabitants and newcomers. Additionally, one end of Çeliktepe, which includes the low-income group, touched the Levent district of Istanbul, which consists of the high-prosperity group, and this situation paved the way for gentrification between Çeliktepe and Levent. Offices, high story apartments, gated communities, and massive shopping areas become the central part of Çeliktepe, which is turned into a central business area (Severcan, 2012). The urban redevelopment project destroyed the historical values of the area. Among the six chosen neighborhoods, Çeliktepe is the most transformed urban neighborhood (see Severcan, 2018).



Figure 13: Old urban fabric of Çeliktepe (Source: www.pinterest.com)



Figure 14: Redeveloped Çeliktepe (Source: www.akustiksahneistanbul.com)

3.3 A Child-Driven Approach for Understanding Children's Place Attachment and Place Knowledge

Many disciplines like urban planning, design, and policy focus on children's level of soundness in cities; also, according to Ataol et al. (2019), there is a growing interest in children's participation, especially in urban planning. Studies conducted with children's perspectives of participation have several advantages. Wilks and Rudner (2013) stated urban planners could make realistic assumptions with the help of this type of study. Additionally, Chawla (2006) and Valentine (2004) stated that children have a right to construct their perspectives according to their experiences as public actors, which is highly dissimilar for all adults. This explanation has supported by Haider (2007), and it was stated that children are different from adults, and they have specific needs. Also, the experience of one particular place can impact children's perspective on future decisions about places (Gill, 2008; Çakırer-Özservet, 2019; Ataol, 2019).

School-aged children (between 6 and 11) are observed widely and the most preferred group in child-driven researches (Ataol et al., 2019). The tendency for choosing this age group is explained by Chawla (1992). Between the ages of nine and 11, children experience their environment and surroundings differently in the circle of everyday movement (Chawla, 1992). Chatterjee (2015) and Severcan (2012) emphasized that children are capable of evaluating and expressing themselves, their surrounding environments, physical, social, and symbolic attributes at the school-aged. Moreover, according to Vasilyeva and Lourenco (2012), children use landmarks and show connections with routes at that age and develop abstract and coordinate cognition. There are critical and beneficial aspects of child-driven researches on environmental studies. For example, at the age of nine and eleven, children learn their right to use public spaces, they develop place attachment to their surroundings; thus, planners may get have a chance to learn children's needs precisely while

studying with them (Severcan, 2012). Therefore, planners or designers could assert and create spatial decisions which serve people from all strata. In this context, this research was conducted in 2010 with children at the age of 9 and 11, considering all of the mentioned parameters.

3.4 Selection of the Child Participants

The research was conducted with 9 to 11-year-old children who were attending the public schools in the chosen neighborhoods. In an initial meeting, children were asked to fill out an assent form to participate in the study; parents were asked to fill out a consent form (Severcan, 2012). All children who wanted to attend the study and whose participation was approved by their parents participated in a survey activity (which included both a questionnaire and a cognitive mapping activity) (Severcan, 2012). Before the initiation of the study, although it was anticipated that 40 children would participate in the survey activity from each chosen neighborhood, in some of the neighborhoods, more children participated in the study. 58, 33, 38, 56, 46, and 51 children participated in the study from Cibali, Ayazma, Merkez, Talatpasa, Galata, and Celiktepe, respectively (total number of participants was 282).

3.5 Data Collection Tools

3.5.1 Place Attachment Questionnaire

To measure children's place attachment in each neighborhood, Severcan (2012) asked children to fill out a place attachment questionnaire. The questionnaire consisted of four parts. The first part focused on children's attachment to their block, the second part focused on children's attachment to their neighborhood, and the third part focused on children's attachment to their city. The final part of the survey aimed to understand children's sociodemographic characteristics like gender and year of residence in the home, neighborhood, and city.

To understand children’s place attachment in each context (i.e., block, neighborhood and city), in line with the literature reviewed, questions were posed to children related with place satisfaction, place dependency, and place identity. These questions were: Are you happy to be in your (block/neighborhood/city)? Do you miss your (block/neighborhood/city)? And, How special is your (block/neighborhood/city)? Responses were provided in a 5-point Likert scale (e.g., Highly feel happy=5; Highly feel unhappy=1) (see Severcan, 2012, 2015). In the survey, children were also asked questions related to their motivation for place care and place knowledge (e.g., knowledge about the social and physical attributes of their neighborhoods) (see Table 1).

Children filled out the questionnaire in a classroom setting. Severcan and the members of the Young Volunteers Association (as the project implementers) assisted children who had issues in filling out the survey.

Table 1: Questions to measure place attachment and place knowledge (prepared by author)

Questions to Measure of Place Attachment		
Place Satisfaction	Place Dependency	Place Identity
<i>"Are you happy to be in your (place)?"</i>	<i>"Do you miss your (place)?"</i>	<i>"How special is your (place)?"</i>
<p style="text-align: center; margin: 0;">Question to Measure of Place Knowledge</p> <p style="text-align: center; margin: 5px 0 0 0;"><i>"Draw the map of your neighborhood"</i></p>		

3.5.2 Cognitive Mapping

To understand children’s knowledge about the physical attributes of their neighborhoods, in the place attachment questionnaire, children were asked to draw a map of their neighborhood. The term ‘neighborhood’ was explained to children as

the readily accessible and walkable area that includes places used for daily activities. To receive children's responses, a blank A3 size paper was attached to the questionnaire.

In the following sections, the author explains how she analyzed children's cognitive maps.

3.6 Analysis Guidelines of Cognitive Maps Drawn by Children Using Kevin Lynch Methodology

Kevin Lynch (1960) introduced a comprehensive method to understand and measure city elements shaped around an urban area's physical and visual form. These elements are composed of five different forms; paths, edges, districts, nodes, and landmarks. In the literature, the urban elements were differentiated into different aspects. For example, while places, paths, and domains were introduced as a visual form of urban elements by Norberg-Schulz (1971, cited in Eraydın, 2014), points barriers, boundaries, paths were associated with urban features by David Stea (1969, mentioned in Eraydın, 2014) as well. In this thesis, two hundred seventy-four children's cognitive maps are measured under the Kevin Lynch framework using five different typologies of urban elements.

First, the definition of urban elements that were found in children's cognitive maps should be understood more clearly with some specific explanation. Some guidelines will be explained next to prevent confusion about elements' exemplification and evaluation process on drawings. Additionally, in the scope of this thesis, neighborhood elements in children's drawings were assessed according to general tendencies of cognitive maps evaluation literature such as Lehman-Frisch et al. (2012), Beneker et al. (2010), Halseth, Doddridge (2000).

- **Paths** are defined as channels that sustain a movement (Lynch, 1960). In cognitive maps, paths are represented as a strong sense of motion with continuous lines. Roads, trails, big gates, bridges, pedestrian lines can be

examples of paths. Each continuous line is defined in evaluating children's maps as a different path in this research.

Additionally, besides of mentioned urban elements as a path, the road is also defined as a path. It is a part of an accessibility system that is a car-oriented area represented by putting cars or lanes into children's drawings.

- **Edges** are introduced as boundaries between two different spaces or places by Kevin Lynch (1960). If there are functional differences in any urban context, differentiated points, horizontal frontiers (Halseth and Doddridge, 2000) can be visible or invisible, also called edge. Edges can also be roads that separate one area from another. In this case, the road was evaluated as a car-oriented area, a highway where pedestrian access can be problematic and limited. Put more concretely, every road is not assessed as an edge; to evaluating an edge, a road should be represented as highways (or as roads with more than two lanes), limiting children's access from one place to another.
- **Districts** are characteristic areas, and according to Lynch (1960), when people are in a district, they feel inside, and as they are in out of places, they have a sense of outside. Also, according to Halseth and Doddridge (2000), districts are known by inhabitants. For example, residential or commercial regions, shopping malls, forests, coastal areas, downtown can be called a district. For one urban element to be a district, there should be a sense of distinction of one another. Also, it should be regional, and the district should include structures or components composed peculiar to the character.
- **Nodes** contain the meaning of interaction and intersection within themselves. Lynch (1960) defined nodes as focal destinations or intersection points. In cognitive maps, they can also be activity points for observers. The main distinctive character of nodes is where daily activities occur. For instance, home, friend's home, urban square, playgrounds, schools, parks, and recreations are known as foci in urban areas and hence can be called a node. In other words, nodes are defined as an activity area for children.

- **Landmarks** are attributed recognition points (Lynch, 1960), and it is highly differentiated from nodes having a feature of meeting or reference points. It also has symbolic meaning by local people. Science centers, pubs, mosques, stores, grocery stores, hairdressers, signs, distinctive buildings, or schools can be examples of landmarks.

3.7 Analysis of Children’s Cognitive Maps

3.7.1 Drawings of Children’s Neighborhoods

A 274 children’s cognitive maps were analyzed using the Lynchian method by the author. Out of the 274 maps, 57 were in Cibali Neighborhood (one of the least redeveloped neighborhoods), 32 were in Ayazma (another least redeveloped neighborhood), 57 were in Talatpasa (one of the somewhat redeveloped neighborhoods), 34 were in Merkez (another somewhat redeveloped neighborhood), and 45 were in Galata (the final somewhat redeveloped neighborhood), and finally 49 were in Celiktepe (which was a highly redeveloped neighborhood). The level of neighborhoods data in reference to their transformation levels was taken from the article of Urban Studies by Severcan’s paper which was published in 2018. All school names, following their geographical locations and levels, and the number of participants is represented in Table 2.

Additionally, Table 2 shows the number of participants and level of neighborhood transformation, which was created as an output of regeneration and children’s use of place in İstanbul as a comparative study conducted in six low-income neighborhoods with 9-11 years of children (Severcan, 2018). These neighborhoods' regeneration levels were evaluated by their traditional public space, historical heritage, traditional commercial functions, massive commercial development, and gated community (Severcan, 2018). Transformations around the selected schools from the 2000s to 2010 can partly be detected from the satellite images shown in Figure 15.

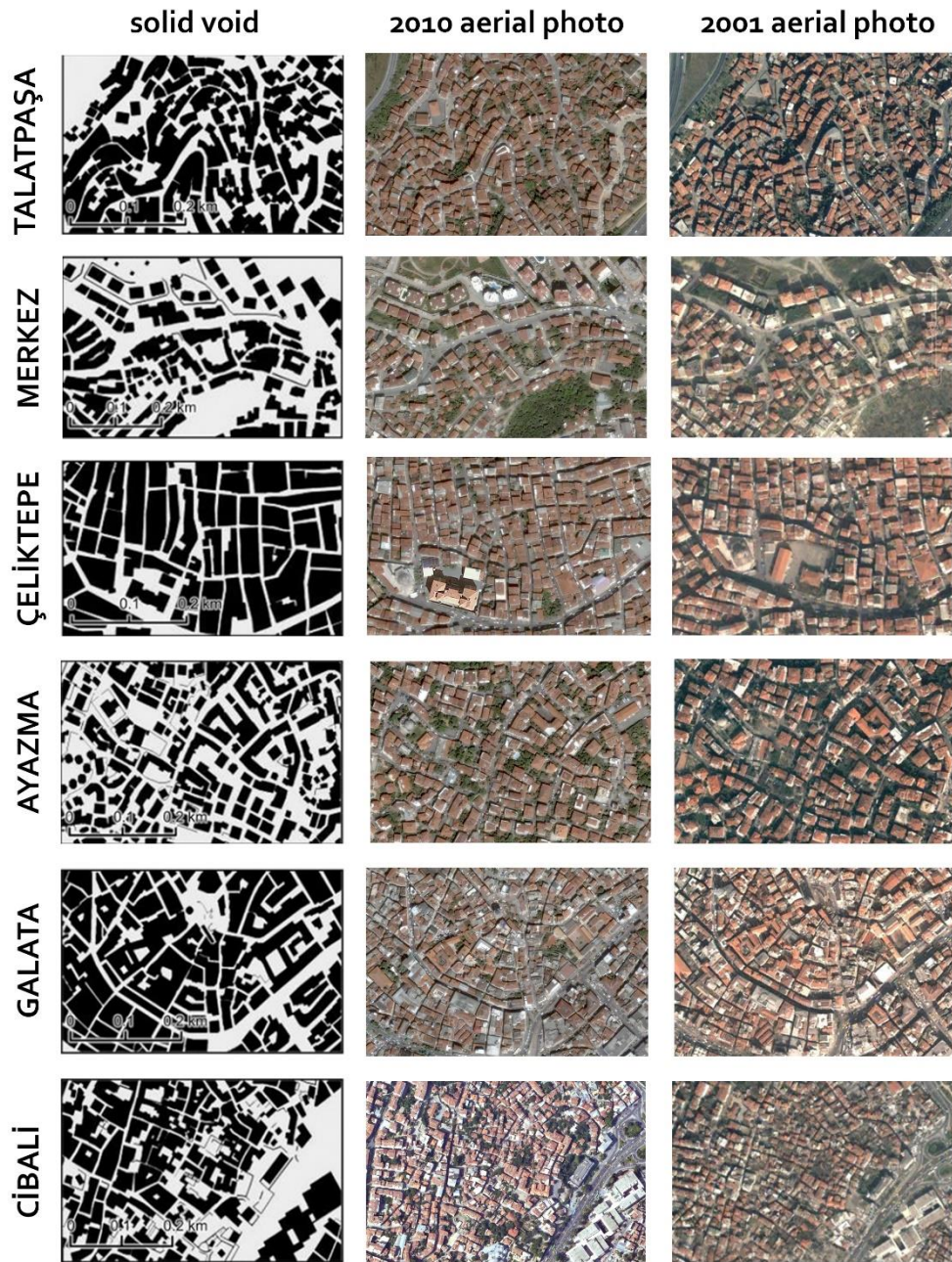


Figure 15: Neighborhoods' Transformations According To Years and Solid-Void Presentations






