CHILDREN'S VIEW OF FRIENDLY ENVIRONMENT IN A LOW COST HIGH DENSITY URBAN NEIGHBOURHOOD

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DEDICATION

To our prophet, *Mohammad*, the messenger of truth, fraternization and
kindness

To my dears *father*, *mother, wife, Mother in-law, brother in-law, brother,
sisters and late father in-law*

To my kind supervisor, *Assoc. Prof. Dr. Ismail bin Said*

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ABSTRACT

Child-friendly environment allures children to become active citizens. This environment in turn increases the children's quality of life. Children's physical, social and mental skills which are essential in their later adult life are achieved through their interaction with the outdoor environment. The environment encompasses a network of places where children can experience a sense of belonging individually or collectively. Children participation in shaping their settings plays a role in the creation of child-friendly environments. Nowadays, children are not only forced to be in places that are not relevant from their point of view, but with various constraints that reduce their movement in outdoor environment. The aim of the research is to determine the child-friendly environment from the view of Malaysian children in places that they play and interact in urban neighbourhood. This is to reveal the factors that influence the range of children's movement and the places they interact and play among middle childhood age (7 to 11 years old) in urban neighbourhood. This research was conducted at Flat Larkin, a residential area in Johor Bahru, Malaysia. Data was elicited using three methods, namely, survey questionnaire (N=120), seven-day-activity log (N=39), and children's drawings (N=52). Confirmatory factor analysis, frequency analysis, and content analysis were used to analyse the data to acquire results. The results revealed three main constructs which are independence, humanity and outdoor environment that affecting children's range of movement in urban neighbourhood. Playgrounds and courtyards were the most visited open places for playing and interaction in the urban neighbourhood. Recreational services with emphasis on natural elements in children's drawing afforded highest contribution to ideal places for children play. The result showed that as children play in the outdoor environment, their personal relationships with the environment are formed. An assessment model for a child- friendly environment was constructed which comprises of two central criteria for friendliness which are the amount of outdoor environment for children play and children's range of movement. The model can contribute to a better understanding of children's interaction and play in outdoor environment in their urban neighbourhood, and highlight the importance of such environment in promoting outdoor play.

ABSTRAK

Persekitaran mesra kanak-kanak menjadikan kanak-kanak warganegara yang aktif. Persekitaran ini seterusnya meningkatkan kualiti hidup kanak-kanak tersebut. Perkembangan fizikal, sosial dan mental kanak-kanak yang sangat penting dalam kehidupan dewasa mereka di kemudian hari akan dicapai melalui interaksi mereka dengan persekitaran luaran. Ia merangkumi rangkaian tempat-tempat di mana kanak-kanak boleh mengalami rasa kepunyaan dan selesa sama ada sebagai individu atau secara kolektif. Penyertaan kanak-kanak di ruang luaran memainkan peranan dalam pembentukan persekitaran mesra kanak-kanak. Namun, pada masa kini, kanak-kanak bukan hanya terpaksa berada di tempat-tempat yang tidak menarik minat mereka, tetapi mereka juga terpaksa berhadapan dengan pelbagai kekangan yang mengurangkan pergerakan mereka dalam persekitaran luaran. Kajian ini bertujuan untuk menentukan persekitaran mesra kanak-kanak berdasarkan pendapat kanak-kanak Malaysia mengenai tempat-tempat bermain dan berinteraksi dengan tarikan utama di bandar. Kajian ini adalah bertujuan untuk mendedahkan faktor-faktor yang mempengaruhi pelbagai pergerakan kanak-kanak dan tempat-tempat mereka berinteraksi dan bermain di kalangan kanak-kanak pertengahan umur (berumur 7 hingga 11 tahun) di kejiranan bandar. Kajian ini dijalankan di Flat Larkin, kawasan perumahan di Johor Bahru, Malaysia. Data dikumpul menggunakan tiga kaedah, iaitu borang soal selidik (N = 120), buku log tujuh hari (N = 39), dan lukisan kanak-kanak (N = 52). Analisis faktor pengesahan, analisis frekuensi dan analisis kandungan digunakan untuk menganalisis data untuk mendapatkan keputusan. Keputusan menunjukkan tiga konstruk utama yang mempengaruhi julat pergerakkan kanak-kanak di kawasan kejiranan bandar iaitu berdikari, faktor kemanusiaan dan alam sekitar. Taman permainan dan halaman perumahan adalah tempat-tempat terbuka yang paling kerap dilawati untuk bermain dan berinteraksi di kawasan kejiranan bandar. Perkhidmatan rekreasi dengan penekanan terhadap unsur-unsur semulajadi yang terbukti dalam lukisan kanak-kanak memberikan sumbangan tertinggi kepada pemahaman tentang tempat-tempat yang sesuai untuk kanak-kanak bermain. Keputusan menunjukkan bahawa apabila kanak-kanak bermain di persekitaran luaran, mereka membentuk hubungan peribadi dengan persekitaran. Model penilaian untuk persekitaran mesra kanak-kanak telah dibina yang terdiri daripada dua kriteria alam sekitar mesra kanak-kanak iaitu jumlah persekitaran untuk kanak-kanak bermain dan julat pergerakan kanak-kanak. Penemuan ini menyumbang kepada pemahaman yang lebih mendalam mengenai interaksi kanak-kanak di alam sekitar di kawasan kejiranan bandar mereka, seterusnya menekankan betapa pentingnya suasana sedemikian dalam menggalakkan kanak-kanak bermain di luar rumah.

