CHILDREN'S DRAWINGS AS RESEARCH TOOL: ESTABLISHING CHILDREN'S ENVIRONMENTAL CONCEPTS AND PREFERENCES

WITH REFERENCE TO URBAN OPEN SPACE PLANNING AND DESIGN IN JOHORE BAHRU, MALAYSIA.

Volume 1

by

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Thesis Abstract

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With Reference to Urban Open Space Planning and Design in Johore Bahru, Malaysia.

MOHD. SAROFIL ABU BAKAR

The aim of this research is to investigate meanings and concepts of children's drawings from cultural and gender perspectives using appropriate qualitative techniques and methods for interpreting drawing. This thesis discusses how children's concepts and preferences may differ from adults' thinking and planning. The study starts with a discussion of various issues of relating to children and urban planning and design in Johore Bahru, Malaysia. This is followed by a review of the psychology of children's drawings; the use of children's drawings in environmental research; the provision for and children's use of urban environments, and the state of Johore Bahru's urban environmental planning. Through the literature review, this research studies "Western" models from interdisciplinary perspectives. The children's drawings were used as a research tool to reveal their concepts of home landscape and activities they preferred in an ideal residential neighbourhood environment. Data from questionnaires and essays were used to check evidence found in drawings. In all, 114 Malay, Chinese and Indian children from seven primary schools in urban Johore Bahru completed the tasks. The findings of qualitative content analysis and interpretation of drawings showed similarities and differences across cultures and genders in environmental concepts and preferences which may indicate shortcomings in current urban planning. Children's drawings provide valuable information on the development of children's environmental concepts and preferences of ideal home landscape. The concepts are represented in the form of diverse, safe, colourful and accessible naturalistic environments for exploration, learning, play and socialising with peers. This finding will help future research projects by providing information indicating issues and problems in provision of open spaces within the urban planning system. The thesis concludes with a critical commentary on the likely use of children's drawing as research tool, children's environmental needs and preferences, together with the possibility of child participation in decision making, planning and design process within the urban planning system in Malaysia.

DEDICATION

To the memory of

MY SON

who died in Sheffield fourteen years ago

and specially dedicated to

MY FATHER and **MY UNCLE**

who died while this thesis
was being written

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In the name of God, most Gracious, most Merciful.
Praise be to Allah, the Cherisher and Sustainer of the Worlds,
For all are children of one God,
And share His loving care,
And must be brought within the pale of His eternal unity and harmony.

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Chapter 1

INTRODUCTION

1.0 INTRODUCTION

Children's urban environment has always been a focus of interest for many including planners, architects, landscape architects, psychologists, sociologists, and geographers. One of the main reasons for this concern was the adults' changing views of and responsibility towards the child (Malone, 2001; Hart, 1997; Pollowy, 1977), and the recognition of the need to integrate research findings and theory in the design of environments (Moore et al., 1992; Moore 1986; Weinstein and David, 1987), eliciting children's views and opinions in decision-making to consider policy and practice (Matthews et al., 1999); to promote and encourage appropriate policies and programmes for children in urban community (Chawla, 2001; Lynch, 1977). It has been recognised that public spaces are hardly planned with children in mind although they are major users of the outdoor environment. Some spaces that are specifically meant for children such as playgrounds, unfortunately do not meet the needs of young children (McKendrick, 1999; Valentine and McKendrick, 1997), or their needs are in conflict with adults (Kong, 2000; Valentine, 1996) or their needs and desires are often not given a high priority (Corsaro, 1997; Spencer et al., 1989; Pollowy, 1977).

An increasing number of children will be spending their life more intensively in housing neighbourhoods. The residential milleu forms important spaces, integrating into the life pattern and activities of children. Activities are a most necessary function of children's lives, for which adequate and supportive home environment settings can provide a very rich and diverse environment to explore. To provide environments that respect children's needs, there is a need first to understand their developmental requirements and place this response in a specefic cultural and socio-economic contexts. Within the context of research however, there is only awareness and concern or intention towards creating child friendly environment (Peh, 1997) and cities (Muhammad, 1997) in Malaysia. The urban home environment or neighbourhood is thus highly important to children and requires further research.

Different research approaches have been used in the past to understand children's environmental behaviour - evaluation, interaction, and experience of various urban settings. In any environmental setting, children's response is often immediate, *"freer of the overlay of symbolic, cultural, and past experiences,"* (Altman and Wohwill, 1978, pp.2), or interacts to modify (Barbey, 1974). The approaches used to elicit the truth about their needs and preferences and utilisation of the environment have employed many methods or techniques. The purpose here is geared towards helping to promote suitable or better planning and design of children's environments in this research. The research tool of interest is children's drawings regarded as an effective communication medium. Children's drawings have generally proven to provide rich and diversed information depending on children's variables such as cultural background and gender differences, purpose and task instruction.

This research acknowledges the problem in the provision of urban space and facilities for children especially within the urban neighbourhood as children's needs have seldom been given a priority in housing development (Weinstein and David, 1987). In order to be able to provide better environments for children, first their needs and preference have to be fully understood. The question of how these needs and preference of children can be best elicited will depend on the research approach. Having establish that, the next question is how the finding can be integrated into the planning and design of urban open space system through the formulation of policies and guidelines. Conversely, the opportunity for achieving a positive change on children environment is inevitably crucial in fulfilling their developmental needs.

In this research, an attempt has been made to examine whether children's drawings can be valid and effective research tool for the purpose of eliciting their concepts on ideal environments and preferred outdoor activities. Another objective of this study is to understand how the findings may vary between children of different ethnic background and gender. It is hoped that this study will share valuable insights toward the improvement and better provision of children's needs in the urban neighbourhood environment particularly in the Malaysian urban context as well adding knowledge and understanding in the existing subject area. The improvement of children's settings through design requires systematic knowledge about children's interaction with the environment as may be revealed through their environmental concepts, values and activity preferences. Equally important, the findings of this study will be of particular value for professional related to the planning and design of environment of environment such as architects, planners, landscape architects, policy makers and management authorities who are responsible for the contributing better urban facilities for children at different levels and stages of the planning and design process.

1.0.1 City Problems and Children

As big cities grow in order to meet many of the requirements for 'high' urban services and amenities, they became steadily more congested with traffic (Ramachandran, 1992), experience flaws of haphazard development, sordic city centre (ISI, 1996), and consequenctially social problems (Omar, 1992), as they became more crowded, confused, inefficient, and more unlovable (Osborne & Whittick, 1977). The pressure on a cities external spaces especially near its centre are great. Often, space has to give way for additional or wider roads or new development to accomodate an increasing demand for facilities and services (Ofori, 1992). The demand for new housing schemes for instance within the city centre or urban fringe in developing countries is increasing and it develops with a very basic planning standard, and with high density (Joglekar, 1992). The urban environment can become packed and overcrowded seriously effecting the everyday environment for children in cities - of home, in the street, the school, the park and playground itself. The space for external activities in the Malaysian cities for children is scarce, poorly planned, and lack of effective management and maintenance, consequently failed to meet the needs of children (Shen-Li,1998). These problems are commonly experienced by most of the Third World cities as they are struggling with urban problems. Lee (1991) in looking at history and issues related to urban planning in Malaysia reports:

> '....the insanitary housing conditions of slums and squatter settlements; ubiquitous hawkers; unhealthy and often dangerous work places; and very contrasting and conflicting modes of urban transportation. Such characteristics are actually manifestations of deeper issues of urban poverty, unemployment and social inequalities....Urban sprawl; traffic congestions; sterile and soulless housing estates; destruction of natural environment such as the beaches, hills and rivers; and wanton tearing down of historically significant buildings are testimonies of the general failure of urban planning.' (pp. 3)

According to Herbert and Thomas (1990), the overall level of urbanisation in South-east Asia in 1981 was 24 percent. In Malaysia, the urbanisation rate is much higher. In 1980 it was 34.2 percent in 1980 and increased to 58.8 percent in 2000. As a result of urbanisation, urban settlements increased to 129 in 1991 from 67 in 1980 (Director General EPU: Seventh Malaysia Plan, 1996). Cities are an essential element in the process of economic growth and social change: a change which involves the transformation of traditional, rural, agricultural economies into "modern", urban, industrial economies. The increase of population for instance, as a result of urban growth led Malaysian cities to struggle with new dimension of congestion, property value and wages costs, and environmental pollution. However, despite the disadvantages, urbanisation in the Third World potentially has rich, diverse urban forms in relation to morphology, ecology and landscape environment inherited from different traditions and cultures. Urban sustainability in Third World cities

requires environmental awareness (Drakakis-Smith, 2000). The urbanisation phenomena is important with respect to children as it involves hardships and children are likely to be affected most (UNESCO foreword, 1977). This hardship may be due to adverse impacts of environmental problems such as noise, crowding (Walter, 1978; Altman and Wohwill, 1978), automobile accidents involving children and air pollution (Alam, 1980; Lourie, 1978). Problems related to traffic, social, and environmental or ecological crises affect children seriously as found by Lynch (1977) in a study of young adolescent children's use and value their spatial urban environment from four different countries. In relation to this, the Government of Malaysia for instance acknowledge the need to address social problems as a consequence of industrialization and urbanization process:

> Rapid industrialization and the consequential rise in urbanization and rural-urban migration have resulted in an increasing occurence of negative social behaviour. Social problems such as drug addiction, child abuse, loafing, juvenile deliquencies, unhealthy lifestyles and strains on the family unit are beginning to emerge. In 1994, there were 17,6000 reported cases of drug addiction, 8,938 cases of AIDS, 871 cases of child abuse and 4,774 cases of runaways. Given that there are many unreported cases, the situation could be worse and this can impair the moral fabric of future generations if measures are not devised to addressed them.
>
> In this context, the Government will establish a high-level inter-agency committee to formulate policies and programmes for enhancing social and family development. Institutional support will be reviewed to provide greater focus and coordination of preventive and rehabilitative programmes for specific target groups such as children, youths and parents. Religious and moral education will be intensfied to instil good social behaviour and promote healthy lifestyles. (Seventh Malaysia Plan, 1996, pp. 27-28)

In the city, children live in a more crowded environment - more children and less play space (Fahmy, 1980) and children's activities are forced to take place in restricted, confined or other communal areas and within limited home territory. Urban children hardly venture out into the natural environment - their lives are often confined to a few streets or rows of houses with limited open spaces. They often have restricted access to private or shared play spaces at the front or back of the house (Shakthi, 1997) because their parents feared for their safety if they let them out (Hassan, 1978). Children in urban housing are becoming less mobile as traffic always was a hazard for the urban child (Abu Ghazzeh,1998). The city, which used to be transparent to young children who could follow paths safely, is now "opaque and impenetrable" and that psychologically isolates deprived urban child (Ward, 1978, pp. 121) may similarly compatible to urban scene in Malaysian cities. Children's environments in urban slums and its overcrowded apartments visually offer the child a minimal range of stimuli (Hassan, 1978). The inner city child is disadvantaged compared to suburban child which enjoyed the amount of green open space and of natural areas rich with natural resources (Sepulveda-Alvarez, 1978). The modern city has failed to cater for children's insatiable desire for their needs to do the activity they prefer.

1.0.2 Urban Open Space Planning - Provision of Children's Landscape Environment in Malaysian Cities

Generally, there is poor planning and design in the provision of open space within the urban area in most of cities in Malaysia, including Johore Bahru, coupled with fast dissapearing existing open spaces as a consequence of urban development programmes. Privatised and joint venture project between developer and government: developing public land has resulted in the reduction of open space. Therefore, the dissapearance of children's playing places at the expanse of "development" has become a common phenomena. To aggravate the matter, the provision of community centres and facilities such as open space is not a local or national government planning and design priority in development and it is kept to a minimum. Some areas which have been initially proposed as open spaces in the local development plan have not been developed for public use at all. Clearly, this shows a weakness at the implemention level despite the amendment of the Town and Country Planning Act 1995 (Act A933) with the intention to strengthen the integration of environment in development which include the requirements for the provision of adequate open space and conservation of natural resources (Department of Town and Country Planning, 1997).

Despite the legislation in the Town and Country Planning Act for open spaces within urban areas, poor planning and lack of management and maintenance, together with disappearing open spaces was characteristics of low priority and less-than-satisfactory implementation. Within the residential neighbourhood development, children's outdoor spaces are part of a shared *ten percent* of the gross development area in the form of playground. It was assumed that this play space would be sufficient in fulfilling the needs and activities of children.

1.0.3 Children's Needs and Activity Preference Outdoors

Children activity patterns in cities are varied and complex. Certain activities are fixed in place and time and evoke regular patterns of movement at constant frequencies, such as home and school. Others may involve a great deal of variability, such as play and recreational activities. At the neighbourhood level, children's awareness of environment affects their needs for variety of play activity (Spencer et al., 1989).

In Malaysia, within the role and responsibility of the Local Authority, project developer and other agencies related to the provision of public facilities there is a the lack of awareness and concern regarding the importance of children's needs and preferences. This attitude is

apparent in children's play spaces left without maintenance, neglected, unsafe and lacking publicity. Apart from poor planning and design, the reason for the poor state of children's environment is due to the low priority of the Local Authority and lack of funding. On the other hand, the majority of the public recognised the importance of better children environments as a way to combat social ills from upsurge in discipline problems especially in violence, extortion, and gang fights. The cornerstone to improving the provision of children environment is to adopt serious effective attention, well-meaning attitudes (ibid, pp.242) and understanding towards the needs and preference of children by all.

1.0.4 Children's Landscape Environment

The term "landscape" is almost similar to "environment" (Manning, 1991, pp.1) and strictly quite subjective to define. Landscape deals with an aesthetics of experience (Bourassa, 1991, pp. xiv), "a reflection of dynamic, natural, and social systems," (Laurie, 1986), and as an environment visually perceived (Appleton, 1980, pp. 14). "Landscape environment" thus, is a term representing expressions, appearances and meanings of objects related to people in settings that can be experienced. It may include idea of a place (Relph, 1976), space, objects, features with their various characteristics depicted together to serve certain functions, utilities, "amenity" or practical in use (Manning, 1991). Thus, in the context of this study, it is what and why children prefer about landscape as an aesthetic objects either man-made or "natural" features they portrayed in drawings that may stimulate or affect their activities. The focus is on outdoor spaces or environment.

There are many definitions of environment. In the context of this research, a useful perspective perhaps is the model involving interaction between children and the environment. A child's environment can be structurally explained using the environmental model developed by Bronfenbrenner (1979) in his book, *The Ecology of Human Development.* Bronfenbrenner perceived the environmental link in term of ecological structure. Here the environment is normally explained in terms of organised settings or pattern of external stimuli that impact upon and affect an individual. Thus, the children's environment is a set of structures within a structure in context with their 'natural ecology'. In this ecological framework , there are four hierarchical levels of contexts with varying degree of complexity: microsystems, mesosystems, exosystems, and macrosystems (Figure 1.1).

At the microsystem level, the most immediate setting of the child's environment is *"a pattern of activities, roles and interpersonal relations experienced by the developing person in a given face to face setting with particular physical and material features and containing other person with distinctive characteristics"* (Ibid., pp. 227). The setting for a microsystem can be a space in home, a playground, a class room in school. These are places where children can

get acquainted with others for personal interactions. The elements of microsystem include the *'factors of activity, role, and interpersonal relation,'* (Ibid., pp. 22).

Mesosystem involves behaviours in more than two settings. For instance comparing children's activity or behavioural relationships between home and street, or street and school environment. Mesosystem analysis involves examining how linkages and processes take place between various settings of a child's environment (Liben et al., 1981) (Figure1.2).

In an exosystem, children are affected though not directly involved since one of the setting in which linkages and processes take place does not *"belong"* to them for instance the parents' work place. At the *"highest"* level, the macrosystem involves the culture and broader social context of the child's environments and linkages that are *"deposited"* in each system.

All the levels of the sytems pose an effect on children. Thus, in analysing children's behaviour, for example how they form their concepts on environments, each of the levels of context will have an influence upon the child. These various influences need to be considered in constructing an accurate picture of how children form a concept of a particular environment as children's concepts and context are interdependent.

In the urban environment various elements of children's environment are clearly recognisable in some part like landscape features,open spaces, playground, left-over space of natural ground, waterbody etc. To many children, a play space is regarded as clearly defined area in which man-made features are predominant. Moore and Young (1978) defined the concept of environment as one that actually utilised and experienced by children based on three conceptual frameworks: territorial range, place and pathway (Figure 1.3). Territorial range determines the extent of 'collective spatial realm of experiential depth breadth and diversity,' (ibid. pp.90), expand from familiar to new venture areas beyond the home boundary as Moore and Young (1978) explain:

> Territorial range indicates the spatial extent and experiential variety of outdoor places inhabited. It embraces the totality of a child's space-time domain - of familiar places close to home as well as a constantly expanding boundary condition, leading to unfamiliar, challenging encounters in new places. Territorial range should not be thought as a gross measure of area within which behavior takes place. Recognizing children's highly selective use of neighborhood space, measurement must take account of the number, variety, occupancy time, and spatial distribution of place-behavior. (pp. 91)

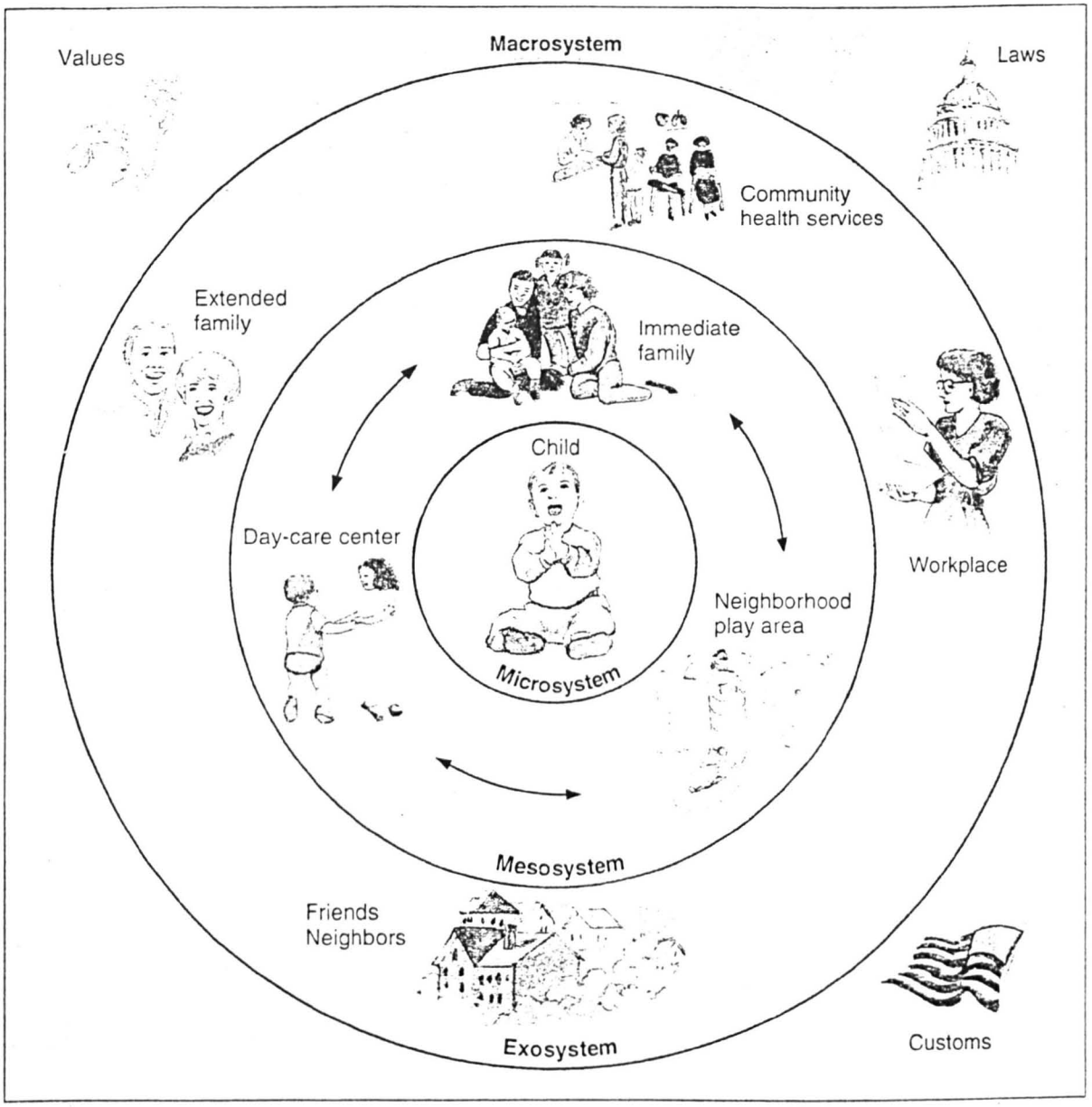

Figure 1.1 Diagramatic representation linking the four layers of the environment in ecological systems theory based on Bronfenbrenner's work. The inner circle of the microsystem refers to a child's relationship with the immediate environment. The mesosystem connects the child's various immediate settings. The exosystem involves broader social settings not directly related but affecting the child. Finally, the macrosystem contains values, laws and customs of the child's social-culture. (*Source*: From Berk, Laura E., 1997).

Figure 1.2 The social ecology of childhood. Different levels of social and cultural elements that influence a child's relationship with environments. (*Source*: From Moore, Robon C., 1986).

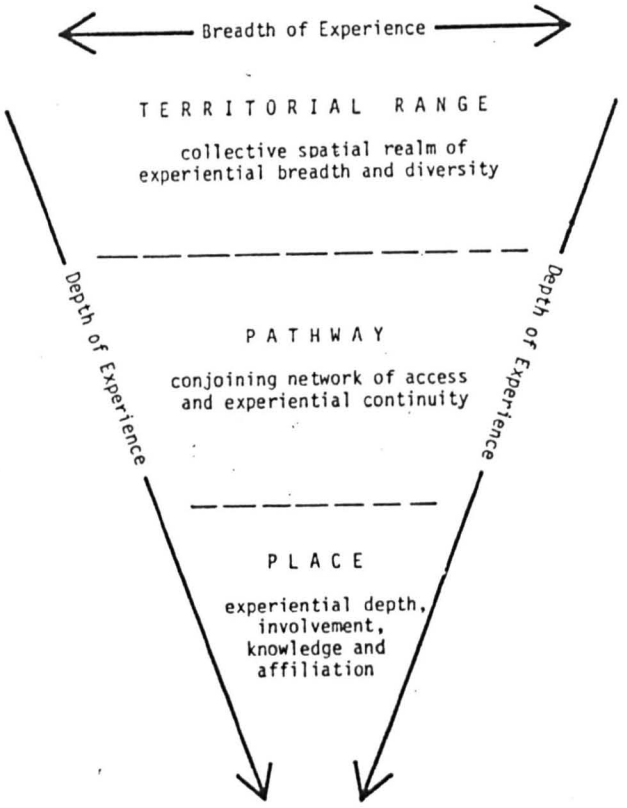

Figure 1.3 Phenomenal landscape: concept of the environment utilised and experienced by children. (*Source*: From Moore, Robin C., and Young, Donald, 1978).

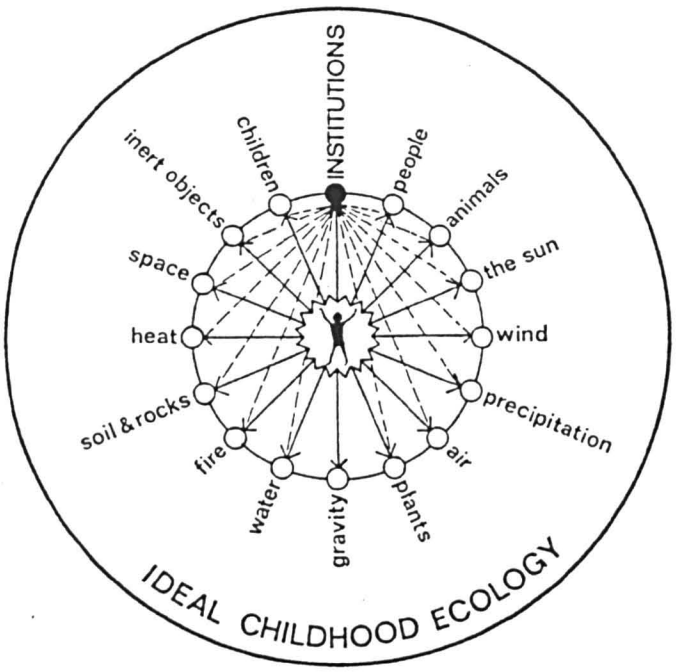

Figure 1.4 The role of adult institutions in determining a child's access to and diversity of environmental resources. (*Source*: Moore, Robin C., 1980).

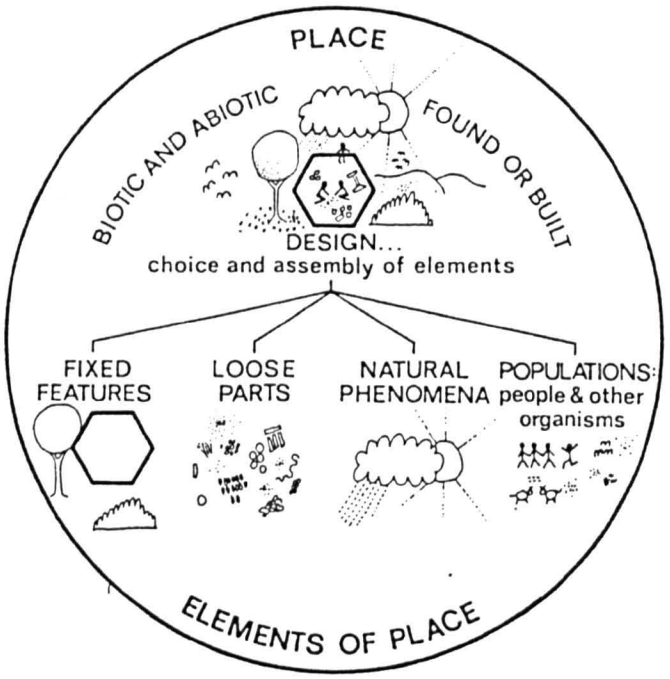

Figure 1.5 Design of children's environment involves connecting various physical landscape elements for creating a sense of place. (*Source*: From Moore, Robin C., 1980).

Children experience and gain knowledge and 'affiliation' through well defined areas of "child's places." Children's territorial range and place are linked together by pathway allowing an expansion for experience through freedom of mobility (Bjorklid, 1994; Parkinson, 1987; Moore and Young. 1978). Moore (1980) presents children's relationship and interaction with their micro and macro-scale environment through direct play experience for fulfilling their develomental needs and gaining knowledge. This interaction and diversity of immediate surrounding determines the quality of environment, as the ecological process of learning and development occur through manipulation of the environment (Figure 1.4). All the environmental factors such as space, plants are controlled by the adult's institution and each of the factors interact with each other independently and can be altered through design. The linkage between factors is dynamically related either through social, cultural, or physical processes for instance "children's" association with other "people" factors contribute to a social process which is play activity.

Children's places are where their social and physical relationship with the environment and supporting facilities can evolve. Figure 1.5 presents various variables that formed children's places in terms of physical design: fixed features, loose parts, natural phenomena and populations. Fixed features include spaces used by children and permanent features or as Moore and Young (1978) termed it *"permanent accoutrements"* such as benches, retaining wall, fences, trees etc. that can be resources for play opportunity. Loose parts are either objects such as elements in form of animals, vegetations and natural resources that children interact with. Materials are referred to as manipulative natural element such as water, soil, fire or dirt that can also be used as play element. Natural phenomena (e.g. gravity, wind, air, sun etc.) can either limit or encourage child's exploration for a different experential dimension. Animals such as fish, frog, chicken, duck, rabbit etc. and other people including adults, siblings, friends, neighbours can have an affective relationship with children as part of the population in the spatial environment.

The built environment comprises the morphological framework of streets and paths or linkages network, buildings, structures, design features and open spaces which is the setting for urban behaviour. Both economic and social values are attached to the elements of this framework. Social values attach significant meanings to space and place. Children's landscape environment could be planned and designed through two approaches. The first approach emphasises visible form and is aesthetic and abstract in its language. The second approach deals with social usage and with the behavioural experience of children in different types of designed environment. The social environment as suggested by Hebert and Thomas (1990) can be divided into impersonal and personal. Impersonal social environments can be measured by census indicators of demographic structure or social

class, gender, ethnic background as they are objective; personal social environments are subjective and rely on children's perception, values, attitudes and forms of behaviour.

1.0.5 The Development And Nature of Children's Concept of Landscape Environment

What is a concept? According to *Concise Oxford Dictionary of Current English* (Sykes, Ed., 1977, pp. 209), concept is is an idea of a class of object, or a general notion. A concept can also be defined as a "mental representation of a category," that help in sorting stimuli into instances and noninstances, and is formed through "abstracting information from instances," (Howard, 1987, pp. 1). How children perceive a landscape environment depend on their understanding simplified with concepts. With respect to this research which is concerned with children's environment and children's formation of concept and meanings of home landscape preferred through mental representation. Therefore, the question of how and what concepts - ideas or general notions of an environment children portray for their landscape environment are primary issue to address.

Children develop, form, and communicate their concepts of phenomena (Willig, 1990) and environment that make sense to them. Literature about children's concepts related to various aspects of their environment exist in diverse different disciplines and are highly specialised for instance, children conception of space (Piaget and Inhelder, 1967); concept of privacy (Wolfe, 1978; Parke, 1978; Parke and Sawin, 1979); concept on home (Parke, 1978); concept of spatial relationships (Cohen, 1982); and concept of familiarity (Acredolo, 1982). Children do not share the same concepts with adults because their concepts develop slowly with understanding (Willig, 1990, pp. ix).

Children's concepts of landscape environment develops and changes with their thinking ability. At different development stage, their concepts vary and are diverse although common features and aspects of these concepts can be identified and categorised. Piaget and Inhelder (1967) used the word *"schema"* and *"scheme"* to represent the concept a *"mental representation"*" of a set of related categories. The term is commonly used in perception, comprehension, memory and learning and Howard, 1987, pp. 31) defines *schemata* as "an organised body of knowledge, a mental structure that represents some part of some stimulus domain." In relation to visual communication, the term *"schema"* 'is a *'basic graphic forms for depicting objects,'* whereas scheme is *'a repeatble behavioural act'* (Gardner, 1980), accumulated through experience and utilised in processing new information that influence schema and change them in accomodating new ideas. Children may present the idea of environment evolving certain patterns, or schemas of familiar

objects on paper as a graphic strategies in portraying some understanding of the spatial environments or scenes (ibid, pp.11).

In relation to concept and schema development, Piaget and Inhelder (1956) suggested children acquire concepts through various stages of cognitive development and use different formats to represent different processes. The stage of cognitive development relevant to this study is the concrete operational stage with the age between 7 to 12 years-old as classified according to Piaget's theory of conceptual development. Briefly, during this stage, children can decentre, comprehend the concept of object can change shape but still maintaining the quantity of material through reversible thinking in explaining certain phenomena. Children's formation of concept is also influenced by 'egocentricity' - a self centred thinking that exclude other viewponts that differ from theirs. However, at the concrete operational stage of development, children's thinking is more coherent and systematic, as they can accept perspectives of others than their own ideas.