Table 2: Number of Participants and Level of Neighborhood Transformation (Source: Severcan, 2018)

Low Level of Neighborhood Transformation		Moderate Level of Neighborhood Transformation			High Level of Neighborhood Transformation
Cibali (Fatih)	Ayazma (Üsküdar)	Talatpaşa (Kağıthane)	Merkez (Kağıthane)	Galata (Beyoğlu)	Çeliktepe (Kağıthane)
Katip Çelebi E.S.	Şemsipaşa E.S.	Günebakan E.S.	Merkez E.S.	Okçu Musa E.S.	Osman Faruk Verimer E.S.
n=57	n=32	n=57	n=34	n=45	n=49
1.	2.	3.	4.	5.	6.

Children’s drawings in a black and white form (scanned maps) were transferred into a digital setting. Each drawing was separated in accordance to their context combining with neighborhoods’ schools. Additionally, drawings were analyzed according to Kevin Lynch’s urban elements known as paths, districts, nodes, edges, and landmarks. The standard table was created for each drawing composed of five different urban elements and was added to every children’s cognitive map. Five different colors were determined according to each element. Markings were made according to the colors in each black and white drawing with digital illustration. In this sense, children’s black and white drawings were not melded with marking colors. For example, the colors of paths, districts, edges, nodes, and landmarks were blue, orange, red, green, and yellow, respectively. The marking was made according to guidelines coding of Lynch’s urban elements (please see chapter three). To remind in general perspective, roads, stairs, sidewalks were associated with paths in children’s drawings. Also, walls, dividing lines, specific separators, or roads that separate different types of areas also were evaluated as an edge. Districts were found in specific characteristic areas such as forest, coast, Bosphorus. Moreover, homes, friend’s homes, parks, schools, gardens were turned to account for being nodes. The

final one is a landmark. Drawings, which included a grocery store, hairdresser, bakery, or similar urban elements were defined as a landmark.

Put more concretely, five examples will be given in next in detail from five different neighborhoods. One of the participants from Günebakan Elementary School named G31 drew seven nodes, and these are parks, gardens, homes (all of which are children's places that gather children together). Three edges were drawn by G31 as borders of the park, garden, and playgrounds. There was one specific district in G31's drawings. It is one of the specific examples of a district where signifies a school. The school was drawn by a child with its components like a garden and its borders. A grocery store was marked as a landmark in a given cognitive map in Figure 16. since it was not a gathering place for children (instead, as indicated in the children's places section in Chapter 2, these places are usually used for points of destination by children). Additionally, stairs that provide accessibility for one of the homes in the southwest of the paper and four different roads were evaluated as paths.

Children Name	G31	
Number of paths		5
Number of edges		3
Number of districts		1
Number of nodes		7
Number of landmarks		1

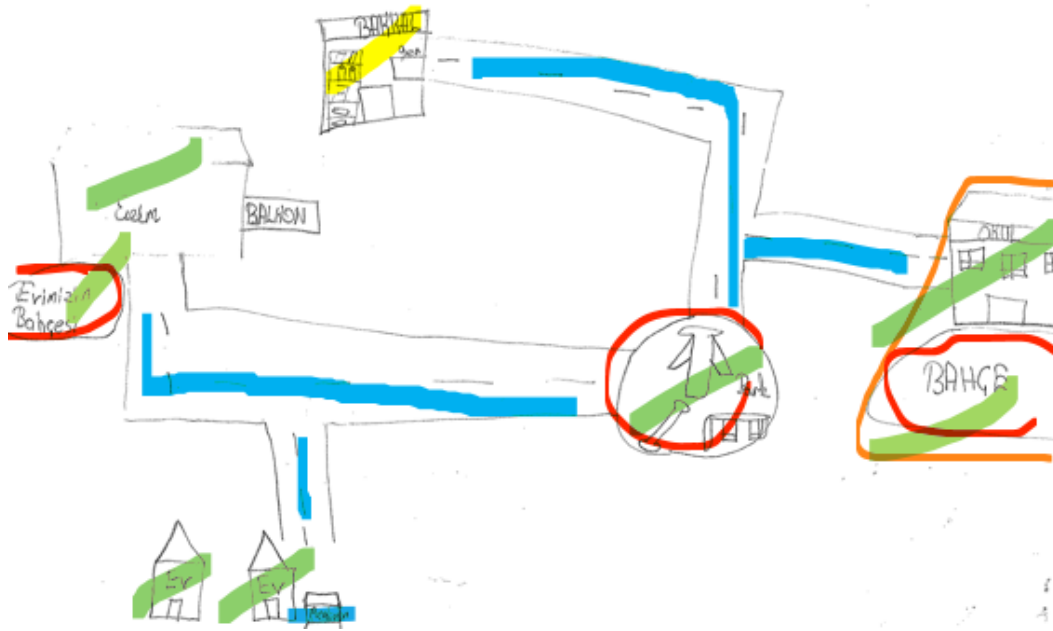


Figure 16: Cognitive Map from Günebakan Elementary School Drawn by G31

The other example shown in Figure 17 was taken from Okçu Musa Elementary School drawn by OM5. This drawing includes Galata Tower in the center of the paper and five different significant urban elements such as pharmacy, hospital, mosque, restaurant, and store. These are marked as landmarks with yellow color, and there are. Total six various landmarks were marked with yellow color in Figure 17. Moreover, nine other roads were noted as paths. There are four nodes aligned in the east-west linear line. Like G31's cognitive map, there was not observed a district and edge in OM5's drawings.

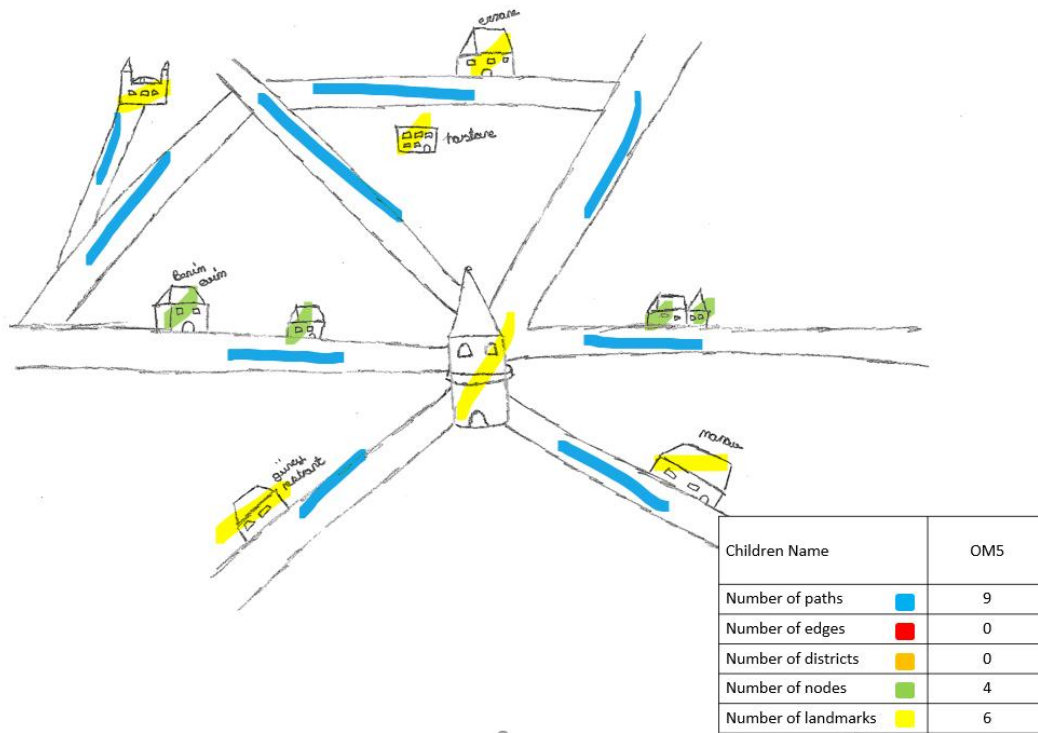


Figure 17: A Cognitive Map from Okçu Musa Elementary School was drawn by OM5

The third example shown in Figure 18 is taken from Osman Faruk Verimer Elementary School, and it is drawn of OFV46. There were two districts which are defined by words. It is important because children tend to indicate their districts with writing. OFV46's cognitive map shows four straight borders with both vertical and horizontal lines, which were called edges. Also, two different roads were again depicted by words. It was defined as two separate nodes being home and a school.



Figure 18: Cognitive Map from Osman Faruk Verimer Elementary School was drawn by OVF46

The other example in Figure 19 is from Şemsipaşa Elementary School. To distinguish the district from other urban elements was important for some children's neighborhood drawings because districts were generally explained with writing in many drawings, as mentioned above. In order to understand the district more precisely, the definition of the district was determined more precisely. For example, Figure 19 demonstrates two distinct districts with writing 'İstanbul Boğazı,' known as Bosphorus, a Coastline of Salacak represented with writing 'Salacak Sahili.' The critical and subjective part is that this area is separated into three specific districts: urban fabric, coastal line, and Bosphorus. Each district has unique components, consisting of parts that have the district's characteristics. Additionally, these three specific areas were distinguished with two vertical lines which were located in the surroundings of coastlines. A participant SP32 indicated three different landmarks in the child's own cognitive map drawing as a historical focal point, grocery store,

and fountain. Also, three important lines which provide accessibility from urban fabric to the coastline were defined in SP32's neighborhood drawings.



Figure 19: Cognitive Map from Şemsipaşa Elementary School was drawn by SP32

Categorization of some urban elements was challenging in some cases. Therefore, it was necessary to spend more time and effort to understand, interpret, and evaluate children's drawings. The last example was drawn by M13, depicting five different nodes which indicate homes and M13's home. Eating house and fish restaurant were marked as two different landmarks. However, defining edge was highly subjective, so as coded in the guidelines section (please see chapter three), two-lane indicates that that road is a car-oriented line and it can limit children's movement in their neighborhood. So this road is evaluated as both edge and path. However, the other road in the southeast part of this drawing which provides accessibility to one of the homes is defined as a path because there were no specific signs such as lanes to evaluate it to be a car-oriented road. In other words, if there are cars or lanes or specific notes which indicate the southeast path as a road, then it can also be marked

as an edge like another road in the east-west horizontal lines. However, southeast lines are not such qualification; thus, it is marked as a second path.