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AVE	-	Average Variance Extracted
CE	-	Children's Environment
CFE	-	Child Friendly Environment
CHRM	-	Children's Range of Movement
CUFE	-	Child Unfriendly Environment
EC	-	Environment for Children
HC	-	Humanity Construct
IC	-	Independent Construct
MGA	-	Multi Group Analysis
OEC	-	Outdoor Environmental Construct
PLS	-	Partial Least Squares
SEM	-	Structural Equation Model

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CHAPTER 1

INTRODUCTION

1.1   Introduction

Children are the main members of the community because they will be the heir of the country, and the next adult citizens of the future (Casas, 1997; Qvortrup, 1997).They are an influential sign of the future (Thomas *et al.*, 2004) thus they should be considered as agents of their own lives (Alanen, 1998).

Children are different from adults in many aspects (Hill, 2006) therefore their dreams and the handling of the environment are completely different from the adults (Matthews *et al.*, 2000). They are able to share many experiences with adults because they are experts in their own lives, thus the children's playing cannot be hidden from adults' eyes (Corbishley, 1995). The perception of adults on children's playing needs is different from young people's private geographies of childhood (Valentine, 1997). Children are aware of their likes and dislikes about their surrounding environment (Hill, 2006; Driskell, 2002; Woolley *et al.*, 1999).

The better future of societies and children depend on the environment provided for them (Churchman, 2003). This is because children achieve the physical, social and mental skills essential for life through their playful interaction with the environment around them. Although children had learned about environmental issues in school they however obtain richer learning from their engagement with the environment (Thomas *et al.*, 2004).

Children learn about the functions of the environment through access to environmental experiences (Bjorklid, 1985). Outdoor environments such as streets and playgrounds offer unique opportunities to children in contrast to indoor spaces such as the home (Castonguay and Jutras, 2010).

Children should go out and join their peers to invent and share games, to organise themselves independently and to exercise their mobility and skills freely (Preeza et al., 2001). Positive impact on children's personal development and wellbeing will be observed if they participate actively in their community (Hart, 1992). Children's participation increases their confidence, articulation and analytical and negotiation skills (O'Kane and Karkara, 2007; Chatterjee, 2005).

Children who are able to access, use city streets for playing, move about in their local area with a reasonable degree of freedom and safety and have some sense of ownership or entitlement to be heard are healthier than children who have a lack of agency, feeling of self worth and efficacy that ultimately play out negatively within the community and gain all of these significant thorough playing in outdoor places and environment (Davis and Jones, 1996). Play is also necessary to express children's drive for understanding and to increase competency (Bartlett et al., 2002). Social and cognitive competencies of children can be facilitated by their playing outdoors and their freedom of moving around (Christensen, 2011; Karsten and van Vliet, 2006).