Piagetian theory has demonstrate how in analysing schema, certain recognisable patterns differ accross children's developmental stages. With respect children's cognitive development theories, it is expected that children's thinking quality of concepts on or of environment interpreted from responses and informations in their drawing may contain irrelevancies or inconsistencies (Willig, 1990). They may also to certain extent portray generalised relationships of expression and physical aspects of environment. Their ideas may also imaginatively represent mental schema, revealing their thought and feeling about an important aspect of their environment (ibid, pp.5).

The importance of discovering children's concepts of environment is that it may contribute to understanding the differences in actual needs and preferences which eventually help planners and designers to provide a better facility and stimulating environment that fulfill the child's needs.

1.1 RESEARCH PROBLEM STATEMENT

1.1.0 Research Approaches to Children's Environment

Many researches on children's environment in the past have depended on different settings either experimental or "laboratory" or in an environment itself (Spencer et al., 1989). A range of method including verbal description, photographic materials or maps, observation, sketch maps, interviews, children's diaries etc. are widely utilised. Each method or combination of methods may be appropriate to elicit children's environmental knowledge. Children's drawings or sketch maps of an environment require skill to draw to recall the past

experience, knowledge, information or memories of the environment (ibid. pp. 12)., and recognition of place elements in the environment (Moore, 1978, 1986), and identification of a few important places of interest (Canter, 1977).

Asking children to draw involves child's understanding of environmental settings - a basic development of environmental cognition, either the knowledge, experience or learning from an environment. In relation to this research, children's drawings as a research tool is aiming to establishing the concepts of environment as children may deliberate, portray an understanding of certain aspect of the physical and emotional environment, thoughts and feeling about thing that excite, interest and concern them (Malchiodi, 1998; Willig, 1990), or relevant aspect of the environment concepts (Barbey, 1974).

There are many problems associated with using children's drawings as a methodological approach in environmental design research on and with children. It is still not regarded as a 'main stream' research method, although children's drawings as research tool have been used and established for over hundred years (Golomb, 1992). Children's drawings are still in social science research not explicitly identified as a method on it's own but perhaps within the category visual document (Baresford, 1995, pp. 42). Like still photographs, sketches as potential data can be used to analysed descriptively aspects of culture (Ball et al., 1992). Drawing is often viewed as a child related activity, that can be used several ways in research with children (Baresford, 1995), treating it as an actual source of information (Levin, 1994), as a means for communication or to supplement data from other methods (Backett and Alexander, 1991). Children's drawing, therefore *'offer a mean of assessing beliefs, attitudes and conceptions of the world.'* (Baresford, 1995, pp. 54).

This research considers children's drawings as an alternative and valid tool for research. At present there are only small number of researchers able and willing to use drawing as mean of data gathering from children. A review of the literature, however reveals that few researches have addressed these issues as a whole and in relation to developing an overall framework or approach for analysing drawings of children environment. There is a need to find a valid approach to the analysis of children's drawings in order to find out what children's drawings can tell us about their experience and preferences for landscape by modifying various approaches from different fields. This entails establishing how the validity of findings from drawings can be ascertained.

Whilst there is now a great deal of literature and case study examples of researches using drawings, examining particular problem and/ or benefits and/ or various environmental setting, as yet this has not been synthesized to form comprehensive methodology for researches to use as a guide in structuring their research. One reason for this is the general

lack of research into children's drawings research methodology. This is a fact lamented by a number of researchers (Moore, 1974b; Hart, 1979, 1997; Canter, 1977). According to Hart (1997), the main reason for this lack of environmental design research using children's individual drawing is children's limitation in the depicting diverse objects and children's attitude towards drawings as Hart (1997) puts it:

> Some problems with drawing as a method stem from the fact that it is a medium used so frequently by children. They may employ streotyped images that relate to what they have learned to draw, which in turn is often an expression of a limited range of objects emphasized by the particular culture or subculture (e.g. for an English child, a streotype house with four windows, a door, a path, smoke from chimney, some flowers, and a sun).
>
> Another problem is that most children have had a history of adults pretending to be interested in their drawings while actually paying only token attention to their content. Unless special efforts are made by the adult facilitator, children sometimes do not consider this medium a serious opportunity to express their ideas. Furthermore, children who have been in school for a few years commonly conclude that they have no artistic talent and begin to feel intimidated when asked to draw. (pp. 162)

Indeed, a survey of the literature seems to confirm there is a lack of information on the theory and process of analysis technique available for analysis data from drawing as a data collection technique within various environmental settings where children are the main user group. Although a numer of researches involving children's drawings as a tool have been published, they are however specifically designed for certain purpose within different fields of knowledge. Thus, only a handful of researches are within environmental planning and design (Canter and Lee, 1974; Canter, 1977; Moore,1974b, 1986, 1992; Hart, 1979,1997; Ladd, 1970; Lynch, 1960, 1977; Appleyard, 1970). These provide little information as to how children's drawings might be analysed and used in environmental design research. Likewise, the empirical research on children's drawings comes from developmental psychology, art, art history, philosophy, sociology, anthropology and education (Paine, 1992). There is certainly a wealth of literature on environmental design research (see for example Built Environment, 1999; EDRA, 1972, 1977,1978,1995, 1996, 2001; Ekistics, 1978,1980; Children's Environments, 1993-1995; Built Environment, 1999; and Local Environment, 2001). There is considerably less research, if any, investigating the use of drawing from the view point of analysis and planning and design: how the information from drawing might be integrated into a planning and design system of open space in urban area so that their use might make a serious and worthwhile contribution to the end product of planning and design.

From the preliminary findings, it became clear that there was a need for objective, systematic research into what children drawing's of their ideal environment can tell and help in the provision of their environment through integrating with the existing planning and design system. The approach and analysis to formulate practical, yet effective way to understanding

children's concepts and activities within their environment. Specifically there was a need for effective means in establishing children's preferences for their environment around home.

1.1.1 The validity of children's drawings as a tool for research on and with children.

How valid are the children's drawings as a research tool? Many literatures on environmental and design research methodology do not include drawing as part of method or as a way to collect data, let alone working with data analysis. Therefore it is important to establish validity of drawing as data generation method. This is whether both method and source of data are able to tell or answering the research questions, and has to be involved in the early part of planning and designing the research. The validity of data generating method can be in form of method that is compatible with the research questions, and enables the development of concepts to provide explainations (Mason, 1996).

There are hardly any concrete strategies and techniques offered to use in getting the most of the data collected through drawing. This study however has to rely on first, several past researches that have used drawing as method. Second, in analysis and interpretation of data especially qualitatively (see Chapter 7), there is a need to adopt and establish suitable and appropriate technique based on various sources scattered in different disciplines or field of knowledge. If the research approach emphasise validity, then the drawing and what it actually means have to closely match to each other. In other words, drawings carry meanings and those meanings can be retrieved or interpreted from the drawing. The analytical procedure is crucial in determining the accuracy of the data to produce a valid study.

Validity of interpretation involves the question of how valid the data analysis and the basis of interpretation. The interpretation can only be valid if the method and sources of information have enabled the researcher come up with concepts to answer the research questions. According to Mason (1996), 'validity of interpretation in any form of qualitative research is contingent upon the end product including a demonstration of how that interpretation was reached,'(pp. 150).

In relation to this research, the relevant sort of validity considered would be *concurrent validity* (Blades, 2000). Concurrent validity has preestablished indicators or measurements that are considered valid, ie. the new findings should respond in a similar or may be highly associated with the established findings though the methods for measuring may be different (Neuman, 2000, pp. 167).

Holistically, in considering drawings as a method, issues, problems and concepts of analysis or interpretation, aspects of validity could be demonstrated through the process and procedure of the research throughout. The research process includes investigating and synthesizing information from a range of disciplines outside planning and design, particularly education, child development and psychology. The holistic consideration of the use of children's drawing in environmental design research involves an investigation into various techniques of analysis in relation to research objectives, and findings that serve further purposes. Thus,it is hoped that by adopting this approach, the findings and conclusions of the research will be of the maximum possible value.

In considering the importance of the need to understand children needs and preference for their environment, it is necessary to identify an optimum way which provides them with a effective voice - incorporating or integrating their needs and preferences in the provision of the environment through a planning and design system. This entails the user having a direct input into and influence over the policy and guidelines with the planning and design system of an urban open space. In other words, having the opportunity not only to voice one's opinion, but to have these need and preferences heard, respected and actioned. Drawings in which children achieve an 'effective' voice may then be described as highly useful. Recognising the right of children as a user to have an *'effective'* means in informing their views, and enabling them to express this may therefore be regarded as the ultimate goal in providing better environments for children. This is the right of a child to participate in decision affecting them , getting involved in contributing to the decision making process in line with the United Nations Convention on the Right of the Child to express views (Marshall, 1997), as Article 12 states that:

> .... assure to the child who is capable of forming his or her own views the right to express those views freely in all matters affecting the child, the views of the child being given due weight in accordance with the age and maturity of the child. For this purpose, the child shall in particular be provided the opportunity to be heard in any judicial and administrative proceedings affecting the child, either directly, or through a representative or an appropriate body, in a manner consistent with the procedural rules of the national law. (pp. 4-5)

1.1.2 Conceptual structure: the use of children's drawing as a research tool.

It is in the light of the need for holistic and pragmatic research into the validity of children's drawing that the research problems addressed in this thesis evolved. Essentially the research problem was envisaged as a exploratory exercise investigating and synthesizing information about the various issues and problems associated with the children's landscape environment based on children'sdrawings of their ideal landscape environment so that a realistic and workable analysing approach might be developed for use in the research.

As Moore et al. (1992) put it, the essential foundation for effective design for children environment must first be multidisciplinary understanding. Without a formalised structure to facilitate comprehension, children's drawing can not grow as a valid tool in environmental design research. It is hope that a new conceptual structure would help planners, designers, policy makers and other interested parties to shape their own understanding to solve problems associated with the provision, planning and design of children's environment in general. As such, thus study is not intended to produce policy, guidelines presenting one *"rigid"* approach in the provision of children environment. It is more important to address the issue holistically rather than focusing on planning and design by means of such guidelines and policy alone.

1.1.3 The need to examine and find out what children's drawings can tell us: establishing a research method for interpreting drawings.

The purpose of this research is to study and interprete children's drawings to ilicit environmental concepts and preference for landscape environments. In exploring what children's drawings can tell us their validity as a tool, to inform planning and design can be further established or disputed, this research:

a). Takes an holistical and pragmatic approach to the research of children's drawings.

b). Attempt to identify what drawings can offer as a mean to understand children's concepts, needs and preferences for their landscape.

c). Checks whether the findings from drawing support or contradict findings from other methods.

d). Develops a conceptual structure for integrating the findings into the main stream of planning and design system of urban open space planning and design.

The research, however, does not aim for a finished end-product in the form of guidelines and policies statements, rather, it illustrate where and how findings might influence policy and provision. In order for the finding to be presented in a form that was both comprehensible and serviceable to planner and designer, the research was primarily oriented towards the exploration environmental concepts and preferences.

A preliminary review of the literature revealed that although a number of environmental design researchers use children's drawings as an approach or means towards understanding children and their environment, few approaches and analysis techniques have been described or made cleas and none were specifically suited to chldren and landscape. The research design and approaches and influence for this work are explained below.

1.1.4 Research Design and Approaches: Drawing Interpretation Techniques and Methods Developed in Research

Researchers from many different disciplines have used drawings in their research including psychology, geography, planning, landscape architecture, architecture, art, sociology, anthropology and sociology (Payne, 1992). At more applied levels, a drawing analysis method or technique was also proposed by the author. From the many approaches towards drawing, this research has been influenced by an *"artistic approach,"* and a*"clinical-projective approach,"* ((Golomb, 1992; Thomas and Silk, 1990) as well as a combination of other approaches for the purpose of analysing the drawings (see Chapter 3 for details). It was envisaged that once a basic structure of research with/ on children using their drawings was established, such a guide could be used to select appropriate techniques for analysing children's drawings. A table or mind map format was also used for the guide. As the mass of data from drawing need to be systematically organised, *Mind Maps* helps to clarify the thought and are usually useful tools for thinking, seprating important ideas to link them clearly (Buzan and Buzan, 2000). Here, all details, information and ideas are placed together to refine for further analysis and interpretation. Further, ideas generated from different ways of drawing analysis have been organised in analytical and creative way using *Mind Maps* as a tool (see Figure 1.6).

Whereas the use of children's drawings may be applicable to both primary (Hart, 1997; Adams, 1990; Titman, 1994) and secondary school (Sheat and Beer, 1989; Sheat, 1993), the technique was developed specifically for the use in analysis of primary school children's drawings. As the applicablity of technique are very much age specific (Ziegler and Andrews, 1987), it was felt that one particular age band should be selected. In the light of the fact that this age group is a major user of urban landscape (Moore, 1986, 1992; Ziegler and Andrews, 1987; DoE, (1979); Holme and Massie, 1970; Hole, 1967), it was decided to focus on primary school children aged 9 to 12 years old. It was hoped that future research will offer the opportunity to refine and adjust to adapt the drawing technique for other age groups appropriately.

Figure 1.6 'Mind Map' on children's concepts of home landscape and preference based on themes, categories analysed and interpreted from children's drawings.

A preliminary review of the literature revealed that the analysis techniques used by other researchers are often too situation - specific to be of general use. They often provide little information about why the technique was chosen, how the data produced from it was analysed and incorporated into the existing provision systems or how it might useful or perform in other situations. Most interpretation techniques used in children's drawings have their origins in other disciplines such as psychology, arts, and have been created for use non-planning or design situations. This means that, in most cases, if the planner or designer wants to find out more about these theoretical and practical aspects, he or she has to search through a great deal of disjointed literature which is written in a language that is less helpful to a designer and planner.

What is needed therefore is some comprehensive overview of technique which would help designer understand both the theory and practice of using techniques which would allow them to integrate and use information for specific purposes.

1.1.5 Envisaged value of research: Lack of understanding in the provision of children's landscape environment ie. there is a need for an effort to integrate/ incorporate the finding with the existing planning system.

It has been envisaged that part of the value of this research is to integrating the findings within the main stream of planning and design of urban open space for the provision of children's landscape environment. (It must be appreciated that if the children's concepts and preferences solicited from their drawings are to play a vital role in any provision of children's environment in Johore Bahru, then this has to be done through the urban open space planning).

For landscape design research, it is hoped that the *"finding"* might provide new ways for understanding children's drawings. Aspect of findings require further testing, refinement and development through research. Issues identified as part of the data gathering process all suggest new areas of research. The conclusions in Chapter 9 will provide more details as to future research prospects. The final section of the thesis also illustrate how integrations and techniques might be organised, incorporated or integrated within the main stream of existing planning and design system towards a better provision of children's urban landscapes.

1.2 THE AIM OF THE RESEARCH

The aims of the research are summarised as the following:

i. To investigate the meanings/ concepts of children's drawings and establish what they may or may not tell us about landscape preferences and prefered uses.

ii. To develop new techniques/ methods for the use and intepretation of drawings in landscape and environmental design research.

iii. To identify differences and similarities in children's drawings between three different cultural groups and between genders.

iv. To inform possibilities to integrate the findings with the planning and design of children's urban landscape.

1.3 OBJECTIVES OF RESEARCH

To achieve these aims, the following objectives are formulated:

i). To review the current problems in planning and design of the urban of landscape for children.

ii). To review the urban planning system in Malaysia.

iii). To review the literature of theoretical aspects of psychology of children's drawings.

iv). To review the literature of children's art.

v). To review the literature of a wide range of methods/ approaches of children's drawings as a tool used in the environmental research and design.

vi). To review literature on research of children preferences and use of urban landscape.

vii). To review literature on qualitative research methods.

viii). To establish an appropriate method for interpreting children's drawings.

ix). To establish the findings from the interpretation of children's drawings relevant to planning and design or urban landscape.

x). To examine differences and similarities of findings from drawings between the genders and ethnic backgrounds of the children.

xi) To discuss the potential of integrating the findings from the children's drawings for the provision of children's landscape environment within the main stream of urban open space planning system in Johore Bahru, Malaysia.

1.4 OUTLINE OF RESEARCH METHODOLOGY

This research investigates aspects of children's drawings as a research tool. An interpretation of the children's concepts of preferred landscapes such as distinctive elements, features or facilities as well as affective or expressive qualities and activity preferences in their environment are investigated through the analysis of drawings. Pipkins (1983) suggests, an investigation of the meanings among the elements will alternately analyse then explain the quality and character of the elements in question. Once, the characteristics of elements are interacted (interconnected) in a affective and meaningful way, a new environmental concept often emerges. The concepts of environment depends on how children perceive the characteristics and relationship between elements in their environment. Barbey (1974) suggests that a practical way to secure information on relevant qualitative aspects of the environmental concept is through querying and interpreting children's imagination by means of their drawings. Environments children experience and interact with, sometimes uniquely; the domains of children are particularly important to be considered as certain 'configuration and content of urban settings could support or enhance children's developmental potential,' (Moore, 1986, pp. iv) and from psychology of children's development, environments inform the 'essence of many psychological processes,' (Canter, 1995, pp. vii).

The study of children's drawings has been central to psychology, geography, art education, art criticism, cultural studies, art history, and environmental design and research. Through analysis and interpretation of children's drawings, it is possible to reveal more fully of children's landscape preference. Understanding of that environment is crucial to provide sufficient knowledge and then formulated further to guide the action (Spencer, 1995). What the children inform us of their concepts and preferrences will also reveal the base lines of communicative capabilities so that its concurrent validity need to be checked by other communication means.

In this research, the data from drawing was analysed, interpreted qualitatively to bring order, structure and meaning. 'Qualitative data analysis is a search for general statements about relationships among categories of data; it builds grounded theory,' (Marshal and Rossman,1995, pp. 111). Through inductive qualitative work, these categories of data generates new or refine concepts, propositions and hypothesis (Fielding and Fielding, 1986), that are grounded in the data (Neuman, 2000).

Children's drawings as a data is complex, has no standard procedure or technique for qualitative analysis. Analysis strategies fundamentally have to rely on seeking patterns of relationships (Stake,1995), establishing significant categories of elements, features, persons, activities or events and characters which affect them. There is also a need to make a link between categories with statements to support the linkage (Glasser and Strauss, 1967). In order to code data from drawings, the supporting evidence from the related literature was used as a guide to suggest possible categories. Analysis and interpretation of drawings give rise to a concepts within more refined categories, and finally 'analysis will be completed when critical categories are defined, the relationship among them are established, and they are integrated into a grounded theory,' (Marshall and Rossman, 1995, pp. 112). The interpretation techniques were adapted from techniques normally used to interpret written or spoken word. It is an inductive analysis as the patterns, themes, and categories emerge out of data instead being imposed before data collection and analysis (Patton, 1990; Glaser and Strauss, 1967).

Analysis of drawings generated several categories, themes, and patterns including: compositional structure and relationships; physical landscape elements and their relationships; colours in landscape; relationships of people and activities; animals; aspects of climate; and finally expressive qualities depicted in the landscape. Here, interpretation brings meaning and insight to the drawings data as reported in findings and discussion of Chapter 8. Those meanings and insights of qualitative aspects of children's landscape environment will be important as they have significant implication for the provision of recreational and children's play facilities as well as open space planning and design with regard to urban spaces.

1.4.0 Data and Data Collection Techniques

There are four types of data and data collection techniques used in this research including literature review, children's drawings, children's essays, and a questionnaire. A literature review of psychological research using children's drawings to inform understanding of children's development and ability in using drawing as communication tool informed part of the theoretical framework for this research. In addition, literature on research methods including of children's drawings as research methods in environmental and design research inform methodological approaches. These theories were developed by 'Western' scholars based on western children's drawings within their specific cultural and environmental settings. However, this review became the central body crucial to the research allowing a common basis for strategy by which a similar research can be conducted within a Malaysian context in Johore Bahru.

114 children, aged between 9 to 12 years old of different sex and ethnic backgrounds were asked to make a drawing of their ideal home landscape during the art class. Children of Malay (N=38), Chinese (N=38) and Indian (N=38) ethnic backgrounds were selected to provide different cultural dimension for this research. The drawings formed core data to be interpreted and analysed qualitatively. Simple quantitative techniques were used to inform themes, and development of categories through coding.

In addition to the drawings, the same group of children made an essay during the language class which was conducted upon the completion of the drawing task. This required them to write about their ideal landscape setting for their home. The purpose was to ilicit data that may support or contradict drawing interpretations. The essay was transcribed and analysed qualitatively and the findings used for assisting the scope and limitations of drawings checks against the findings from both drawing and questionnaire.

The final technique used was a questionnaire survey of the same sample of children as means of communicating about the landscape they prefered and was carried out once the drawing and essay tasks had been completed. The purpose of questionnaire was also to establish informations on children's residential types and social economic status. The findings from the questionnaire were analysed using descriptive statistics, such as frequencies, percentages and cross-tabulation tables. It is useful in providing information that can be used to check the validity of the drawing.

Two separate pilot surveys using drawings and questionnaires were conducted much earlier, prior to actual data collection. Drawing task was meant for children, however the questionnaire survey involved various groups of adults including professionals, planning officials, parents and children. The purpose of pilot survey was to record and understand broad issues and problems related to urban environment in general from perspectives of various groups of people.

1.4.1 Techniques for Interpreting Drawings

At various stages, this research adopted different methodologies in order to be able to answer the research questions and objectives. At the first stage appropriate methods that can suitably be used to analysed or interprate the children's drawings were used. These techniques may come from several drawing approaches ie. developmental, clinical projective, artistic, and process. Distinctive aspects, characters, elements or features were then examined as they were revealed in the drawings. The influence of several

independent variables such as gender and ethnic backgrounds on the above factors were also investigated quantitatively.
The second stage involved the qualitative interpretation of the drawings looking for emerging themes or patterns from data toward developing concepts and theoretical propositions. The third stage examined the drawings in relation to questionnaire and essays to assist in identifying potential and limitations of communication through drawings.

The nature of subject matter and the research questions require a mixed methodological approach. Thus, the research employed both qualitative and quantitative methodology in data collection and analysis. However, the nature of this research which focus the children's concepts and preferences in the landscape environment means that it is primarily qualitative in nature. For making generalizations, general ideas, themes, or concepts were used as guide, as well as variables that are commonly used in quantitative research. Non-variable concepts or simple nominal-level variables (Neuman, 2000), e.g. gender difference, were also used in data analysis. Chapter seven will provide a more detailed theoretical discussion of the research methodology and procedure adopted for this research.

1.5 ORGANISATION OF THE THESIS

The thesis is planned in the following manner:

The thesis is divided into two volumes. Volume 1 is an account of issues, problems, that justified the study that was conducted, and literarure reviews. Volume 2 is an account of the fieldworks carried out that involved children.

Volume 1

Chapter 1 presents the overall context and background structure of the research in order to provide a review of the scope, purpose and objectives as well as the methodology adopted. It provides a brief introduction to the subject matter and highlights the significance of the research.

Chapter 2 provides a literature review of principal theoretical approaches to children's drawings in research. It undertakes a comprehensive review of the early research literature on children's drawings. The chapter seeks to summarise what is known about the psychology of drawing as a motor and cognitive act. It relates existing theories on children's drawing, specifically addressing the history of research on children's drawings, approaches to children's drawings, purpose and analytical techniques of children's drawings. This provides a background of the existing body of knowledge relating to children's drawings as

tool in research specifically for the purpose of establishing concepts of and preferences for landscapes and their use and meanings.

Chapter 3 summarises significant studies that have used children's drawings as a method in environmental research. This chapter includes a detailed review and evaluation of the studies of use children's drawings, application and research approaches.

Chapter 4 presents the aspect of provision of children environment in the context of urban open space planning. It examines from the historical and theoretical point of views the provision for children spaces and facilities within the development of urban open space, park and playground. Children's interaction, use of urban environment will also be examined for understanding children-environment relations and their environmental perceptions. This broad and general understanding provides a context to the issues and problems in relation generally to children's landscape environment.

Chapter 5 presents evidence of children's environment in the context of urban space planning for children in Johore Bahru, Malaysia. Aspects of the planning system as mechanisms that control the development of urban areas are briefly discussed. It also highlights the existing aspects of urban development within the study area in relation to planning and design for children's spaces and facilities. This hopefully provides a clear direction possibly in the effort to integrate the research findings within the main stream of planning and design of urban open space for the provision of children's landscape environment.

Volume 2

Chapter 6 presents the series of research questions and sub-research questions.

Chapter 7 explains the methodology and procedure of the research. It establishs the choice and rationale of the methodology adopted in the research.

Chapter 8 presents drawing interpretation or findings of the research together with discussion. The interpretation of children's drawing are themed and presented against gender and ethnic contexts and discussion. The findings from questionnaire and essay are also presented as from the past researches for comparative study as assist interpretation of children's drawings. This chapter also offers additional indirect evidence on the validity of the drawing as a research tool as a measure of children's concepts and activity preference of their environment by discussing more fully the gender differences found in boys' and girls'

drawings of ideal landscape environment, as well as certain cultural differences noted in the drawings by Malay, Chinese and Indian children.

Chapter 9, the final chapter, concludes the main findings of the research as well as highlighting the contributions of this research. The planning and design of urban open spaces in relation to the provision of children's landscape environment, implications of the findings are also discussed in this chapter. Some suggestions for further research into this area using drawing as a tool and also limitations of this research. Finally, a general conclusion to the research conclude the chapter. Appendices I - II cover the brief overview of urban planning system in Malaysia, and issues and problem from News paper cuttings. Appendices III - IV present the questionnaires and essay format as the methods used in research, while Appendix V covers details of statistical analysis carried out for Chapter 8.

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Chapter 2

CHILDREN'S DRAWINGS IN THE CONTEXT OF PSYCHOLOGY

2.0 INTRODUCTION

Children's drawings are a product of an *'artful activity'* that requires skill for certain techniques that can be mastered through learning and practise (Cox, 1992). Or they are ways for children to express emotion informing psychological condition and personality (Malchiodi, 1998) or their inner minds (Greig and Taylor, 1999). Other definitions include a type of symbol (Krampen, 1991), and that they are related to a child's emotional and cognitive development (Thomas et al., 1990). Thus, 'drawing is a uniquely human activity whose complex syntactic and semantic development can be studied systematically,' (Golomb, 1992, pp.2).

The term "*children's drawing*" and "*children's art*" often refer to the same thing and carries similar meanings in much literature written about drawing. They may be interchangeable or may not be depending on the context in which the drawing is viewed. Children's drawings according to Carother and Gardner (1979) and Gardner (1980) can only be considered as works of art if they appeared to make use of aesthetic characteristics. Only at a certain stages of children's development, do their drawings start to display fundamental aesthetic characteristics which are normally found during pre-adolescent years, aged between 11 to 12 years old. This proposal was based on suggestion by Goodman's observation that as symbols, artworks serve different function and can be judged on the basis of aesthetic qualities demonstrated by the characteristics of the symbols themselves. These aesthetic characteristics may be in the forms of '*constitutive*' lines that have relevant functions in part of drawings or drawings capable of expressing ideas, feelings, and emotions for instance through the use of colours and varied lines of a drawing technique.

Harris (1963, pp. 93) on the other hand identifies certain criteria for drawings to be considered as artistic including "*pleasing, appealing, interesting.*" To Kellog (1979), children's drawings are inevitably categorised as art on the basis that the lines and shapes children used are the 'essential unit of art' (pp. 8). As children draw, it involves visual stimulation thus, 'the whole becomes an implied overall aesthetic shape,' (ibid, pp. 10). In defining children's drawings, de Bono (1970) studied them from the thinking process perspective in problem solving creativity among children ranging in age from four to fourteen and uses the following description:

> A child's drawing lies somewhere between poetry and reason and humor and art. As in poetry things are freely put together to achieve an effect that rises above petty rules of procedure. Yet within his limited experience a child's drawing has the clear logic of reason. Humour is produced by the clash of this logic with our own as we are suddenly made to look at things through the eyes of a child - and being made to look at things in a different way is the essence of humour. Above all the directness of communication of a child as he draws ideas rather than mere things is surely the basis of art.
>
> If poetry and reason and humour and art all involve a new way of looking at things to which we respond, then it is not surprising that they are to be found in children's drawings. For in a unique way children are the same as us but different. And that is what one would say about a poet, an artist, a humourist or a logician. (pp.9)

For Arnheim (1969, 1974), drawing is "*visual art* " and to understand a drawing's language and graphic logic requires a specific approach involving "*artistic process*" and a "*dynamic conception of visual perception.*" In his theory (Arnheim,1974) , children's drawings are seen from the perspective of visual art, produced through artistic process moulded with '*graphic logic*' and understanding drawing requires '*conception of visual perception.* ' In problem-solving mental activity, the internal logic of representional developments is important as principle in representational theory which places emphasise on children looking for equivalent form to represent or correspond not literally but structurally or dynamically to the actual object or scene so that it is recognisable for the observer (Freeman, 1993, pp. 112). Golomb (1992) suggested an equivalent position in defining drawing as being influenced to certain extent by Arnheim's *representational theory.* Arnheim views children's drawings as cognitive problem-solving activity where a child creatively searches for meaning:

> Perhaps, more than other symbol systems, representational drawing is a truly creative activity of the child, who invents or reinvents in every generation, and across different cultures, a basic vocabulary of meaningful graphic shapes. It is a remarkable feat since there are no real "models" available to the young child that might lend themselves to imitation. Unlike spoken language, which offers a ready-made model for the child who is learning to speak, neither the natural nor the man-made environment provide the child with a comparable model for drawing. The flat paper and the tools for making lines, dots, and circles do not correspond in any strict sense to the objects in the real world..... Representation does not aim for a one-to-one correspondence between the elements that constitute an object and the depicted image, nor does it aspire to copy the original. (pp.2-3)

The study of children's drawings has drawn the interests of many researchers from various backgrounds for more than a hundred years because of the distinct communication drawings can provide . The use of drawing by children serves many purposes and has the ability to present many *facets* of children's lifes and activity. Since drawings have attracted researchers from various backgrounds, their purposes of studying children's drawings are also varied. Understanding the nature, purposes and potential for children's drawings help the design and development of future studies on children using drawing regardless of discipline and "*language*" for interpretation. Diverse phenomenon from drawings inevitably resulted from different perceptions of drawing, diverse intentions, different aspects of child's life, and come from researchers different backgrounds and interests. Looking at conflicting views in drawing research, Paine (1992) explains the potential of studying children's drawings in understanding various educational, art and behavioural issues of a child as she writes:

> The particular study of development in drawing has always offered us potentially special insights into some of the most important issues in education and in art as well as into the realm of human behaviour: into the learning process; into the very nature of drawing and art as emergent capacities; into their dynamic and inter-active role in human development; into socio-cultural change; and into the creative determinants of that process. (pp.1-2)

Amongst the wide field of researchers studying children's drawings there are psychologists, artists, educationists, planners and designers, art historians, philosophers, sociologists, anthropologists, psychiatrists, and art therapists. Their area of interests are very broad. The range of perspectives in research has been summarised in Table 2.1.