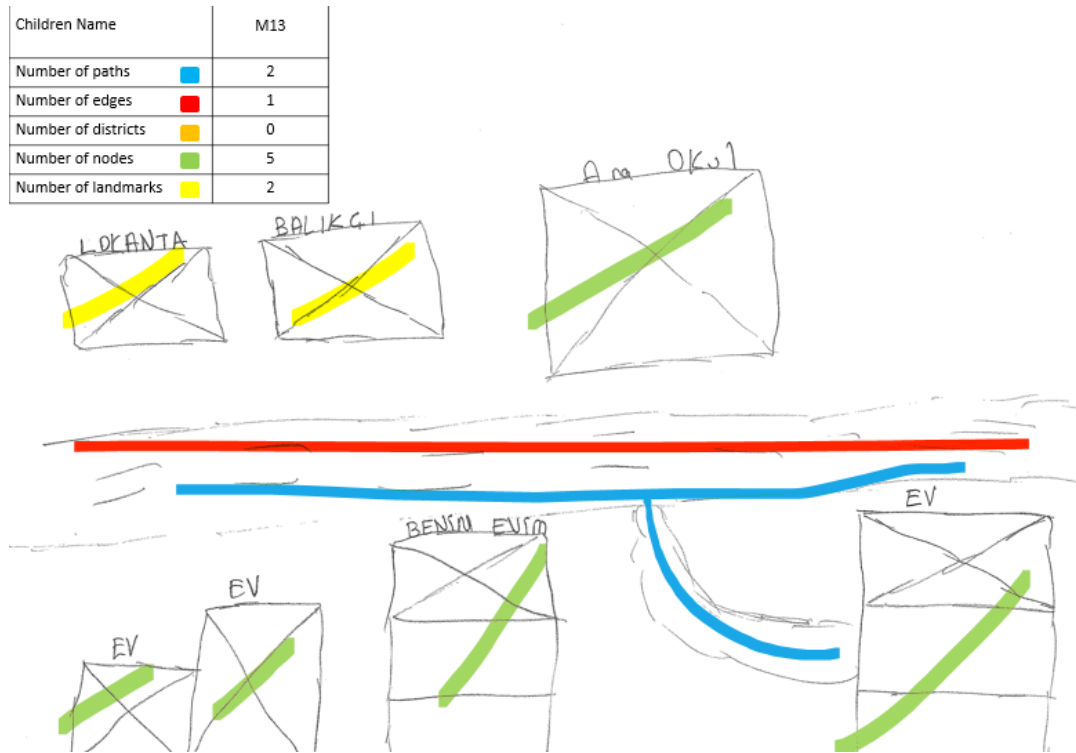


Figure 20: Cognitive Map from Merkez Elementary School was drawn by M13

3.7.2 Analyzing Children’s Place Knowledge According to Geographical Discrepancy

Cognitive maps may be composed of five different urban elements, and each drawings’ total number of these elements gives children’s place knowledge more specifically knowledge of the physical attributes of their environments. All of the children’s cognitive maps were evaluated by one, and in total, 274 cognitive maps are evaluated; finally, it was reached the results of 274 children’s place knowledge. One of the 274 drawings was unknown (M1) only, so it was included the evaluation process of place knowledge. In other words, place knowledge evaluation analysis has one unknown neighborhood drawings and the total number of participants is 274.

However, an unknown child has eliminated the correlation between place knowledge and place attachment analysis. In addition to this elimination, in cases where no answer was given to the question of place attachment. Those children were also excluded in the correlation analysis. Thus, correlation of place knowledge and place attachment was realized with 267 child participants. The reason for the elimination of one children's is the unknown name; the motivation of removals of the other 7 of them was not answered at least one of three place attachment questions. Put more concretely, an additional note that needs to be shared here is that one of the 274 drawings' author was unknown (M1), so this map was analyzed for answering the first research question of this study (Whether and to what extent do the urban redevelopment levels of the neighborhoods that children live in affects their place knowledge?) but not for answering the second research question since for this question the author had to match the data coming from the cognitive maps and the data coming from the place attachment questions.

More precisely, as shown in Figure 18, the number of paths is two, edges are four, districts are two, and nodes are two. Thus, their sum indicates place knowledge which is OM5 is 10. In order to understand children's place knowledge respecting their contextual differences, cognitive maps were separately measured. In other words, every six different districts were evaluated additional documents to understand whether contextual differences have different impacts on children's place knowledge. The differences were calculated by dividing the number of each neighborhood's total place knowledge by child participants. For example, the sum of place knowledge in the Cibali Neighborhood was found as a 447. Also, the total number of participants was 57 in there. The place knowledge result of this neighborhood can be obtained by making 447 divided by 57.

3.7.3 Analyzing Children Place Knowledge According to Neighborhoods' Transformation Levels

Transforming neighborhoods were presented under three categories in Table 2. They are categorized as low transformed, moderate transformed, and high transformed neighborhoods. As mentioned in the previous part, all place knowledge values were summed up, and they were divided by participants' numbers. The main difference from the previous measurement method is that neighborhoods' total place knowledge is accumulated according to their level of transformation. For example, the low level of neighborhood transformation value is found by summing the place knowledge values of Cibali and Ayazma neighborhoods and dividing by the number of participants in that area. Also, moderate one has calculated the total sum of place knowledge values coming from Talatpaşa, Merkez, and Günebakan Neighborhoods, they total value divided into these three neighborhoods' participant numbers. Similarly, a high level of neighborhood transformation was calculated using Çeliktepe Neighborhood's datasets. All of the values were transformed into an excel file, with their percentages, and calculation was made using its formulations to reach three different levels of neighborhood transformation areas by 274 different values coming from children's drawings.

More specifically, to understand the relationship between the level of urban transformation and place knowledge, the distribution analysis of place knowledge elements is conducted for each level of urban transformation. In that context, the percentage of each urban element and their description are given in a table for three-level of urban transformation. The five analysis tables are created to understand children's place knowledge according to context for each urban elements such as edges, paths, districts, nodes, and landmarks. This methodology is inspired by one of the cognitive mapping studies published in the *Journal of Environment and Planning B: Planning and Design* by (Halseth and Doddridge, 2000).

3.7.4 Analyzing Correlation of Children's Place Knowledge and Place Attachment

To measure the correlation between place attachment and place knowledge each value of children's responses about place attachment (5-point Likert scale questions from one to five) was transferred into an excel file. In order to measure children's place knowledge, it was asked to children draw their cognitive map, and this was evaluated under the five different urban elements. Similarly, place attachment questions which are composed of three additional questions about place satisfaction, place dependency, and place identity also put into the same excel file. All of them are located in this file separately. Initially, children were not differentiated according to their neighborhood context or year of residency in the neighborhood. The main motivation was to create a correlation between two variable factors: place knowledge and place attachment. However, in the following stages of the analysis process, the author explored the role of the year of residency in this correlation, arguing that a place attachment and place knowledge in children develop over time. In this correlation analysis, children who have lived in their neighborhood for three years and more residency and children who have been lived in their neighborhood for nine years and more residency are also calculated in the scope of this research analysis.

Moreover, the number of children participating in the cognitive mapping section was 274 when analyzing place knowledge values according to neighborhoods and analyzing transformation level differences about place knowledge. However, as mentioned before, when measuring the correlation of place knowledge and place attachment, the total participant number was taken 267. Therefore, eight of 274 people were eliminated, and these are OFV32, OM17, OM30, OM37, K7, M19, M1. Additionally, one of the drawings was defined as an unknown (M1); it was also eliminated in this analysis. So, the correlation measurement was calculated with 267 children.

Each correlation of place knowledge and place attachment components value, and also overall place attachment and place knowledge values were examined

differently. SPSS software was used to measure this correlation. Therefore, all values located in an excel file were transferred into SPSS software. As a calculation method, Pearson Correlation was selected. This correlation coefficient calculated by this method determines how strong the relationship between two data sets or how strong they are correlated. It is defined within the range of -1 and +1. In Table 3, the value of the correlation coefficient and its interpretation is shared.

Table 3: The correlation coefficient (r) and its interpretation

The magnitude of the correlation coefficient	The level of the correlation between two datasets
$r < 0.2$	no relation or very weak relation
$0.2 < r < 0.39$	weak relation
$0.40 < r < 0.59$	moderate relation
$0.60 < r < 0.79$	strong relation
$0.80 < r$	very strong relation

In extreme cases, the +1 correlation coefficient means that two datasets are proportional, and as one dataset increases, the other one increases as well. On the other hand, the -1 correlation coefficient means that two data sets are inversely proportional, and as one dataset increases, the other decreases. Additionally, the 0 correlation coefficient means that the two are independent.

In extreme cases, +1 correlation coefficient means that as when one dataset are proportional. On the other hand, the -1 correlation coefficient means that two data sets are inversely proportional, and as one dataset increases, the other decreases. Additionally, the 0 correlation coefficient means that the two are independent. Also is another parameter, called two-tailed P-Value in SPSS software. If P-Value between two data set is less than 0,05, it means that the two datasets have a strong relation. However, if it is higher than 0,05, it means that there is no or weak correlation between the two datasets.

In the scope of this thesis research, place knowledge and place attachment correlation were analyzed on the basis of this theoretical framework. Also, a two-tailed P-Value was calculated. All of the outputs were collected in one matrix, and it is called a correlation matrix. This correlation matrix shows a relationship between two dataset coefficients. For example, overall place attachment and place knowledge was shown in the correlation matrix. Also, each component of place attachment questions was differentiated in this matrix, and the coefficient value was located for three questions. In other words, three additional calculation has been done. At the end of this calculation, a 4x4 matrix was obtained, including three questions' values of place attachment and overall place attachment values by comparing each of them with place knowledge.

In order to investigate whether there is a correlation within a specific subset of the survey data or not, the survey data is categorized in two different aspects. In the first categorization, the survey data is divided into three subsets according to their level of transformation; low, moderate, high levels of transformed neighborhoods. The second additional categorization is shaped according to the year of residence of children in their neighborhoods.

In this chapter, the method of the research analysis was provided. More specifically, information about site, data selection and collection process, analysis guidelines was introduced. Finally, drawings of children's cognitive maps according to different neighborhoods and different transformation levels was investigated into the cognitive maps of children's analysis section.

CHAPTER 4

RESULTS AND DISCUSSIONS

This chapter demonstrates the results of this thesis research and also discusses the outputs. In the first part, general statistical information of the research about children's neighborhood elements are presented. There after, the results of contextual differences which affect number of used urban elements in children's drawings are given. How neighborhood regeneration affects place knowledge are shown in the following part. Additionally, the correlation between place attachment and place knowledge have been illustrated in detail.

4.1 General Statistics of Urban Elements Drawn by Children

It can be stated that each children's place knowledge change and fluctuate according to some parameters like context, transformation level, residence years. Each child had a different understanding of his or her environment and different drawing skills. Therefore, they all illustrated their neighborhoods in different ways. Some children drew the plan of their neighborhood; some sketched their environment, some preferred to write down the names of the places, and some others used hatching techniques to represent the places in their neighborhood.

Table 4: Total Number of Urban Elements & Participant Number in Cognitive Maps

Place Knowledge	Number of Paths.	Number of Edges	Number of Districs	Number of Nodes	Number of Landmarks	TOTAL
Values	508	153	64	1187	502	2414
Percentage	21%	6,3%	2,7%	49,2%	20,8%	100%

The total number of urban elements depicted in the cognitive maps and their percentages are illustrated in Table 4. Based on this table, we can see that 274 children drew 508 paths, 153 edges, 64 districts, 1187 nodes, and 502 landmarks.

In children's neighborhood drawings, the nodes were the most mentioned urban elements with 49,2% including gardens, homes, friends' homes, schools, parks, etc. More precisely, the children have a tendency to draw nodes in a general perspective.

Most of the node representations also had borders around the children's drawings. For example, in some illustrations, the park and its borders were taken as both the node and the edge. Similarly, in some children's drawings, the school was represented with its own walls and with the different buildings of the school. In that time, again, walls and buildings separately marked both edge and nodes. Some distinct lines are found as vertical or horizontal dividing lines, some dividing roads or area boundaries were noted as edges in children's cognitive maps. Edges are found in children's drawings which were sometimes highly distinctive, on the other hand sometimes highly interpretive. The total edge number of 274 children's drawings is 153 with 6,3% among total urban elements.

Landmarks are the second most preferred urban elements with 20,8%. It was observed that most of the textual information (i.e., name of the places) are used in for landmark drawings. In some drawings, landmarks were detailly drawn by children giving their particular and distinctive attributes. To illustrate that, children show Galata Tower with detailed drawings together with writing specific names. Moreover, it was found that grocery stores, hairdressers, or markets were drawn by children giving them their specific names. It can be seen in Figure 19.

21% of all children represented paths in their cognitive maps. In general, paths refer to roads, stairs. In some cases, roads are noted as both edges and paths together. Finally, the least drawn urban elements are the districts with 2,7%. Children pictured their neighborhood generally with a title as "mahallem," apartments region, or coastal area.