Children wish to be in places that encourage a sense of belonging where they are able to change the setting of the place according to their preferences. They require natural places that offer more green space, trees, hiding places, less litter, less traffic and better public transports. In addition, they prefer parents and other children to defend their local environment more than anything else (Thomas et al., 2004).

Empirical studies discussing the interaction between children and outdoor environment can be categorised into four types: neighbourhood environment, school ground, forest and natural environment and public places. Table 1.1 indicates children's interaction with regard to the different outdoor spaces that they engage in.

Table 1.1: Different outdoors-on children-environment interaction

Type of environment	Author/Year	Major findings
Neighbourhood	Horelli, (2007), Francis and Lorenzo (2002), Hüttenmoser (1995), Castonguay and Jutras (2009), Karsten and van Vliet (2006), Page *et al.* (2009), Heft (1988), Veitch *et al.* (2008)	Children participation is a major area of environmental design proactive and research today. Unsuitable living surroundings influence the period of parental accompaniment to children. Physical activity and independent mobility are likely to be influenced by the type of neighbourhood as well as perception of the neighbourhood. Form-based description of environment does not change with regard to individual development, but affordances of environment.
School ground	Ozdemir and Yilmaz (2008), Harvey (1989), Dyment *et al.* (2009)	Nowadays school grounds does not provide suitable environment for children to play. The primary concern of designers should be to improve the physical and landscape qualities of the public school yards, in order to improve the health of children.
Forest and natural environment	Smith *et al.* (2008), Fjortoft and Sageie (2000)	The environment scale and size, the features, and also the diversity can affect children's sensitivity, preference and play functions that can be met in natural landscape.
Public places	Harden (2002), Lennard and Lennard (1992)	Public places offer the opportunities to improve interpersonal attitudes and emotions of children however, they have been recognised as dangerous places.

Source: Author

The studies regarding the neighbourhood environment emphasise the significance of the design of the living surrounding that will not only affect children's fascination to be more active in their neighbourhood but also influences their overall participation in the community. As the result, different neighbourhoods influence the things that children do, can do, like to do and are able to do. In addition, many adults prefer to live in neighbourhoods where residential zones are separated from commercial zones. Nevertheless, children distaste adults' preferences, because this separation cuts them off from many facilities that are beneficial in their own terms, such as shops, parks, and loose-fit places.

Density of neighbourhood is another effective aspect that influences people who live there especially children (Castonguay and Jutras, 2010). Consequently high density neighbourhood is a better place for living from children's view because; children living in a high density neighbourhood have more friend than children living in a low density neighbourhood (Cooper-Vince *et al.,* 2014).

The second category refers to school grounds. This environment is beneficial yet it is not always accessible. The finding from studies of Ozdemir and Yilmaz (2008), Dyment *et al.* and (2009), Harvey (1989), investigated school ground

highlights that playing in school ground is an occasion that allows children to get knowledge regarding their environment (Ozdemir and Yilmaz, 2008). However, the school ground is highly controlled by teachers and adults, so children do not have access to this type of environment without adult permission. The third category is the outdoor, namely the natural environment where children's preferences and functions are met. Therefore, natural landscapes with rich set of affordances for children in their daily life are useful for their physical and cognitive development. Finally, the last category refers to public places. It highlights using public places by children despite being identified as a risky environment by parents, police officers and other adults, because public places are full of strangers and social dangers.

From the start of its history, Malaysia has been a multicultural country providing settlements for different cultures and religions which causes a new integrated but distinguished Malay culture to appear. Contemporary Malaysia represents a unique fusion of Malay, Chinese and Indian with different cultures, religions and even languages. These dissimilarities influence the people's way of life especially children. The findings of the pilot study indicated that Malay children do not play with Chinese or Indian children.

Similar to other countries and communities, Malaysian neighbourhood had changed due to urbanisation and industrialisation. Neighbourhood's physical and social outlooks have an important role in determining individual behaviour in Malaysia. Salleh (2008) mentioned the rate of children access to playing spaces as a one of the factors that yields satisfaction from neighbourhoods in Malaysia.