This chapter examines different definitions of children's drawings and purposes used in research. It will address theoretical aspects of children's drawings where the discussion is focused on psychology of children's drawings. It aims to review how children's drawings have been seen from various and diverse perspectives, and how these views significantly shift or constantly change through out (Golomb, 1992; Paine,1992; Carothers and Gardner, 1979). One of the perspectives is children's drawings as reflecting child's mental conception of their surrounding environment. Children's drawings are also viewed as portraying their feelings on the basis of "*projective significance*" from a psychodynamic perspective. Equally important, Paine (1992) suggested that there should also be an effort to try to understand the nature, purposes and potentials of children's drawings.

FIELD OF RESEARCHERS	BROAD DESCRIPTION OF AREA AND INTEREST IN CHILDREN'S DRAWINGS	EXAMPLES OF RESEARCH
Psychologists	Relationship between drawing and behaviour, use to understand development of intelligence or personality, personal representation and therapeutic value.	Eng (1954, 1957); Harris (1963); Goodnow (1977); Cox(1991,1992,1993); Thomas et.al (1990); Selfe (1977, 1983); Spencer (1995); Willat (1977, 1997); Blades (1987, 1990).
Artists	Interested in emotional expression, cultural meaning, tradition and innovation, dynamism and symbolism, seeing drawing holistically, asexpressive more than as representational.	Strauss (1978); Paine (1992).
Educationists	Drawing as therapy, as learning media in thecurriculum through which an expressive and creative activity is propagated. It is also used in teaching in the professional field, like engineering and architecture where drawing is regarded as communication tool that provide visual language or design vocabulary. To reexamine the conceptions that have guided the study the study of child's art then to formulate the issues to address empirically.	Piaget (1956, 1967); Lowenfeld et.al (1987); Paine (1992);Kellog (1969, 1979);Arnheim(1969, 1974); Golomb (1992); Krampen (1991); Heberholz et.al (1990); Willig (1990); Harris (1963);Goodenough (1926); Paine (1992); Barraza (1999).
Geographers, Designers and Planners	Idea, concept development, problem solving through drawing, presentation and communication of ideas and images.	Moore (1986, 1992); Lynch (1960,1977);Mathew(1992); Hart (1979); Beazley (2000).
Art Historians	Contemporary reference of drawing in relation to forms, 'subject-matter and iconology of art.'	Strauss (1978).
Philosophers	Significant relationship of drawings concept with definitive concepts development of mind, aesthetic, creativity and imagination.	de Bono (1970, 1972); Goodman (1976).
Environmental Psychologists Sociologists and Anthroplogists	Environmental and cultural aspect that influence upon drawing and how these influence children's cognition, cultural expression and social change.	Barbey (1974); Ladd (1970); Appleyard (1970); Maurer et al. (1972); Alland (1983); Machover (1949, 1951).
Psychiatrists and Art Therapist	Drawings provide insight into the psychological state of children; used as part of assessment, intervention, or treatment; aid in diagnosis of psycho pathology of mentally ill patients.	Malchiodi (1998); Di Leo (1971, 1973); Machover (1949, 1951).

Table 2.1 Field of Research Into Development of Children's Drawings
Source: Adapted from various works including of Payne (1992)

An overview of psychological theory of children's drawings has several purposes including to inform methodological approaches and issues for this research, to be able to relate with other similar research field, and to guide where this research "*sits*" theoretically. Thus, this chapter is written into three parts. The first part deals with an overview of drawing psychology theory. This section examines how researchers have identified various stages in children's drawing development, the purpose it serves, and issues pertaining to it. It is important to examine psychological drawing theories in some detail as they have greatly influenced researchers opinions and attitudes towards children's drawing as a whole. More importantly,

the approaches to analysis and interpretation of drawing are influenced by these theories of drawings. The findings established through analysis and interpretation of drawing based on certain approaches can be useful to inform the provision of children's landscape. The second part of the chapter is concerned with purpose and benefit of children's drawing in relation to research on and with children. This part is concerned with the characteristics and the "*how*" of children's drawing, looking at the various stage of drawing development. In the third section, issues relating to information that can be expected from drawing will be examined, looking at the formation structure and types of drawing. This last section will also attempt to define the "*content issues*" or the "*what*" of children's drawing that helps in analysis and interpretation.

2.1 ATTITUDES TOWARD DRAWING

2.1.0 Views Of Children's Drawings

As we have seen there are many reasons for studying children's drawing and they vary from discipline to discipline (see Table 2.1). However, within these diverse disciplines, fields of inquiry or analytical approach, there are two main orientations in viewing drawings (Golomb, 1992). In the first orientation, drawings are seen as a reflection of children's limited or undeveloped ability for conceptual representation or as "*cognitive deficit*" :

> .... (drawing) can best be described as cognitive deficit view of child's art. Children's drawings are seen as revealing the child's immature conception of the world, as graphic statements... a kind of cognitive map or "print-out" of the child's limited mental life.... It considers the childish forms and their spatial arrangements as primitive deviations from reality and from the projective retinal image....children's drawings are seen as symptomatic of a deficit, whether it be perceptual, conceptual, or executive, a defect that is overcome in the course of development. (Golomb, 1992, pp.1-2)

The analysis and assessment of drawing achievement eventually will look into completeness, accuracy and details judged on a basis of realism or naturalism standard. Piaget and Inhelder (1967), for instance interprets children's drawings based on these limitations in supporting his theory of development of logic and intelligence in the child.

The second approach takes a more positive view regarding drawing activity as an opportunity to produce "*equivalence*" as the graphic statements are not influenced by the optical retinal image.This orientation employs psychodynamic perspectives that translate drawing from the "*projective significance*" to reflect the children's emotions or feelings. Psychodynamic theory on children's functioning is based on the interplay of drives and forces within the children (Stratton and Hayes, 1988). Through drawings, children are able to project or manifest their feelings influenced by several internal factors. An analysis will serve as explanation of development at every stage of graphic achievement in terms of

meaning, concept and assessment of completeness. This helps in understanding the medium of drawing and its capabilities and the objects represented or projected which became increasingly sophisticated and significantly important to a child. Thus, in reviewing the psychological theories of children's drawing and their relation to cognitive and emotional development, it supports established notions that "*children draw what they know not from what they see*" (Barnes, 1996) or "*drawings mirror expressions of emotional experience or unconcious wishes*" developed from the above views.

2.1.1 Approach To Drawings: Naturalistic And Experimental

Recently, there have been various alternative theoretical approach to children's drawing that present new research findings. One recent approach is through experimental investigations involving children in a designed drawing task in order to answer specific research questions as drawing becomes important and more widely used as research tool. These include for instance, children's attitudes toward landscape (Sebba, 1991), knowledge and beliefs (Oakley et al., 1995), environmental preferences (Seibert and Anooshian, 1993), children's environmental cognition (Blades and Spencer, 1987; Blades, 1990; Wells, 2000). In this experimental approach, a researcher has specific research questions, methods and task assigned and designed for children. This approach replaced the earlier naturalistic approach of explaining the drawing's development (Kellog, 1969, 1979; Goodnow, 1977; Lindstrom, 1957; Eng, 1954, 1957). This naturalistic approach has no specific task oriented for children and rather relys on free or spontaneous drawing exercise produced by the subjects of interest. There was also awareness of how drawing processes influence the end product of drawing (Willat1977a, 1985). Both naturalistic and experimental orientation become important research approaches towards understanding and enquiring into children's drawings as well as in answering certain questions on issues and problems related to children.

2.2 PSYCHOLOGICAL THEORY OF CHILDREN'S DRAWINGS: HISTORICAL AND THEORETICAL OVERVIEW

There are several distinct periods in the history of research into children's drawings, each associated with a particular theoretical approach. Many researchers have touched on historical developement of children's drawing that give rise to voluminous literature (see Eng, 1954, 1957; Lindstrom,1957; Harris, 1963; Goodnow, 1977; Cox, 1991, 1992, 1993; Thomas et al.,1990). There are four different theoretical approaches towards drawing as outlined by Thomas et al. (1990), i.e. developmental, clinical-projective, artistic, and process approaches. In each approach, the purpose it serves and a basic principle that evolve

throughout the drawing development as well the distinction between them will be discussed briefly.

2.2.0 Developmental Approaches

During the early study of children's drawings, there was a widespread interest in establishing a taxonomy of children's art (Thomas et al., 1990), and a belief that children reflect their "*mind image*" through their drawings presenting thoughts and feelings. This was done through inspection, description and classification of a vast collection of children's spontaneous drawings in relation to gender or their cultural background. Sometimes the aspect of drawing topics were described by means of construction of an objective scoring system. These early studies included Kerschensteiner in 1905, Rouma in 1913, and Luquet in 1913, as reported by Thomas et al. (1990) and contributed to the drawings classification in relation to developmental sequences. Kerschensteiner for instance divided development into three broad categories according to age group: *schematic drawings, drawings in terms of visual appearance and drawings that attempt representations of three - dimensional space.* The most significant (ibid, pp. 28) classifications were put forward by Luquet (1913) with three stages of drawing development: synthetic incapacity, intellectual realism, and visual realism (Holloway, 1967, pp. 9) (see also Section 2.4.0 and Section 2.4.1). His works became extremely influential and frequently cited (Paine, 1992, pp.6). In his theory he identified five different stages of development that formed a unifying theory which was subsequently adopted by Piaget. Luquet believed that children's drawings were based on as "*internal mental model*" (Piaget's equivalent term of "*mental image*") and that the intention of drawings effort was to produce identifiable and realistic representation of the intended object. However, factors like *graphic skill and interpretation* could influence the translation of the internal model into the finished drawing. Luquet's "*sequence of drawing development postulated developmental stages in organizational and graphic skills as well as in the child's realistic intentions.*" (Thomas et al., 1990, pp. 28).

Goodenough's (1926) book proposed that drawing can be used as a basis to measure "intelligence." In her work she developed a method known as "*draw-a-man*" test which is further revised and extended by Harris (1963). He revised Goodenough's well-known scale for measuring "intelligence quotient" (IQ) and developed an alternatives to accomodate older children of twelve years old or so. In his book 'Children's Drawings as a Measures of Intellectual Maturity.' Harris (1963) presents a comprehensive literature on children's drawings and highlights some broad theoretical views or orientations toward children's drawings. He regarded the Goodenough's *'Draw-a-Man Test'* as useful tool or device in measuring intellectual status of young and handicapped children. The drawing test reflects children's mental ability as many aspect of children development are age-related. The

concept of mental abilities in the drawing test is related to formation of children's ability to produce multiple concepts representing intellectual or conceptual maturity. The test measured the score assigned to each feature included on the figure known as the Goodenough Intelligence Quotient. It was assumed that children's drawings are directly expressive of child's concepts or categories of the particular object or topic concerned.

A concept formation involves visual perception that develop and influences the drawing. Test may be "*reliable*" when "testers are restricted to one drawing per child" in the "Draw-a-Man Test," but become less impressive whenever more drawings from the same child are used as children can constantly vary their drawings. The variation is crucial as the measurement relys on number of elements drawn to complete the rating score. The validity of the intelligence measured by this test is no longer reliable, but it still can be used as a screening test for those of below-average intelligence and is useful for individual with mental ages between 3 to 10 years (Thomas et al., 1990) that still produce basic drawing. Older children are likely to produce more varied or multiple and complex drawings, and details of measuring elements or concepts may not change (Blades, 1990) or may changed from time to time depending on task demand and verbal instructions to effect compositional structure and context of drawings (Barrett et al., 1985).

The interest in studying children's drawings gradually declined by the mid-1970s, as a result it became a neglected topic in the field of cognitive development and developmental psychology research and is no longer used as an intelligence assessment. Freeman and Cox (1985) placed blame on prejudices for the lack of interest in a study of the development of pictorial representation. Developmental psychology was dominated by Piagetian theory that regarded drawing as somewhere in between *symbolic play and mental images.* Piaget only used children's drawing to explain his theory associated with the children's conception of space, but the studies of drawings were not a focus in the development of his theory.

2.2.1 Clinical - Projective Approaches

In clinical psychology and psychiatry research, drawings have been used to assess personality and psychological adjustment (Di Leo, 1971, 1973; Lewis et al., 1983; Malchiodi, 1998). Di Leo (1973, pp. 217) for instance, suggested that drawings can be viewed as expressions of feelings, as projections of personality although it involves uncontrollable subjective elements of variables for examiners such as experience, insight, and intelligence may influence drawing's interpretation. He suggest the use of drawings as diagnostic aids based on drawing of a family member that can reveal the important relationship of children in their life. Diagnostic interpretation is based on expressive or negative attitude by virtue of significant omission of a family member or self, and a figures

relative position, size, and similarity. Aspects of test rest on the notion of expressive qualities informing of concepts whose form resulted from children experience will be projected as part of children's impressions:

> In drawing, the child expresses himself creatively in visual images. These derive from a variety of sensory phenomena, acted upon, assimilated, and conceptualised. The nature of the experiences will affect the form which the image will assume, particularly during the early years, probably the first five, when impressions are vivid, persistent, and often uneffaceable. (Di Leo, 1973, pp.128)

Another example of the use in clinical projective approaches is for a *clinical projective* test using drawing that can be administered through systematically analysis of mentally retarded and emotionally disturbed children (Golomb, 1992, pp.5). Although these children are found to develop similar graphic language and skill, their drawings developments are not affected by mental problems rather than the contents. However, drawings with emotional meaning can be effectively utilised for gaining knowledge of children's state of feelings in a therapeutic context.

Despite the diversity of interpretation approach, the aspects of personality expressed in drawings are found mirrored by psychological and psychiatric interviews. Projective methods assumes that children *project* their emotions and motives into their drawings. Interpretation however have been based on intuitive and subjective impressions not on scientific analysis. Human figure drawings as expressions of intellectual maturity has to rely on validity demonstrated by numerous investigators using different intelligence scales for children. Aspects of realibility involves consistency in interpretation and consistency of children. Variables of children, procedural matters in research may also becomes important factors that may account for the realibility of children's drawings as measurement technique.

The assumptions that drawings are related directly to "expressive of emotional states" is similar to the Goodenough-Harris assumption that drawings were directly expressive of concepts of an object reflecting mental abilities (Harris, 1963, pp. 1). The emphasis of interpretation is very much on the structure of finished product and no account is taken of the process involved in the construction or making of drawing. It was then suggested in the drawing process, children may encounter planning difficulties and eventually affect the finished product (Willats, 1985; Freeman et al., 1985, Alland, 1983).

2.2.2 "Artistic" Approaches

Artistic research approaches emphasise art activity for emotional expression that play important role in development and education of children. There are many researchers (eg. Strauss, Lowenfeld, Kellog, Arnheim) that propogate the notion of the importance of artistic expression in children's development and education. Strauss (1978) was concerned with child's spontaneous early drawings with their "*lively and dynamic style*" which is not influence by adults. It was believed that at particular stages of development, a child's individuality can be understood through drawings. As Strauss puts: '... the child's unconcious perception of the laws of development of his own being which are mirrored in his drawings,' (pp. 9). Lowenfeld and Brittain (1987) on the other hand suggests that children's individual self-expression of thoughts and emotions in art can contribute to healthy and personal development and bring awareness of the environment around them:

> Young children use art as a means of learning, through the development of concepts which take visible form, through the making of symbols which capture and are an abstraction of the environment, and through the organization and positioning of these symbols together in one configuration.
>
> Art is a dynamic and unifying activity, with great potential for the education of our children. The process of drawing, painting, or constructing is a complex one in which children bring together diverse elements of their experience to make a new and meaningful whole. In the process of selecting, interpreting, and reforming these elements, children have given us more than a picture or a sculpture; they have given us part of themselves: how they think, feel, and see. (pp. 2)

This belief is partly based on psychoanalytic ideas developed by Freud that concerned personality development and human functioning as the unconcious mind reflects on everyday behaviour. Psychoanalytic theory of how childhood experiences are powerfully influenced the adult behaviour remains fundamental, and it has had an extremely wide influence on Western culture, for example in the understanding or art and literature (Stratton and Hayes, 1988).

This "*artistic approach*" to drawing was manifested in Rudolf Arnheim's (1969, 1974) works and his followers (Kellog, 1970, Goodnow, 1977, Gardner, 1980, Golomb, 1992). Their work dealt with comprehensive theoretical account of children's drawing within a unifying framework of perception, emotional-expression and cognitive-development. Arnheim in particular established a structural description of children's drawings in terms of the Gestalt principles of perceptual organization. Gestalt means "*good form*" and Gestalt theory dealt with basic processes involved in perception as the brain functions actively to construct or impose meaning in order to receive meaningful perceptual relationships from stimuli to arrive at "*good form.*" Another aspect of the Gestalt approach is its emphasis on *holistic orientation* as the understanding of perceptual process involves its entirety and not into

individual elements as "the whole is greater than the sum of the parts." What is more important to the brain is to sort out sensory inputs to produce meaningful perceptual relationships and this phenomena is explained through various Gestalt's perceptual organisation principles: *proximity, similarity, closure,* and *size consistency* (Veitch and Arkkelin, 1995, pp. 83). In relation to Gestalt principles, Arnheim's *representational theory* for instance observed in drawing, that a child actively looks for a good suitable or appropriate or form that will do justice in representing the object.

Similarly, to the above notion drawing activity is seen as visual-mental response resulting from stimulus received by the brain to make hand movement. First the brain comprehends visual stimuli for the overall shape or form, then to identifies detail (Kellog, 1979). Scribble is considered as "aesthetic" as the child organises it into shapes that are characteristically balanced (Kellog,1969, 1970, pp. 11), colourful, rhythmic, expressive in conveying a meaningful process of creation, elaboration, and self expression (Gardner, 1980, pp. 11) with purpose and clarity that "make sense" to them . Therefore art plays an important role in children over all mental development. Both Kellog and Gardner have looked closely into child's development and the importance of art for over-all mental develpment and self-expression. Goodnow (1977) believed that the interest of children's drawings has raised question regarding the nature of children, their skills, and the nature of meaning. Children's drawings represent aspects of development and skill, nature of thought and problem-solving among children. Among other things, she reasons out the importance of studying children's drawings, and the patterns and sequence in drawings.

Golomb (1992) studied children's art within a broad field of developmental psychology inquiry focusing on issues and questions related to pictorial representation, graphic development within "*stages of development.* " Other aspects studied include the nature of changes in drawing style and children's competency; the influence of basic universal rule systems in early graphic development; and the impact of cultural models. It was found that the medium affects children's representation as the child give meaning to pictorial theme through the arrangement of elements to present concepts in drawing. This representational concept was based on certain compositional principles children employed to organised the elements to make up a drawing. In her study, Golomb suggests that children are able to use colour and form for expression of effect.

These "*artistic-expressive* " approaches are perhaps very practical in an educational contex to propagate healthy cognitive development and personal growth among children through projection of emotional, perceptual and intellectual experiences into their drawings. Drawing is seen as a media that allows children spontaneous self-expression especially useful both in therapy and in education (see Strauss, 1978;Lowenfeld et al., 1987; Golomb, 1992). Art

therapy is based on therapeutic value of art activity that allow children to express ideas, feelings or emotions. Art becomes a medium for emotional expression that can effect children therapeutically (Thomas et al., 1990, pp. 123). In psychological therapy, educational value lies in the process of drawing activity and is considered more important than the product itself. Thus in art therapy, a descriptive study reporting the sequence or progress in drawing may be supported by children's verbal description for ideas and thoughts (Harris, 1963, pp. 153). The underlying principles and ideas in this artistic approach influenced in the development of art education and art therapy despite its vagueness in psychological theory.The weakness of the theory perhaps lies in the fact that it was based on the proposal that the psychological state of children is reflected by the product of their drawings and painting, i.e. symtomatic of mind and emotion but no systematic studies to prove this claim.

2.2.3 Process Approaches

The theoretical approaches towards drawings discussed so far has mainly refered to the surface structure (compositional structure) of children's drawings. Few of these researchers report on the process of constructing the drawing that may influence the end product of a picture. Piaget's theory on drawing which is adopted from Luquet proposed that drawing was children's attempt to represent the real world based on a mental image (Piaget and Inhelder, 1969). Piaget had a tendency to overlook this problem faced by the children and this may have led him to underestimate children's knowledge. Children between the age of three and ten are found able to judge the most elaborated drawings between two presented but their limited production abilities pose them a problem in implementing knowledge and planning and executing graphic activity they wanted desired on much advance *internal models* equivalent of an adult (Fayol et al., 1995, pp. 303). Thus, children know more than what they are able to present in their drawings which are only limited by their undeveloped drawing skills.

Many studies (Freeman, 1977,1980; Freeman and Cox, 1992; Willats, 1977a; 1977b) observe that in making a drawing, children are faced with organizational and procedural difficulties especially in translating conceptual knowledge (or mental image) into a recognisable representation on paper. These planning difficulties and performance biases in drawing have substantial effects on the final form of a finished drawing (Freeman, 1977,1980; Willats, 1977). Generally the difficulties relate to certain approaches to drawing representations such as drawing of solid objects (Chen, 1985; Willats,1997; Ashcroft, 1988), partial occlusion (Ashton, 2000; Cox, 1978; Freeman and Janikoun, 1972), and drawing the three-dimensional scene (Freeman, 1980). Chen (1985) for instance found in her study that children can produce more advanced drawing when copying a picture of a

solid object as compared to their drawings made from a real-life model. It was suggested the *line configuration* of the object helped to guide the 'depth relationships of a solid object onto a picture plane,' (ibid. pp. 173). While copying, younger children may adopt a *content-directed strategy* that lacks understanding in depicting depth relations in perspective. As for older children, their copied drawing perhaps incorporated a *structure-directed strategy* to depict object successfully in reasonable perspective, indicating the control of object knowledge. Partial occlusion is normally used to depict the "*behind* " relationship of an object (e.g. a cup or an apple) and is found absent in young children's drawing (except in a few drawings) of a child below the age of eight (Cox, 1992). Another difficulty shown by young children is drawing depth relationships due to an inability to execute a translation of three-dimensional scene onto a two-dimensional surface (Freeman, 1980). This ability is manifested by children of different age in various *projection systems* (e.g. orthogonal projection with ten years of age, vertical oblique with twelve years, oblique, naive perspective, and perspective projections with the oldest children aged fourteen years) when asked to draw a picture of a real three-dimensional scene (Willats, 1997, pp. 11, and 1977a, 1977b).

These aspects of difficulties in drawing procedures and the structure of the finished product were not a prime issue considered in Piagetian theory, the Goodenough-Harris intellectual assessment and clinical-projective analysis of drawing in drawing making process. Therefore, as Thomas and Cox (1992) suggest, it is important to understand the process factor if the interpretation of drawing as expressions of personality and emotional states are to become valid and reliable. The other advantage of understanding strategies including partial occlusion, and three-dimensional or perspective used by children in making drawing is that it offers the 'possibility of progress in understanding the development of planning and organizing skills in general,' (pp. 32) and the drawing process identified from the strategies adopted by children will provide a framework for discussing their drawings (Chen, 1985, pp. 174).

2.3 CHARACTERISTICS OF CHILDREN'S DRAWING

In the previous part, the study of children's drawing looked into various important historical research developments and perspectives. It is now appropriate to deal with the character of children's drawing across age group. There are many ways the drawings are obtained, chosen, and analysed depending on purpose of answering certain research questions and expectation of researchers. The collection methods can be through *lateral investigations* (Paine, 1992) / *cross-sectional* or *longitudinal studies* (Thomas and Cox, 1990).The former method involves many samples and selection of few items from each child. The latter acquires many drawings from small sample usually one or two children over longer period of

time. Most of the studies in this area have been *lateral/cross-sectional* (Kellog, 1969, 1979; Golomb, 1992; Goodnow, 1977), with a few *longitudinal* studies particularly looking at the developmental of skills and progress in drawing (Luquet, 1913, Eng, 1954, 1957). The cross-sectional studies produced a mass of data that empirically formed a basis for developing categories of children's drawing into various stages. For example, Kellog (1969) reported examining approximately a million drawings done by young children mainly from children enrolled in the kindergarten, childcare centres, nursery schools, public elemantary schools, and a vast collection from friends and interested persons. This approach to data collection technique however, has been critised as unsystematic and one that may give rise to questions and uncertainty about the ideas and findings.

Their analyses are mainly characterised by studying finished drawing product. However, Freeman et al. (1985) noted, the finished forms have been strongly influenced by the constructing process in the making of drawing. Sequential development progressed from a simple towards a more detailed, elaborate, highly proportion and realistic drawings with distinctive features at each stage throughout the development (see Thomas et al., 1990).

2.4 DEVELOPMENTAL STAGES OF CHILDREN'S DRAWINGS

Investigation of how drawings develop, the characteristics and nature of developement sequences at each stage it can serve the purpose to increase understanding of children's drawings. Many researchers of children's drawings (e.g.Harris, 1963; Kellog, 1969; Goodnow, 1977; Thomas et al.,1990; and Golomb,1992) acknowledge that the drawing process evolves through recognisable developmental features as children of the same age groups do employ similar tools, strategies or techniques in depicting certain objects or figures in their drawings. These various stages appear to be a result of the child's limited cognitive conceptual development that impose restrictions on achieving more complex depictions in drawing as suggested by Piaget (Holloway, 1967) (Table 2.2). These stages are seen as a series of phases in the '*successive organization of a complex response*' (Harris, 1963) and starting from lowest level, each child must experienced or go through acquiring certain skills and knowledge before reaching to more advance stage (Kellog, 1969). Each developmental stage is marked by distinct "*inherent patterns*" of process that can be classified according to age groups from simple to more complex representation. Harris (1963) in viewing drawing development suggests: "... the child's stages of drawing depict successive steps in his attainment of complex concepts and his discovery and mastery of intricate techniques for delineating these concepts within the limitations of the medium - crayon or pencil on a plane surface," (pp. 229).

APPROX-IMATE AGE	DRAWING	COGNITION
0-1	*Reflex response* to visual stimuli. Crayon is brought to mouth; the infant does not draw.	*Sensorimotor stage.* Infant act reflexly. Think motorically.
1-2	At 13 months, the first scribble appears a zig-zag. Infant watches movement leaving its marks on a surface. Kinestetic drawing.	Movement gradually becomes goal-directed as cortical control is gradually established.
2-4	Circles appear and gradually predominate. Circles then become discrete. In a casually drawn circle, the shild envisages an object. A first graphic symbol has been made, usually between 3 and 4 years.	The child begins to function symbolically. Language and other forms of symbolic communication play a major role. The child's view is highly egocentric. Make-believe play.
4-7	*Intellectual realism.* Draws an internal model, not what is actually seen. Draws what is known to be there. Shows people through walls and through hulls of ships. Transparencies. Expressionistic. Subjective.	*Preoperational stage* (intuitive phase). Egocentric. Views the world subjectively. Vivid imagination. Fantasy. Curiosity. Creativity. Focuses on only one trait at a time. Functions intuitively, not logically.
7-12	*Visual realism.* Subjectivity diminishes. Draws what is actually visible. No more X-ray technique (transparencies). Human figure are more realistic, proportioned. Colors are more conventional. Distinguishes right from left side of the figure drawn.	*Concre operational stage.* Think logically about things. No longer dominated by immediate perceptions. Concept of reversibility: things that were the same remain the same through their appearance may have changed.
12+	With the development of the critical faculty, most lose interest in drawing. The gifted tend to persevere.	*Formal operational stage.* Views his products critically. Able to consider hypotheses. Can think about ideas, not only about concrete aspects of a situation.

Table 2.2 Development of Drawing Related to Piaget's Stages of Cognitive Development - A Synoptic View.
Source: Adapted from Di Leo (1983, pp. 38)

According to Thomas et al. (1990) there are four different classification of developmental stages in which children's drawings seem characterized by clearly distinctive features at each stage of drawing development as follows:

2.4.0 Drawing of children eighteen months to two-and-a-half years (Pre-representional stage)

From eighteen months onward, children usually start scribbling on paper; practicing eye-hand co-ordination and are able to recognise the aesthetically pleasing shapes and patterns that emerge (Cox, 1992, pp. 12-18). Within a seven year period of research, Kellog (1969) reported collecting over 300,000 drawings that helped to identify twenty different types of "scribble" and seventeen "placement patterns" on paper (see Figure 2.1 and Figure 2.2). She also identified in doing that, children's drawing achieved a degree of visual balance. These early scribbles have been interpreted by researchers (Luquet, 1913, Piaget and Inhelder, 1967) as play and exercising with no intention of representing anything specifically. Similarly, Arnheim (1974) shared the same belief with Luquet and Piaget as he viewed scribbles as resulting from a domination of "*motor-impulse*" determined by a "regular rhythmic expressive movement" and feeling of the child at the early age. Children scribble to present pattern on paper rather than represent something or an object. Thus, scribbles are "presentation" and not "representation."

Occationally, children 2- and 3-year-olds do interprete their scribbles as pictures after completion and Luquet (1913, pp. 146) identified this stage as that of "*fortuitous realism*", i.e when image is recognised after drawn. Children's first enclosed form - the "primordial circle", as Arnheim (1974) acknowledged - is likely to represent any object within the children's environment. However, Read (1969) observes that sometimes children simultaneously name their scribbles. This simplest preferred visual pattern of circular shape among young children is flexible enough for continuous experimentation. Drawing activity allows children to gain motor pleasure through out the stage even after their drawings become recognisable as representations. These claims, however are not fully verified independently. The claims are supported by explanation that certain shapes, forms or patterns of marks are naturally visually balanced and perceptually satisfying.

2.4.1. Drawings of children two-and-a- half years to five years

Children in this age group normally draw to represent certain things. Sometimes children declare the intention before starting, or give the meaning while the drawing is in progress. There is still an element of opportunism in their interpretaton. However, at this stage, their drawings final product may turn out to be different from that initially intended so children change from time to time meaning placed upon their drawing (Luquet, 1913).