Overall, the number of place knowledge values was found as 2414, calculating the sum of all mentioned urban elements in children’s neighborhood drawings, and the average place knowledge of children is found 8.81 by dividing total Place Knowledge by the total number of children. It is shown in Table 5.

Table 5: Average Place Knowledge of Children

Overall PK	Total Place Knowledge	Total Number of Children	Average (PK/C)
Outputs	2414	274	<u>8.81</u>

4.2 Effects of Contextual Differences on Children’s Place Knowledge

As mentioned before, one of the hypotheses of this study is that the children’s place knowledge changes according to different neighborhoods. According to the results, they use a different number of urban elements in their drawings due to contextual differences. In order to measure this hypothesis, it is questioned in the scope of this thesis that whether children refer to different urban elements in different neighborhood contexts.

Table 6: Level of Place Knowledge According to Neighborhood

Level of PK Acc. to Neighborhood	Number of Paths.	Number of Edges	Number of Districs	Number of Nodes	Number of Landmarks	Total	Number of Child Participant	Avarage
Cibali N.	74	34	8	248	64	428	57	7,509
Ayazma N.	92	38	17	258	110	515	32	16,094
Talatpaşa N.	104	26	18	262	96	506	57	8,877
Merkez N.	62	21	9	134	36	262	34	7,706
Galata A.	80	17	5	133	107	342	45	7,600
Çeliktepe N.	96	17	7	152	89	361	49	7,367
TOTAL	508	153	64	1187	502	2414	274	8,810

As mentioned in the previous chapter, the place knowledge values were accumulated for each of the six neighborhoods: Cibali, Ayazma, Talatpaşa, Merkez, Galata, and Çeliktepe. The urban elements, as well as the number of participants with respect to each neighborhood, can be seen in Table 6.

Table 7: Percentage of Place Knowledge According to Neighborhoods

Level of PK Acc. to Neighborhood	Per. of Paths.	Per. of Edges	Per. of Districs	Per. Of Nodes	Per. of Landmarks	Total
Cibali N.	17,3%	7,9%	1,9%	57,9%	15%	100%
Ayazma N.	17,9%	7,4%	3,3%	50,1%	21,4%	100%
Talatpaşa N.	20,6%	5,1%	3,6%	51,8%	19%	100%
Merkez N.	23,7%	8%	3,4%	51,1%	13,7%	100%
Galata A.	23,4%	5%	1,5%	38,9%	31,3%	100%
Çeliktepe N.	26,6%	4,7%	1,9%	42,1%	24,7%	100%
TOTAL	21%	6,3%	2,7%	49,2%	20,8%	100%

As can be detected in Table 7, each neighborhood's average number of urban elements varies. The highest place knowledge value belongs to Ayazma Neighborhood with 16,094; on the other hand, the place knowledge value of Çeliktepe Neighborhood is 7,367 with the least value among others. The average place knowledge number of Cibali is 7,509; Galata is 7,600; Merkez is 7,706; Talatpaşa is 8,877.

In every neighborhood, the highest number of urban elements is a node. The reason could be that the children are more aware of the places which contain living, playing, learning, and interacting. Children used more than half of the total urban elements as nodes in the Cibali Neighborhood with 57,9%. The Neighborhood of Talatpaşa is the

second neighborhood using the node most with a percentage of 51,8. The following percentage is 51,1 in the Merkez Neighborhood. The values of nodes are drawn as Ayazma with 50,1%, Çeliktepe 42,1%, and Galata 38,9%, respectively.

The children possibly prefer to select nodes from the places offering children a set of daily activities. These nodes also afford themselves a place to address their personal needs (it was detailly mentioned in the second chapter defining human needs, please see chapter two). In the light of the cognitive map's data-sets, these focal points can be described as a subset of their neighborhood that children can come together and share something with each other. This perspective, known as a behavior setting theory introduced by Barker (1968), was examined in detail in chapter 2. The places where the physical environment is suitable for children's behaviors and defined as a subset for children's interactions are nodes, which are the urban elements that children described most by a dramatic margin.

The number of paths is the second most mentioned urban element in four different neighborhoods: Cibali, Talatpaşa, Merkez, and Çeliktepe Neighborhood. In other words, the second most drawn element is paths except Ayazma and Galata Neighborhoods. For example, children have drawn paths as roads, stairs, sidewalks with 26,6% of Çeliktepe Neighborhood where has highest percentage of marked paths, 23,7% in Merkez, 23,4% Galata Neighborhood, 20,6% in Talatpaşa Neighborhood, 17,9% in Ayazma Neighborhood, and 17,3% in Cibali Neighborhood. Children focus on spaces that are transitional spaces which they use to move to reach somewhere. In other words, children preferred to draw paths as one of the most mentioned urban elements in order to provide a possibility to their orientation in their neighborhood. In general sketches, roads are defined with their surroundings and generally provide a destination to different places. This point is important because children try to show channels which offer themselves a possibility to reach somewhere. For example, stairs show accessibility from a street to their own homes. Also, as shown in Figure 19, three different roads offer a possibility to reach Galata Tower in OM10's drawings. This perspective is associated with Gibson's Theory of Affordance, which is defined as possibilities to interact with their

surroundings.

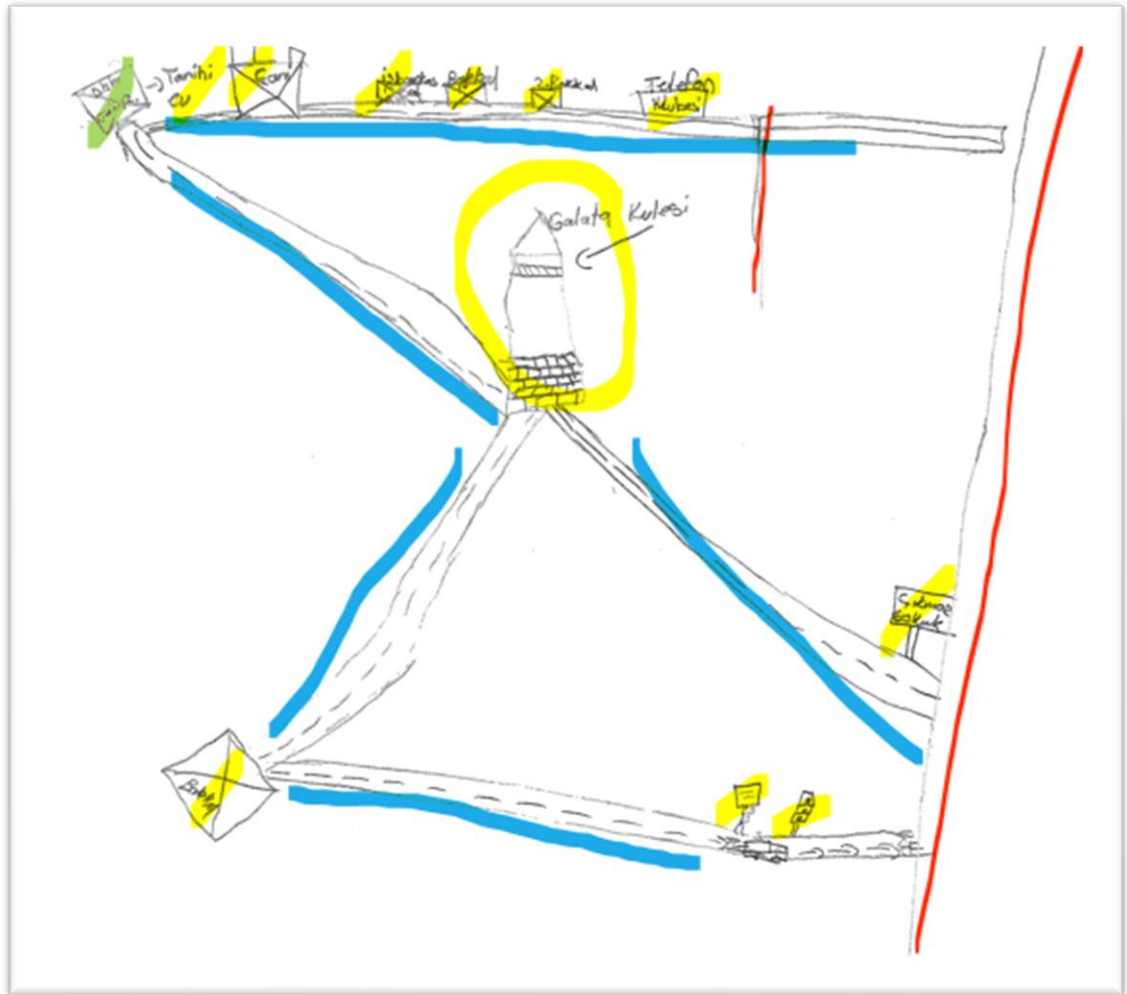


Figure 21: Cognitive Map Drawn by OM10

Landmarks are the third most mentioned urban elements, and they were highly depicted detailly in children's cognitive maps in four different neighborhoods. However, the landmarks are the second most preferred urban elements in Ayazma Neighborhood and Galata Region. In fact, it can be expected that children refer to more historical and cultural points in Üsküdar and Beyoğlu Districts, considering their strong and rooted history, which was mentioned in chapter three, method. Lots of historical landmarks are perceived by children, reflecting them on their drawings. In Galata Region, the declared percentage of landmark 31,3 which is highest among others. The least mentioned urban element as landmarks are Cibali Neighborhood

with 15%. Children's cognitive map results show that they are mostly emphasized as the grocery store, bakery, special tree, hairdresser, a mosque in Cibali. The result can be interpreted that children focus on primary and significant landmarks in this neighborhood. However, compared to Galata Region, whose children used the most urban elements as a landmark there, to Cibali, landmarks' type of functional differences are distinctive. For example, children from the Galata Region drew lots of churches, mosques, Galata Tower, İstiklal Boulevard, several signboards, restaurants, high schools, trees, passage, grocery stores, carpenter. Actually, even from the inference of children's representations about landmarks, it is understood that the urban fabric is a highly historical site. Additionally, it is understood that children are aware of landmarks most in a historical site when compared to other neighbourhoods. According to many scholars like Low and Altman (1992), Hummon (1992), Scannel and Gifford (2010), symbolic meaning is composed of several shared values located in society, and shared meanings contribute to a person's place attachment. More precisely, the context of Galata provides children with several shared values which feeding up historical, cultural backgrounds.

Edges as borders are defined the most in the Merkez Neighborhood, with a percentage of 8. With respect to the percentage of edges drawn by children, this was followed by Cibali Neighborhood (7,9%), Ayazma Neighborhood (7,4%), Talatpaşa Neighborhood (5,1%), and Galata Neighborhood (5%). It can be inferred that compared to their peers in other contexts, the children are more aware of the limitations in Merkez Neighborhood (and/or that there are more clear edges in Merkez than other five neighborhoods). Edges are least drawn in Çeliktepe Neighborhood and representations, and several drawings include several borders as roads. In some cases, the interpretation of edge was challenging. Because as mentioned in Kevin Lynch's definition, cognitive maps can contain visible and invisible borders. For example, some roads in mental maps were depicted as huge spaces like a massive highway, giving a clue that the child does not feel suitable there for themselves, and this can be associated with the Theory of Affordance.

The least drawn urban elements are the districts in each neighborhood from Cibali to Çeliktepe. Results show that in three neighborhoods, the children have drawn districts with an approximately similar percentage, and these neighborhoods are Talatpaşa, Merkez, and Ayazma. With 3,6%, Talatpaşa is one neighborhood where children used the district the most, among others. Additionally, Cibali and Çeliktepe Neighborhoods have similar values with 1,9%. Children who are living in the Galata region have the least represented urban elements as the districts with 1,5%. In the light of results, the place knowledge values demonstrated in As mentioned in the previous chapter, the place knowledge values were accumulated for each of the six neighborhoods: Cibali, Ayazma, Talatpaşa, Merkez, Galata, and Çeliktepe. The urban elements, as well as the number of participants with respect to each neighborhood, can be seen in Table 6.

Table 7, according to the results, the children did not acknowledge areas with huge and specific characteristics which are not suitable for them; instead, they focus more on their own places, where they can play, get rest, learn, meet friends, socialize and interact with surroundings.

4.3 Effects of Transformation Levels on Children's Place Knowledge

It was assumed in the scope of this thesis that as the level of urban transformation increases, children's place knowledge decreases. The results will be shown in the following section according to each urban element that is combined with three different levels of urban transformation.