1.2   Problem Statement

Article 31 of the Child Friendly cities (CRC), states children need places to play within their neighbourhoods (Chawla, 2002) whilst these days are no exploratory places for young children (Wridt, 2004; Gaster, 1991). Many modern cities have been identified as negative places to live (Taylor *et al.*, 1998) especially

for children because of their traffic and other hazards preventing children to play outdoors unsupervised, getting physical activity and commuting independently. Generally, children's outdoor play and free access to their neighbourhood had decreased remarkably over three generations (Gaster, 1991). Therefore, there is considerable reduction in children's freedom of movement because of the declining in children's access to outdoor spaces to have free play and improving in children's living condition (Rissotto and Tonucci, 2002) that causes children's accompaniment with their adults more than past. Therefore, most important children's problems towards active free play are less movement and few places to interact and play.

1.2.1 Less Movement

Presently, children are encouraged to play in a regulated play environment in their home, their friend's home and "commercial play or recreation facilities" because it could save them from being exposed to environmental hazards. However, children's participation in places that mentioned above, have long-term effects on children's social and emotional competencies (Tranter and Malone, 2003: 89). In the past few years the access of children to public spaces is limited. The independent mobility of children is decreased due to the growth of urbanisation (Kytta, 2004). Children's freedom to play is not only limited in developing countries, but also in developed countries; spatial mobility restriction is mostly applied to children (Punch, 2000).

The number of cars moving on streets increases proportionately with the increase in size and scale of the cities and population. This increase has effect on children safety when they use the streets in various ways on their own and causes restriction on movement of children (Heurlin-Norinder, 1996).

The autonomy and independency of current generation, specifically children to access their neighbourhoods has decreased (Gaster, 1991). Older generation in their childhood period not only have more places to explore and play which were

safe and secure but have also more autonomy and few access limitations to the surrounding environment (Raymund, 1995). Parents used more outdoor places than their children in their childhood period but children play more often in supervised locations near the home for example home yards or play indoors much more. (Valentine and McKendrick, 1997).

Although the understanding, experience, exploration and thoughts of children in spaces are different from adults but the use of outdoor areas by children are dependent on adults (Valentine, 1997). Adults think that they know more than their children, have more experience than children, are more serious than children and are more important than children (Valentine, 1997). Therefore, parents nowadays do not allow children to be alone in outdoor places because they worry about their children's safety (O'Kane and Karkara, 2007).

For example, in a Malaysian urban neighbourhood, the feeling of insecure caused parents to restrict children physical activities in outdoor environment (Saimon *et al.*, 2013). This change causes the decrease in the time that children spend on street, in parks and natural areas, hence, in favor of indoor environment (Spencer and Blades, 2005).

1.2.2   Fewer Place to Interact and Play

Children seek to find outdoor places to play such as playground, parks, natural green spaces, sport fields and streets. The presence of these places provides more opportunities for spontaneous play and social contact for children (Woolley *et al.*, 1999).

Using public places for outdoor play and personal development is beneficial to children by improving children's social interaction (Thomas *et al.*, 2004). Good comprehension of environmental issues is obtained when they explore their own natural environment but this need is limited due to the limited access to outdoor

environment (Thomas *et al.*, 2004). The special place for children is those that offer safety and security (Raymund, 1995). Children spend most of their time playing in a public space near their homes. The sense of children's self efficacy can be improved when they have found a special place for play (Korpela *et al.*, 2002).

The number and diversity of places that children interact have decreased with the increase of urbanisation (Raymund, 1995; Gaster, 1991). The greatest change is due to the replacement of "fields, woods and orchards" with "formal city parks and busy street" (Raymund, 1995: 363). Over the half of last century the redesign of industrial community causes the disconnection between places of living with garden and natural environment (Chawla, 2002).