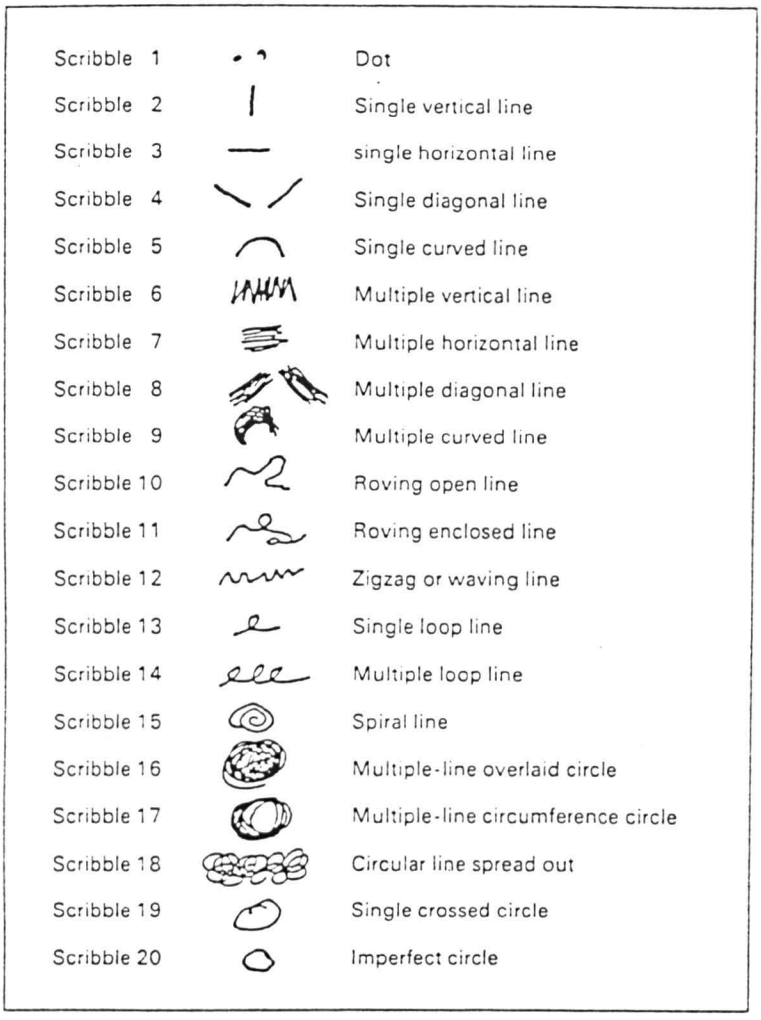


Figure 2.1 Twenty different basic children's scribbles identified by Rhoda Kellog. (*Source*: From Kellog, Rhoda, 1969, pp. 15).

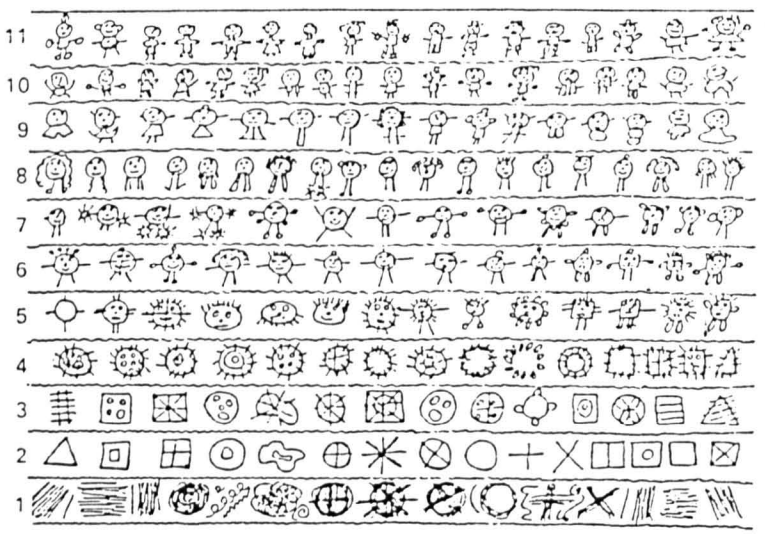


Figure 2.2 Complex forms of human figures developed from children's basic scribbles of "combines" and "aggregate" as suggested by Rhoda Kellog. (*Source*: From Kellog, Rhoda, 1969, pp. 109).

As scribbles developed further, the undifferentiated and irregular forms such as circles, squares, triangles and crosses drawn in outline form superimposed on each other as "*combines*" and when numbers of scribbles appeared close to each other, they formed an "*aggregate*" - unit of three or more diagrams (Kellog, 1969, pp. 52). One of the "*combines*" that is known to appear most frequently is a cross superimposed on a circle - a "*mandala.*" This may be preferred by children as a search for "order, harmony and overall balance in their drawing" (Thomas et al., 1990). More systematic research is required to confirm that a child's drawing development individually are represented in those idealized progressions and orders of complexity (Figure 2.2). Little evidence has been found to support Kellog's theory that children prefer using "combines."

Other prominent shapes which appear in children's drawing of this age are suns, circles and radials. Circles were thought to be most flexible with great graphic potential where the first human figure representations emerge in the form of circles (Arnheim, 1974).These basic shapes are further transformed and incorporated in later development stage to form different feature in children's drawing. It was also observed that at this developmental stage, children of three-an-a-half years sometimes fail to connect parts of elements or features to make a representational drawing. Luquet (1913, pp.174), called this occurence as "*synthetic incapability*" (L'incapacite synthetique), and Freeman (1980) termed the stage as '*failed realism*' (Thomas et al., 1990). For examples, unconnected or fragmented parts of a body in a human figure or features in a house is due to missing relationship not to a false relationship between the drawing's elements.

Drawing of "tadpole" human figure for instance may be in the form of circle representing the head and /or trunk and lines for legs which appear around the age of 3 years (Cox, 1992). Restricted shapes especially circles are used that can represent almost anything and this schema may also be used for different presentation purpose, either for humans or animals whenever necessary. At this stage, sometimes the subject drawn functions as a symbol and the schematic drawings with this representional character are called "symbolic realism" (Barret et al., 1976, pp. 202). Simple formula or schemata (Lowenfeld and Brittain, 1987) appear later at about the age of three-and-a-half years as a basis for unifying details of a drawing with each other.

2.4.2 Drawing of children five years to eight years

Children's drawing progressively become more visually realistic with age especially in terms of scale and detail. The human figure for instance is no more depicted using tadpole schema but with an identifiable head, and trunk couple with hands, finger and clothing details. However between age five to seven years, children sometimes produce "*transparency*" or

"*X-ray*" drawing, a phenomenon occuring during the stage of "*intellectual realism*" (Luquet, 1913). According to Freeman (1980), there are two types of X-ray drawing. In the first type, children attempt to show an object hidden inside something, whereas in the second type shows an object which is hidden behind a nearer object or better known as "*occlusion*," (Figure 2.3). Some children, although they are aware certain drawing technique however, when depicting occluding object, their drawings representation may not be visually realistic. The concern is to produce drawing that "look right" and their graphic skills may be influenced through exposure to adult works and learning experienced at home or in school teaching (Ashton, 2000).

2.4.3 Drawing of children eight years to adolescence

Luquet used the term "*visual realism*" for this latter stage in drawing development characterised by drawing with relatively high realism for individual parts and relationship of objects. Children are normally at this stage able to draw using proportion, scale and single view point. Between the age of nine or ten years old, children's drawing's become more "*conventional*" in style with cartoon and comic strip characters. Children's drawing become less variable and less idiosyncratic. At the age of nine or ten children may gradually abandon drawing activity as a result of dissatisfaction in not been able to achieve the effect they want in their drawing and their art skills do not progress beyond the level of development they reached (Edwards, 1979). Only a few children continue to draw often due to education and encouragement and manage to maintain certain degree of freedom in their expression (Gardner, 1980).

It is therefore common for older children to neglect drawing (Arnheim, 1969) that increasingly demands visual realism (Gardner, 1980), and makes it less a satisfactory medium for expression, not a vital skill required as compared to language skills including speech and reading (Edwards, 1979). This view however is not fully proven systematically through empirical data and needs further research to support the claim.

2.4.4 Universality in drawing development stages

Most research on children's drawing have been within a "Western" context. Fewer studies about children's drawing have been carried out else where with a few exception (Alland, 1983; Wilson, 1985; Wilson and Wilson, 1987). Some studies have found similar accounts in drawing development of children from different cultural backgrounds especially between the age of seven or eight years (Thomas et al., 1990). According to Kellog (1969), there is a universal pattern of development in children's drawing and art. Study by others like Alland (1983) and Deregowski (1978,1980, Barraza, 1999) argued that many factors including

culture influence the development of children's drawing. Drawing of children from non-Western culture may develop differently, not following a "universal grammar of drawing," (Deregowski, 1978; Kellog, 1970; Barraza, 1999).

A study of children's drawings from six different cultures by Alland (1983, pp. 210-211) revealed that drawings differ not only in detail and style but the strategies or processes used in constructing them as well as stylistic differences among different culture. He suggests:

> Equally striking are strong stylistic differences among the six cultures.... These appear early and persist through all age groups. It is quite clear from the data that cultural influences appear early and have a strong effect on the overall style of children's drawing. Leaving aside similarities in the development of human figure drawing (there appear to be real cross-cultural regularities in this domain) generalizations about particular stages of development in children's drawing appear to be false.... data strongly suggest that development from scribbling toward representation is not an automatic result of maturation, or even experience with drawing. Children are often content to play with form and need not imbue this form with meaning.
>
> While this study suggests that culture plays an important role in the development of style in children;s drawing it does not prove or disprove the hypothesis that universal aesthetic principles exist in humans. There are two reasons for this. First of all, it may be that such principles do not emerge until rather late in the developmental process and that when do emerge they depend upon both inborn propensities and experience. (pp. 211)

Thomas et al., (1990) in supporting possible cultural influence on drawing summarise:

> "...a particular shape may occur frequently in drawings made by children from a particular culture, not because it is aesthetically pleasing to those children, but because it is a by-product of a culturally-determined drawing strategy. Only when the causes of cross-cultural differences in drawing have been identified can we establish,... whether or not there are patterns and shapes with universal aesthetic appeal," (pp.40).

Before one can establish whether a universal aesthetic appeal of shapes in children's drawing exist, there is a need to identify the possible causes of cross-cultural difference in drawing. It was also claimed by Alland (1983) that given a chance, older children in certain culture can draw in representational way immediately eventhough they lived in a culture with no exposure to representational drawing at all. This contradicts the claim made by Kellog (1969) that earlier scribbling stages are a pre-requisite to the development of representational drawing.

There is an issue with the classification of drawing development into various stages. It appears that there is no clear cut association between a child's age and the drawing developmental stages. Children who have already acquired high development skills may revert to use strategies typical of earlier stages. This occurence tends to obscure the continuities in development.

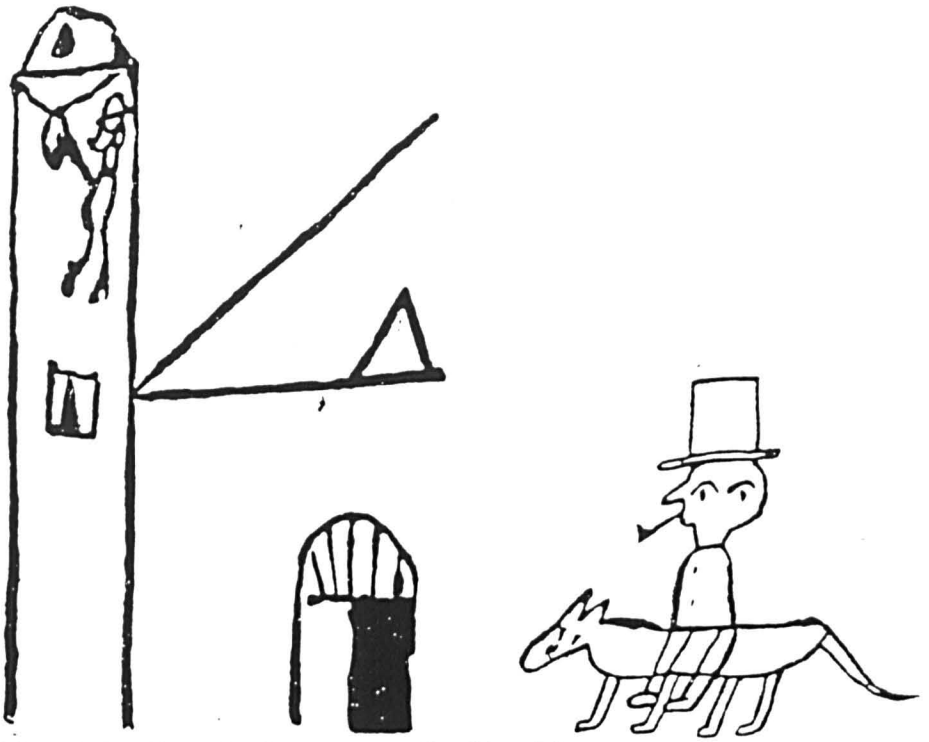


Figure 2.3 Example of "transparency" or "X-ray" drawing as a man can be seen in the church's bell tower (left). A hidden right leg of a man behind animal's body is shown as failure to depict "occlusion." (*Source*: From Ricci, Corrado, 1887, pp. 24 and pp. 41).

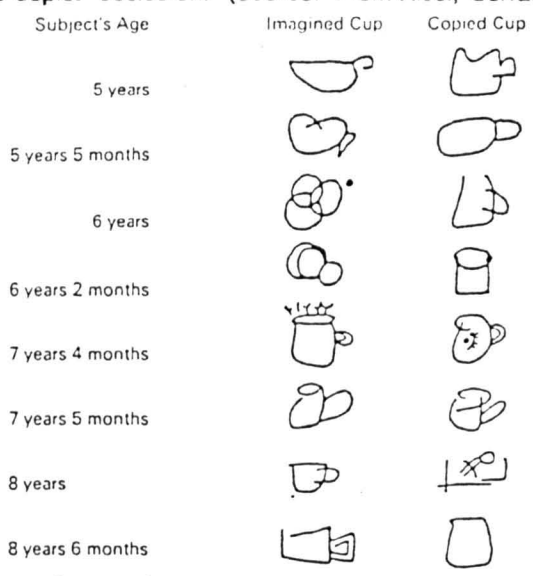


Figure 2.4 Drawing of a cup by children of different ages. The cup handle is represented by all children when copying a cup with hidden handle, except children aged 8 years and above who exclude the handle. (*Source*: From Cox, Maureen, 1992, pp. 89).

In their study, Wilson and Wilson (1987) reported that elderly people who had never drawn during their childhood, when asked, produced a basic drawing of tadpole schemata that under normal circumtances belonged to four-year-old children. They conclude that for normal drawing development, training practice and exposure to people's drawings are necessary. This view is supported by their later studies on drawing development of children from different cultures (Wilson and Wilson, 1987). The study compares pictorial composition and narrative structures of children from two different cultures, i.e. urban Japanese and Egyptian village children. They discovered that Japanese children "*over-approximate*" their "real" world compared to Egyptian children's drawings that "*under-approximated*" their environment. This phenomena lead to suggestion that aspects of culture and the influence of media and imagery have cognitive affects on the way children reflect to construct their surrounding environment.

2.5 WHAT INFORMATION IS PRESENTED IN A DRAWING?

Any attempt to understand and explain children's drawings will try to answer the question of what information is contained in a drawing, including the structure and appearance of the topic or scene represented, as well as feelings and emotions potrayed about the topic. It is therefore important to establish types of information conveyed by means of drawing. The next section identifies different categories of representation.

Early drawings produced by children are usually purely symbolic drawings that may only acknowledge the topic, and are unlikely to carry information or "represent" the subject matter (Arnheim, 1969). There are two types of information conveyed by children's drawing of certain topic or scene. The first type of information deals with the structure of an object or scene. Drawings of this nature can either provide information about the structure of an object - object-centred representations or present information about the spatial relations of objects in a "scene-array-centred representation." Secondly a drawing can also carry information about the way that the object or scene looks from a particular viewpoint - viewer-centred representation. Viewer-centred representation may not be good for conveying structural information about an object and the scene depending on the specific selected viewpoint.

2.5.0 Types of information in drawing presentation

A closer look at the presentations of various types of information in drawing is needed as many factors can influence information presentation. Children's free drawing mostly comes from memory, and normally portray a favourite topic such as people (Thomas et al., 1990), house, vehicle, animals, (Eng, 1954) still objects and landscape environment (Golomb,

1992) etc. Any information children present in their drawings can be further analysed through specifically designed drawing tasks that are not normally part of children's free drawing experiences. The different kinds of information and possible factors that influence information presentation can be summerised as follows:

2.5.1 Symbolic drawings

Children's early drawings serve mainly as conventional symbols without describing the subjects which they present. Consequently, very little information is given about the structure or appearence of the objects. These '*generic drawings*' (Barrettt and Light, 1976, pp. 202) depict the genus of topic represented not by example of an object shown individually. This drawing approach is a character of the "*symbolic realism*" stage, usually appearing in 5 to 7-year-old children's drawings. Drawing of this stage depicts information about the character of an object with standard features to which topic of the drawing normally belongs to.

2.5.2 Drawing with object-centred information

2.5.2.0 Canonical representation

Young children around 5 years old normally prefer to draw by showing the whole view of an object although it is not realistically possible to view this in reality. Ricci (1887) suggests in drawing, children are more concerned about expression of knowledge rather than an effort to depict the real appearance of objects (cf Cox, 1992). Children only include features of object that can portray meaning "central to concept of particular class of objects," (Kerschensteiner, 1905, cf. Cox, 1992) and are limited to utilising schema or formula they have mastered. Luquet (1913) similarly shared the notion children's concept of the object are mentally embedded as *internal models* containing information that serve to guide when representing the idea of the object . All these ideas lead to the axiom that '*children draw what they know rather than what they see.*'

Freeman and Janikoun (1972) in their study found a distinct result in 5- to 9-year-olds drawings of a cup from imigination and a real cup with a flower painted on the front but with handle turned out of sight. All drawings of cups drawn from imigination had handles, and drawings of children below the age of 8 years drawn based on the real cup seem to include handle but exclude the painted flower (Figure 2.4, on page 55). The finding that children's (age seven years) preference for specific view representation is not because of executive limitation, but alternatively chosen to represent structural information about the object drawn including defining features even if they were out of view. Older children's drawings (age 8

years above) however, portray more realistic view or present view-specific structural information even at the expense of excluding defining features i.e. drawn according to the cup seen. To younger children, the handle not a painted flower is a feature central to cup as an object and drawn from their internal model. A similar study that manipulated the amount of information about the structure made available to the child by Bremmer and Moore (1984) reinforced the conclusion "that children up to the age of seven years are disposed to include object-centred structural information at the expense of excluding view-specific information," (Thomas et al., 1990, pp. 92) or "*view-centred*" for a more realistic drawing from specific viewpoint (Cox, 1992).

Drawing which is oriented toward representing a recognisable object through inclusion of 'defining features of an object' is known as *canonical view.* Since the drawing of this nature is object emphasised, it is also known as *array-specific* or *object-centred* drawing (Cox, 1992). Thus, the most peculiar aspect of children representation was the awareness of salient characteristics and structure of an object in the drawing. The intellectual realism stage saw the evidence of transparencies or X-ray drawing and children '*predilection for canonical views*' as evidence for this awareness (Thomas et al., 1990).

"*Canonical form*" is also the term used to describe a view of an object that perfectly displays its characteristic features (Hochberg, 1978, pp.195, cf. Thomas et al., 1990). Freeman (1980) refered that the general-purpose representations that makes an object highly identified as "*canonical representation.*" For instance, an easily understood and recognisable house, or human figure is created normally with a front view; whereas a vehicle, fish, other animals are usually given a side view. Structural information of an object is most likely to be represented by children in a canonical view. Researchers such as Goodnow (1977), Freeman (1985) have found that children's preference for canonical orientation comes when they choose to draw familiar objects. This approach and preference for canonical presentation becomes common and persists over other different orientation of objects.

2.5.2.1 Size-scaling within an object

Children aged between 4-8 years old are known to have sense of scale when they relate the size of various elements that form part of the structure of a complex subject in their drawings (Thomas et al.,1990). They always have the intention to give a correct scale in their drawing presentation. This idea was put forward by Allik and Laak (1985) in their study, which suggested that visually realistic intention in relation to size had a direct link with the characteristics of the "*canonical representation*" of an object. Children maintained size consistency even if a drawing task was repeated, and relative size consistency was also

maintained from free drawing task to drawing that require "finishing touches" to complete. Obviously, the children's use of size to indicate scale is based on rule or principle of proportion. Freeman (1980) for instance found that in figure drawing, 2-4-year-old children always prefer the arms attached to the element of largest shape either head or trunk.

Size, however as suggested by many (Lowenfeld and Brittain,1987, Arnheim, 1969) is determined by the degree of importance of topic drawn and up to six years, children normally do not demonstrate accurately the scaled part of their drawings. Relative size of the elements are found to be affected by factor like content of the topic (Allik and Laak, 1985), planning problem and performance (Thomas and Tsalimi, 1988).

2.5.2.2 Transparencies

Studies have also looked at the phenomenon of "*transparencies*" among children's drawing (see Ricci, 1887; Luquet, 1913; Freeman, 1980; Crook, 1984; Clark, 1987; Cox, 1992). As discussed earlier (see Section 2.4.3), (Figure 2.3, on page 55), there are two types transparency drawing normally appear among children's drawings of 5-8-year-olds. The first type of transparency drawing is related to children effort to show something invisible inside. An aspect of children failure to show an occlusion is another type of transparency. It is suggested by numerous researches above that transparencies do not always reflect effort to show structural information. Although young children age 5-year-olds normally based their drawings on structural information or description of the topic however, they need not necessarily try to communicate the information. Thus "*transparencies*" in drawing could occasionally be the result of drawing process in presenting the structural information.

2.5.3 Drawing of three-dimensional objects

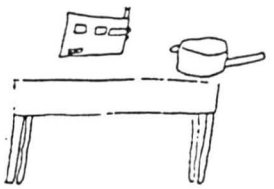
A three-dimensional drawing made on a two dimensional flat surface creates a conceptual effort to represent real objects. In relation to this, some studies (refer Freeman,1986; Willat, 1977b) have focused on children's drawings of a cube as this form offers an ambiguous canonical picture that requires the representation of depth in order to grasp three-dimensional shape of a solid. It was claimed children's developmental ability towards depiction of depth can be studied in drawing of a cube. The difficulties in drawing solid model cube for instance, are age-related as younger children tend to include hidden features in their drawings. Children of seven to nine year olds were more flexible incorporating pictorial logic in drawing of a cube (Ashroft, 1988).

In constructing pictures, children encountered various problems and used different approaches to solve them. These can be explained through the projection "system" that is involved in constructing pictures. Certain rules need to be learned first by children prior to execution of three-dimensional relations on two-dimensional paper (Willats,1977a). These rules 'mapping spatial relationship in the scene' into spatial relationships in the picture known as transformation systems: *orthographic, vertical oblique, oblique,* and *perspective* (Figure 2.5).

Orthographic projection is formed when "parallel rays strike the picture plane at right angles', ie no depth depicted in it. In vertical oblique projection, " parallel lines strike the picture plane at right angles in the horizontal plane, but at the oblique angle in the vertical plane" and depth information is translated into the vertical dimension on the paper. "In the oblique projection, parallel rays strike the picture plane at any angle and edges in the third dimension of an object are presented by oblique lines." In the perspective projection, "the projection rays converge to vanishing point on the picture surface." Selfe (1983) termed this as "photographically realistic presentations" and Gibson (1979) as "artificial perspective."

It was found that oblique projections are much preferred by many young children age nine years and older as it provides the most direct mapping of shape and angles onto paper together with definitive depth information. For a young children age 5 to 8-year-olds, an oblique projection imposed difficulties, for instance to joint lines at oblique angle when by and large they are sensitive only to perpendicular and symmetrical biases. Perspective projections are rarely drawn in both older adolescents and adults .

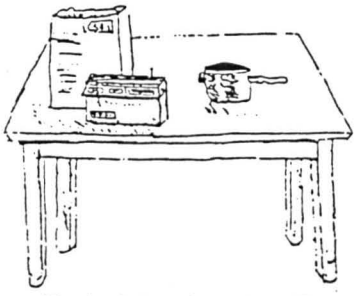
The research on children's drawings of a cube (Cox,1986) suggested that the traditional assumptions about a developmental progression from object-centred to viewer-centred depiction not necessarily true throughout. Children find difficulty in drawing an oblique projection which is "an object-centred, canonical depiction of a cube that adequately convey depth information." However, oblique projection is prefered by adults as compared to older children age 10-year-olds and above that seem to involve more visually realistic drawing (Cox, 1986), i.e appears towards preference for more drawing of perspective type (Willats, 1977b, pp. 197) (Figure 2.6).



Typical drawing class 1:
no projection system

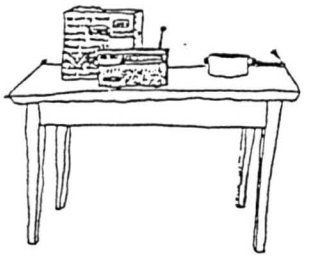
Typical drawing class 4:
oblique projection

Typical drawing class 2:
orthographic projection



Typical drawing class 5:
naïve perspective

Typical drawing class 3:
vertical oblique projection



Typical drawing class 6:
perspective

Figure 2.5 Six different types of drawings by children aged 5- to 16-years-old based on Willat's study (1977): No projection, orthographic, vertical oblique projections, naive perspective, or perspective. (*Source*: From Cox, Maureen, 1992, pp. 150).

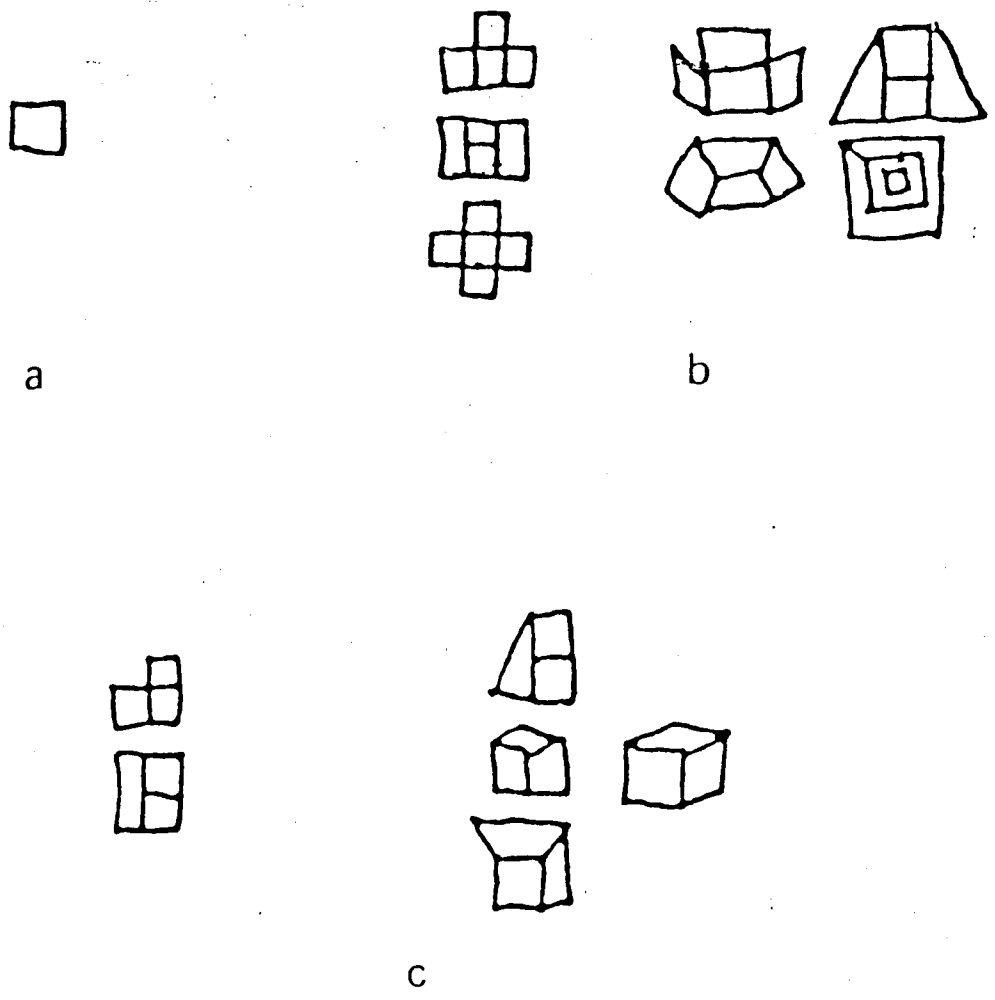


Figure 2.6 Children's drawings of three dimensional object - a cube. An orthographic projection of a cube resulted a simple single square (a). A vertical oblique projection of a cube is depicted with front and upper segments of a cube with many sides (b). A cube is represented with oblique projection. All three segments of a cube (front, top and one side) failed to fit together (c). (*Source:* Cox, 1992, pp.30; Thomas et al., 1990, pp. 96-97)

2.5.4 Array-specific information in drawing

Children are probably able to represent concepts of more than one subject drawn in isolation and to link the idea between the subject for one particular drawing's topic. The term "object-centred" refers to drawing that emphasise information about the particular object (Cox, 1990) Whereas patial arrangement of two or more objects in a composition is called "*array-specific information*" (Thomas et al., 1990). There are many specific research designs related to children drawing of array-specific information.

Children are found to be sensitive towards such composition in conveying information about spatial relationships in their drawings, although at the expense of view-specific information (Light and Humprey, 1981). In their study using models of animals, it was found children age 5 -and 6-year-olds are more concern with presenting array-specific information of an animal. Children age 7-and 8-year-olds are aware of different arrangement in relation to viewer orientation, thus they represented their drawings mostly using view-specific information. However, if the task involved drawing objects behind each other, it is expected of younger children age 5 to 7-year-olds represent spatial arrangement side by side or above each other. As their age increases, children may utilise vertical relation instead of horizontal relation for the object. They may also employ view-specific information with total or partial occlusion. In array-specific information, children are concerned to represent the spatial configuration of an object in a scene, unlike view-specific information it is object-centred information and may possibly yield canonical representation.

2.5.5 View-specific information

Thomas defined view-specific information in a picture as " information that conveys something about the position of the drawer/viewer in relation to the objects or scene depicted," (pp.201). In Western art, pictures commonly employed a single viewing position or station point. In other cultures, a single picture may be presented using various viewpoints. The topic that children usually depict in their drawing conveys view-specific information through the orientation of the topic in relation to the viewer. This line of sight and position of viewer can also be determined by looking at the occlusion of objects in the drawing. Another way in which a picture can provide view specific information is by means of foreshortening and diminishing size relative to distance in perspective projection drawing. This perspective drawing is a rare achievement among young children below age 10-year-olds (Willats, 1977a).

Children up to the age of seven years show a preference for canonical orientation over a specific viewing position. The canonical view is defined as a typical or streotyped view of each particular object which is 'the least ambiguous vis-a-vis the identity of each object' (Cox, 1986). Piaget and Inhelder (1967) suggested this occurence reflects children's conceptual immaturity, lacking in cognitive ability. Freeman and Janikoun (1972) found that children are able to produce drawings with view-specific information.

In research on view-specific information studies of partial occlusion when one object only partially masks the object placed behind it (Cox, 1981,1986), children (aged six years) given appropriate circumtances are able to focus on a viewpoint to show partial occlusion of two different objects but no occlusion for similar objects. As for younger children (aged four years), both conditions either similar or different objects yield a small number of partial occlusions. The degree of similarity between two objects influences the ability of children of different age groups to comprehend the composition arrangement before they can start drawing. Thomas et al. (1990) conclude that children's failure to present view-specific information is not a result of their conceptual limitation.