4.3.1 Evaluation of Paths According to Level of Neighborhood Transformation

The children have demonstrated paths with a second high percentage. In general, paths are accumulated as a representation of car-oriented roads. In addition to that, pedestrian roads, highways, stairs are also depicted in the children's cognitive maps.

Appraising at the transformation levels, in areas transformed moderately, it is shown that the children use most various paths like uphill, train line, avenue, sidewalk, cul-de-sac, highway, pavement, stairs showed in Table 8. On the other hand, the children used limited urban elements as paths in a high level of neighborhood transformation such as roads, stairs, avenues, cul-de-sac, highways.

Table 8: The Percentages Depicting The Paths And Their Descriptions With Respect To The Transformation Levels Of Neighborhood Areas

Categorization of Neighborhood Transformation Levels	Percentage Depicting	Descriptions
Low Level of N. Transformation	18%	road, highway, stairs, walk, sidewalk, coast road, street, avenue, uphill, bridge
Moderate Level of N. Transformation	22%	highway, road, uphill, pavement, bridge, stairs, street, cul-de-sac, sidewalk, avenue, train line
High Level of N. Transformation	27%	road, stairs, avenue, cul-de-sac, highway

It can be inferred that highly transformed areas could not provide children with various types of paths; on the other hand, low and moderately transformed areas provide an opportunity for children to experience various types of urban elements as paths. However, regardless of the variations of path types, the most percentage depicted belongs to the high level of the transformed area, and the minimum one belongs to the low level of neighborhood transformation area. According to the analysis results, when neighborhoods' level of transformation level increases, they provide more paths with less diversity of paths.

4.3.2 Evaluation of Edges According to Level of Neighborhood Transformation

In general, the edges were defined as a border of nodes. For example, parks or gardens often have been depicted with their own frontier in children's cognitive maps. In some cases, roads were evaluated as edges. The edges are defined as borders of public open spaces, car-oriented roads, highways, mountains, walls, fences, dividing lines, coastlines, natural thresholds, roads. It is shown in **Hata! Yer işareti başvurusu geçersiz.** that the most various descriptions about the edges also have the highest percentage depicting which are in a low level of neighborhood transformation in the children's illustrations. The neighborhood that was transformed with high levels has depicted with the least rate and has the least variety.

Table 9: The Percentages Depicting The Edges And Their Descriptions With Respect To The Transformation Levels Of Neighborhood Areas

Categorization of Neighborhood Transformation Levels	Percentage Depicting	Descriptions
Low Level of N. Transformation	8%	borders of public open spaces, car-oriented roads, boundaries of the urban area, walls, fences, highways, dividing straight lines, mountains, coastlines
Moderate Level of N. Transformation	6%	borders of public open spaces, straight dividing lines, walls, area borders, structure borders, car-oriented roads, fences, natural threshold, boundaries of the urban area
High Level of N. Transformation	5%	roads, mountains, straight dividing lines, wall

It can be apprehensible that children showed that they were aware of their urban limitations, especially in low and moderate levels of transformed neighborhoods.

4.3.3 Evaluation of Districts According to Level of Neighborhood Transformation

The least represented urban elements are the districts in accordance with the analysis results shown in Table 4. Although the district is the least represented urban element, the classification includes a diversity of components such as empty plot, houses regions, huge activity region, mass housing area, lawns, bazaar, and so forth. The low level of neighborhood transformation and moderate one has the same percentage depiction; also, their descriptions share similarities.

Table 10: The Percentages Depicting The Districts And Their Descriptions With Respect To The Transformation Levels Of Neighborhood Areas

Categorization of Neighborhood Transformation Levels	Percentage Depicting	Descriptions
Low Level of N. Transformation	3%	parking area, empty area, empty plot, houses region, graveyard, commercial area, coast, Bosphorus, huge activity region, mass housing area,
Moderate Level of N. Transformation	3%	forest, empty area, writing of children's own neighborhoods, school district, lawns, bazaar, houses region, concrete houses area, construction sites, graveyard, factory region, parking area,
High Level of N. Transformation	2%	writing of children's own neighborhoods

It is graspable that children focus on housing typologies in a moderately transformed neighborhood and differentiate them as concrete structures. Also, it should be highlighted that the picture of the district is generally explained with words and writings. Another important point is that a construction site was found in several drawings in the moderately transformed neighborhood, indicating that the area is still transforming.

4.3.4 Evaluation of Nodes According to Level of Neighborhood Transformation

As represented in Table 4, the nodes are the most illustrated urban elements in the children’s cognitive maps. Children and their interaction of places, focal points, living, and learning areas are located in this classification of urban elements. The highest percentage belongs to the low level of neighborhood transformation with 54%, and the last one is a high level of neighborhood transformation at 42%. The main examples of nodes are focal points of children’s activities represented by children.

Table 11: The Percentages Depicting The Nodes And Their Descriptions With Respect To The Transformation Levels Of Neighborhood Areas

Categorization of Neighborhood Transformation Levels	Percentage Depicting	Descriptions
Low Level of N. Transformation	54%	children’s homes, homes, schools, apartments’ blocks, park, field, relatives houses, gardens, friends homes, activity areas, playing area, neighbors’ houses
Moderate Level of N. Transformation	48%	Schools, homes, parks, neighbors’ houses, friends homes, playing area, children’s homes, gardens, apartments’ blocks

High Level of N.
Transformation

42%

Schools, homes, parks, neighbors'
houses, children's homes, friends
homes, garden, activity points

Descriptions of the nodes are generally similar for three cases, such as children's homes, schools, parks, apartments, gardens, playgrounds. More precisely, the children focus on more various urban elements in a neighborhood with more or less preserved urban fabric. However, the children who live in highly transformed neighborhoods focus on their interaction spaces. When low and high transformation areas were compared, it is observed that the children living in low transformed places have an understanding that is more diverse urban elements and more commanding about their surroundings. Moreover, it can be inferred that low transformed places provide a possibility of various spaces to be reached by children. Additionally, children tend to emphasize homes strongly; they also differentiated by giving names according to users type, such as friends' or relatives' or neighbors' homes. Results show that children recognize more nodes in their environments.

4.3.5 Evaluation of Landmarks According to Level of Neighborhood Transformation

The Landmarks are defined as a symbolic and notable point in the children's drawings. The Landmark was more represented in the highly transformed neighborhood areas with 18%, and a minor level in the urban areas with the low level of transformation with a percentage of 25. Although the highly transformed area has the highest percentage, drawn urban element as the landmark is least in high transformed areas. The children generally pictured mosques, grocery stores, restaurants, hairdresser pharmacies, and post offices.

It was found that the children who lived in a less transformed area focused both on historical and traditional places such as grocery stores, bakeries, and historical mosques. The highly transformed neighborhoods also contained landmarks that can serve for daily activities such as post office, pharmacy, market, estate agent, etc. A

wide variety of landmarks were encountered in the moderate ones. The children who live in a moderate level of neighborhood transformation focused on historical, cultural symbolic functional landmarks. For example, these children showed their neighborhood with signboards, churches, mosques, Galata Tower, hairdresser, bakery, tree, flag, and so forth in their cognitive maps. One of the significant results of the children’s neighborhood drawings in moderately transformed neighborhoods is that children give detail with writing place’s names or painting detail parts of places. They generally give a clue about where they are trying to show. They recognize their environments by giving their specific names from schools’ to apartments or churches.’

Table 12: The Percentages Depicting The Landmarks And Their Descriptions With Respect To The Transformation Levels Of Neighborhood Areas

Categorization of Neighborhood Transformation Levels	Percentage Depicting	Descriptions
Low Level of N. Transformation	18%	grocery store, tree, bakery, greengrocer, old structure, carpenter, hairdresser, mosque, Ayazma Mosque, market, İmrahor Mosque, veterinary, shrine, Kara Davut Paşa Cami, school, restaurant, pharmacy, coffee house, key maker, patisserie, traffic lamb, health service, tailor, greengrocer, shop center, taxi stop, internet café, nuts seller, Kaptan Paşa Mosque, Fountain
Moderate Level of N. Transformation	22%	grocery store, stationery, hotel, marriage place, Hasbahçe, outfitter, bakery, flag, hairdresser, coffee house, shoe seller, post office, tree, market, bakery, Hoca Ali mosque, pharmacy, city hall, restaurant, Kırım Church, fish restaurant, butcher, coal bunker, security, mosque, Galata Tower,

<p>High Level of N. Transformation</p>	<p>25%</p>	<p>church, hospital, patisserie, signboards, telephone kiosk, highschool, passage, carpenter, greengrocer, chocolate factory</p>
		<p>grocery store, pharmacy, mosque, market, tree, buffet, hairdresser, internet café, estate agent, library, health center, stationery, taxi stop, city hall, Hasbahçe, post office</p>

In a general perspective, the children from different transformed neighborhoods levels refer to each urban element with different percentages depicting. That result was expected based on the first research question's second part, which is whether children refer to different urban elements in different neighborhood contexts. Every context gives various opportunities for children to experience their own neighborhoods. Therefore, as Table 6 illustrates, in different neighborhood contents, place knowledge differs in children. Contextual differences can increase with urban transformation projects. As a matter of fact, places that change and lose their old urban fabric do not allow children to experience their environments in a respectable way with such urban practices. In the light of five different tables results as In general, the edges were defined as a border of nodes. For example, parks or gardens often have been depicted with their own frontier in children's cognitive maps. In some cases, roads were evaluated as edges. The edges are defined as borders of public open spaces, car-oriented roads, highways, mountains, walls, fences, dividing lines, coastlines, natural thresholds, roads. It is shown in **Hata! Yer işareti başvurusu geçersiz.** that the most various descriptions about the edges also have the highest percentage depicting which are in a low level of neighborhood transformation in the children's illustrations. The neighborhood that was transformed with high levels has depicted with the least rate and has the least variety.

Table 9, Table 10, Table 11, except for the paths and the landmarks, children in neighborhoods that have been highly transformed have the least reference to other three urban elements in their drawings compared to other neighborhoods. Also, as

shown in Table 8, Table 12, it was found that even if the percentage depicting urban elements is high in high transformed neighborhoods, there is a limited number of urban elements in children's description of their cognitive maps. It is understood that children refer to more urban elements in neighborhoods that have managed to protect their urban fabric compared to more transformed neighborhoods except for two urban elements. These are a path and a landmark, and they have the highest percentage of children's place knowledge in highly transformed neighborhoods. The reason can be that if the environment of the children is transformed into a monotony, different places can be noticed effortlessly by children. Thus, they refer in their cognitive maps landmarks more in highly transformed neighborhoods. Moreover, since children do not know their own environment in highly transformed neighborhoods, they may have a tendency to reach and desire to go to nearby neighborhoods. For example, Hasbahçe, which is not located in the Çeliktepe, was drawn in one of the children's drawings who live in the Çeliktepe Neighborhood. The reason can be that they could not find a place to meet their daily needs in their own neighborhoods. Therefore, children can describe paths and landmarks about accessibility to these nearby neighborhoods and define important places on their own cognitive maps. Another reason can be related to neoliberal order that, as mentioned at the beginning of this thesis, it is possible to come across car-oriented roads and areas for consumption at the end of an urban transformation process that serves the neoliberalist system. So, it is inevitable that children refer to paths and landmarks in their neighborhood drawings in this system that serves the material world, not the human. Another indicator of the inability of children to know and adapt to their neighborhoods in highly transformed neighborhoods is that at least a percentage of children draw their own spaces as nodes in highly transformed neighborhoods. It is thought that this may be related to the gentrification of the neighborhoods, and for this reason, children may have given very little space to nodes in their neighborhood drawings in highly transformed neighborhoods. Thus this thesis second hypothesis is proved for some of the urban elements; nodes, edges, districts, according to the results presented here.

4.4 The Effects of Urban Transformation on Place Knowledge

Before the initiation of this study, it was assumed that children demonstrate more urban elements in neighborhoods that protect their historical values. On the other hand, it was expected that children living in more transformed neighborhoods mention fewer urban elements when they are asked to draw their neighborhoods.

As demonstrated in Table 13, the low transformed neighborhood has the highest average place knowledge among the other two, and the average is 10,59. The average place knowledge value of a moderate one is 8,16, and the highly transformed neighborhood's place knowledge is 7,37. The average results that were obtained from calculations of place knowledge values dividing with participant numbers according to three different transformed neighborhood-level show that hypotheses were proved. More precisely, children's knowledge of the place decreases as the place transforms, and there is an inverse relationship between place knowledge and level of transformation.