Cities are not provided with many or enough places which are specialised for children. They do not encourage children to have more autonomy because children are always under full surveillance at all times (Spencer *et al.*, 2000; Buss, 1995). This does not only apply to only large cities, but also to small areas such as the neighbourhood and other aspects of the cities such as recreational areas, business areas and commercial areas (Ritzdorf, 1986). The children who live in rural areas have more outdoor places and natural places to explore and play compared to children who live in cities with less access to outdoor places (Thomas *et al.*, 2004). There is a huge gap between children in rural and urban areas in terms of the quality of their access to high quality environment (Thomas *et al.*, 2004). For example, in many Malaysian towns and cities, the freedom and opportunity for children to create their own place is very limited (Said *et al.*, 2012).

A guideline that is related to designing of the outdoor environment in Sweden, suggests that the distance from children's home to playing space should not be more than 50 meters and this distance could be increased to 150 meters for older children (Swedish building code, 1982). The distance to school, shopping and recreational facilities, the safety and cleanliness of the city, and the number of playgrounds and green buildings are some factors that make a good city according to children (Chatterjee, 2006). Based on researches before the 1990s, streets and home environment are the places that children used the most during their childhood (Chawla, 1992) whist nowadays streets are a main threat for children's safety.

Children who have no access to outdoor places have less interaction, communication and play with other children (Bjorklid and Nordstrom, 2007). Nowadays the connection between children and environment are reduced. This relationship has a direct effect on children's well-being. Well-being has been defined as individual characteristics of an inherently positive state such as happiness or in terms of one's context such as standard of living (Pollard and Lee, 2003). Children's access to private gardens is limited. Nevertheless, children's view about these places is similar for instance; children's description about the beach will always be the same even though they had never visited the beach (Thomas *et al.*, 2004).

When living surroundings where children can move freely have been limited by traffic, vehicles drive fast, and children are not paying attention in urban environments, parents will not allow children to play outside. Consequently, children retreat from public domain of the street to playgrounds and they are sent to home zones or in supervised care and recreational settings (Castonguay and Jutras, 2010). Less play in outdoor places among children are due to fewer spaces near their home (Carver *et al.*, 2008; Loucaides *et al.*, 2004; Johns and Ha, 1999). Children, instead go to places that are specifically designed for them such as playgrounds. They do not have unplanned places to hide or secret places that they can claim their own (Raymund, 1995) also the traditional children's places are changed in to adult places. This change causes children have less public place and less ownership on their surroundings (Matthews, 2003; Chawla, 2002; Valentine, 1997).

In addition, Living environment in many towns and cities in South-east Asia is rapidly growing in the last two decades. Green spaces including farmlands, forests and river corridors are transformed to residential communities and commercial centres. As such the communities are packed with row houses and high-rise apartments with fragmented green spaces for recreation and play. In addition, new neighbourhoods provide insufficient walking and cycling ways for the communities. This is the common practice in new community development in cities in Malaysia such as Johor Bahru, Kuala Lumpurs (Said *et al.*, 2012).

In Malaysia, the fragmentation of open spaces in urban residential neighbourhood is the result of regimentation planning of the houses that maximises space for buildings and road system. Therefore, playgrounds and parks are placed not

in strategic location for children to access easily and safely. Residential streets are not equipped with walkways for children to walk in group. In addition, cars are parked along local streets that limit the space for the children to roam the neighbourhood at their own pace and behaviour (Said *et al.*, 2012).

1.3   Research Gap

There are plenty of researches about child friendly environment; however, less research had been done on the child friendly environment based on their views and presence in places that they prefer to be at. Most researches were done in non environmental design discipline such as environmental psychology, developmental sociology and children environmental For example, Haikkola *et al.* (2007), and Horelli (2007) in disciplines of environmental psychology and developmental sociology provided 10 dimensions that define the scope of environmental child friendliness. The dimensions are (1) housing and dwelling, (2) health, education and transport, participation, safety and security, family, kin, peers and community, urban and environmental qualities, provision and distribution of resources; poverty, reduction, ecology, sense of belonging and continuity, and good governance.

On the other hand, Corsi (2002) studied on child friendly cities in discipline of developmental sociology. His study mostly focused on environmental areas, cultural areas, and institutional areas while research conducted by Woolcock and Steele (2008) focused on agency, safety and feeling secure, Positive sense of self and other concepts. Other concepts contained activities for fun, freedom and competencies, spaces for children to connect with people, sense of community, interaction with others, need for natural places.