2.5.6 Size-scaling between objects

In drawing, children relate one piece of information to another by virtue of size scaling between objects. The structural information about the size of different elements of an object is communicated by children through relative scaling within an object. In early drawing phase, young children's drawings are not drawn with visual realism in term of scale as sizes of different topics are not regarded as important. Accurate size scaling between objects develops in older children's drawings starting after single object differentiation (Arnheim, 1969). Other research (Silk and Thomas, 1988; Silk and Thomas, 1986) has proved that young children at three-and-a-half-years-old manage to indicate correct size scaling, especially within objects of easy and salient dimension for differentiation (eg. a house, man and dog). It is expected that if objects of relevant size are drawn close to each other, it will facilitate the comparison that result in the children increasingly scaling the two objects more realistically. Children's knowledge of the size of certain topics may be potrayed quite accurately especially the ordinal size scaling between various objects and its application is based on this certain basic scaling rule. These findings, despite numerous examples of "*incorrect*" scale, suggest that many other factors like the importance of the topic and the process involved in constructing the drawing may influence size in children's drawing.

2.6 SUMMARY OF IMPLICATIONS FOR THIS RESEARCH: ESTABLISHING AN APPROACH

In summary, there are three factors influence children's presentation of information in their drawing: Firstly how familiar the drawing topic is to them? Secondly, what are important aspects of information children find necessary to present? Finally, how able are they to represent this information in their drawings? Thomas et al. (1990) conclude that the last two factors have been ignored or underestimated in the past as suggested by the traditional theoretical approaches such as Luquet's (1913); Piaget and Inhelder (1956); Goodenough (1926); and Harris (1963). Their propositions that children's state of conceptual and intellectual development mirrored their drawings presentation ignores the fact that drawings reveal less than what children often know.

Certain drawing topics like cube posed difficulty to young children and perhaps was beyond their ability to comprehend due to their lack of knowledge, skill or having a guide to their conception of spatial relations (refer Figure 2.6). As Thomas et al. (1990) cautiously remind us; any inferences from the information in children's drawings about their knowledge and concepts has to be carefully made. They claim no research so far has accumulated enough data to allow a definitive and clear picture about what children's drawing can tell us. Perhaps one aspect of the gap that needs further research is to understand the concepts of their landscape environment and preferences as intentionally presented in drawings.

Many researches that involved children with specific designed drawing task have discovered findings that are unlikely to be elicited from children's "free" drawings. The final product of a drawing is conclusively affected by the context, content and instruction of drawing task. The above kinds of research have accumulated enough evidence to prove that children at the drawing stage of "intellectual realism" are far more able to present more through drawings than has been traditionally thought. The idea that children progress from "intellectual realism" to "visual realism" may not be thoroughly true. The earlier belief about the evidence for conceptual limitations of children is in actual fact due to executive limitations or preferences for certain types of drawings. Children below seven years old, for instance, prefer drawings that present information about the structure of the topic or the spatial relations of the array in which it is located. Drawing "view specific information" seem to appear more often among the older children of 7-year-olds and above . A summary in relation to this research statement for children's drawing development perhaps should acknowledge what children at each stage of development assume to be satisfactory in representing the subject of interest. Thus, various kinds of children's drawings production may not necessarily reflect their efforts to communicate ideas about certain topic, but just to represent the subject of interest adequately.

There is no clear evidence to explain the origin of children's preference for object-centred or viewer-centred drawings. Arnheim (1974) suggested that normal progression is developed on a certain basis: Children's perception and drawing develop from the general structure of the object then at later stage, children become more familiar with how the object might look from a specific viewpoint. An aspect of culture may also influence certain tendency towards view-specific pictures, for instance the "*visual realism*" prominent in Western art that may cast an influence in Western children's drawing (Hagen, 1985). This norm however, may also influence other children from other culture as a result of widespread effects on educational and information transfer through media and other technological means over many years (Lowenfeld and Brittain, 1987, pp. 353; Alland, 1983; Wilson and Wilson, 1987).

It can be summerised that children are capable of presenting various information through their drawings. In drawing development, early drawing are "symbolic representations of the genus to which the drawing topic belongs." Drawings that depicted object-centred information indicating the structure of the object and about the structure of the array of objects in the scene, are normally developed at the later stage. As for children older than seven years old, drawings which are viewer-centred are more preferred. The information children present in their drawings is very much influenced by performance factors, and this eventually has a bearing towards children's knowledge and types of information necessary for them to include as part of their drawings.

2.7 IMPLICATIONS OF THE DRAWING THEORY

This chapter on theory of children's drawing presents an overlayering of ideas and many conceptual views. The purpose of this section is to provide a concise review and discover implications of the definition, approaches, and views resulting from reviewing the psychological context of children's drawings.

Through psychological theory, the drawings were seen, examined, and analysed for most part governed by the psychological approach at two different but interconnected levels: methodological and analytical. Judging from the broad research aim and objectives, it seem that *clinical-projective* and *artistic approaches* are likely will be able to serve for specific purposes in this research compared to developmental and process approaches as discussed in the earlier part of this chapter. However, understanding all theoretical approaches towards drawing will serves to guide an analysis and interpretation of drawings better. In the past, only a few environmental design researches have explored and used children's drawing as a core method to serve their purposes in answering certain research questions (see Chapter 3).

The theories of children's drawings explain some of the findings that are useful in environmental design research. This fact is valid enough to justify the need for planner and designer to utilise children's drawing in research on and with children by adapting the psychological approach. In doing so the planner and designer will be able to identify some issues that were not comprehended before. The main objective for such undertaking is to ensure that children's drawing can be a valid and effective method in the analysis technique and the findings elicited from it. With this better understanding, a more receptive attitude may lead to better finding that will eventually open the opportunity to link with the provision of children environment through planning and design. As a result, this may eventually lead to better children's environments that are effective in fulfilling the needs and preferences of children. Thus, in the framework of this research, it is important to clarify that drawings can serve like any other research methods as valid and effective tools depending on the aim, objectives and orientation of the reasearch.

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Chapter 3

A REVIEW OF METHODS FOR ENVIRONMENTAL RESEARCH AND DESIGN INVOLVING CHILDREN

3.0 INTRODUCTION

This chapter outlines many aspects pertaining to research methods on or with children and their environment. The first part deals with various methods of data collection that have been used by focusing particularly on environmental research and design involving children. A theoretical model of research design based on children's spatial cognitive development and developmental changes in children's drawings developed by Piaget is briefly discussed. It helps to clarify the research framework for this work in relation to children's developmental stages and how particular methods fit within each stage. The next topic looks specifically the use of children's drawings as a research tool from multidisciplinary approaches, their application and uses, form and task, and how they served the purpose of research. Finally, the conclusion summarises the appropriateness, the strengths and weaknesses of various methods discussed in the earlier part of the chapter.

There are many different methodologies for environmental research and design available and widely used to understand the quality of children's interaction with the environment. One of the aims of this literature review is to establish appropriate methods for the research of this thesis. In selecting appropriate methods, several aspects need to be taken into account such as 'cognitive development, social competency, personal mobility, autonomy and control' (Ziegler and Andrews, 1987). There has been growing concern to allow children to participate actively within their capacity in matters that affect their everyday lives (Hart and Moore, 1982-1983; Baresford, 1997; Hart, 1997; Matthews et al., 1999). Many studies have been made which investigate children's perception of environment.

In the planning and design of children environments, they are generally a 'powerless minority' (Cooper-Marcus and Moore,1976), have less input and are not usually as important as decision makers although they may be very active participants or users of facilities for instance the home or neighbourhood environment. Thus, the values of children have been under represented and neglected (Lynch, 1977). Sometimes the facilities they use do not cater for adults or can be in conflict (Valentine, 1996) if not separated. Children occupy

different space within the same environment as adults. Adults have believed their needs can be satisfied through provision of playground that fulfilled places for play (McKendrick, 1999). The home environment, playgrounds and other external spaces explicitly designed for children's activities are used in diverse and often unpredicted ways by children. It is resonable to suggest that children form and have different concepts about the environment around them and that within different environmental settings, children behave and react differently from adult users.

It is obvious from the reasons outlined above therefore, that different tools or methods are required in undertaking research with children as a population of subjects in order to establish how children form concepts of their landscape, and how they use and evaluate it. Some reseach methods may be practical to use with children but only serve certain purposes or are limited in utility. Some research methods that commonly suit use with adults may not be appropriate for children, and others may be specifically designed for use only with children. Studying children's relationships with their physical environment requires a different level of understanding of objects and events qualitatively that seek children's point of view (Cox, 1991; Smith, 1995) to deal with unbiased data interpretation. Eventually, the findings may help in answering the research questions so as to gain a deeper understanding and so enable comparison and generalisation to be made (Sixsmith, 1986). At the applied or practical level, the findings may also serve to guide formulating criteria, procedure and policies towards improvement of the children's environment (Cooper-Marcus and Moore, 1976, pp. 22). In categorising the questions of research in human-environment relations involving children, Ziegler and Andrews (1987) suggest three broad groups:

> ..... questions concerning children as users of the built environment - behavior, patterns of activities, and utilization of environmental settings and facilities; questions concerning children perception of the built environment - relating in particular to the development and formulation of the child's cognitive representations of environmental settings of different scales; and questions concerning children perception of environmental settings that focus on the child's evaluation and appraisal of environments - that is, on the nature and quality of children's attitudes towards given environmental settings. (pp. 302)

The objectives of research involving children and landscape is similar to the objectives of environmental research, i.e. ' to identify, utilize, and evaluate alternative appropriate methods and alternative research designs, for given populations with respect to given environmental settings, and given research questions,' (Ziegler and Andrews, 1987, pp. 302). The selection of particular methods for collecting and analysing data information are addressed only after the specification of the research problem, environmental setting, and subject population have been identified.

3.1 METHODS OF DATA COLLECTION IN RESEARCH INVOLVING CHILDREN

It was acknowledged that obtaining data about children and their landscape is not an easy task as it involves many different aspects and peculiarities. As an alternative, instead of dealing with children directly, an information on children's usages and preferences can be obtained from adults such as parents, teachers, or neighbours. However, this is usually done as an additional method for comparison purpose together with direct approaches querieing or observing children themselves.

Wells (2000) asked the mothers of seventeen children living in a poor urban environment, age range between seven and twelve years to answer a series of question to measure children's cognitive functioning or ability to form their attention using a tool called Attention Deficit Disorders Evaluation Scale (ADDES). The scale consist of naturalness scale of several spaces in the home that formed a basis of 46 questions answered by the parent regarding the child's bahaviour. The finding revealed that "greeness" of a home environment increased the level of cognitive functioning among the subjects. In a large-scale qualitative study on children's experience of urban area to elicit their fears and concerns, Wooley et al. (1999) carried out a quantitative survey of 1648 children age ten to twelve years old from twenty one towns and cities in the United Kingdom. Their findings were supported by additional survey data from group discussions with a total 428 children from twenty one schools. In research by Medrich et al., (1982), the information about children's activities after school is obtained through an hour long interview conducted with each children (aged eleven to thirteen years old) and alternatively supported by information obtained through questionnaires completed by the parents.

Interviewing techniques demands language and literacy skills and are not suitable for younger children but their physical behaviour can be directly observed. This observation if it is conducted in a structured manner may help to build in realibility and validity checks. A number of direct techniques have been used for eliciting children's topographical representations of the physical environment including pictorial sketches and drawings, maps constructed by children, modelling environments using toys, and verbal descriptions and reports (Mark, 1972). Verbal descriptions and reports require linguistic modes which are not fully developed in young children. Sketches and drawings and maps are only reliable for school age children between seven to twelve years old.

Other indirect techniques are direct observation of children's activities and verbal behaviour, followed by derived inferences as to the process underlying the observed behaviour, and way-finding tasks in which children's movements in response to a direction are observed, or children are asked a direction to locations (Blades et al., 1996). These two indirect techniques are usually used to elicit children's ability to communicate verbally. The tasks require children's ability to communicate and understand complex instruction. Thus, the application of method that demands linguistic and graphic skill is only suitable for eliciting an older child's or pre-adolescent spatial perception and is certainly inappropriate for the very young children.

3.2 THE MEASUREMENT OF CHILDREN'S BEHAVIOURS IN LANDSCAPES

The planners and designers of environment are interested in children's perceptions and usages of the landscape environment as the understanding of this relationship provides a useful guide for an effective design. Children's activity and behaviour are influenced by environmental perceptions and usages and suitable methods would be unlikely to be self-report or verbal feedback but direct observation of children's manipulation of concrete objects in their environment (Ziegler and Andrews, 1987).

The study of children's interaction with environment has been influenced by Piaget's theoretical model for the understanding and production of children's spatial perceptions and behaviour. Children's awareness and their environmental perception, environmental crisis (Barraza, 1999) within a specific environmental context can be measured based on the theory of children's development of spatial cognition and cognitive development (Piaget and Inhelder, 1967; Hart and Moore, 1973). Piaget proposed four major stages of children's spatial cognitive development in relation to capability to encompass formal, abstract dimensions; ability to understand symbols, development concept of object permanence, combining point and route, and reversing a route, etc.

Many studies of children's perceptions and representation of specific environments utilised a similar approach based on the theoretical foundation developed by Piaget, together with other methods like questionnaires, interviews, drawings and direct observation to ascertain or validate aspects of children's physical landscape in the findings. The spatial scales of landscape environmental settings for children's activity and experience are dependent on age. However, the nature of the landscape settings under investigation has less influenced on research methods on and with children compared to children's competency related to age group.

MEASUREMENT TECHNIQUE	CHILDREN AGE GROUPS			
A: SELF - REPORT METHOD	Infants	Pre-school	School Children	Adolescents
1. Survey Attitude Instruments				
Open ended questions			x	x
Directed questions			x	x
Likert scale			x	x
Semantic differential			x	x
Cognative mapping			x	x
Diaries - activity log			x	x
Photographic simulation		x	x	x
Games		x	x	x
Scale models		x	x	x
2. Interview Techniques				
Unstructured		x	x	x
Structured		x	x	x
Participant interview		x	x	x
Content analysis		x	x	x
Q-sort		x	x	x
3. Visual Graphic Techniques				
Drawings			x	x
Sketch maps			x	x
Aerial maps		x	x	x
Cognitive maps			x	x
B: NON-SELF REPORT				
4. Instrumental Observation				
Time-lapse photography	x	x	x	x
Still photography	x	x	x	x
Video taping	x	x	x	x
5. Direct Observation				
Behaviour setting	x	x	x	x
Personal space		x	x	x
Time sampling		x	x	x
Behavioural mapping	x	x	x	x
Structure observation	x	x	x	x
Specimen record (from parents)	x	x	x	x
Driving census		x	x	x
Walking census		x	x	x
Field trips		x	x	x
6. Indirect Methods				
Tracks		x	x	x
Records	x	x	x	x

Table 3.1 Various Measurement Techniques in Relation to Age Groups Appropriate for Environmental Research Involving Children.
Source: Adapted from Ziegler and Andrews (1987, pp. 330).

3.3 RESEARCH DESIGN IN RELATION TO CHILDREN'S SPATIAL COGNITIVE DEVELOPMENT STAGES

3.3.0 Sensorimotor Period (Infancy - From Birth to Age Two)

The sensorimotor stage (up to 2 years of age) is that during which the child defines his or her place in the world in terms of actions operative through tactile senses and manipulation of objects.At this developmental stage, children's range of environment for interaction is limited and controlled by others, typically home-based and indoors. Children develop the concept of object permanence as the existence of object is not determined by their presence visually. The only research methods suitable for use with this age is non-interactive or direct contact but must be observational in nature, for instance by using videotape, still photography or tape-recorders. It was suggested that a combination of methods is more appropriate for instance a structural interview with parent or caretaker prior to direct observation. Other indirect methods through investigation of aggregated records may also be utilised in the study of children's interaction with the environment.

There are many aspects of children's environmental interaction at this particular stage that have been researched into including: the impact of space and colour (Read et al., 1999), daycare design (Herrington, 1999; Trancik et al., 1995; Sanoff, 1989), health (Backett and Alexander, 1991), dirt play (Wood, 1993), developmental stimulation (Wachs, 1989), child care centre (Olds, 1989; Moore, 1994), playground environment and children's behaviours (Brown and Berger, 1984; Frost, 1989; Perkins and Antoniuk, 1999), disabled children (Murphey, 1989) etc.

3.3.1 Preoperational Period (Pre-school Children - age Two To Six or Seven)

In the pre-operational stage (between the ages of 2 and 7 years) children may acquire awareness of a few topological properties of space such as proximity, sepration, enclosure, surrounding and order; recognising home as a special place with strong emotional attachment and develop elementary notion of territoriality. This phase represents the transition between the stage of intuitive thought and behaviour and later stages which contain clearer evidence of organisation. Children at this stage have the ability to symbolically represent their external environment as their mental activity can manipulate without the presence of concrete phenomena. Athough children have acquired motoric competence, and basic graphic and linguistic skills these abilities are not compatible enough to rely on for research method. The study of their interaction with landscape environment has to be direct observation and through their manipulation of concrete objects.

Aspects of study with this age group included the ability to recognise and use landmarks (Blades and Medlicott, 1995; Biel, 1995), environmental mapping (Blaut et al.,1970), play behaviour (Laike, 1995), their use of outdoor environment such as parks (The Trust For Public Land, 1995), playgrounds (Slee, 1995), use of streets (Abu Ghazzeh, 1998), spatial competence (Conning and Byrne, 1995), psychiatric facility (Shepley, 1995), and garden (Whiren, 1995; Francis, 1995). A wide range of methods become available to use with children for data collection purpose including interview, movie camera techniques to observe the behavioural changes and direct observation of children in play area. Ziegler and Andrews (1987) however, place a higher value for observation technique for studying children's interaction and behavioural changes in their environmental settings as they note:

> Observaton, despite its cost, remain the best tool for evaluating place-and space-related variables for young children, and the nursery and play-group-based studies have the additional advantage that children can be observed doing what is both natural and constructive for them: manipulating concrete, play objects. (pp. 312-313)

In a study of children's use of streets, Abu Ghazzeh (1998) utilised various techniques each to suit different age groups from pre-school to middle childhood. For younger age group, he used thirty-eight one hour observation to record data on children's size, activity, location on street, posture, physical element used, and the nature of interaction among them. While documenting children's behaviour in the street, he also utilised photographic techniques (pp. 810).

It is clear despite the preference for observational approach with children as this stage, other method such as structured interviewing is found useful taking 'the form of probing around concrete stimuli, such as the environmental features themselves (ideally), or three-dimensional modes or photographs.' Within observation methods, behavioural mapping techniques allow the researcher to study the uses of specific places for activity classification and group types by age, gender or ethnicity (Coates and Sanoff, 1972).

3.3.2 Concrete Operational Period (School-age Children - Age Six to Thirteen Years of Age)

The concrete operational stage (between ages of 7 and 11 years) is marked by a maturing of the ability to represent environment and to recognise interrelationships of the topological properties in an intergrated system. Children of this age group are most studied in relation to their physical environments and behaviour. They use the outdoor environment more often, and as major users of playgrounds, and parks they have more freedom of choice, a wider range of accesible environments and places to be and can carry out activities they prefer more freely.

The subject area of interest that have been researched for this age group include the study of children's needs and experiences of nature (Kong, 2000); children's use of street as playground (Abu-Ghazzeh, 1998; Valentine and McKendrick, 1997), behavioural incidents (Shepley, 1995), children's gardening (Heffernen, 1994), outdoor activities in a suburban residential area (Raymund, 1995; Cooper-Marcus, 1995; Aeillo et al., 1974); children's environmental perceptions, expectations and concerns for the future (Barraza, 1999); children's perception and preference for play equipments (Cunningham and Jones, 1999; Peterson et al., 1973; Bishop et al., 1972); school playground (Moore and Wochiler, 1974); aspect of children's privacy (Weinstein, 1995); privacy and territoriality in the use of home (Parke, 1978) child-environment-activity relationships (Medrich et al., 1982); children's experience of place (Buss,1995; Hart,1979); children's use of place (Smith, 1995; Freeman, 1995; Moore,1986); children interaction in relation to classroom planning (Durlak and Lehman, 1974); children's preference for classroom layout (Rivlin et al., 1974); teacher-pupil interactions (Gump, 1978).

Many researchers like Haseltine and Holborn (1987), Hole (1967), Holme and Massie (1970), Moore (1986), Cooper-Marcus (1974b) and Hart (1979) for instance chose to utilise ethological or direct naturalist observation when studying children's use of their play environment of various settings. A study on 'Children at Play' conducted by the Department of Environment (1979) UK looked into children's play behaviour in residential area. It utilised 50,000 observation in sixteen residential areas in an effort to identify places where children play, their preferred activities and attitudes towards play activities. However, Lynch (1977) suggests that because of the scarcity of open-ended, naturalistic studies of how children use and value their spatial environment they are still needed.

Other techniques that depend on verbal and or graphic skills have been used by researchers. These include technique such as questionnaires, interviews, cognitive maps, and various other self-report techniques. In some case observation is supported by interview with children in documenting children activity in residential area. This approach was also adopted to establish design guidelines for outdoor play environments (Moore et al., 1992).

Byrant (1985) developed the 'Neighbourhood Walk', a kind of fieldwork trip followed by structured and open-ended question in the interview to elicit meaningful cues regarding children's experiences in their home neighbourhoods. This research was designed ' as a procedure to assess the social context of developing children and to provide a means to study the relation of their sources of support to their social-emotional functioning,' (pp. 1).

Map drawing techniques depend on children's ability for "concrete operational" thinking and are likely to be applicable for use with older children of twelve years and above. Ziegler and Andrews (1987) cautiously raise the question as to whether children's perception and knowledge can be represented accurately by means of their drawing:

> While younger children can and do draw pictures of their physical worlds, it is questionable whether such pictures and diagrams can be relied on to reflect accurately children's environmental perceptions and knowledge. Individual differences in drawings are noncomparable. (pp. 315)

Photographs of places or objects in certain environmental settings can be utilised in documenting children's behaviour (Abu-Ghazzeh, 1998). They are also useful in getting feedback for visually preferred objects or settings of obvious characteristics that children find difficult to describe verbally through lack of vocabulary. The use of photographs to generate straight forward verbal response has proved an appropriate approach for working with young children. Paterson et al. (1973) and Bishop et al. (1972) used photographs of play equipment using paired comparison and rank order formats during personal interviews to establish children's preferences for different types of playground equipment. The preference scale obtained from the two different formats are identical, reliable and valid, and are then used to check probability of use of play equipment measured by hidden time-lapse camera. Both personal interview and observational data produced high correlations. However, the differences in rates of use or preference among alternative equipment can easily be noticed through direct observation, but not by the scale. When a similar photographic method was used with adult designers, their preference differed significantly from children's preferences. Other researchers have also used photography to record places where interactions between teacher-pupil occur in school setting (Gump, 1978).

Other research which studies children's concept of privacy (Weinstein, 1995) suggests that observation is more reliable compared with interview or self-report in revealing the use of facilities by children. Thus, in studying children in environmental settings, both observation and an interview seem to be more appropriate method for school age children. Hart (1979), in study of children's experience of place, seeking information relating to children's spatial activities, place knowledge, place values and feeling, and use of place, utilised various methods especially observation and interview, where as Medrich et al., (1982) relied on personal interview in their study of child-environment-activity relationships; children'a activity, home, and play opportunity in relation to street and other accessible places near home (Abu Ghazzeh, 1998). The study of children's concepts of privacy by Wolfe (1978) solely used an interview method in collecting the data that yields various categories in response to meanings of privacy.

Taylor et al. (1998) investigated children growing up in the inner city by observing 262 children and recording their everyday activities, access to adults at sixty-four urban public housing outdoor spaces on four separate occasions. A study on how two different types of playgrounds: contemporary and traditional effects the pretend play behaviour of 80 children was conducted through observation to record the nature and temporal occurence of the child's play behaviours (Susa and Benedict, 1994). Durlak and Lehman (1974) and Rivlin et al. (1974) used observational techniques to study the effect of classroom planning on activity patterns. Questionnaires were used to collect additional information on teachers and children's perceptions of the environment for comparison purposes. The used of both observation and questionnaire techniques helps in eliciting both quantitative and qualitative informations to explain and compare different sets of environments. Rivlin et al. (1974) used modelling techniques for children to design their preferred environment as a concrete stimulus that later helped direct questionnaire sessions to be more reliable in eliciting children's environmental preferences. Brunetti (1972) used both observation and questionnaire techniques in studying noise, distraction and privacy in conventional and open school environments.

In dealing with children at the stage of pre-adolescent, it was obvious many researchers opted for direct methodologies that do not depend on literacy skills. Preferred techniques include observation and personal interview especially when subject matter has to do with children's environmental perception and their usages of the facilities. These methods though tedious, time-consuming and costly require no reading and writing ability in the child participants.

From this review, it is obvious that direct observation, either by personal observation or through photographiy are the most widely utilised in environmental behaviour research involving school age children. The use of other methods have also proved successful. Investigation of children and their environment normally require combinations or multiple research methods. The combination of research approaches ranging from experiment and observation is yet to be explored and utilised in environmental research. In this respect, Ziegler and Andrews (1987) point out:

> In dealing with children's uses of and preferences within the built environment, the opportunity for combining experimentation and observation is often overlooked. Such two-pronged research strategies have potential advantages over observation alone: They are likely to be more economical because they focus the subjects' attention/ behavior on the central interests of the research and may indeed reduce the total amount of "pure" observation time that might otherwise be required. (pp. 324)

3.3.3 Formal Operational Period -Adolescents (Age Twelve and Above)

The formal operations stage (from 12 years of age) is marked by an increasing ability to use abstract spatial concepts which involve the use of symbols and transformations. Topological transformations, for example, involve rules of proximity, separation and sequence, geometrical transformations involve metric relationships which coordinate space with respect to a system of outside reference points.

It has been recognised at this stage, children are closer to becoming adult, and have cognitive ability fully developed in capacity for formal, abstract and relational thinking. Their ability to comprehend complex tasks opens up the opportunity for using various research methods that are suitable for use with adults. A wider range of research is now possible dealing with adolescents such as environmental knowledge and perception by cognitive mapping (Kosslyn et al., 1974; Lynch, 1977). This opportunity develops as they have acquired certain skills in graphic and literacy production and enables for example the administration of pencil-and-paper questionnaire, and production drawing of maps and diagrams. Self-reports questions may employ both direct and indirect approaches and they are less costly in time and money than direct observation. However, Lynch (1977) used systematic observation, interview, questionnaire, and map drawing in the study of children's behaviour in urban public spaces of four different cities.

Other research which involved an understanding of gender difference in degree of personalisations and social emphasis with the childhood pyhsical environment has used essay writing technique (Holahan, 1978). A study of children's place behaviour by Hart (1979) utilised various experimental research methods including observation, modelling, drawings or sketches and questionnaires. It is clear that having the linguistic, conceptual, and graphic abilities, many aspects of children's environmental relationship at this stage can be studied using a wide range of research techniques such as observation, questionnaire, written self-report, and graphic presentation.

All the methods for environmental research and design involving children, their purposes of study and examples of researchers involved as discussed above can be summarised in the following table:

	RESEARCHERS	METHODS USED	PURPOSE OF STUDY
1	Abu-Ghazzeh (1998)	Observation Structured interview (both mother and children) Behavioural mapping	To understand children's use of the street as a play in Abu-Nuseir, Jordan. The use of street as playground. Number of user and length of stay. Age of users and types of activities.
2	Aeilo et al. (1974)	Walk through strategy. Other method include observations and interview with some of the school age children in the study area.	To document children's outdoor activities in a suburban residential area. The method employed 30 trips, 2 hours each, over 3 months and sampling to cover all times of the week.
3	Barraza (1999)	741 children's drawings from 3 schools in U.K and 8 schools in Mexico.	To evaluate children's environmental perceptions, their major expectations and concerns for the future. To identify the effect of culture and school ethos on the formation of environmental perceptions in children.
4	Betchel (1974)	Use of mechanical instrumentation in addition to observation (cameras, tape recorders)	Relating infants' environment to behaviour.
5	Bishop et al. (1972); Patterson et al. (1973)	Personal interview by showing children the photographs of existing pieces of play equipment. Asking children to state their preferences intwo different formats: - paired comparison - rank order The use of photos makes verbal response brief and simple. Some photographs used for designer to predict children's preference with remarkable low accuracy.	A study of 8 year old children's perception of school playground equipment. The two formats produced identical results, and reliable and valid scales of preferences. The preference scales were used to predict probability of use of each piece of equipment - then measured with hidden time-lapse camera on the playground.
6	Brown et al., (1987)	Children's own drawings.	To reveal children's changing perceptions of nuclear power stations over time.
7	Brunetti (1972)	- observation - questionnaire	To study noise distraction and privacy in conventional and open school environments.
8	Cadwell (1968)	Direct observation Inventories of amenities and facilities available.	Home-based infant-environment studies.
9	Chase et al. (1974)	Questionnaires Video recording Still photography	The use of three-dimensional play materials designed to enhance development by infants and their caretakers.
10	Chawla (2001)	Approach with multiple methods: maps, observation, individual interviews with children, parents, and local officials, guided tour.	An 'action research' to gather information that could validly inform policy and practice, as well as assemble a network of people who would support initiatives to improve the urban fabric for children; integrating children effectively into Local Agenda 21.
11	Coates and Sanoff (1972)	Behavioural mapping	To describe behaviour density and diversity and to yield profiles of activity types and group types.

	RESEARCHERS	METHODS USED	PURPOSE OF STUDY
12	Cohen et al. (1978)	Combination of architectural inventories of physical context, site built facilities, and furnishing. Observations of the spatial behaviour of children and staff. Focused interview with facility planners, children, and parents. Observations were recorded with behavioural maps, sketches and photographs.	To identify key design features that facilitate chld development.
13	Cohen and Wingererd (1993)	Interview followed by the task: - picture discrimination - a picture arrangement - a picture comprehension task.	Children and environment: Ecological approach among pre-school children. To examine ecological awareness among pre-school children (88 children age 3-5 years old, 45 boys and 43 girls.
14	Cooper-Marcus and Moore (1976)	Observation	To study children use of space outdoors, around houses, and in parks, streets, and lanes.
15	Depeau (2001)	Multi-method: interview, questionnaire, sketch map, and guided neighbourhood tour that focused on young people aged between 9 and 19 years old.	To understand the factors influencing young people's (from different cultures) autonomy and their perceived risks when moving around the city.
16	Devlin (1994)	Drawings 126 children age 6-12 year old and 88 adults were asked to select their preferences based on 2 sets of drawings of houses. Interviews	Children's housing style preferences: regional, socio-economic, sex, and adult comparisons. Children and adults view the world (housing world) differently. Children's housing preference.
17	Durlak et al. (1972); Durlak and Lehman (1974)	Direct observation (data on furniture layout, the proximity of teacher to students numbers and sizes of students clusters etc.). Questionnaires (provide information of teachers, principals, and students' perception of the environment.	To investigate aspects of open school-person interaction. Numbers of people occupying spaces at varying times group composition, activities, amount of movement, number of tools being used. To describe the general structure of activity settings, teaching style, and student activities.
18	Ellis (1972); Heron and Frobish (1969); Wuellner et al. (1970)	Observation using camera in laboratory testing	To measure frequency of use of items in the room, time on the apparatus.
19	Essen et al. (1978)	Interview	Relationships between health and achievement indices and housing history, including indices of crowding, amenity, and tenacy type.
20	Evans ,Saegert and Harris (2001)	One-on-one interviews with children aged 8-11 years old with their mothers.	To investigate the relationship between residential crowding and mental health among children in low-income families.