Table 13: The Relationship Between Place Knowledge and Level of Neighborhood Transformation

Relations of PK and Neighborhood Transformation Levels	Transformed Neighborhood with Low Level	Transformed Neighborhood with Moderate Level	Transformed Neighborhood with High Level
Values of PK	943	1110	361
Number of Child Participant	89	136	49
Avarage	10,59	8,16	7,37

According to the results, it can be inferred when one area is transformed at a high level and if lost historical traces or previous knowledge about their places, then children could not develop knowledge of place with their surroundings. It is observed

that if urban areas as neighborhoods transformed strictly, children could not experience surroundings and adapt to new areas with the same speed of transformation process. Also, if highly transformed neighborhoods serve only adults and are motivated to create rant regardless of the children's needs, the transformed area would not provide a place for the children; thus, the children's place knowledge could not be developed. However, transformation is made with a low and moderate level; then, the children could use former place knowledge while trying to find a place themselves, and they may quickly adapt to new areas in metropolises where they are a target of urban transformation projects like İstanbul.

4.5 Correlation of Place Knowledge and Place Attachment

In order to understand the correlation of place knowledge and place attachment, six different correlation matrix are shown in Table 14, Unlike the previous correlation matrix, each level of transformed neighborhood accumulated within themselves, and three different correlation matrix shown in Table 15, Table 16, Table 17 with different results. Outcomes from the correlation matrix of PK with PS, PD, PI, and overall PA values show that correlation is not found between PA and PK in low transformed neighborhoods.

More precisely, the correlation coefficient between PK and PS is -0,47; r is found out -0,187 between PK and PD; r is found -0,092 between PK and PI; r is found -0,127 between PK and PA. According to Table 3, there is no relation or very weak relation between PK and PS, PD, PI, PA due to all pearson correlation coefficient numbers less than 0,2. Additionally, P-Value is found 0,666 between PK and PS; 0,082 between PK and PD; 0,394 between PK and PI; 0,240 between PK and PA. Results show that there is a weak correlation between PK and PS, PD, PI, PA according to their P-Values which are higher than 0,05.

Table 15, Table 16, Table 17, Table 18, Table 19.

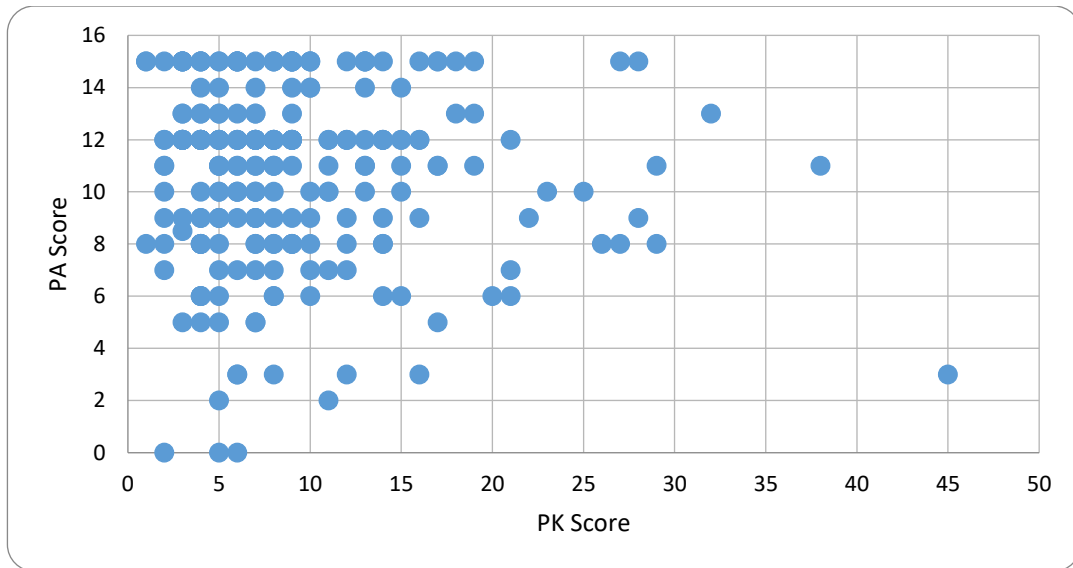
Table 14 demonstrates a 4x4 matrix that contains values of PK, PD, PS, PI, PA according to both pearson correlation (r) and sig (2-tailed) called P-Value. Results from the correlation matrix of PK, PS, PS, PI, and overall PA values show that there is no correlation between PA and PK which was composed of the data from 267 children’s drawings about PK and their survey answers about PA.

Put more concretely, the correlation coefficient between PK and PS is 0,014; r is found -0,078 between PK and PD; r is found -0,28 between PK and PI; r is also found -0,58 between PK and PA. According to Table 3, there is no relation or very weak relation between PK and PS, PD, PI, PA because of $r < 0,2$. Also, P-Value is provide a calculation of correlation 0,822 between PK and PS; 0,205 between PK and PD; 0,652 between PK and PI; 0,345 between PK and PA. Results show that there is a very weak correlation between PK and PS, PD, PI, PA according to their P-Values which are higher than 0,05.

Table 14: Correlation of PK, PA, and Components of PA

		Correlations				
		PK	PS	PD	PI	OVERALLPA
PK	Pearson Correlation	1	,014	-,078	-,028	-,058
	Sig. (2-tailed)		,822	,205	,652	,345
	N	267	267	267	267	267
PS	Pearson Correlation	,014	1	,622**	,460**	,496**
	Sig. (2-tailed)	,822		,000	,000	,000
	N	267	267	267	267	267
PD	Pearson Correlation	-,078	,622**	1	,404**	,507**
	Sig. (2-tailed)	,205	,000		,000	,000
	N	267	267	267	267	267
PI	Pearson Correlation	-,028	,460**	,404**	1	,929**
	Sig. (2-tailed)	,652	,000	,000		,000
	N	267	267	267	267	267
OVERALLPA	Pearson Correlation	-,058	,496**	,507**	,929**	1
	Sig. (2-tailed)	,345	,000	,000	,000	
	N	267	267	267	267	267

** . Correlation is significant at the 0.01 level (2-tailed).



Unlike the previous correlation matrix, each level of transformed neighborhood accumulated within themselves, and three different correlation matrix shown in Table 15, Table 16, Table 17 with different results. Outcomes from the correlation matrix of PK with PS, PD, PI, and overall PA values show that correlation is not found between PA and PK in low transformed neighborhoods.

More precisely, the correlation coefficient between PK and PS is $-0,47$; r is found out $-0,187$ between PK and PD; r is found $-0,092$ between PK and PI; r is found $-0,127$ between PK and PA. According to Table 3, there is no relation or very weak relation between PK and PS, PD, PI, PA due to all pearson correlation coefficient numbers less than $0,2$. Additionally, P-Value is found $0,666$ between PK and PS; $0,082$ between PK and PD; $0,394$ between PK and PI; $0,240$ between PK and PA. Results show that there is a weak correlation between PK and PS, PD, PI, PA according to their P-Values which are higher than $0,05$.

Table 15: Correlation at Low Level of Transformed Neighborhood

		Correlations				
		PK	PS	PD	PI	OVERALLPA
PK	Pearson Correlation	1	-,047	-,187	-,092	-,127
	Sig. (2-tailed)		,666	,082	,394	,240
	N	88	88	88	88	88
PS	Pearson Correlation	-,047	1	,709**	,328**	,307**
	Sig. (2-tailed)	,666		,000	,002	,004
	N	88	88	88	88	88
PD	Pearson Correlation	-,187	,709**	1	,354**	,350**
	Sig. (2-tailed)	,082	,000		,001	,001
	N	88	88	88	88	88
PI	Pearson Correlation	-,092	,328**	,354**	1	,973**
	Sig. (2-tailed)	,394	,002	,001		,000
	N	88	88	88	88	88
OVERALLPA	Pearson Correlation	-,127	,307**	,350**	,973**	1
	Sig. (2-tailed)	,240	,004	,001	,000	
	N	88	88	88	88	88

** . Correlation is significant at the 0.01 level (2-tailed).

Table 16 shows the correlation of children’s place knowledge from a moderate level of the transformed neighborhoods and PS, PD, PI, PA. Pearson correlation value is found 0,071 between PK and PS; -0,031 between PK and PD; 0,06 between PK and PI; 0,035 between PK and PA. All values of pearson correlation are revealed in Table 16 are less than 0,02, and results show a very weak correlation between them. The P-Value is evaluated and found correlation of PK with PS as a 0,421; PK with PD as a 0,726; PK with PI as a 0,494; PK with PA as a 0,695. It shows that all values are above 0,05, so there is no or very weak correlation between PK and PS, PD, PI, PA in a moderate level of the transformed area.

Table 16: Correlation at Moderate Level of Transformed Neighborhood

		Correlations				
		PK	PS	PD	PI	OVERALLPA
PK	Pearson Correlation	1	,071	-,031	,060	,035
	Sig. (2-tailed)		,421	,726	,494	,695
	N	131	131	131	131	131
PS	Pearson Correlation	,071	1	,545**	,525**	,806**
	Sig. (2-tailed)	,421		,000	,000	,000
	N	131	131	131	131	131
PD	Pearson Correlation	-,031	,545**	1	,471**	,842**
	Sig. (2-tailed)	,726	,000		,000	,000
	N	131	131	131	131	131
PI	Pearson Correlation	,060	,525**	,471**	1	,813**
	Sig. (2-tailed)	,494	,000	,000		,000
	N	131	131	131	131	131
OVERALLPA	Pearson Correlation	,035	,806**	,842**	,813**	1
	Sig. (2-tailed)	,695	,000	,000	,000	
	N	131	131	131	131	131

** . Correlation is significant at the 0.01 level (2-tailed).

The correlation of PK from a high level of the transformed neighborhoods with PS, PD, PI, PA is expressed in Table 17. More precisely, r is found 0,035 between PK and PS; 0,131 between PK and PD; 0,075 between PK and PI; 0,091 between PK and PA. As demonstrated in Table 17, and results show no or weak correlation between them, since pearson correlation values are less than 0,02 in all cases. The P-Value also found of PK with PS as a 0,812; PK with PD as a 0,373; PK with PI as a 0,075; PK with PA as a 0,537. Results indicate in a high level of the transformed area that all P-Values are above 0,05, so there is no or very weak correlation between PK and PS, PD, PI, PA.

Table 17: Correlation at High level of Transformed Neighborhood

		Correlations				
		PK	PS	PD	PI	OVERALLPA
PK	Pearson Correlation	1	,035	,131	,075	,091
	Sig. (2-tailed)		,812	,373	,610	,537
	N	48	48	48	48	48
PS	Pearson Correlation	,035	1	,664**	,823**	,931**
	Sig. (2-tailed)	,812		,000	,000	,000
	N	48	48	48	48	48
PD	Pearson Correlation	,131	,664**	1	,571**	,843**
	Sig. (2-tailed)	,373	,000		,000	,000
	N	48	48	48	48	48
PI	Pearson Correlation	,075	,823**	,571**	1	,893**
	Sig. (2-tailed)	,610	,000	,000		,000
	N	48	48	48	48	48
OVERALLPA	Pearson Correlation	,091	,931**	,843**	,893**	1
	Sig. (2-tailed)	,537	,000	,000	,000	
	N	48	48	48	48	48

** . Correlation is significant at the 0.01 level (2-tailed).

The following correlation matrix is shown in Table 18 with a differentiated dataset considering all neighborhoods without any separation. Children who live in their neighborhoods for three or more years are included in datasets of this matrix, and results show that still there is no correlation between PK and PS, PD, PI, PA. For example, results of r range as -0,085, -0,139,-0,103, -0,120 respectively correlation of PK and PS, PK and PD, PK and PI, PK and PA. All of them are again in below from 0,2. Additionally, P-Values array as 0,221, 0,044, 0,137, 0,082 120 correspondingly correlation of PK and PS, PK and PD, PK and PI, PK and PA. P-Values found more than 0,05 except the sig. (2-tailed) value of PK and PD.