The research concerns of previous studies on child friendly environment are summarised in Table 1.2. As shown in the Table 1.2, many studies were conducted in developed countries. Thus, study on the child friendly environment based on

children's views and presence in developing countries such as Malaysia should be conducted.

Table 1.2: Different Researches of Child Friendly

Discipline	Author and context of study	Major findings	Parameters of study
Environmental Psychology	Horelli (2007), Finland	Environmental Child-Friendliness	Housing and dwelling, Basic services (health, education and transport), Participation, Safety and security, Family, kin, peers and community, Urban and environmental qualities, Provision and distribution of resources; poverty, reduction, Ecology, Sense of belonging and continuity, Good governance
	Haikkola *et al.* (2007), Italy and Finland	Urban Child Friendliness	
Developmental Sociology	Corsi (2002), Italy	Child Friendly Cities	Environmental areas, Cultural areas, Institutional areas
Environmental Design	Chatterjee (2005), India	Children's Friendship with Place	Learning and competence through place experience, Creating and controlling territories, Having secret places, Freedom of expression in place, Meaningful exchanges with places, Care and respect for the place
Children Environmental	Woolcock and Steele (2008), Australia	Child Friendly Community	Agency, Safety and feeling secure, Positive sense of self, Other concepts: activities for fun, freedom and competence, spaces for children to connect with people, sense of community, interaction with others, need for natural places

Source: Author

1.4   Research Aims

The aim of the research is to determine the Malaysian children's view of friendly environment in urban neighbourhood. This would reveal the factors that influence the range of children's movement and the characteristics and type of places where children play and interact.

1.5   Objectives of Research

To achieve the aim, the following research objectives are formulated:

1. To determine the factors that influence the children's range of movement in the urban neighbourhood;

2. To identify the characteristics and type of places that children play and interact in the urban neighbourhood; and

3. To acquire children's view of the ideal places where they prefer to play and interact in the urban neighbourhood.

1.6   Research Questions

For the purpose of this research the following research questions were formulated to achieve the aim of the study. These include the following:

1. What are the factors that restrict children's range of movement in the neighbourhood?

2. What are the characteristics and type of places that encourage children to play and interact more in the neighbourhood?

3. What is the children's view about child friendly environment based on their presence in the neighbourhood?

1.7 Scope and Limitation

The study is based in environmental design research which investigates child friendly environment. It explores the behavioural and perception responses of children aged 7-11 years old. The reason for selecting children within this age group is because at this age children will start to navigate without adults and develop a sense of local geography (Corriveau, 2010; Kegerreis, 1993; Matthews and Young, 1992; Cobb, 1977).

The study was conducted in Flat Larkin, a high-rise apartment located in the center of Johor Baharu. The reason for choosing Johor is because Johor is the second state in Malaysia that has the highest number of children aged between 7-11 years old, after Selangor (Department of Statistics Malaysia, 2010).

Independent (contain independent mobility, freedom and autonomy), humanity (consist of parental decision and acquaintanceship) and outdoor environmental construct (include physical and social dangers and weather condition) are expected to influence children's range of movement in urban neighbourhood. In addition, definition and type of places that children play and interact in urban neighbourhood are considered. This study also discusses children's conception of the ideal environment in urban neighbourhood, which represents their needs and preference.

However, it is beyond the scope of this study to examine the behavioural and perception responses due to different gender, ethnic, socio-economic and cultural factors.

1.8   Significance of the Study

The study is significant in order to respond to the problem statement and research gap:

    i.   The study adds to the body of knowledge that children with more range of movement have more places to explore, to playing and to interact in urban neighbourhood.

    ii.   A model of analysis which emphasises the child friendly environment, for children in urban neighbourhood is formulated. The formulation of the model is based on the degree of children's freedom and the extent of areas that children play and mingle in urban neighbourhood.

    iii.   From the aspect of planning and design, the study reveals the properties, attributes and key dimensions that support children's interaction and participation in the urban neighbourhood, taking into account the children's preferences and needs.