	RESEARCHERS	METHODS USED	PURPOSE OF STUDY
21	Gaster (1991)	Literature (archival data, autobiographical method). Interview.	Urban children access to their neighbourhood: changes over three generations. To determine changes in children's use of local public space between 1915-1976. The age at which children were first allow outdoor without supervision. The number and quality of settings visited. The number and nature of environment obstacles. The number and nature or paren-imposed restriction. The number of professionally supervised activities undertaken.
22	Gump (1978)	Use of photograph in school settings	To record the location of teacher-pupil interactions; where a child sits and influence the interaction.
23	Hart (1979)	Number of research methods in an experimental fashion. - observation - interview - colour photograph - aerial photograph	To obtain information relating to children's spatial activities, place knowledge, place values and feelings and place use. Eliciting place knowledge of the town. Emphaise frame and setting.
24	Hefts (cf. Ziegler and Andrews, 1987)	Interview	To determine the level of interior and exterior background noise as well as the activity level of the home.
25	Hole (1966); Cooper-Marcus (1974a, 1974b); Rhodeside et al. (1970)	Observation Interview Detail analysis of site utilization from layout plans and site inspections Pre-panned route Walked through Driven through at pre-scheduled intervals.	Studying children's play behaviour in high and lower-density housing estates.
26	Ittelson et al. (1970)	Behaviour mapping	The technique of describing the users by age, gender, and sometimes ethnicity, and the uses of specific built sites.
27	Kinsman and Berg (1979)	Direct observation without a camera in two play areas of a nursery-kindergarten room.	To record identity of child in the setting, the size and composition of the group, the type of play, and the effective expression of each child. To document changes in group size, sex ratio, and type of play activity (relevant/ irrelevant; integrative/ uninvolved), the spatial arrangement of activities and effect.
28	Kosslyn et al. (1974)	Map drawing and combination with observation.	Examining adolescencents' environmental knowledge and perception.

	RESEARCHERS	METHODS USED	PURPOSE OF STUDY
29	Lindholm (1995)	Children to draw the school yard on a piece of paper size AO format. Describing the activities that took place in the different parts of school. Depict their dream school yard on a G8 size paper. Touring school yard (photo taken at places of activities). Interview with children age 9-12 years old.	School yards: the signifcance of place properties to outdoor activities in schools. Sufficiency of outdoor activities. Preference for outdoor teaching activities. Good vs. bad school yard.
30	Loo (1978)	Observation	To rank a group of preschool children on several characteristics (hyperactivity, behaviour disturbance, and motor inhibitation).
31	Lynch (1977)	Systematic observation to record children's behaviour in public spaces (age 12-14 years growing in cities of four different nations). Individual map-centred interviews were to precede the observations, both in time and emphasis. In the interview, children were first asked to draw a map of their area of the city and then asked a series of questions about places and activities, with reference to the maps.	To record children behaviour in public spaces in urban areas.
32	Maxey (1999)	Fieldwork conducted in two case study.	To investigate the spatial and social places of children's play and the role of playgrounds as sustainable places.
33	McKechnie (1977)	Questionnaire (105 children grade 4 to 10)	Using ERIC (Environmental Research Inventory for Children) to measure children's environmental dispositions as they are reflected in belief, attitudes, and values. Eight content scale, including such dimensions as urbanism, environmental adaptation and the need for privacy.
34	Medrich et al. (1982); Berg and Meldrich (1980).	Questionnaires (parents fill out a questionnaire). Participant-interview Group administered questionnaire (grade 9 age 14-15 years old) Student-produced area maps (grade 12, aged 17-18 years old)	Study of the out-of school activities of six-grade in Oakland, California. Emphasise activity observed within the frame and children environmental settings. To explore chilld-environment-activity relationships.
35	Moore (1974b)	Systematic bservation Children's drawings Interview On-the-spot user feedback Pictorial technique (photograph of locations or objects in a particular environmental settings)	To compare children's different usage of layouts and sets of play equipment. For observation of children activities in order to assess the design of play equipments in school yard.
36	Moore and Wochiller (1974)	Drawings	To elicit the childre preferences between traditional and modern play structures.
37	Parke (1978)	Observation	Negative effects of noise as an over-stimulator of infants. Studies of privacy and territoriality in the use of home by pre-adolescent children.

	RESEARCHERS	METHODS USED	PURPOSE OF STUDY
38	Gad,1973 (cf. Ziegler and Andrews, 1987)	Interview	Relationship between crowding and lowered academic achievement.
39	Piaget and Inhelder (1967); Hart and Moore (1973)	Children were asked to build in a sand-box a model of their built and material environment - the school buildings, roads, rivers; to trace in the sand their route from home to school; to draw the model; and to reorient the model after the school building was rotated 180 degrees.	To test children's understanding of spatial relations in the physical environment. Used as a tests of children's perceptions and representations of specific environment and behaviour settings.
40	Rivelin et al. (1974)	Scale model (children grade 2,3, and 4, aged 7-10 years old) to furnish scale model to represent the existing open class room and as they would like to see it.	Children ability to translate their images of the room to the model. To answer detailed question about the room. The use of concrete stimuli was appropriate for the age group from a developmental theory perspective. The initial task of translating to the scale model an observable environment provided a means of validating the methodology before applying to elicit children preferences. Utilising a concrete stimulus such as the child-designed model made direct questioning of young children more reliable than attepmting to elicit information about a subject that lacks such as concrete referent.
41	Rohe and Nuffer,1977 (cf. Weinstein and David, 1987); Gump (1978)	Observation	Behaviour study The effect of increasing (spatial) density. Sheltering activity.
42	Rohe and Patterson (1974)	Behaviour observation using stop-frame movie camera technique	Behaviour of 12 children aged 2-5, under varying level of density and resources. Raters (whose inter-realibility was established) then recorded every instance of four categories of behaviour (social interaction, participation, constructiveness, use of area).
43	Rothenberg et al. (1974)	Activity sampling Behavioural mapping Individual tracking (in behavioural settings) Interviews with children.	To describe the site use at three different kinds of playground.
44	Salvadori (2001)	Children design space using a three-dimensional model with movable elements.	Children can become active agents in constructing a better environment for themselves. Given the opportunity and the tools, children can be designers and leaders in environmental transformation.
45	Scanlan,1980 (cf. Weinstein and David, 1987)	Observation Mental maps (with working-class children in apartment house neighbourhoods in 5 cities around the world).	Maps were analysed for the presence/ absence of particular features, such as cars, houses, and stores. Observational data to describe behaviour settings (public spaces and playgrounds), playgroup somposition, activities, and the ratio of adults to children in outdoor settings.

	RESEARCHERS	METHODS USED	PURPOSE OF STUDY
46	Sebba (1991)	Questionnaire for students (21-30 years old), teachers, school principals, and nursery teachers (25-50 years) Questionnaires for children age 8-11 years old on "What is your favourite place?"	The landscape of childhood: the reflection of childhood's environment in adult memories and in children's attitudes To investigate the environmental preferences and the nature of the experiences of being outdoors as reflected in adult's (N=198) recollection and in children's (N=174).
47	Seibert and Anooshian (1993)	Sketch maps of familiar environment. Interview Subject: 21 first grader (6-7 years); 25 fifth grader (10-11 years); 34 university students (18-31 years old); 16 older adults (66-86 years old).	Indirect expression of preference in sketch maps. A dissociation between indirect (map drawings) and direct (specific recall) approach to expressing preferences. To establish categories of preferences (like, neutral and dislike).
48	Smith and Connolly (1972); Jones (1972); Wright (1960); Sackett,1978 (cf. Ziegler and Andrews, 1987); Simm and Boyer,1970 (cf. Ziegler and Andrews, 1987).	Observation	Observing human behaviour and social interactions from ethological tradition. To produce extensive "behaviour dictionaries" or "taxonomies" which are valuable for comparison and classifications.
49	Spencer and Darvizeh (1995)	Cognitive mapping	Children's ability to follow simple plans of rooms, with some assistance in initial orientation and allirnment. Children's ability to recognise and use landmarks.
50	Stea and Blaut (1973)	Aerial photo	To find out children's capability to recognise fairly sophisticated symbolic place.
51	Susa and Benedict (1994)	Observation (follow the child using the behavioural categories). Questionnaire Interview Subject (38 girls, 42 boys age 4-11 years old).	The effect of playground design on pretend play and divergent thinking. Pretend play would occur on the contemporary than the traditionally designed playground.
52	Taylor et al. (1998)	Observation (observer walked from one space to the next following a route map designed to lead them past each space one time) Coding play Coding assess to adults	Growing in the inner city: Green spaces as places to grow. What do children do outdoors. Does vegetation influence children's outdoor play? How much access to children have to adults, and does vegetation influence children's access to adults?
53	Thomson and Brorowiecka,1980 (cf. Ziegler and Andrews, 1987)	Walk through, observations and interview with some of the school age children.	To arrive at design guidelines for outdoor winter play environment.
54	Tranter and Pawson (2001)	Formal questionnaires administered to parents and their children aged 9 to 11; group interviews (8-10 children)	To provide a case-study of variability in children's independent access to their local environments. It also explores the role of social traps in impeding the creation of a more sustainable, child-friendly city.

	RESEARCHERS	METHODS USED	PURPOSE OF STUDY
55	Wachs et al.,1971(cf. Ziegler and Andrews, 1987)	Structured interview Direct observation	To examine the relationship between infants' social and physical home environment and their cognitive development.
56	Weinstein (1982)	Self report Interview	Self-report for privacy not reliable compared to observation.
57	Weinstein and Pinciotti (1988)	Observation of school yard before and after construction involving the entire school population of 400 children from kindergarten to grade 3 children aged 5-9 years old.	Changing a school yard intention, design outcomes. Playground design, how it impacts on children's behaviour. Age and sex difference in play behaviour. Behaviour observations Frequency of uses Predominant categories of behaviour. Sex differences in play behaviour Age differences in play behaviour.
58	Wolfe and Laufer (1974); Wolfe (1978)	Open ended questionnaire Interview	Children (5-12 years old) concept of privacy. Yield user-generated response categories 39 coding categories about the meaning of privacy.

Table 3.2 Various Methods Utilised by Researchers in Environmental Design and Researches Involving Children for Different Purposes.

3.4 THE USE OF CHILDREN'S DRAWINGS AS A METHOD IN ENVIRONMENTAL AND DESIGN RESEARCH

3.4.0 Research Context

Since children's ability in communication will be affected significantly by the context and environment in which the research encounter takes place, a research technique using drawing may appropriately take place during an art class in school. The familiarity which the surrounding class room and activity helps children to communicate effectively and at ease, without any sign of tension (Barraza, 1999).

A visual methods relevant to use with young children (Hart, 1997, pp. 162), as well as older children (Sheat, 1993; Sheat and Beer, 1989) is drawing. It is familiar, fun, and cheap and gives the opportunity for children to freely express themselves. The individual drawing is seen as an effective tool to initiate and stimulate further discussion or expression, as well as powerful tool for evaluation purposes (Barraza, 1999). Through drawing, children can become more sensitive of the visual qualities of the environment around them and give the opportunity to act and modify in several ways as they wish. Despite the advantage of using drawing as a method, there are some problems due to fact the children's limited skill may

prompt them to using streotype images of object they know how to draw. Some children may not find drawing an interesting mean to express their ideas, thus instead of being seriously involved, they take it for granted or become reluctant to participate.

Children's drawings in most cases have been suggested as falicitators to "support" other research methods (Levin, 1994; Hart, 1997; Backet and Alexander, 1991) for instance the data collected from drawings may supplement an interview. Children's drawings have been used in a number of other ways in research as they are a common part of children's activity. Rubeinstein et al., (1987) described drawings as - 'windows in children's perceptions of the social world.' Children's drawings can also provide a 'window' into their thoughts and feelings, mainly because they reflect image of children's mind (Thomas et al., 1990). Researchers dealing with children's relationships to environments from actual and retrospective points of view (Sebba, 1991), or remembrance of landscapes past (Cooper-Marcus, 1978, 1995), sensory childhood experiences through memory (Siebenaller, 2001) have used drawing sketches with written statements in order to "establish" landscapes of childhood. Seibert and Anooshian (1993) investigated children's expressions of environmental preferences of familiar environments using their drawings. Their findings have suggested a dissociation between indirect approaches through drawing of sketch maps and direct approaches through specific recall. Certain research acknowledges the limitation posed by drawing's in research especially where abstract concepts are involved. Backett and Alexander (1991) and Willats (1985, 1997) remind us of differences in children's ability and drawing's processes which may result in omission of drawn items.

Another technique of using drawing in research is to combine it with written accounts to compensate for the problem of differences in drawing ability affecting the data collected (Oakley et al., 1995). They found that children's drawings were a valuable research tool in collecting data from children. It is expected that children have certain values attached to their external environment and will be able to express these in certain ways (see Chapter 2). Children's views of relationships with their environment can be reflected by the uniquely narrative qualities of their drawings. Malchiodi (1998) observes on 'interpersonal aspects' of children's drawings:

> Drawings have the ability not only to reflect children's unique personalities but also their unique perceptions and experiences with others as well as the influences of others. It is important to remember that drawings are not made in isolation from the world; parents, significants others, community, and society do effect the content of children's expressive work, and these interpersonal aspects are often included in their drawings. In this sense, children's drawings are uniquely individual narratives about themselves within the world, reflecting not only personality, but also personal observations, values, judgements, and perceptions of others and relationships to family, schools, community and society. (pp. 192)

Moore and Wochiler (1974) acknowledge that the use of drawing among five to eight year old children could elicit their play structure preferences. However, some highly utilised play facilities with low visibility did not surface though through observation proved otherwise. Therefore although the use of the drawings has proved useful, other methods of informal and systematic observation, structured interview may need to be incorporated or combined in an approach.

3.5 THEORETICAL FRAMEWORKS FOR USE OF CHILDREN'S DRAWINGS AS A METHOD IN ENVIRONMENTAL AND DESIGN RESEARCH

The study of perceptions of the environment brings together two traditions of investigation: firstly the cognitive mappers, exemplified by Lynch (1966), and secondly the developmentalists, exemplified by Jean Piaget and Inhelder (1967). Many children grow up in cities (Hebert and Thomas,1990, pp. 290) , their world is an urban world which enlarges from home, to locality, to city as they move from childhood to adulthood. This spatial learning experience of children has attracted a considerable amount of research which often draws upon the four-phase developmental framework of Piaget and Inhelder (1967) i.e. sensorimotor, pre-operational, concrete operational, and formal operational periods as discussed earlier in this chapter.

3.6 METHODOLOGICAL APPROACHES USING DRAWING

The 'constructivist' approach holds that children's spatial learning of the environment is based on their experience (Hebert and Thomas, 1990). Hebert also reported that a study by Piche (1981) on children's intuitive and systematic approach to spatial learning ties with Piaget's scheme of development. First, children define space entirely in terms of personal actions at the stage of egocentric confusion of self and environment followed-up by practical apprehension of Euclidian space with positions for self and objects like landmarks. However, children's cognitive schemes were rigid or not reversible.

Stea and Blaut (1973) used children's drawings to study their ability to comprehend routes from home to school. Younger children normally draw straight lines in indicating route while older children present more varied and accurate directions. Lynch (1966), Ladd (1970), and Appleyard (1970) demonstrated the potential of sketch maps which gave some insight into the form as a result of spatial awareness of the city and neighbourhood.

Canter (1977) suggested 'sketching' as one of the procedures available for identification and description of a place that can be used as behavioural research methods for environmental design. The sketching method is normally utilise in the context of peoples ability to draw from memory places they have experienced to establish important components or features of the places of interest. The designer can benefit from this technique as it helps elicit spatial arrangement, pattern of activities that form part of the "place concept" for use in design. As Canter (Ibid) describes further: 'perhaps the greatest potential is for exploring sketches made of places to be created in the future, or of "ideal" places,' (pp. 160).

There are a few studies using children's drawings as a tool in child-environment interaction that have focus on the school-age or middle childhood period. These include Robin Moore's study of the children of a three different cities neighbourhoods of Notting Dale, Bedwell, and Mill Hill in England, involving ninety six children with equal number of girls and boys in their middle years (eight-to-twelve-year-olds), (Moore, 1986). An earlier study involved in series of investigations into children's evaluation of school playgrounds in America (Moore and Young, 1978; Moore, 1980a); various studies by Matthews (1984, 1985, 1987, 1992) on research techniques with children age range from six to fifteen years old, gender cognitive differences, and children's geographical understanding of large-scale environment; Hart's (1979) study on children experience of place and children's participation (Hart,1997); Barbey's (1974) study on children's home concept; Lynch's (1977) study of adolescent children from four different cities; and Barraza's (1999) study focused on children's environmental perceptions and their attitudes towards environment. Given the relatively comprehensive nature of the drawing method utilised, it is worth describing some relevant studies and each of the above mentioned studies in more detail although some of them are considered relatively 'old' literature.

3.6.0 Establishing Children's Concepts for Place

Moore's study 'Childhood Domain' (1986) is comprehensive in many respects. The aim was to investigate the children-environment relation with the urban neighbourhood settings. In Moore's work, methodological aims required a multifaceted approach as data about childrens interaction with their larger environment is both extensive and intensive. In his studies, Moore used children's free sketch drawings in addition to personal interview, field trips and an interview with the child's parent(s). He started with drawing exercises for all ninety six children age nine to twelve years old with an equal number of boys and girls. Only five to six children participated at any one time working separately in a designated quiet space to

discourage copying from each other. Each child was provided with a standard 18" X 24" white catridge paper with a black, medium size marker and a set of coloured wax crayon as a media to work with.

The study was focused on a specific environmental setting in a neighbourhood - favourite places within the home range by asking: "*can you please make me a map or drawing of all your favourite places - where you go after school or at weekends, including in summer - around your home, in the neighbourhood where you live.*" (Ibid., pp. 268) The children took between twenty minutes to an hour to complete the drawing task. While the drawing was in progress the researcher took the opportunity to discussed the content of children's drawings in order to help at the later stage of analysis. Children's explanations about their drawings were very useful in helping understanding of what appears in the drawing. Otherwise, drawings may be subject to speculation and invalid interpretation. Toward the end of the exercise the children were asked if they had included every important thing in their drawings.

Moore's basic methodological approach towards drawing is descriptive and based on memory and experience and the children's ability to recall and presented on paper using the graphic skill they have. Certain theoretical assumptions are made about the drawing method as Moore (Ibid) clarifies:

> A key assumption in relation to the drawings was that they were a valid representation of each child's most vividly recalled favourite places, and that together they represented a valid 'turf map' for each study site. Obviously, the drawings demonstrate a wide range of graphic skill on the part of the authors. A second important assumption, the effects of good and poor graphic differences cancelled each other out across the whole sample. (pp. 270-271)

The drawings were later analysed by coding the contents based on various sets and categories that had been developed earlier for other projects, followed by computer tabulation. The drawing task was followed by personal interview for fifteen to twenty minutes. This interview served the purpose for selection of twenty five percent of locations presented in the drawings for field trips with children.

Apart from drawings, Moore used other methods to collect data information relating to children's specific interaction with their surroundings, activities, place values and child development. The idea started with an effort to find out the actual activity children were involved with, the place, time frame, environmental features or facilities and people involved. The field trips technique was selected on basis of drawing activity outcomes and personal interview and was seen as an important method in establishing more refine qualitative information that was significantly different for each child. The field trip technique was used

with few children because it was not possible to cover the very vast scale of children's environment or territories that contain each and every specific place setting as portrayed in the drawings. Between twenty minutes and two-and-a-half hour, the field trip proved most informative as it covered the ground shown on the drawing and sometimes much wider territory. The trips were used to 'capture' the "children's interaction" with the environment. Both drawings and photographs could later be used as a checklist for the places, pathways, peoples, objects and activities, significant features and spaces list. Once the field trip was over, an interview with parent(s) immediately followed that lasted between fifteen and forty-five minutes.

It was found that the drawings showed a higher number of places and place elements (723) compared to responses from interviews (319). The drawing produced much richer data, and contained greater diversity and number of elements representing a richer "realistic" picture of the physical environment as compared to the interview. However, the interview provides a different set of information in relation to children's interaction in the social and physical 'hidden dimension' of places.

Through drawings children were able to represent specific place elements (e.g. trees, pond, shrub, hills, topographical change etc.). With verbal limitations, a single general term may be used to present broad territories or elements instead of differentiating into various possible place elements. The findings from drawings and interviews formed part of important numerical data supported by other data in guiding and highlighting certain aspects of the topics. The interpretation of results can be very useful in search for better understanding of children's interaction with the environment qualitatively.

The core methodology used by Moore is the extensive use of children's drawings, other methods of personal interview and field trip visit adding more variety to the data information. The study emphasises children's use of place and is activity centred. It investigates children's interaction with environment, favourite places, their usage in relation to activity, people and time-space, and on children's territorial range. The general overall approach was influenced after Moore's investigation on children's interaction with urban neighbourhood environment, Hart's study children's experience of place and Lynch's work on urban children.

3.6.1 Children's Concepts of Ideal Environment

In a study conducted by Barbey (1974), she solely used children's drawings as a data collection method to analyse "home concepts" from the anthropological perspective. Her work involved qualitative interpretation of only five children, three boys and two girls aged between eight to fourteen years old (Figure 3.1). The theoretical framework is based on Piaget's (1966, cf. in Barbey) theory of children's psychology that "children are not influenced passively by the physical environment but act upon it in several ways so as to modify it and make it react," (Ibid., pp. 144). The investigation is based on two anthropological hypotheses. First, many of the children's values were anchored in the "deepest life instinct." Second, the dominance of efficiency as criteria in society (such as the attitude that better life quality can be had on the basis of technological progress and economic growth) are ambiguous because they may to certain extent deprive quality of actual life; a symtomic failure of present housing system.

To aid in the study, the children were given a drawing task to design an "ideal home' after having played at a "natural" site building houses.The intention was to find out how the sensuous spatial experience of play activity directly channeled into the drawings. It was found that play activity had a profound influence upon the end products. Through imagination, drawings revealed the important aspects of home concept manifested symbolically in the form of dwelling components. The analysis of subjective concepts of home was carried out by interpretation that emphasised similarities and differences of spatial and symbolic organisation of spaces. Children's concept of home was represented as various habitats including surrounding features. Desire for but also rejection of dependence of the adults world was also communicated. Environmental characteristics such as dominance, defence, care, familiarity, comfort and pleasure. The transfer of experience of play in the outdoor environment prior to drawing happened at two levels. First, it was expressed in a practical way by suggestions of securing food, rest and hygiene. Second, through affective means with presence of favourite people, animals and various features.

Barbey's investigation is highly relevant and informative although conducted with a very small sample of subjects. The use of drawings method demonstrate children ability to portray quite diverse and ingenius concepts of home. Thus, although the data from drawing is informative but highly subjected to adult interpretation if other methods are incorporated in the research design, it perhaps helps to offer means for cross-checking the reliability and validity of the findings. The investigation using solely children's drawing as primary method could lead to suspicion as it 'leaves a great deal of room for the pre-emption of children's ideas by adult interpreters' (Hart, 1997, pp. 162).

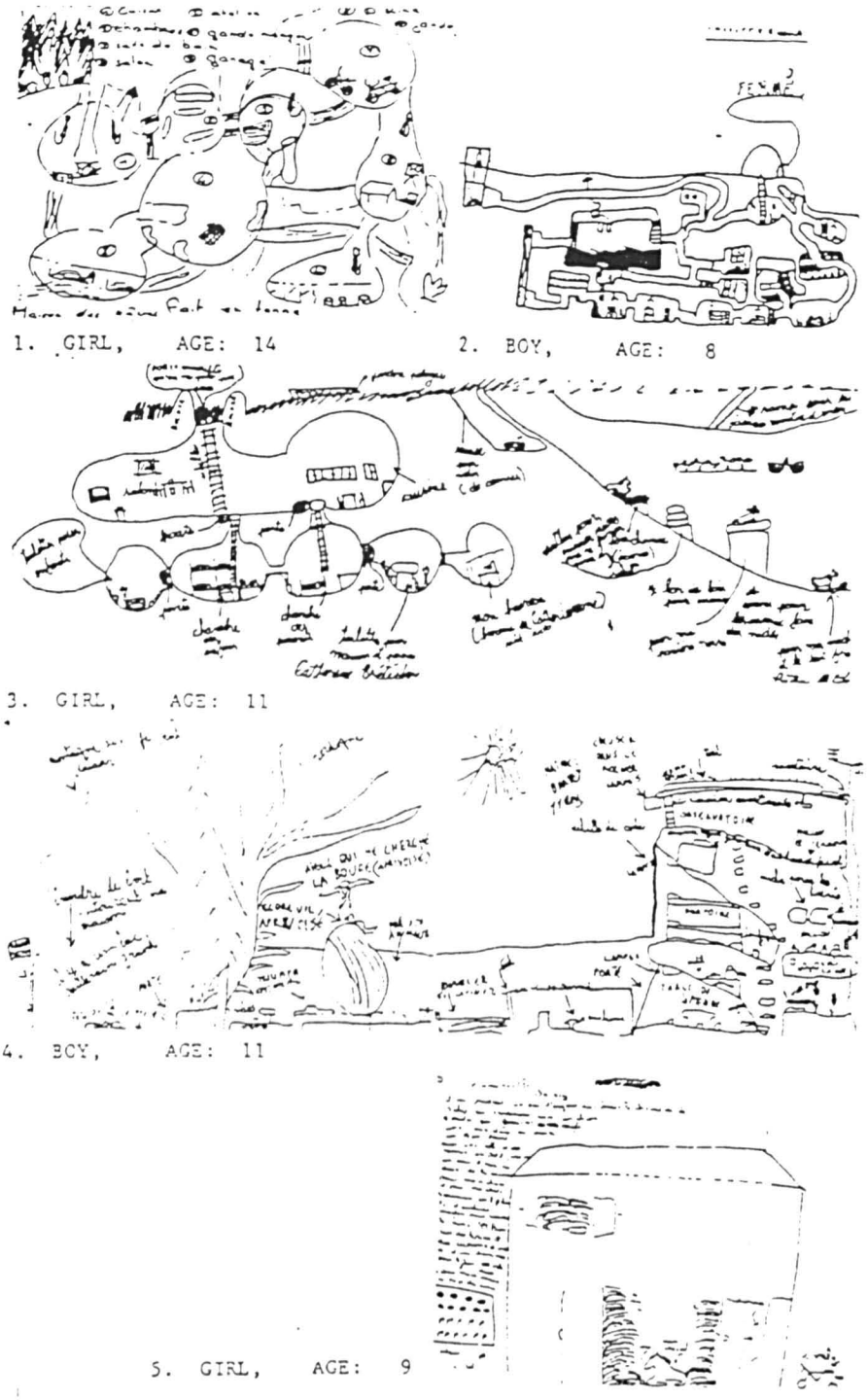

Figure 3.1 Barbey's Children's Drawings of Ideal Home. (*Source:* Barbey (1974), pp. 145).

3.6.2 Children's Participation

The very recent work of Chawla (2001) for UNESCO-MOST (Management of Social Transformations): Growing Up in Cities project, which is based on Lynch's early work in 1977 and provides a useful framework for children participatory project. In her work, Chawla proposed various indicators of local environment from children's input. This set of environmental indicators can usefully be utilised as a basis for city councils in creating child-friendly and sustainable cities in supporting Local Agenda 21. Another useful publication is "United Nations Children's Fund (Unicef)" study by Hart (1997), "Children's Participation: The Theory and Practice of Involving Young Citizen in Community Development and Environmental Care." This describes many relevant methods involving children in environmental research, planning, design management, education, and political action. Involving children in research acknowledges the need to get children directly involved for ethical reasons and to produce adequate research (Baresford, 1997). This is in line with one of the fundamental rights of the child as identified by article 12 of the United Nations Convention on the Right of the Child (Matthews et al., 1999, pp. 136). Marshal (1997) states that children have the right to say what they think about anything which affects them, and that what they say must be listened to carefully. Research or practical work can provide a platform for children to participate and influence decisions to the events and situation impinging on their lives. In methodologies for participation Hart's emphasis is on visual methods as they encourage and stimulate children's participation.

3.6.3 Children's Use and Perception of Environment

Another large-scale study of adolescent children is reported by Lynch (1977) in his work of Growing Up In Cities - Studies of Spatial Environment of Adolescence in Crocow, Melbourne, Mexico City, Salta, Toluca, and Warszawa sponsored by UNESCO The study involved adolescent children with the aim: "to help document the human costs and benefits of economic development, by showing how the child's use and perception of the resulting micro-environment affects his life." (pp.1) It was anticipated the study would help towards the formulation of public policies, through which children environments can be improved. Equally important is the learning process in the study can bring to surface the 'environmental indicators, long-term changes in child environment, the perceptions of planners and educators, and the latent public support for improvement.'

The first stage of the study employed interviews with small group of twenty early adolescent children in one area for their opinion on usage, thoughts about the surrounding environment. An interview with parents and planning authority or professionals responsible for the planning and design of the particular environment was also conducted. The study

also involved an observation technique intended to establish children's actual use of environment settings, and for a site inventory through a careful physical description of the places.

Lynch's study involved four different countries (Argentina, Australia, Poland, and Mexico) of various locations in the urban setting. It affords diverse environmental settings that differ significantly in term of climatic, landscape, and cultural artifacts. This research is excellent in demonstrating comparative studies, as well as examples of various methods that may be employed that have strength and weakness in their application for each of the locations used in the study. At some locations, apart from standardised procedures, the study diversified with field trips through the city to understand the children's mental structure of the environmental images, based on Piagetian theory, together with discussion to generate ideas from children about environmental improvement. Photography techniques were also used to elicit responses from children.

Chawla (2001) revisited in the1990s two sites of Lynch's early study in 1970s to explore both children's use of their local environment and their assessments of its quality using closely the original methods of interviews combined with walking tours through places of importance to children. Community life in the places children used, at different sites were also observed both formally and informally. Other methods include focus group discussions, child-made photographs and commentaries, and children's drawings of area in which they lived. The findings were regarded as children's indicators of environmental quality. This set of local environment quality indicators was used as a valuable tool in participatory action-research project for urban-children into Local Agenda 21: toward creating child-friendly and sustainable cities.

3.6.4 The Use of Map Drawing in Design and Environmental Research

Children's drawings are used for the purpose of establishing their image of their neighbourhood with the drawing task: "draw a map of the area you live in." This technique can yield a varied, vivid, systematic, accurate and elaborate image of the selected settings, but can also ilicit drawings with a lack of sensuous detail. Most children's drawings when asked to map their neighbourhoods include all the "important" urban features - standard houses, main roads, canal, walls, patterned sidewalks, woods and hills, community facilities like churches, schools, and places of entertainment, historical memorials, and special outdoor activities. Children are able to focus their maps on the places with which they are involved; primarily outdoor play places within the housing neighbourhood and they neglect most of the adult features.