Table 18: Correlation for 3 years and more residency at neighborhood

		Correlations				
		PK	PS	PD	PI	OVERALLPA
PK	Pearson Correlation	1	-,085	-,139*	-,103	-,120
	Sig. (2-tailed)		,221	,044	,137	,082
	N	211	211	211	211	211
PS	Pearson Correlation	-,085	1	,600**	,411**	,415**
	Sig. (2-tailed)	,221		,000	,000	,000
	N	211	211	211	211	211
PD	Pearson Correlation	-,139*	,600**	1	,353**	,440**
	Sig. (2-tailed)	,044	,000		,000	,000
	N	211	211	211	211	211
PI	Pearson Correlation	-,103	,411**	,353**	1	,939**
	Sig. (2-tailed)	,137	,000	,000		,000
	N	211	211	211	211	211
OVERALLPA	Pearson Correlation	-,120	,415**	,440**	,939**	1
	Sig. (2-tailed)	,082	,000	,000	,000	
	N	211	211	211	211	211

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 19: Correlation for 9 years and more residency at neighborhood

		Correlations				
		PK	PS	PD	PI	OVERALLPA
PK	Pearson Correlation	1	-,127	-,174*	-,125	-,144
	Sig. (2-tailed)		,137	,040	,142	,091
	N	139	139	139	139	139
PS	Pearson Correlation	-,127	1	,588**	,326**	,332**
	Sig. (2-tailed)	,137		,000	,000	,000
	N	139	139	139	139	139
PD	Pearson Correlation	-,174*	,588**	1	,288**	,366**
	Sig. (2-tailed)	,040	,000		,001	,000
	N	139	139	139	139	139
PI	Pearson Correlation	-,125	,326**	,288**	1	,949**
	Sig. (2-tailed)	,142	,000	,001		,000
	N	139	139	139	139	139
OVERALLPA	Pearson Correlation	-,144	,332**	,366**	,949**	1
	Sig. (2-tailed)	,091	,000	,000	,000	
	N	139	139	139	139	139

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

The last correlation matrix is created with children's PK and PA data who live more than nine years in Table 19. Results are similar to the previous five matrices. All Pearson correlations are under the 0,2, and all P-Values are above 0,05 except the P-Value of PK and PD, and a similar result of PK and PD is found in Table 18.

Considering all correlation matrices, the author found that there is no correlation between place knowledge and place attachment. Therefore, the last hypothesis, which is defined as a having correlation between children's place knowledge and place attachment, is disapproved. Although the dataset is changed, the results are still the same, with not having correlations even if the correlation coefficient and P-Value differ. The reason can be about the formation and generation phase of place attachment and place knowledge. It means that place attachment develops over time; however, an individual's place knowledge can come into existence even one day.

CHAPTER 5

CONCLUSION AND FUTURE WORK

This thesis adopts critical evaluations of the children's place knowledge according to urban transformation levels and focuses on the correlation of the children's place knowledge and place attachment. Urban elements are crucial for this thesis research, giving information about the children's cognitive reflections about their environments.

5.1 Summary of Thesis

This research has aimed to elaborate the children's neighborhood knowledge according to the neighborhood's transformation levels. Also, it is aimed in the scope of this thesis that interpretations of the relationship between place knowledge and place attachment are to be grasped. Research questions are formed to understand these relations. This thesis aimed to find out whether children refer to different urban elements according to contextual differences or not. Also, it aimed to understand whether children refer more urban elements in their neighborhoods that have managed to conserve their historical urban fabric compared to a neighborhood that have been moderately or highly transformed. The last question searches the answer for whether there is a correlation between place knowledge and place attachment. In order to answer these questions, a comprehensive theoretical framework is presented. This thesis also argues that children's cognitive maps can be a tool to understand these relations. An expressive method is chosen in order to evaluate children's place knowledge. This research provides solid results to the children and places literature with a high number of data sets, which is rare in literature, and relations of place knowledge with neighborhood transformation levels and place attachment. The thesis contributes to a quantitative evaluation of this relation.

5.2 Main Findings of Research

Results show that the children's place knowledge differentiates with respect to the neighborhoods is one of the essential key findings. Second, the children refer to urban elements more in a low transformed area in general. Also, the variety of each urban element is great in low transformed neighborhoods, and the children demonstrate the spatial richness of urban elements there. Historical urban elements as a node or landmarks are shown in generally low and moderate levels of transformed neighborhoods. On the other hand, the children refer to more functional and primarily spaces and places in the high level of neighborhood transformation with limited spatial richness. Additionally, the children refer to more construction sites, highways, high-raised apartments, workplaces more frequently in a moderate and high level of transformed areas. One of the other significant key findings is about referred urban elements in general perspective. Children demonstrate nodes more in all six different neighborhoods on their drawings. When children's place knowledge is ordered from highest to lowest, the ranking is as follows: low, medium, and highly transformed neighborhoods. The correlation of place knowledge and place attachment is one of the other key findings. Even if datasets are changed and accumulated according to the neighborhoods' transformation levels or year of residence, the correlation is not found according to the given results between place attachment and place knowledge.

The children demonstrate their drawings which are vital for them. Results show that the children refer more to their own spaces like parks, friends' homes, gardens, activity points, their own homes, schools. Similar results were found in one of the studies which were conducted by Castonguay and Jutras (2009). According to their study results, the children choose places like parks and playgrounds most. This thesis findings also support their conclusions due to the fact that the children drew nodes with the highest percentage in their neighborhood drawings. The children generally focus on their own places because those places provide plenty amount of

opportunities for them to play, run, learn, interact with others. The critical point is the suitability of places where children can experience there freely and safely.

Gibson (1979) stated that place should not be evaluated with subjective or objective perspectives; instead, suitability is one of the main criteria to evaluate places where children can experience there. Also, if the neighborhood meets children's needs providing a place for living, socializing, feeling safe, reaching somewhere, and so forth (Maslow, 1943), children can interact there. Gibson's Theory of Affordance indicates provided opportunities from a place for living beings. Then it can be inferred that nodes and paths, which are generally the most mentioned urban elements of the children's drawings, draw more because these elements deliver opportunities for children to run, play, meet friends, learn, walk, discover in their neighborhoods.

According to this thesis results, the children also focus on their living areas' surroundings; similarly, Min and Lee also found in their survey results that children focus where they can experience their core behaviors (2006). Additionally, the findings of this thesis support the research results of Kytta et al. (2018). They found that environmental affordance and outdoor behavior settings are important for them, similar to this thesis results. The landmark is a recognition point for the children of this study, and the most important diversity for them is given children's drawings. Min and Lee (2006) also stated that community services, the commercial area, are important for children's perception. While the variety of landmarks mentioned were found in the children's cognitive maps, specific and symbolic values common to everyone were found in adult-driven cognitive map studies (Boğaç, 2009).

Today, urban transformation practices have provided more adult-driven places ignoring children's places. Unfortunately, urban redevelopment projects are realized with many material concerns without considering the previous historical, natural or cultural structure of an area. As urban areas are getting changed, deteriorated, and lost of the traces of the previous historical urban values after transformation, highly transformed neighborhoods are generally not afforded the children's places. More

precisely, in neighborhoods that have been changed from medium to high levels, the children mention a lot about places they do not have access to in their neighborhood drawings, such as high-rise buildings, concrete areas, workplaces, and construction areas. Parallel results are found in some studies of children's drawings by Halseth and Doddridge 2000 and Lehman-Frisch et al. (2012). One of the main results of this thesis is that highly transformed neighborhoods cause children to experience their environment differently to not finding suitable places for themselves generally, and so their place knowledge is differently developed as similar findings found by Çakırer-Özservet cognitive mapping research (2019). In general, the children referred to buildings' surroundings like many scholars found and showed results indicate that results are consistent with the literature were obtained.

Urban elements most used by the children as a park, school, homes, relatives' homes are expected results. Because these areas satisfy the children's needs by providing opportunities for them diverse suitable subsets to interact children's with their environments, the other predictable result is that the urban elements used in these neighborhoods were differentiated according to each context. Because every context has different geographical discrepancies, the children exhibit different behavior patterns in different physical settings. This causes drawn urban elements to change according to contextual differences among the children's drawings. It was also expected that the children's knowledge of the place would differ according to the level of transformation of their neighborhoods and that in the least transformed neighborhood, a person would have the most spatial information, and the most changed would have the least knowledge. However, unexpected results were encountered as a result of the research conducted to understand the relationship between place knowledge and place attachment. There are many parameters that affect results. To understand differences, it will be offered some implications for future works in the next heading.

5.3 Implications for Future Research

Under the scope of this thesis, the research is conducted in order to understand the effects of urban transformation levels on relations of place knowledge and place attachment levels from the perspective of children. Also, the correlation between place knowledge and place attachment levels is investigated. When examining these relations, no significant or very weak correlation was found between place attachment and place knowledge. Some additional methods are planned proposed in order to research this issue more profoundly find correlations in future studies. Firstly as mentioned before, there is no correlation between place knowledge and place attachment is found in this thesis results. More precisely, the reason for the no significant correlation values between the variables could be that no or very weak correlation between them can be about the correlation dataset number for each different level of reveloped neighborhood. If there are higher data number sets to correlate place attachment and place knowledge values, it is possible to obtain different correlation values. Cele (2006) stated that the cognitive map is very subjective and generally highly related to children's drawing abilities and skills. For example, at this point, it is thought that the children should be supported with additional studies in order to analyze the children's place knowledge more objectively. Additionally, suppose the children were given some specific place scale to be drawn by them, with some verbal place knowledge survey questions. In that case, the correlation between place knowledge and place attachment can be detected differently. Shamai (1991) stated that although place attachment is fed by place knowledge, place attachment and place knowledge develop differently. As mentioned in the fourth chapter of this thesis, place attachment and place knowledge occur at different times. In addition to the concept of time, children's drawing ability is also an essential factor. Children's drawings were used when measuring the place knowledge of the children. Since the results of neighborhood drawings are related to the drawing ability, the results may not be precise, so expanding the research design

may be considered at this point. It is thought that it may be possible to obtain different results in the study, perhaps by supporting the method with photo mapping.

5.4 Contribution to Urban Design

The projected valuation instrument in this study to understand the relationship between place knowledge with neighborhood redevelopment level and place attachment was assessed according to the scope of the given theoretical framework discussed before. How children's spatial knowledge is affected by the effects of urban transformation and the place attachment to the area guides planners and urban designers about which parameters should be considered when designing an area. It is vital to merge children's participation with urban design. Urban transformation process or new implementation in planning field generally occur with participating adult-driven research generally. However, such investigations with children should be encouraged because they can give several clues and enable urban designers to comprehend their needs and feelings. Such studies have very important contributions to both children's personal development and society and urban work and discipline. Concepts such as participation, self-expression, and voicing problems should be instilled in children from an early age. They are future citizens. If they grow up with such a perception, they will take a more active role in society in the future, and it is possible that they will become individuals who can respond to social problems and produce solutions. Urban planners and designers should feed their design fictions according to local children's needs where they shape and provide children's living place and space. If there is an elitist approach to urban design, children's needs will not meet precisely. In the scope of this thesis, in addition to the results discussed above, this study aims to help researchers understand what children's places are and how children evaluate their neighborhoods with drawings.

Study results suggest that urban design policies should include the provision of diverse land-uses or activity settings to increase the children's experiences with their environments. For example, it is essential to add children's activity programs such as

playing games, being in the park, walking, running, resting, and having fun by learning in the urban transformation projects. Moreover, some main roads or construction sites are places that consider children's orientations instead of limiting access to children's place and place experiences. Also, these projects should protect their previous values about their urban fabric to children not feel aligned to the area and use their previous place knowledge to meet their needs. In this way, the areas where children can interact with the environment increase, and their place knowledge develops. According to the evaluations of the urban elements used by the children, it was determined that the place knowledge of the children decreased as the transformation level of the neighborhoods changed. In this case, since children's place knowledge is less in very transformed neighborhoods, they may have less sense of that area. For this reason, areas that allow children to get to know their neighborhoods should be designed more by urban designers, planners, and municipalities.