1.9   Outlines of Research Methodology

The study explores children's perceptions and preferences of places based on their presence in outdoor environment in urban neighbourhood. Therefore, the study focuses on middle childhood children (aged 7-11 years) as its respondents. The reason for choosing middle childhood children is because it is the most important stage of children's development, whereby through their social, cognitive, emotional and motor development they gain a logical and positive perception of becoming adolescents and adults (Moore, 1978; Matthews, 1987). They have the ability to interpret their experiences, preferences and feelings as they use the outdoor environment extensively (Kellert, 2002; Chawla, 1992). They perceive that play in

outdoor environment offers them various exciting and challenging play elements and provides them with the opportunity to choose, make decisions, experiment, and imagine and create new things (Cobb, 1977).

Previous researches on children's experience with their outdoor environments indicated multi-method measures to collect data. Table 1.3 indicates methodologies that were used by 21 former researchers in order to evaluate children's responses towards their outdoor environments. In order to obtain a deeper understanding of phenomenological inquiry into the child friendly environment, the study engaged the children in research. The study utilised survey questionnaire, seven-day children's activity log, and children's drawing. Figure 1.1 indicates the methods of collecting the data that were used in this study. The method for determining the factors that influence the children's range of movement include children's survey questionnaire. To identify the characteristics and type of places that children play and interact, children fill seven-day activity log and finally to acquire the children's view about child friendly environment, children draw ideal places that they prefer to be at.

Table 1.3: Methods of evaluating children's responses towards outdoor environment

Discipline	Author/Year	Method	Number of respondents
Children's independent mobility	Ahmadi and Taniguchi (2007), Karsten and van Vliet (2006), Veitch *et al.* (2008), Risotto and Tonucci (2002), Page *et al.* (2009)	Behavioral mapping, Questionnaire, Interview, Instrument	75, 212, 64' 1307
Children's environment	Huttenmoser (1995), Castonguay and Jutras (2010), Smith *et al.* (2008), Osborne (2005), Kytta (2003), Heft (1988), Fjortoft and Sageie (2000), McMillan (2007), Pellegrini (1987), Thorleifsdottir (2008)	Interview, Questionnaire, Photographing, Observation, Children's activities log	1726, 926, 28, 36, 43000, 98, 143, 35, 30, 29,48
Children's behavior	Pellegrini(1990), Francis and Lorenzo (2002), Orsini and O'brien (2006), van Vliet (1983), yeung *et al.* (2008)	Observation, Photographing, Interview, Questionnaire, Behavioral mapping	94, 6, 148, 162, 318

Source: Author

The methods utilised in this study were questionnaire, seven-day children's activity log, and children's drawing. Research methods are divided into two types which are qualitative method and quantitative methods. All data gathered from seven-day children's activity log and children's drawing (as qualitative approaches) were analysed using frequency and content analysis, except for the children's survey questionnaire (as quantitative approach), which were analysed using inferential statistics. Firstly, the data on degree of children's movement range of movement, gathered from the children's survey questionnaire, were analysed inferentially using confirmatory factor analysis to determine the factors that influence children's mobility. The seven-day children's activity log was analysed using frequency analysis to identify the characteristics and type of places that children interact and play in urban neighbourhood and finally data from children's drawings were analysed using content analysis to acquire the children's view about child friendly environment based on ideal places that they prefer to be at, in urban neighbourhood.

Figure 1.1 Methods of eliciting data

The focus of this exploratory research is to understand child friendly environment based on children's view and presence in urban neighbourhood. To achieve the aim and objectives, the study was conducted in four operational stages:

    i.   Definition, background, theories and concepts of factors that restrict children's range of movement, the places that those children interact and play in urban neighbourhood and child friendly environment;

      ii.   Field survey and data collection;

     iii.   Frequency and content analysis for qualitative data and inferential analysis for quantitative data; and

     iv.   Documentation of findings on the factors that influence children's mobility, places that children interact and play and ideal places in view of children in urban neighbourhood, a model of child friendly environment, conclusion, and implications of study.