Lynch (1977) found that sketch maps suggest a significant difference in environmental representation between genders; as some boys represent the environment as a schematic map of streets and blocks and which lacked sensuous detail. Their environmental images that serve as a place for activity can be "monotonous." On the other hand, girl's pictorial representation often consisted of imaginative details - textures, decorative elements, and a very colourful environment. Their sensuous map drawings represent a kind of wish or an ideal environment full of colour and trees, very much in contrast to their present environment which was dull and repetitive.

Ladd (1970) studied how urban adolescent black boys (age range between twelve to seventeen years) represented their neighbourhood through graphic sketch maps. The analysis of "content" of the children's neighbourhood as depicted in the maps provided information needed by social scientists and planners on the significance of urban living to children of different age, ethnic background, and socio-economic status. Appleyard (1970) on the other hand, formulated and classified four different types of maps produced by seventy-five respondents from four different cities resulting in their own styles and methods of structuring city and local area through map drawings.

In general, children drawing's of sketch maps consist of rich information on important aspects of personal values, feelings understanding, activities they prefer, and confusions of spatial arrangements reflected in the way things have been placed. Athough there is some uncertainty whether map drawing truly represent their mental image, Lynch strongly advocates the strength of this technique:

> As a nonverbal technique, like photographs and videotape, they cut through language difficulties and reveal feelings and concepts that otherwise do not surface. Placement, sequence, scale, and style all say something and are permanently recorded, in contrast to most questionnaire interviews where intonation and expression tend to be lost. Undoubtedly, mapping is an obstacle in some adult interviews, but the children, at least in mapping their local area, attacked it with conviction. (pp. 73)

In conclusion, the study by Lynch emphasised children's place within the larger urban environment that the children perceived and used. How children conceptually hold a mental image of their neighbourhood is clearly represented through their sketch maps. To some groups of children their focus varies depending on many factors such as which sity they live in, and variable such as gender, age, and race truely reflected in the rich and diverse information on the way children perceive and conceive of their environment at different locations. As Lynch suggests:

> A detailed analysis of the children's drawings of their actual environment and desired changes to it, has shown that drawings may be a valuable technique in studying children's perception of the environment. The technique allows us to uncover the essential categories used in perception, as well as to make numerical comparisons between children of various environments, with regard to some both quantitative or qualitative aspects of their perception. Thus the technique may be useful for comparative studies. (pp. 153)

Despite various research conclusion that map drawing is useful and the wide spread use of map drawing, one can also question the realibility of data collected from sketch maps (Blades, 1990). However, the finding from the repeated task of sketch maps drawn by the same subject demonstrate that the method of sketch maps is reliable for data collection technique as he summarises:

> ....experiment has shown that sketch maps are a reliable method of data collection, and that the same individual will produce essentially the same sketch map of the same area over a short period of time. This is the case for both individuals who know an area well and for those who are less familiar with it. The consistency can be relied on even when the instruction given to the individuals are varied between trials.....this provides support for those experiments which have utilized sketch maps as a source of data. (pp. 338)

Other methods like field trips, interviews with children, parents, and professionals, the use of photograph, naturalistic, open-ended techniques of dialogue and field observations of child behaviour are also included in many studies involving children. The essential part of the study consisted of approach to requiring a basic environmental description from children, thus field observation of children activity and uses of place, and core interview with children. All these techniques, in eliciting informations from children, have adapted the research approach to suit a specific situation of each location to ensure the research will have its own internal validity as well as be useful to effect planning and design decisions. This study serves as an examples of method, and as a probe on its strength and weakness, depending on location and subject's cultural, environmental variables.

3.7 CONCLUSION

The main aim of this review of various methods that have been used or are available in research involving children is to review the use of drawing for researching children's relationship to environment. Aspects or various areas of research interests are also highlighted.This review serves as a general and broad understanding about the nature, issues and problems pertaining to research methods with children and their environment including identifying appropriate methodologies for different age-stage development.

Most of the literature on methodologies in relation to investigation of children and environment are scattered in research writing on specific methods and contexts (e.g. home, street, school, parks, playgrounds, urban environment etc.). Conclusive information on methodologies specifically for design purposes for children-environment research is sparse. There is no comprehensive guide readily available for the children-environment use of drawing. The children's age group is the determinant factor in deciding the appropriateness of the techniques for collecting data information as Ziegler and Andrews (1987) emphasise:

> ....interviews, drawings, questionnaires, and behavior mapping are not equally valid and useful for subjects from infancy through adolescence; and techniques for eliciting information on child-environment relations depend far more on the age group of the subjects than they do on either the general research questions being addressed or the particular scale and nature of the environmental setting being examined..... Just as children of different ages see the world through different eyes, so must we, in seeking to explore their worlds, approach them in a variety of ways. Children's cognitive development and their awareness and use of the world around them are achieved essentially through processes of creative learning: furthering our understanding of these processes similarly requires creavity in research design, ingenuity in the development of age appropriate methodologies, and sensivity in their application. As the child's cognitive and physical world expands, so do our paths to and within it. (pp. 329)

Children experience events or situations differently and have their own perspectives which are different from adults. Good research on children essentially involves their experience and views. Having recognised the importance of childrens involvement in research, the next issue is to adopt the appropriate approach to allow their views and perceptions to be communicated and understood. Qualitative research techniques seems to be more appropriate if the aim of the research is to seek to describe, interprete and understand phenomena where children directly participate in the research. Children's perspectives or perception accounts, and frequently voiced themes are centrally important in answering research question through inductive enquiry. This contrast with quantitive research that defines and predicts phenomena or relationships using a number of pre-defined variables or factors (Stake, 1995; Fielding and Fielding, 1986).

Qualitative research normally focus on methods using interview, observation and the analysis of formal and informal document like photographs, diaries and official policy statements (Baresford, 1997). However, the use of children's drawing in qualitative research method helps to discover values, views, knowledge and experiences as well provide access to children's perception, and key information of environmental concepts (Barraza, 1999). There is a need to recognise the difference that the process of research with children and adult as both of them exist within different cultures. Children's views of events and situations for instance is influenced by their cognitive development and experiences and these influence the data analysis and interpretation. Children's

construction of reality may significantly differ from that of adults (Bronfenbrenner, 1979) as they actually try to make sense of situations and events they encounter. Children's cognitive development and drawing skills impacts on the research process since the ability among children of same age and culture varies considerably (Barraza, 1999, pp. 64). The above important factors need to be sonsidered when analysing children's drawings. Children are also found to perform better on the research tasks carried out within a meaningful real-life experience, an emotionally supportive environment will improve children's performance during the research. In recalling and describing events or situation, children rely on context and cues so that they may be able to recall accurately without fantasy.

3.8 REFERENCES

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Chapter 4

PROVISION FOR AND CHILDREN'S USE OF DIFFERENT LANDSCAPE SETTINGS

4.0 INTRODUCTION

This chapter gives an overview of the development of different children's environmental settings on a Western context. This literature review highlights developmental issues of how children's spaces and facilities evolved throughout planning of urban spaces. Equally important is to understand children's utilisation of various types of environmental settings. These serve the purpose of gaining insight into the planning for children's facilities, children's attitude and interaction, and use of different environmental settings.

Many children's environments and facilities are planned and designed by adults (eg. play areas, school grounds, recreational facilities) on the assumption that adults have a full understanding and knowledge of children's needs (McKendrick, 1999; Spencer et al., 1989). Influential decision-makers are also convinced that they know what is right in making decisions to consider environmental needs of children (Cunningham and Jones, 1999), in both used or inhabited environments (Cooper-Marcus, and Moore, 1976). The planning and design of residential and public outdoor recreational facilities, e.g., playgrounds in urban areas is perhaps an example of provision and development carried out with a lack of knowledge of the users needs (McKendrick, 1999; Anderson and Tindall, 1972), or not supportive of children's needs in the neighbourhood (Malone, 2001), and or one that does consider children's needs in planning process (Tranter and Pawson, 2001).

As children heavily invest time in play, various types of play areas have been built throughout the historical urban development of cities. Planned and designed environments aim to satisfy the imaginative and social developmental needs of children. Cunningham and Jones (1999) believe it is wrong to ignore children's needs in environment with provision of playgrounds alone which do not necessarily satisfy their needs. However, many recent studies have found that children are keen and attracted to venture into and use "unmanned" undesigned spaces rather than those specifically

planned and designed for them. In less developed countries, the allocation of open space at the neighbourhood level is often given the lowest priority in development areas, and becomes space left over after planning (SLOAP) (Sobaihi, 1995). Many children have been observed to use the street as their preferred play area though streets in urban areas are becoming dengerous, unsafe and inaccessible for children because of increase in motor vehicle use (Abu Ghazzeh, 1998).

Children's developmental needs in neighbourhood landscapes are related to their environmental awareness. A "natural green" environment plays an important role in improving the levels of cognitive functioning among the children living in poor urban homes (Wells, 2000). Children activities in space mirror their development of cognitive processes (Hill and Michelson, 1981), which influences their understanding and ability to explore the configuration of neighbourhood. Parental restrictions significantly limit children's use of neighbourhood landscapes. The range of activity, ways of exploration and learning about environment are affected by this restriction (Hart, 1979). The habitat of children is reflected in the affective factor of neighbourhood image (Spencer et al. , 1989, pp. 220).

The natural environment is known to affect children's needs and feeling: 'the physical environment is not a mere neutral backdrop for the child's social and personal development..but has the potential to be a major factor in well-being in childhood.' (ibid., pp. 224). Studies of children's activities in urban areas show that although the planning and design of urban areas has failed and has neglected their environmental needs, children are still able to utilised resources in urban areas for social and personal development. Perhaps, children's environmental needs can be determined through studying their activities and analysing their representations of the social and physical resources available to them. At certain levels these needs are closely related to the use and control over spatial resources that serve different spatial and social purposes. The extent of their spatial resources is known as their 'environmental territory.'

4.1 CHILDREN ENVIRONMENT IN GENERAL: WESTERN CONTEXT

4.1.0 Planning of Parks, Playgrounds and Open Spaces: Provision of Physical Landscape

The planning and management of open space in urban area is part of the provision of children's open-space needs. Urban open spaces have been synonymous with important informal local play-spaces for children (Freeman, 1995). Provision of children's environments can be best described through the planning and design of urban open spaces. In the UK the concern for provision of children's open-space needs is to facilitate

children's access to natural areas for play. There are many organizations involved in developing knowledge and expertise towards collaboration with children for enhancing natural environments for children, for example, Learning Through Landscapes (LTL), British Trust for Conservation Volunteers, Groundwork Trust and other Voluntary Organizations. With this kind of voluntary supporting expertise, through consultation and working partnership, the planners are able to contribute to the improvement and provision of natural environment in meeting the children's environmental needs.

The development of open space within the urban fabric rather than on green-belt land has been criticised because it reduced play opportunity for children and their independent mobility (Freeman, 1995). It is a requirement to consider as a priority in the land-use planning of urban areas for children's needs. Rapid development of urban spaces if left unchecked will eventually limits children's range of physical environments. Urban settings need to become the "natural environment" that can preserve and enhance children's interaction with nature for their activities (Sivakumaran, 1996).

4.1.1 Historical Development of design and planning for children's facilities in urban areas.

An overview of park development is important because as parks evolved so did children's environments in form of playground and other facilities as important components in park evolution. It is therefore appropriate to view briefly the development of parks to understand how the provision of children's environments developed from there. For brevity purposes only development of parks and open spaces in UK and US will be viewed as basis to provide understanding of how the evolution in provision of children's environments in the urban environment took place.

4.1.1.0 Development of Children's Facilities in UK

During Industrial Revolution in UK, children were found to share the family and community works more often instead of playing (Holme and Massie, 1970). The over-crowding towns and cities in the 19th. century caused serious problems in health care, hygiene, comfort and lack of recreational facilities. Children from lower classes were exposed to the hardships of the workplace in 'tender years' but the concern for children however, gradually improved as major changes in economy, ideology, family structure took place especially when children's play began to be viewed as an aid physical and mental development of a child (Cohen, 1987). Joseph Paxton was among the important figures involved in designing a number of public parks including Crystal Palace(1852), Prince's Park, Liverpool (1842), and Birkenhead (1844). Prince's Park for instance includes footpaths, excluding traffic for

pedestrian, spacious lakes for caneoing activities with islands, large and convenient spaces for all kinds of games for children (Chadwick, 1966). Playgrounds and space for as many varieties of plays and games were required by city committee in park's developments. The development of Birkenhead Park in 1847 with various kinds of rural sports and amusements was Paxton's design of "strongly formal pattern interwoven with a wholly informal design, - Gardenesque type of pattern as garden becoming landscape on a large scale applied to the problem of the large public park," (ibid., pp. 94). The Recreation Ground Act of 1859 concerned children and provision of play spaces:

> Whereas the Want of open public Grounds for the Resort and Recreation of Adults, and of Playgrounds for Children and Youth is much felt in the Metropolis and other popular Places within this Realm, and by reason of the great and continuous Increase of Pupulation and Extension of Towns such Evil is seriously increasing, and it is desirable to provide a Remedy for the same. (cf., Holme and Massie, 1970, pp. 42)

During Victorian times, "the function of a town park was to provide facilities for rest, relaxation and association with natural beauty and it normally incorporated attractively landscaped areas often enclosed within wrought iron railings. Later parks often devoted some space to accomodating organised games," (Seeley, 1973, pp.124), and efforts to bringing countryside image of trees, meadows, and serene lakes closer to city dwellers (Jellicoe, 1968).

The Open Space Act of 1906 acknowledged the importance of open spaces in an urban environment although the street was equally important to children for play in urban areas. The street was easily accessible, familiar, close to home for possible supervision and an immediate meeting place among children within neighbourhood. The provision of play space facilities was aimed at improving recreational opportunities for children of the working class. By 1914 "play centres" had been widely established with the main objectives: to provide organised educational facilities for children's, mental development, as alternative to streets activities that may expose children to juvenile crime (Holme and Massie, 1970, pp. 43).

The park was viewed essentially as important feature in city for 'walking exercise and mental improvement,' (Chadwick, 1966, pp. 99). By 1913, most of the city parks in large urban centre like London and Manchester had recreation grounds with sand gardens that formed part of a park's features. The recreational needs of children had been recognised within legislation of the Physical Training and Recreation Act of 1937 that gave power to the Board of Education to allocate grant for provision of physical training and recreational facilities; and Street Playgrounds Acts of 1938 through which local authorities has the power to improve safety for children to play in the street. In 1935, the National Playing Fields Association was

introduced and became an influential pressure group working mainly toward establishment of playing fields. Park provision was based on standards with a minimum of 0.4 ha. per 1000 population recommended by the association. It also helped promoting Physical Training and Recreation Act in 1937. Various voluntary organisations were active in promoting play for children of various age groups. For example, in 1948, with the helps of voluntary group in Camberwell, first public adventurous playground was constructed (Benjamin, 1974, pp. 16). Adventurous playgrounds became popular as they only used numerous affordable and available materials to build with. The voluntary movement (e.g. International Playground Association in Sheffield) is growing and played significant a role in promoting and provision of various children's facilities in their environments as part of work towards recognising child's right to play (Bengtsson, 1972).

Later, in 1960s the concern for urban spaces was toward public parks, children's playgrounds, and allotment gardens. Park types were classified on the basis type of users, location of the facilities and by the form or arrangement of the park (Seely, 1973). Larger parks catered for the needs of city, region or neoghbourhood population. As for smaller park such as district or local parks they supported the needs of community in residential neighbourhood. Local parks normally cater the needs of young children as they were located near homes.

4.1.1.1 Development of Children's Facilities in USA

Cranz (1989) looked at the people's attitude towards the purpose of urban parks and open space from a historical point of view in the US to discover the evolution of the role of city parks within American social structure and the intelectual and moral life of culture.The development of urban parks saw changes to and varing attitudes amongst the general public and authorities throughout. Parks could be unsafe place, or creat the psychological sense of being in nature for a naturalistic experience within the city.

The provision of children's environment initially started with the installation of standard playground equipment. These are regarded as superficial tokens of play and recreational purpose within the park. The purpose of urban parks became an issue not long after parks became institutionalised. Children's playgrounds, part of streets and open spaces formed an integral part associated with urban parks. In defining a park, Cranz (1989) writes:

> In contemporary practice the word "park" applies to an almost indiscriminate range of properties, from children's playgrounds, neighborhood playfields, golf, bathing, and camping areas, athletic fields to zoological and botanical gardens, arboretums, landscape ovals, triangle, and other small segments of street grid, neighborhood parks, downtown squares, scenic outlets, waterfront, and land reservations. (pp. ix)

Parks carry a symbolic cultural image of natural environments embedded in greenery, trees, grass for everybody especially children. Many social forces influenced the planning and design of parks that indirectly affected chidren's opportunity to interact with the environment. Cranz (1989) describes the importance of the park from a social perspective:

> Parks themselves are still important today in different ways, emphatically not just part of the parenthetical history of gardens or landscape design. From the point of view of understanding society they are an excellent example of how social forces, economic, political, and psychological processes influenced park location, size, shape, composition, and equipment and landscaping. Once these features were fixed, they both limited and stimulated the option available for human interaction. (pp. xii)

The building of parks in the US during the Pleasure Ground period (1850-1900) derived from an anti-urban ideal, a 'relief from the evils of the city,' (ibid., pp.3) to escape to the country. Parks were conceived as great pleasure grounds meant to be pieces of the natural environment, with fresh air, meadows, lakes, and sunshine right in the city. Fredrick Law Olmsted who designed Central Park New York perceived that open spaces should be exempted from urban characters and be "a class of opposite conditions," a visual anti-thesis to grid-iron street and rectangular houses with the notion of "aesthetic colony," (ibid., pp. 8). Thus, parks needed to be well managed to become a new centres of cities (Welch, 1995). The city was not supposed to exist in the park. Olmsted had promoted the concept of picturesque landscape - "pastoral middle landscape" for parks as he believed "pure wilderness" can provide desirable contrast to urban character of city and elements of nature in the parks could contribute to the physical and mental health to urban dwellers. In anticipating demand for organised games, Olmsted incorporated playgrounds in one of the open space areas inside the south of the Central Park. A site for small children's play was given care and attention in detailed design (Chadwick, 1966).

The needs of children have long been recognised by Recreationists from the 1940s as many active unstructured activities in pleasure grounds were meant for children: bicycle riding, sporting activities etc. (Cranz, 1989). The appropriate activities for children would be watching wildlife, picnicking, boating, and play. The truest value of public pleasure grounds for large cities was to enjoy nature: 'to love trees and shrubs and open fields, birds and flowers, rivers, lakes and skies ... to see and appreciate the beautiful things about them,' (ibid., pp.15). As the emphasis was more towards establishing "natural" environment, formal play areas for children like playground was relegated to areas of less 'valuable' landscape e.g. an unutilised space near the edge of the park.

During the Reform Park period (1900-1930) many park reformers used the vulnerability of children as argument for their cause to gain public sympathy to support the development of playgrounds. Unlike the pleasure ground, which encouraged family excursions and recreation, the reform park segregated ages and sexes. For the first time children became a distinct and important focus of park planning. The reform park movement, in fact, stemmed in part from the late nineteenth-century playground movement, and the early reform parks were often aptly called playgrounds. Thus the impetus for the development of Reform Parks (1900-1930) was based on the idea that both playground and local park could play an important role in providing for daily recreational needs in neighbourhood areas. In playgrounds, typical facilities included a sandbox with bench, slides and swings together with natural landscape elements - trees, flowers, grass and waterbodies. Children's activities in parks were heavily emphasised and professional play leaders started in 1913 to oversee and supervise their activity and satisfying the children's specific needs of different age group and sex.

Later in 1930, the important function and value of the parks was to serve the recreational needs of all age groups, not only children in the playgrounds, with the emerging of recreational facilities from the playground park. For children, although supervised play activities were maintained as an important feature, the addition of various other facilities tended to neglected the importance of natural landscape elements. The emphasis was on active recreational activities. Many large town parks in the US were design to give city dweller the opportunity to enjoy being closed to nature away from hectic urban life. A parks main function was to provide pleasant environments like woodland, meadow, lawn, zoological garden, botanical garden, and nature museums for recreational activities such as picnic, boating, and day camps (Seeley, 1973). The provision of these recreational facilities were influenced by variety of factors including topography, climate, population density and availability of funds.

The emergence of new conceptual approaches from 1965 and after to looking at parks, streets, plaza, and empty lots as a continuous linked open spaces gave rise to the "open-space system." Traditional play equipment like swings, slides, climbing frames were replaced by different 'free-form environments and play equipment' - the adventure playground. In the early 1960s, various fixed, vandal proof and easily maintained architectural designed components formed an integral part of new playground features for children. The philosophical foundation for open space system rested on the exploitation and opportunity to maximise the use of every piece of land available in the urban area regardless of size and location. Thus, the toddler lot, the adventure playground and the urban plaza can easily be accomodated with small urban lots to form a network of open spaces.

Park history in the US 'reflects immediate social goals, an idealogy about order, and an underlying attitude towards the city.' (Cranz, 1978, pp. 18) The importance of playgrounds in the early pleasureground model recognised the provision for different facilities for different age groups of urban population needs. In conclusion, the park policies were administered to fulfill the contemporary need of urban populations with regard to their social well-being and attitudes toward cities.

4.1.2 Children's Rights as Users of the Environment

The importance of incorporating of the needs of children and their rights in the planning process has been recognised. Children "form an integral component of the urban community," (Freeman, 1995. pp. 384). In current practice, children's needs are considered if an area has been previously been designated. Thus, there is a call to acknowledge and integrate the children's right into mainstream planning policies (Sivakumaran, 1996; Hart, 1997; Moore et al., 1992).

4.1.3 Role and Types of Urban Open Space

In the UK, through the work of some organisations like the Institute of Leisure and Amenity Studies (ILAM) and Learning Through Landscapes (LTL), new findings acknowledge the need to establish the benefit of informal green open space in urban open-space policies. The "negative value" often placed upon undesignated areas of land (left over space with natural vegetatation) do not match the high recreational and environmental value regardless of size as compared with formal designated large open green space. The high value placed on natural open space may influence the development of open-space policies and in turn affect the provision of children environment for play. The role of urban open space planning may then place an emphasis on ecological value of the site that can potentially provide various experiences to the user rather than on size in the hierarchical approach to provision. The emphasis has been on size, as the standard to aim at in planning policy. The National Playing Fields Association in the UK for instance suggested that the provision for reacreational outdoor activities and sport should not fall below 6 acres (2.4 ha) a 1000 persons, with at least another 1 acre (0.4 ha) a 1000 for other kinds of parks or open spaces. In building a new site for a school, the Ministry of Education emphasis the standard: for primary schools of 400 pupils, 6 acres (2.4 ha); for secondary schools of 450, 17 acres (6.8 ha).

The Department of the Environment (DoE, 1987, 1988) in the UK has recognised the need for derelict and neglected area in the urban to be incorporated for children's activities though the emphasis on the playground facilities and the area that can promote environmental learning. Other planning policy guidelines need to be broadened to address the environmental needs of children to include housing areas, public park and other urban open spaces.

4.1.4 Children's Environmental Knowledge and Activities

Children's interaction with the large-scale environment, and their participation in organised activity are influenced by their knowledge about the environment itself. It was found that children develop a greater appreciation of neighbourhood spatial dimensions the older they become. There is also gender variation as up to nine year of age, boys demonstrate the ability to represent information about more places around their home environment compared to girls. Girls on the other hand, despite a more limited range of places used, one usually able to present more elaborate and personal detail events (Andrews, 1973; Matthews, 1984).

Children's individual differences explained their activity patterns in various environmental settings. Their attitudes toward environment vary according to their expectations, familiarity, past experiences and their demands of the environment based on knowledge and affection (Spencer et al., 1989). Children's knowledge may be influenced by individual difference - experience, and environmental cognitions. The extent of environmental interaction may be influenced by involvement in the neighbourhood or the immediate surrounding environment, and perception of the risks or dangers associated with various part of environment, for instance safety in streets.

Parental restriction imposed on younger children age 6-10 year-old influences both their range of activity and exploration. The learning process in becoming knowledgeable about surrounding environment are related directly to individual children's activity range. Usually boys tend to know more about their surrounding neighbourhood than girls as parents are normally less restricitve to allow greater freedom of movement among boys than girls (Hart, 1979; Van Vliet, 1983b; Gaster, 1995).

4.2 CHILDREN'S ENVIRONMENTS IN URBAN AREAS

Children's behaviour patterns differ from those of adult as play and learning has an important role in influencing their everyday activity. Children's land-uses and facilities are distinguishable from adults. If places are shared, children are often used them for different purposes than adults. Children have less autonomy and accessibility to resources and they do not normally take part in decision-making processes in the planning and design of environment they shared with adults. There is a lack of opportunity in to participate in such processes (Hart, 1997; Hill and Michelson, 1981). The study of child-relevant features, children's activities demonstrates the relationship or pattern of usage, that in turn is interelated with socio-cultural factors. The study also found many negative environmental features that influence children tremendously such as danger from traffic etc.

4.2.0 Traffic and Children

The street environment is synonymous with children's play (Abu-Ghazzeh, 1998; Appleyard, 1981; Moore and Young, 1978; Ward, 1978; Opie and Opie, 1984). Children use streets as a place for social interaction with peer or friends within their immediate neighbourhood (Andrews, 1973; Moore, 1987). Streets and other spaces associated with street like nooks, street corners are important play and meeting place among children (Hester, 1975; Noschis, 1994), and important "ecological places" (Moore, 1986; Lynch, 1977; Banerjee and Lynch, 1977) where children learn about each other and explore to interact with surrounding environments. The advantages of streets compared to designated play spaces are their immediacy and 'close-to-home' play and that children can easily be seen for supervision.

A study by Pedestrian Association in UK has shown , "children now lead increasingly confined and supervised lives and no longer walk or play on the street," (cf. Rosenbaum, 1993, pp. 54). Both actual road accidents and parents' fear of danger from traffic and children safety affect the children's quality of life (Ibid.), and restrict children's travel (Van Vliet, 1983a). Parents' anxiety and fear for the risk of children's traffic safety have caused "traffic environmental stress," (Bjorklid, 1994, pp. 399). As a result of increasing trafic levels, children's independent mobility has declined dramatically. In a study, Pia Bjorklid looked into experiences of children, teachers, parents and authorities and how these experiences influence their interpretations on children's environments and traffic safety.

In general, teachers viewed traffic environments as dangerous for children and that they had negative impacts on their behaviour in school. Parents concerns on traffic safety forced them to become more protective by imposing control and restriction to children's mobility, allowing activities only in safer environment and constantly reminding children of traffic dangers. This observed phenomena is supported by Titman (1992) who see parental restriction (see also Hart, 1979; Hole and Miller, 1966) and lack of access to outdoor facilities affect children's freedom and independent mobility:

> Children today have less freedom and independent mobility than previous generations. Parental concerns about traffic and other potential hazards and lack of appropriate, accessible, outdoor spaces/ places where children can play close to home have caused a fundamental change in childhood lifestyle (Titman, 1993, pp. 3).

The above statement is shared by Hillman et al. (cf. Rosenbaum, 1993, pp.59) findings that children have lost the "personal freedom and choice" that was normally permitted a typical seven-year-old, but have been set back for two to three years until they reach the age of nine-and-half-year-old. Ward (1978) too noted that young children's freedom of city streets was no longer available:

> The assumption that the car-driver has a natural right to take his vehicle anywhere has, quite apart from the threat to life, gradually attenuated many of the aspects of the city that made it an exciting and usable environment for children. The street life of the city has been slowly whittled away to make more room for the motor car .... Whole areas which were once at the disposal of the explorer on foot are now dedicated to the motorist. The city, which used to be transparent to young citizens who could follow the routes across it unerringly, is now opaque and impenetrable. (pp. 120-121)

Although children in the urban areas become more aware of the dangers as they constantly have negative exposure of traffic environments around them, they are limited in knowledge (Bjorklid, 1994), and lack skills and experiences (Rosenbaum, 1993) to cope with growing complexity of traffic problems.

4.2.1 Children's needs in the planning of neighbourhood streets

For many children, streets though dangerous are preferred areas for play activity (Spencer et al., 1989). The street environment provides sources of information important for children's intellectual development (Garling and Golledge, 1989). Abu-Ghazzeh (1998) suggested that "street play is an essential experience of childhood," and important for the "child's intellectual development," and should be a place for learning:

> The importance of street lies in the central role that play occupies in the physical, cognitive, social, and emotional development of the child. It offers opportunities for physical exercise, sensory pleasure, testing and improving skills, emotional release, trying out autonomy and self-reliance, experimenting (learning to give and take), developing conversational and organizational skills, fantasy, creative expression, and adventure and exploration... (pp. 801)

Although at the policy level, for instance transport policy in the UK has not considered children's independent freedom of movement (Rosenbaum,1993). However, a number of US and European countries have incorporated "traffic calming" (traffic tranquilization) programs and neighbourhood protection in neighbourhood planning (Newman, 1972). The philosophy behind these ideas was to create stability, encourage residential participation and social coherence among the community. The traffic movement in neighbourhood areas is expected to slow down. Suitable planning actions aim to ensure "sense of belonging and promote greater neighbourhood pride, better maintenance, and more stable play pattern among children," (Abu-Ghazzeh, 1998, pp. 802).

One ingenious and well thought through program was the design of *Woonerven* in the Netherlands. The concept of *Woonerf* is to turn streets in neighbourhood areas into pedestrian priority areas or "pedestrian-dominated residential yards," (ibid.,pp.802) through physical intervention: reduce vehicle speed by eliminating through traffic, rerouting traffic, narrowing traffic lanes, paved surface finish and building bumps. Paved surfaces provides larger spaces for games, cycling and playing with toy vehicles, attracting larger number of children to interact among them. *Woonerven* have positive impacts on children's play as it was observed children spend more time playing unsupervised, enganging in a complex play (Eubank-Ahren, 1985, 1987). It also gives an opportunity for children to be "in contact with the adult's world." With better physical and social facilities in Woonerven, younger children too have the opportunity to explore the environment. Here, psychologically and conceptually the street is seen to belong to people rather than vehicles.

In the research on children's use of the street a playground, Abu-Ghazzeh (Ibid.) found that the design of residential streets need to incorporate traffic volume and the neighbourhood's character, more towards creating street as a public places. The emphasis is on safety, especially for children:

> Streets in residential neighbourhoods need to be safe for children and adults. They must also function as part of the symbolic environment, optimizing the community's sense of place and expressing collective territoriality. None of this is possible as long as the automobile retains its supremacy in the domain of the residential street. Children, in particular, should not be forced to withdraw from the street because of the hazards posed by traffic. The street environment should have places in which people can sit, converse, and play. Inhabitants need to see the street of their neighbourhood as a place rather than a traffic channel. Residentia street should be destinations, not toutes. (pp. 828)

Findings from research help in planning and managing urban landscape resources to provide a better environment for children through the planning and design of urban open spaces. In managing urban open space, the priority and focus is directed towards provision of formal designated areas - playground, neighbourhood parks, green open spaces, recreational and leisure facilities, neighbourhood streets, and institutional facilities etc. However, the unplanned and undesigned places are equally important for the pursuit of children's activity.