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APPENDIX

A. Place Knowledge Data

	CODES	PATHS	EDGES	DISTRICTS	NODES	LANDMARKS	TOTAL PK.
KATİP ÇELEBİ ELEMENTARY SCHOOL	K1	2	1	0	3	2	8
	K2	0	0	0	3	0	3
	K3	3	0	0	2	0	5
	K4	1	1	0	2	0	4
	K5	0	0	0	3	1	4
	K6	1	3	0	6	2	12
	K7	1	1	0	2	0	4
	K8	0	0	0	3	0	3
	K9	0	0	0	4	0	4
	K10	0	0	0	2	0	2
	K11	2	1	0	1	0	4
	K12	0	0	0	1	2	3
	K13	2	0	0	2	1	5
	K14	0	0	0	2	1	3
	K15	0	0	0	4	0	4
	K16	0	0	0	1	0	1
	K17	5	0	0	2	3	10
	K18	0	0	0	3	2	5
	K19	1	3	0	3	0	7
	K20	0	0	0	2	1	3
	K21	0	0	0	1	0	1
	K22	0	0	0	1	0	1
	K23	1	0	0	3	0	4
	K24	1	2	0	2	1	6
	K25	1	1	0	10	1	13
	K26	0	0	1	1	7	9
	K27	0	0	0	3	0	3
	K28	0	0	0	2	2	4
	K29	2	1	0	17	9	29
	K30	3	0	0	2	1	6
	K31	1	2	0	7	1	11
	K32	2	0	0	13	0	15
	K33	2	0	0	4	1	7
	K34	0	1	0	6	0	7

K35	1	0	0	4	0	5
K36	5	1	0	1	1	8
K37	3	0	0	2	2	7
K38	2	1	0	4	0	7
K39	0	0	1	3	0	4
K40	1	0	0	2	2	5
K41	3	1	2	15	0	21
K42	1	0	0	2	1	4
K43	2	2	0	5	4	13
K44	2	0	0	2	1	5
K45	4	0	0	8	0	12
K46	4	1	0	8	0	13
K47	1	0	0	4	1	6
K48	2	2	1	1	2	8
K49	0	0	2	28	2	32
K50	0	0	0	3	1	4
K51	1	0	0	3	4	8
K52	3	0	1	5	1	10
K53	2	4	0	11	1	18
K54	1	4	0	2	1	8
K55	2	0	0	10	0	12
K56	1	1	0	1	2	5
K57	2	0	0	1	0	3
Total	74	34	8	248	64	428
Average	1.298	0.596	0.140	4.351	1.123	7.509

	CODES	PATHS	EDGES	DISTRICTS	NODES	LANDMARKS	TOTAL PK.
SP1	1	2	0	18	8	29	
SP2	3	3	0	16	3	25	
SP3	3	1	0	5	3	12	
SP4	4	5	1	7	2	19	
SP5	5	2	0	7	1	15	
SP6	0	2	2	7	0	11	
SP7	8	0	3	22	5	38	
SP8	1	0	0	5	1	7	
SP9	8	1	0	11	3	23	
SP10	1	1	0	2	1	5	
SP11	0	2	1	2	6	11	
SP12	2	0	0	5	3	10	
SP13	2	1	0	2	7	12	
SP14	1	1	0	6	7	15	
SP15	2	0	0	19	0	21	
SP16	4	1	0	3	7	15	
SP17	2	1	0	4	0	7	
SP18	11	2	0	22	10	45	
SP19	2	0	1	4	7	14	
SP20	9	2	1	6	8	26	
SP21	3	0	0	1	0	4	
SP22	0	0	0	0	2	2	
SP23	5	1	1	15	6	28	
SP24	1	2	1	4	2	10	
SP25	1	1	2	7	0	11	
SP26	3	1	0	6	5	15	
SP27	0	0	0	1	1	2	
SP28	0	0	0	2	3	5	
SP29	0	3	0	7	3	13	
SP30	2	1	0	5	3	11	
SP31	5	0	1	21	0	27	
SP32	3	2	3	16	3	27	
Total	92	38	17	258	110	515	
Average	2.875	1.1875	0.53125	8.0625	3.4375	16.093	

ŞEMSİPAŞA ELEMENTARY SCHOOL

GÜNEBAKAN ELEMENTARY SCHOOL

	CODES	PATHS	EDGES	DISTRICTS	NODES	LANDMARKS	TOTAL PK.
G1	5	4	3	7	3	22	
G2	2	0	0	2	0	4	
G3	4	1	0	6	6	17	
G4	2	2	1	6	1	12	
G5	1	0	0	5	1	7	
G6	0	0	0	2	2	4	
G7	0	1	0	7	1	9	
G8	0	0	0	2	0	2	
G9	1	0	0	5	0	6	
G10	4	0	0	5	0	9	
G11	0	0	0	2	0	2	
G12	3	0	0	4	2	9	
G13	1	0	0	1	3	5	
G14	2	0	0	3	2	7	
G15	2	0	0	3	0	5	
G16	2	0	0	4	1	7	
G17	5	0	0	11	1	17	
G18	0	0	0	27	1	28	
G19	2	0	0	2	0	4	
G20	1	0	0	6	0	7	
G21	0	0	1	15	0	16	
G22	1	1	1	6	0	9	
G23	1	1	0	2	0	4	
G24	3	0	1	3	1	8	
G25	1	0	0	1	4	6	
G26	0	2	0	1	6	9	
G27	0	0	0	5	0	5	
G28	3	1	0	8	2	14	
G29	1	1	0	1	4	7	
G30	0	0	0	2	1	3	
G31	5	3	1	7	1	17	
G32	4	0	0	1	0	5	
G33	1	0	0	5	1	7	
G34	2	0	0	3	1	6	
G35	2	0	0	6	1	9	
G36	1	0	1	3	2	7	
G37	1	0	0	2	2	5	
G38	3	0	0	3	1	7	
G39	4	0	0	3	2	9	
G40	0	0	0	5	8	13	

	G41	2	0	0	5	6	13
	G42	4	0	1	4	4	13
	G43	1	2	1	5	3	12
	G44	0	0	0	3	1	4
	G45	1	1	1	3	4	10
	G46	2	0	0	6	1	9
	G47	1	0	1	3	2	7
	G48	1	0	0	5	1	7
	G49	1	0	1	4	2	8
	G50	0	1	0	3	1	5
	G51	2	0	0	9	5	16
	G52	2	1	1	4	3	11
	G53	1	1	0	2	0	4
	G54	0	0	0	3	0	3
	G55	5	2	3	8	0	18
	G56	1	1	0	1	0	3
	G57	10	0	0	2	2	14
	Total	104	26	18	262	96	506
	Average	1.825	0.456	0.316	4.596	1.684	8.877

	CODES	PATHS	EDGES	DISTRICTS	NODES	LANDMARKS	TOTAL PK.
M1	4	2	0	4	1	11	
M2	5	1	0	2	0	8	
M3	2	1	0	3	8	14	
M4	5	1	0	7	0	13	
M5	5	0	0	10	2	17	
M6	4	0	0	5	0	9	
M7	0	2	0	4	2	8	
M8	3	0	0	4	0	7	
M9	1	1	0	2	1	5	
M10	1	2	2	1	0	6	
M11	3	0	0	4	1	8	
M12	0	0	0	3	1	4	
M13	2	1	0	5	2	10	
M14	2	0	0	3	1	6	
M15	0	1	0	4	2	7	
M16	0	1	0	2	1	4	
M17	1	0	0	7	0	8	
M18	0	0	0	4	0	4	
M19	0	0	0	2	0	2	
M20	1	0	0	3	1	5	
M21	0	0	0	1	2	3	
M22	1	1	0	4	2	8	
M23	2	1	0	4	1	8	
M24	2	0	0	4	4	10	
M25	1	0	0	1	0	2	
M26	1	1	3	3	0	8	
M27	4	0	0	5	0	9	
M28	4	3	0	3	0	10	
M29	2	0	1	3	0	6	
M30	0	0	0	1	3	4	
M31	2	0	2	4	0	8	
M32	1	1	1	11	0	14	
M33	3	1	0	5	0	9	
M34	0	0	0	6	1	7	
Total	62	21	9	134	36	262	
Average	1.8235	0.617	0.264	3.941	1.058	7.706	

MERKEZ ELEMENTARY SCHOOL

	CODES	PATHS	EDGES	DISTRICTS	NODES	LANDMARKS	TOTAL PK.
OKÇU MUSA ELEMENTARY SCHOOL	OM1	1	0	0	6	3	10
	OM2	3	1	0	0	6	10
	OM3	1	0	0	1	1	3
	OM4	4	0	0	17	4	25
	OM5	9	0	0	4	6	19
	OM6	3	0	0	10	2	15
	OM7	4	0	1	1	2	8
	OM8	1	1	0	4	8	14
	OM9	3	0	0	1	3	7
	OM10	5	2	0	2	10	19
	OM11	3	0	0	1	3	7
	OM12	1	1	0	3	1	6
	OM13	2	0	0	2	0	4
	OM14	2	0	0	4	2	8
	OM15	8	0	0	7	6	21
	OM16	0	0	0	1	2	3
	OM17	0	0	0	1	1	2
	OM18	2	0	0	3	0	5
	OM19	3	5	0	8	1	17
	OM20	1	0	1	4	3	9
	OM21	2	0	0	0	3	5
	OM22	1	0	0	2	1	4
	OM23	0	0	1	1	3	5
	OM24	0	0	0	4	3	7
	OM25	1	0	2	4	7	14
	OM26	0	0	0	2	0	2
	OM27	0	0	0	1	2	3
	OM28	1	0	0	4	1	6
	OM29	1	1	0	7	0	9
	OM30	3	1	0	2	4	10
	OM31	0	0	0	2	0	2
	OM32	1	1	0	3	1	6
	OM33	0	0	0	1	0	1
	OM34	3	0	0	2	4	9
	OM35	1	0	0	2	1	4
	OM36	0	0	0	0	2	2
	OM37	1	0	0	1	0	2
	OM38	2	0	0	1	0	3
	OM39	1	1	0	4	0	6
	OM40	1	2	0	2	4	9

OM41	1	1	0	2	2	6
OM42	1	0	0	4	0	5
OM43	1	0	0	1	2	4
OM44	1	0	0	0	2	3
OM45	1	0	0	1	1	3
Total	80	17	5	133	107	342
Average	1.778	0.378	0.111	2.956	2.378	7.600

	CODES	PATHS	EDGES	DISTRICTS	NODES	LANDMARKS	TOTAL PK.
OSMAN FARUK VERİMER ELEMENTARY	OFV1	1	0	0	2	1	4
	OFV2	0	0	0	2	2	4
	OFV3	2	0	0	5	2	9
	OFV4	1	0	0	1	0	2
	OFV5	1	0	0	2	0	3
	OFV6	1	0	0	2	3	6
	OFV7	1	0	0	4	0	5
	OFV8	2	0	0	3	2	7
	OFV9	2	0	0	2	1	5
	OFV10	1	0	0	2	2	5
	OFV11	1	0	0	4	1	6
	OFV12	0	0	0	4	0	4
	OFV13	1	0	0	2	1	4
	OFV14	2	0	0	1	1	4
	OFV15	4	0	0	2	2	8
	OFV16	1	0	0	4	3	8
	OFV17	2	0	0	4	1	7
	OFV18	0	0	0	8	1	9
	OFV19	3	0	0	2	4	9
	OFV20	1	0	0	4	2	7
	OFV21	0	0	0	2	1	3
	OFV22	2	0	0	0	3	5
	OFV23	1	0	0	1	0	2
	OFV24	1	0	0	2	4	7
	OFV25	2	0	0	7	7	16
	OFV26	1	1	0	2	1	5
	OFV27	4	0	0	3	2	9

	OFV28	0	0	0	1	4	5
	OFV29	8	0	0	6	6	20
	OFV30	6	0	0	6	4	16
	OFV31	2	4	0	5	3	14
	OFV32	2	0	0	6	1	9
	OFV33	3	1	2	6	0	12
	OFV34	2	0	0	2	2	6
	OFV35	3	1	0	1	1	6
	OFV36	5	0	3	3	0	11
	OFV37	5	0	0	4	5	14
	OFV38	2	0	0	2	4	8
	OFV39	3	4	0	9	0	16
	OFV40	1	0	0	1	0	2
	OFV41	0	0	0	2	2	4
	OFV42	4	0	0	5	4	13
	OFV43	1	0	0	3	1	5
	OFV44	0	1	0	2	0	3
	OFV45	2	0	0	2	2	6
	OFV46	2	4	2	2	0	10
	OFV47	0	1	0	3	0	4
	OFV48	3	0	0	3	2	8
	OFV49	4	0	0	1	1	6
	Total	96	17	7	152	89	361
	Average	1.959	0.347	0.143	3.102	1.816	7.367