1.9.1   Stage 1: Literature Review

The literature review focuses on the history and theories of factors that have effect on children's range of movement, different environment and places in the urban neighbourhood that children interact and play, and child friendly environment. This preliminary stage involved gathering literature from several fields including environmental psychology, children's geographies, child development, childhood education, place and health, preventive medicine, environmental education, outdoor education, architecture and landscape architecture.

1.9.2   Stage 2: Data Collection

To elicit data on the environment-behaviour responses and perceptual responses of children in the outdoor environment in their urban neighbourhood, the study engaged the children in research. Three measurement strategies were conducted including (i) children's survey questionnaire regarding factors that influence their range of movement in urban neighbourhood, (ii) seven-day children's

activity log of places that they interact and play in urban neighbourhood, and (iii) children's drawing of their ideal environment in urban neighbourhood.

1.9.3 Stage 3: Data Analysis

The focus of the analysis is to understand the phenomenological inquiry of the factors that influence children's mobility in urban neighbourhood, places that children interact and play in urban neighbourhood and children's view of child friendly environment based on ideal places that children prefer to be at, in urban neighbourhood. The data on children's survey questionnaire, that is, the factors that influence children's range of movement, were analysed using confirmatory factor analysis (Rezasoltani, 2013). The data on seven-day children's activity log, that is, about places that children interact and play in urban neighbourhood, were descriptively analysed. The statistics include frequency and percentage distributions. The data on children's drawing, that is, the drawing of children of ideal place in urban neighbourhood, were analysed by content analysis. In content analysis (Samborski, 2010), the processes include segmenting significant statements into categories, developing codes and themes, and interpreting a meaning from the data (Creswell, 2012). Descriptively, the codes and themes derived from content analysis were quantified so they could be compared with the quantitative data (Creswell, 2012) from the surveys.

1.9.4 Stage 4: Documentation of Findings

Children's view of friendly environment in urban neighbourhood will be presented in the following format:

  i. factors that influence the children's range of movement;

  ii. characteristics and type of places that children play and interact in urban neighbourhood; and

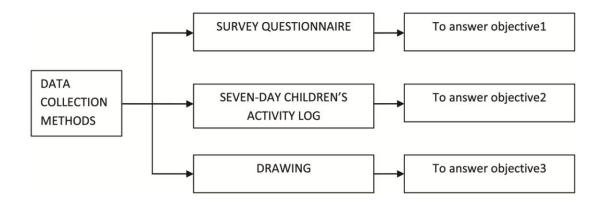 iii. children's view on their environment based on ideal places that they prefer to be at in urban neighbourhood.; and

  iv. theoretical and design implications of outdoor environment for children in urban neighbourhood.

1.10 Organisation of the Thesis

The thesis is divided into five chapters as follows:

Chapter 1 introduces the issues of the research. The chapter also contains the research aim and objectives. In addition, the research gap, scope of the study, research design, and overall thesis structure are also presented in this chapter.

Chapter 2 defines the meaning of play as an essential part in children's emotional and physical development. Then, it reviews the factors that limit children's range of movement in an outdoor environment in urban neighbourhood. Moreover, the chapter reviews places that children interact and play in urban neighbourhood. This part starts with a review on neighbourhood and continues with a definition of the different locations and places that are located in urban neighbourhoods. Then, the aspects that make up a child friendly environment will be discussed.

Chapter 3 presents research design utilised in this study. Data collection methods are also discussed, which is divided into three major types including survey questionnaire, seven-day children's activity log, and children's drawing. It is followed by the type of analysis used in this research including the Confirmatory Factor Analysis, frequency analysis, and content analysis. The three types of analysis method are also defined in this chapter.

Chapter 4 presents the research findings and the discussion. The findings on the categories of factors that influence children's rang of movement in an urban neighbourhood are explained. Then, the findings about the places that children interact and play in urban neighbourhood, is reviewed. Finally, the finding about children's perception of a child friendly environment is discussed based on the number of children present in those ideal places.

Chapter 5 concludes this thesis with a discussion on the overall findings. A model is constructed to discuss the relationship and triangulation between the most effective categories of influential factors on children's range of movement, places that children interact and play in their daily life in urban neighbourhood and children's view of an ideal place and a friendly environment. Research limitations and further studies will also be discussed in this chapter.

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