4.3 "NATURAL" AND MAN-MADE ENVIRONMENTS

In relation to children's needs and natural environment, Tuan (1978) suggested that natural environments should be accessible to children so that they are able to interact and experience the nature for their social and personal development. Acquiring knowledge about the environment as experienced by children is of the way to understand the needs and their preference for natural environment. Both nature and culture are interrelated as children have "common innate capacities" to appreciate nature and "innate sense of kinship with nature," (ibid., pp. 8-9). Indications of children's need for context with natural world elaborated by Tuan suggest that children are found to enjoy playing with natural materials as water, clay, sand, trees, and grass. Further, he posed several questions relating children's cognition and behaviour in natural environments: "How do children perceive nature? and What aspects of the natural environment do they respond to and how do they adapt to it in feeling, ideas, and outward behavior?" (ibid., pp.8)

Children's cognition, experience and use of urban areas are influenced by a wide range of variables, i.e. parental restriction (Hart, 1979), configuration and content of urban neighbourhood settings (Moore, 1978, pp. i), realms of inner, social, and physiographic spaces (Moore and Young, 1978, pp.83). A diverse environment supports and enhances the needs of children and their developmental potential.

Past studies have clearly indicated children's preference to play in the natural environments that offers freedom for exploration and manipulation of the environment (Cooper-Marcus, 1995; Moore, 1986). In a study to compare perception and preference for natural landscape from a cultural and developmental perspective, Herzog et al., (2000) found that young children placed higher preference for all the natural setting categories compared to other age groups in the sample (see also Hart, 1979, Moore, 1986, Coffin and William, 1989). Many elements such as water, trees, flowers, rock, and wildlife are of greatest interest to children. Hart's study 'Children's Experience of Place' found that waterbody features like lakes, rivers were highly appreciated and value most by the children, although their

accessibility and experience of the river and lake within the neighbourhood were restricted or limited. Similar findings were observed by Moore's in a study 'Childhood Domain' as children placed higher value on streams and ponds areas where they can be involved in many activities and observe wildlife. The existence of small enclaves of natural environmental settings within a large man-made urban environment were very much preferred by children. These natural enclosures served as significant outdoor places for favourite activities with best friends in creating 'pathway' and 'place'. The use of natural landscapes affords a rich, diverse and manipulatible natural features of the environment, unequivalent to the man-made environment. Children's ingenuity helps them to turn "wasteland" into 'a private, wild-flower, play area: a place for buried treasure, picnics, sharing secrets - and infinite richer place to develop imaginatively than the designer-play equipment,' (Spencer et al., 1989, pp. 225).

Children gain knowledge and developmental support through their relationships with the natural environment, activity and interaction with natural elements and phenomena. The character of children's interaction with environments has an implication for the provision of settings that facilitate such interaction and should not be an incidental design consideration. Interactions with various types of environment are important to a child's development, physically and mentally especially environments that offer both physical and fantasy play opportunities (Sobaihi, 1993; Smith, 1982). Children need both physical and mental stimulation from sensory qualities of natural and man-made environment (Lukashok and Lynch, 1956; Ward, 1978). Children's interaction with natural environments suggest that their active life can not be separated from the process of nature (Freeman, 1995).

The physical qualities of environments are perhaps related to children's sense of attachment to places that are important to their development. This sense of attachment to place or places have been termed differently, as "placeness" (Relph, 1976), "topophilia" (Tuan, 1990), and "rootedness" (Lynch,1966). Social and cultural aspects of local environments influence people's attitudes and responses toward place attachment to physical environments of certain settings such as natural, rural areas (Vorkinn and Riese, 2001). Investigating children's awareness about natural environments through their interactions with natural landscape features may suggest how environmental experience is influenced by preference (Kaplan, 1985) . Establishing children response to certain phenomena may uncover what 'many natural features have a time-scale that is much higher than that of human beings." Spencer et al. (1989) explained children's everyday activity of 'doing nothing' in relation to the sensory environment. "Doing nothing" can be an active exploration of physical characteristic of an object or element in the environment. He cites the works of Wood and Moore that have focused on childhood and how 'doing nothing can turn into full-blown fantasy games, contests, or being sociable together,' (pp.227).

4.3.0 Natural Play Areas

Play areas that are normally associated with various natural elements that have potential for exploration and adventure for children's creative play. The provision of children's environments often means formal recreational play areas planned and designed to accomodate fixed play equipments. However, questions are raised about the play value offered by these "high tech" elements compared with natural elements. A recommended approach is to make links between children's play areas, landscape and community (Herrington, 1999) or to integrate both man-made with the conserved natural environments (Freeman, 1995, pp. 386).

One of the approaches adopted to incorporate children's play needs into urban planning is through providing means and access for children's participation in the life of the city (Kettleborough, 1994; Wooley et al., 1999). Another option is to include relevant policies related to children into the mainstream planning process such as conservation of urban natural resources, development planning of residential areas and planning specific areas for children's interest. Generally, the provision of children's spaces and facilities in urban areas has moved towards incorporating children into planning agendas despite the difficulty at the technical and implementation level as Freeman (1995) describes:

> Some planning departments have incorporated child-friendly policies into statutory plans, but more frequently into subject plans and area strategies. Some have devised additional planning-policiy guidance to address the growing concerns with children's play and the use and provision of open space in housing developments....Planners have to confront the dichotomy between their own mission "to plan", and the fact that children essentially favor "unplanned" space. Planners' freedom to influence both design and policy is constrained by national government planning guidance - including the requirement that their activiies be precisely confined to land-use planning decisions, which are decisions in which economic considerations tend to be paramount. (pp. 386)

Wtihin urban open space planning, the designation of natural play areas can therefore be seen as an attempt to acknowledge children's play needs especially informal play activities. Looking at planning for the future, Freeman (Ibid.) highlighted the current state of planning activities in the UK that hindered the provision of children's environmental needs in urban areas, together with positive development at the local level. She indicates:

> Where children have been taken into account it has been as recipients of planning provision. Children's environmental needs have not been, and still are not, an established planning concern. Planning activities as they are structured in the UK do not facilitate the development of the child-centered planning policies, which demand cross-sectoral, integrative work practises that go beyond pure land-use planning restraints. There are now indications that such corporate and partnership initiatives are becoming more common in local authorities, and that children are (on a limited scale) being identified as a focus for such initiatives. (pp. 387)

4.4 CHILDREN IN THEIR NEIGHBOURHOOD

4.4.0 Children's Neighbourhood Spaces and Networks

The perceptions and lives of younger children aged 5 to 8-year-olds are confined to their neighbourhood area around house, street, school, and designated area for children such as play areas. The neighbourhood needs or sources of support for the child can be assessed from both social and physical aspects of neighbourhood. Byrant (1985) classified the sources of neighbourhood support into three categories for seven and ten-year-old children. First, other persons and animals or pets serve as resources. Second, interpersonal sources that facilitate children with their hobbies and fantasies, and finally environmental resources in the form of informal meeting places in "natural" environments and formally designated areas in play areas, park or garden. The informal network of social and environmental facilities increases parallel with the age of children. The way the child perceives the environments that are available in the neighbourhood reflects social-emotional aspects of the child. Understanding neighbourhood needs of the child for instance their need for privacy and the opportunity for autonomy, as well as direct support from others, will uncover their empathy, locus of control, acceptance of self etc.

Looking from a practical rather than theoretical perspective at children's environmental needs, the guidelines for residential areas should specifically address the issue of children ability to explore their neighbourhood safely instead of being restricted to designated play areas. Exploration is subject to independent mobility, decline as the "natural" areas become segmented from home environment or separated by the traffic. This limits and affects children as their access to "natural" areas for play becomes restricted and unsafe.

The perception and the use of neighbourhoods by adolescent children is a social-environmental function of their home range that expands with age (Van Vliet, 1983b). Home range is defined as the environment outside the home, playground, and institutional facilities for children. Children's use and knowledge of the environment influences home range, thus the neighbourhood serves continuously as an important "fourth environment" for development for children (ibid. pp. 567). A comparative study of adolescent children's perception of city from different ethnic group conducted by Maurer and Baxter (1972) noted that the local neighbourhood was an important source of social and personal support for the child. Banerjee and Lynch (1977) investigated how young adolescents from low income families and resource poorly areas used and valued their spatial environment inorder to develop public policies for environmental improvements. It was found that adolescent children required various places and facility settings for meeting, social learning and

exploration as their home range is much wider. The different ways children use and place value upon environments are found to be a product of social contexts for instance some children live in overcrowded home environment, have different level of resources, and parents with lower level in the income scale (Banerjee and Lynch, pp. 111). Another important activity among adolescent children is 'hanging around' and 'doing nothing,' (Spencer et al., 1989).

Lynch's (1977) study focused on adolescent use of space in various locations of lower income and urban areas with poor resources in four cities (briefly discussed in Chapter 3, Section 3.6.3) and found that culture difference affected home ranges and time-budgeting for activities. In general, children had a preference for environments marked by the dominance of "natural" landscape. Children's perception of social-physical settings varied between different city locations, was influenced by availability of resources, community well-being, integrity and activities. One can expect that within a similar culture and location there could also be vast differences in children's attitudes and perceptions apart from comparative difference between varied cultures and regions.

4.4.1 Children's Values in Urban Space and Landscapes

Children's individual preference for spaces and landscapes such as indoors, homes, neighbourhood space, streets, hills, playgrounds or schools vary. Disliked places may include: vacant lots with dirt and rocks, open area full of trash, and busy, narrow streets. Children's ideal places to live rejected the man-made urbanised environment in favour for more natural environments as Banerjee and Lynch (1977) report:

> When the children were asked to describe the ideal place to live in, their utopias reflected consistent themes: trees, friends, quiet, lack of traffic, small size, cleaniliness. They seem to reject the everyday din an bustle of the urban environment, and to prefer bucolic scenes and rural settings. Only a minority advocate city centre excitements. (pp. 110)

Better environment for children may need a large open grass area (Becker, 1976), more trees, better streets with traffic control, more parks, playgrounds and recreational facilities, a cleaner and more "beautiful" environment. Children's relationship with the surrounding and social environment influences the interaction and value placed upon the environment. In discussing a comparative study of the spatial urban environment of adolescence, Banerjee and Lynch (Ibid.) found social aspects influenced children's interaction with environment. Home environments though important, accessible public spaces becomes an extension within their home range that can offer varied opportunities of activity and experience:

> .... the social conditions can produce a difference in the way children use and value their environment. Neverthless, certain basic themes persist. It becomes clear that the home range environment plays a very significant role in the adolescent life. They are in close contact with that environment in their everyday life, and they depend on it for psychological stimulation and sustenance. Since their actions at home are rigidly prescribed, and often supervised, they rely on the larger public environment for their independent activities and expressions of self. The children are even more outward-looking when the physical home is crowded; the public environment becomes an extension of home. They look toward the larger environment not only for settings for organised play and recreation, but also for opportunities to adapt, manipulate and control existing settings and spaces, or create new settings or novel experiences. The environment is usually unresponsive, however. Beyond the programmed spaces provided by the adult society, there is very little they can control or own. Other parts of the public environment are either unsafe and dangerous, or inaccessible because of the adult management and maintenance policies. (pp. 111)

4.4.2 School Landscapes

For many children, school grounds are the first experience of public space after years attached to home environment. Unfortunately, in the UK for instance many schools had outdoor landscapes ill designed, fragmented, mainly tarmac spaces, which failed to make use of advantages of thegrounds (Lucas, 1995). School grounds whether landscaped with tarmac or grass are a unique and potential educational resource or place for learning (Adams, 1993). The grounds can be planned and designed and developed as outdoor classroom to become part of *"formal,informal and hidden curriculum* " (Adams, 1993, pp.180) for children's education where both learning and playing can take place at the same time (Titman, 1992; Moore, 1974a, 1974b, 1974c,1978,1980, 1981, 1989a). Formal curriculum deals with initiative learning by teachers; in informal curriculum, children learn by themselves through play and interaction with peers; and hidden curriculum is related to what school landscapes can offer to child's developmental needs (Adams, 1993).

One of the influential independent national organization in UK that promotes the idea for development of school grounds is Learning Through Landscapes (LTR). It regards landscapes of school grounds as "outdoor classroom" with vast educational potential uses. The philosophical approaches of "outdoor classroom" are based on the belief that school landscapes are important place influences children's development and behaviour:

> ... school grounds are extremely important places. In many areas of Britain and elsewhere in the world, they provide a last, relatively safe, refuge from traffic and adults in an increasingly dangerous world. But more than that, they have a huge impact on the development of a child's and, indeed, a young adult's emotions and outlook. Their design and management clearly affects the behaviour and happiness of those who spend time in them (Lucas, 1995, pp. 235)

The landscape of school grounds affects and influences children, teachers, parents, and community as they frequently use and experience the space. Children may perceive school grounds as a unique play space for them to enjoy with sense of freedom that no other

spaces can offer them. Incorporating the needs for children's playg, school grounds can becomes a place to be together (Moore, 1978), opportunities for interaction and privacy (Weinstein and Pinciotti, 1988). It becomes crucial to fulfill the needs of outdoor activities of children more effectively and maximise the benefits of school landscapes. As a dynamic place, school offers a set of behavioural pattern for children. The number of activity settings in school influence the children involvement in activities. Older children's concepts of an ideal school become less congruent compared with actual school environments as they develop more ideas with age (Lee et al., 1983).

The planning and design of school grounds will influence childrens various activities and social interaction. Thus, school grounds landscape have to be essentially flexible, comfortable, able to offer certain degree of privacy and give "sense of place" to children as Titman explains the appropriate design and functional purposes of school ground:

> In addition to the basic elements of space and 'thing to do', there are other less specific but equally important considerations in terms of the design of the grounds. School grounds should, by design, enable and offer the potential for all aspects of the informal Curriculum, not just games and physical activities - places to read, make up stories and act out plays, marvel at the antics of a spider, delight in the properties of soil and generally to ponder the wonders of the universe.
>
> In addition to the functional uses the grounds need to support, they should be special places which children delight in and value because they posses a 'sense of place.' It is essential that grounds offer diversity, flexibility and change; stimulate the senses through variety of colour, texture, shapes; provide a stimulating and exciting 'place to be', which is reflective of and responsive to children's needs. (pp. 9)

In supporting the above ideas, Grove and Mason (1993) found children's preference for various types of play activities and the presence of naturalness and colourfulness in school landscapes play areas require an adaptable program, allowing children to be able to do many different things. In conclusion, there is a need to consider the function school landscapes serve by looking at potentials of familiar environment through children's experiences and perceptions that encouraged learning process (Adams, 1993, pp. 191).

4.4.3 Home Landscapes

In past literature, many researches have focused on children's perception of their own homes or ideal homes. Parke (1978) was concerned with children's understanding of the spatial-perceptual aspect of home environment and understanding of social organization of home settings. Thornberg (1973) investigated children's conception of places to live in and revealed that children's concepts of home do not change much compared to the development of representational competence. In a sorting task used to understand the meanings attributed to home, the range of expressive associations by children were

measured against multi dimensional scaling to relate with own and ideal home (Norburg-Schulz, cf. Spencer et al.,1989). Sebba and Churchman's (1983) study on children's activity and accessibility to specific home area suggests it is a significant factor contributing to definition of spatial control in territory.

Gaster (1995) looked into the concept of children's "home-range" contributing to children's access to their neighbourhoods and vice versa. It reveals relationship of children with their immediate home landscapes - pedestrian walks, backyards, neighbourhood shops, play spaces, natural areas, and vacant lots. Home-range is also related to children's needs to experience different places and spaces within their neighbourhoods (see Section 4.5.0 and Section 4.5.1).

Some studies look at home landscapes in term of natural environment and how nature effects children's cognitive functioning. Wells (2000) for instance suggested poor urban housing landscapes quality may caused various socio-psychological problems, health and "cognitive well-being" (pp. 778) resulting from eliminating children's experiences with nature or urban parks and natural areas. Since children spend more time in home environments, housing landscape quality may have serious repercussion on them. Within home landscapes, the presence of natural elements such as green vegetation (grasses, trees) and rocks, and outdoor natural play areas that can provide good views from home have a tremendous effect on children's cognitive functioning (ibid., pp. 790). Children's response to natural home landscape as favourite outdoor places is more positive , much preferred especially among boys (Sebba, 1991). The affective link between children and natural environment due simply to "nature is unlikely to grow tiresome," (Wells, 2000, pp. 791). In her study, Wells found the well-being of urban children living particularly in poor environments was significantly affected by the presence of natural landscapes, i.e. natural environment facilitate various types of play activities and this contribute to behaviour, physical and mental health of children.

4.4.4 Meaning of Home

Many studies deal with adults' interpretation the meaning of home, and fewer studies are concerned with children's concept of home. Children may or may not share similar views of home concepts with adult's. However, it is appropriate to view adults' concepts of home perhaps, and some pertinent aspects of home relevant to child's concepts of home environment. For adults, there are many factors affecting images and concepts, meanings and values of both housing and home that vary depending on an individual social economic status, cultural backgrounds (Lawrence, 1991). In order to understand the complex nature

of meaning and use of home, individual, cultural, and human factors need to be examined in relation to residential environment and Lawrence explains further:

> Housing evokes a range of images and concepts commonly related to the material and physical nature of one or more kind of dwelling units. Nonethless, the meaning of *housing* like the meaning of *home* varies from person to person between social groups and across cultures: houses are commonly attributed an economic value, an exchange value, and aesthetic value and a use value, whereas, in addition to these, a home is usually attributed a sentimental and a symbolic value. All these values, as well as domestic roles, routines and rituals, are not simply expressed by individuals: they are acquired, nurtured, transmitted, reinforced, or modified by interpersonal communication (e.g. between parents and children or between members of the same social or professional group). Hence, communication between different groups of people clarifies one or more systems of domestic customs and values in a society at precise points in time. This implies that the meaning and use of home are complex subjects, and that, in order to comprehend them, a range of cultural, societal and individual human factors need to be examined historically, as well as in relation to extant residential environments. (pp. 92)

Despres (1991) investigated the "concept of home" from adults perspectives and suggested two types of approach in defining the meaning of home. The first approach was based on a conceptual model for the home as defined by the home residents. In the second approach, the meaning of home was interpreted through "different interpretive theories of the human factors that have shaped the meaning of home," (ibid., pp. 97). She proposed the most exhaustive list of ten general categories meaning of home that may be relevant to this study thus, they are summarised briefly by Table 4.1: a profile consisting of psychological and social-cultural sets of meanings.

The study of home concepts in the past has been influenced by various contextual aspects including cultural, linguistic, historical, philosophical, phenomenological and psychological. Having looked into vast past studies on concept of home within environmental psychology, the very recent study by Moore (2000), reckoned there is still lack of "critical or innovative theories and methods," (pp. 207) to examine the home. It was suggested the concepts of home needed further reappraisal. In her study focusing on concept of home , Moore placed "home" in broader physical and cultural context by outlining several aspects of home including spiritual, cultural, symbolism, including suggestions to explore negative meanings of home as she puts:

> Future research could also focus on the exploration of *home* meaning. While moving away from the earlier phenomenological ideas, such as rootedness, placelessness, and sense of place, *home* has often been objected and classified into discrete variabless such as housing quality, levels of attachment, satisfaction etc. More focus is needed on the spiritual, cultural and symbolic essence of *home* which writers in phenomenology and sociology have highlighted. However, the renewed focus on meaning will need to focus on the ways in which *home* disapoints, aggravates, neglects, confines and contradicts as much as it inspires and comforts us. The challenge for future research is to empirically engage with this multifaceted complex concept without losing sight of the many layers of *home*. (pp. 213)

MEANINGS OF HOME	PSYCHOLOGICAL AND SOCIO-CULTURAL PROFILES
1. Home as security and control	The ability to have a control means a sense of physical security that vary depending on age and gender. Adults have shown preference for "spatial control and social supervision" unlike younger children concern for "freedom of action" and "physical and emotional security," (Despres, 1991, pp. 98).
2.Home as reflection of one's ideas and values	Home represent symbol or portraying self-image, an essential aspect of the identity and self definition (Welter, 1966, cf Moore, 2000, pp. 209) where manifestation of personal tastes, interests, and characters can be expressed by means of personal artifacts and belongings in home. To a child, 'home' carrys an image to retreat for feelings of companionship and hope (Beazley, 2000).
3.Home as acting upon and modifying one's dwelling	The ability to control and change the environment give meaning of home for some people through physical, resource, and emotional commitment. This gives "a sense of achievement and control, a place for self-expression and or a place for freedom of action," (Despres, 1991, pp. 98).
4. Home as permanence and continuity	The experience in home over long period of time create sense of familiarity, attachment and belonging - 'placeness' (Relph, 1976), 'topophilia' (Tuan, 1978), and 'rootedness' (Lynch, 1960). Childhood memories can also be associated with individual's "changing life objectives, aspirations, and future goals," (Despres, 1991, pp. 98).
5. Home as relationships with family and friends	This dimension of meaning is emotionally important that home can provide a place and environment for social links, allowing for behavioural experiences with other people especially family members, siblings, relatives, friends, and neighbours. Children associates home environment as focal place for social interaction in play activities with family members, best friends and neigbours (Moore, 1986).
6. Home as centre of activities	Various activities may take place in home environment both indoor and outdoor. Activities are related to psychological needs either works, hobbies, and recreational activities. Children may associate their play as main purpose of activity occurs within the home environment settings outdoor.
7.Home as a refuge from the outside world	Home represents "a locus in space - a central point of reference in the world." (Hayward, 1975). Home also carries an image of "heaven and corner of the world," (Bachelard, 1964, cf. Moore, 2000, pp. 209) or "sanctuary" allowing individual to seek solace or refuge for privacy and independence from the world around. Hayward (1975) relates home as territory, concept of home "as local area, a neighborhood and territory that implied a physical area involving personalization and defence," (ibid., pp. 5). Children may see home environment as a place with total entity, portrayed concept that helps them to be able to be away from an adult's world (Barbey, 1974).
8. Home as indicator of personal status	Social-economic status may be important to have it recognised or represented by home. Home becomes significant status indicator that can be easily identified. In this respect, home as sense of self and self-identity that becomes part or extension of individual influencing choice for home (Hayward, 1975; Cooper-Marcus,1995).
9.Home as material/ physical structure	Physical structure or built-form and characteristic of home contribute to this meaning. The common concept of home is as a place, a physical environment, a structure fit for living in (Hayward, 1975). Many aspects of home in context with the character of neighbourhood environment, location, the availability of spaces, facilities, resources and services are part of material structure of home. An aesthetic values of home as portrayed by architectural form, style, detail features are also part of elements that give meaning to home.
10.Home as a place to own	Ability to own home is a basis to family life, and the pride assiciated with home ownership. It allows personal freedom for activities in a controlled space or place and give sense of permanency.

Table 4.1 The Meanings of Home: A Psychological and Social-Cultural Profile
Source: Adapted from Carole Despres (1991) and others.

The concept of home despite being well focused in environmental psychology research has been within adult's perspective and very few have looked into the concept of home from children's points of view. Among children's studies is, Barbey's (1974) children's concept of ideal home that deals with qualitative aspects of home from symbolic and anthropological dimensions of dwelling (see also section 3.6.2 in Chapter 3). Methodologically, the interpretation was based solely on childrens' drawings in exploring qualitative aspects of home: "space dynamic, ambivalence and permanence," (ibid., pp. 143). Certain children's concept of home may or may not be significantly equivalent of adults' concepts as children learn to share the adult's world around them.

4.4.5 Children's Playgrounds and Parks

There is voluminous literature written on children play area from various perspectives: historical development (Cranz, 1989), children needs (Holme and Massie,1970), play spaces in housing area (Hole, 1967; Cooper-Marcus et al., 1986), types of playground (Bengtsson, 1972; Hayward et al., 1974), aspects of planning and design (Susa and Benedict, 1994; Moore et al., 1992; Senda, 1992; Titman, 1992; Eriksen, 1985; Cooper-Marcus et al., 1986), purpose and usage (McKendrick, 1999; Herrington, 1999), preference for equipment (Bishop et al., 1972) etc. There is no intention to attempt to summerise the literature here, but it would be appropriate and sufficient to highlight specific observations and findings that related to provision for children's use and needs and preference for activities in play areas within a larger scale (park) landscape.

In the US, devotion to children's play started with attention to schoolyards, atheletic fields and in the form of children's sand garden (Cranz, 1989). Later, in late 1800s the playground movement became instituted in municipal park service. The provision of play facilities for children in existing parks and public squares became popular in the early 1900s. The national institution of Playground Association of America was established in 1906. With this playground movement, people became concerned with parks as places for children's play. Ideally, the playground movement advocates that playgrounds should have both an aesthetic appeal and be serviceable. It was suggested that play facilities and features could exist side by side with natural elements of trees, shrubs, and flowers without planting intefering with the play spaces. The planning approach in integrating play equipment and traditional parks was to separate the area for children's play from the rest of the park. Some designers such as C.S. Sargent felt that playground should be separated all together from large parks. Whatever the approach taken, playgrounds for children have since been recognised not just as outlets for the instinct of play but as settings for the children's social interactions through games within parks. In facilitating children's play, the role of play leader

was recognised to provide expert leadership for children and to foster a general sense of ethics (Cranz, 1989, pp. 170-172).

Various naturalistic studies of children's environments (Hart, 1979; Moore, 1986; Hole, 1967) have indicated low usage and low preference for formally designated play areas as they 'supported a relatively small proportion of the child's available time for play,' (Spencer et al., 1989). The development of playground has seen various types of layout and play equipment from traditional, adventurous, modern, contemporary or composite designer-playgrounds. Although all these playgrounds have been used by children of different age groups and obviously satisfied a function for many children, sites other than playgrounds are equally important and visited by children in the course of everyday play (Hayward et al., 1974). Integrated types of play equipment, despite the credit of greater complexity and flexibility of playground layout to promote creative play did not necessarily benefit social, language and motor development (Brown and Berger, 1984). The availability of different types of play facility will determine age of users, and influence the behavioural pattern of children (Ibid.).

In the study of children's play at four different neighbourhoods by Berg and Meldrich (1980), it was found that the children were concerned for social interaction opportunities with peers through play. They also found both man-made and natural landscape and environment contribute to play opportunities. Certain environmental conditions or setting such as street, natural terrain, backyards, vacant lots, and designated play areas facilitate social interaction among children. In their study, Berg and Meldrich (1980) found children's patterns of social interaction in the neighbourhood were affected by terrain (e.g. flat land or hilly), land uses (e.g. neighbourhood facilities such as commercial areas, shops, schools, parks), and children density (the presence of more children allows better social interaction). "Flatlands" neighbourhood facilitate children's mobility and expand their home range and autonomy. Designated parks and school play areas were not considered as "their own" by children but "found" play spaces in form of vacant lots were much preferred.

4.5 CHILDREN'S TERRITORIES AND TERRITORIALITY IN THEIR NEIGHBOURHOOD

4.5.0 Children's Home Range

One of the earliest studies in an attempt to explore the concept of home range through its characteristics and elements was conducted by Anderson and Tindall (1972) using children's 'turf maps.' The focus was on cross-cultural and developmental study to establish the actual measures of the children's home range. In defining the concept of home range,

Gelwick (1970), (cited in Anderson and Tindall, 1972) emphasised mode of movement or mobility and freedom of children and peer groups within the single spatial area either continuously or discontinously linked, as *"that series of linkages and settings traversed and occupied by the individual in his normal activities."* Thus, understanding the way the home range of children in different culture or setting evolves may provide important insights into children's environmental preferences (Anderson and Tindall, 1972). On the other hand, Andrews (1973, pp. 74) suggests the idea of home range of children evolves around *'conceptualizations of the development of environmental cognition'* that grows from small familiar and used territory such as home base to a much actively explored larger area in form of activity nodes. Here, the home range area is measured empirically by means of the inclusion of landmarks as significant activity nodes. The territorial range expansion is seen as a function of age and ability to experience in relation to activity and exploration: from small space (e.g. a room) to a house, group of buildings, neighbourhood, city, and region. Other variables such as gender, mobility (Hart, 1979), and length of residence strongly influence the extent of home range.

Home range is a spatial range of children's play space within the boundaries of accessible areas from home - streets, playgrounds and school and for adolescent children the range may vary between half to two kilometres away (Benerjee and Lynch, 1977). As the centre of children's environments, different home settings have different meanings. Children's territory or spatial range is proportionate with their age (Hole, 1967, pp. 10; Michelson and Michelson, 1980, pp. 89; Pollowy, 1977, pp. 39). The extension of home range is necessary for social, physical and cognitive development (Brunner and Conolly, cf. Spencer et al., 1989). It provides an opportunity for children to venture into the environment around and acquire competence and greater understanding (Pearse, 1977, cf. Van Vliet, 1983b). Parental restrictions on children's range hinders the development of skills to explore and to handle the situations when facing with danger in the environment (Hart, 1979; Valentine and McKendrick, 1997). Thus, spatial range is important to children, but planners have been primarily concern with standard distance from home to schools and playgrounds rather than range (Dee and Liebman; and Levin and Bruce as cited by Van Vliet, 1983b). Within this standard distance of home environment, children's travel to various facilities do not necessarily utilise the playground and park planned for them (Brower and Williamson, 1974; Churchman, 1980; Gold, 1972; McKendrick, 1999).

Play equipment attracts children for brief periods at a time (Hole, 1966, pp. 16), and attracts only a few children (Department of the Environment, 1979, pp. 40). Children are found to spend time outside the home, in school, and at playgrounds (Cunningham and Jones, 1999; Medrich et al., 1982) in what Van Vliet (1983b) termed as "*the fourth environment*," - the environment outside the home, play spaces, especially child's oriented institutions such

as daycare centres and schools. These types of environments are necessary to satisfy children's developmental needs as ability to explore the "*fourth environment*" is manifest the extent of their home-range. Children use their neighbourhood fabric without discrimination (Moore, 1986). Neighbourhood environment gives crucial social support system to children (Depeau, 2001), as a meeting place for socialization (Lynch, 1977), and as important settings for "the development of self-concept and the acquisation of skills that facilitate children's gradual integration into the adult worlds," (Van Vliet, 1983b, pp. 579).

Past studies have found that urban children have smaller range as compared to children living in the suburban environment (Anderson and Tindall, 1972; Hart, 1979; Lynch, 1977; Banerjee and Lynch, 1977; Moore, 1986). Children's spatial behavioural pattern in suburbs is influenced by the scattered facilities or services over a wider location of home for their activities, thus offering a large home range for the children. It was also found that older children and boys normally afford a larger home range than younger children (Anderson and Tindall, 1972; Coates and Bussard, 1974, pp. 138-139; Hart, 1979, pp. 55-63; Michelson and Michelson, 1980, pp. 88-92). Apart from age and gender, not many studies have specifically researched aspects of difference such as in ethnic background (Ladd, 1970; Appleyard, 1970; Lynch, 1977; Berg and Medrich, 1980).

Other studies have indicated subjects' home range from various perspectives of "neighbourhood" by ethnic groups (Ladd, 1970; Berg and Medrich, 1980), phenomenal landscape (Hart, 1979); parental restriction on children mobility (Hole and Miller, 1966; Berg and Medrich, 1980); home range structure and territorial behaviour (Parkinson, 1987; Van Vliet, 1983b; Sebba and Churchman, 1983; Anderson and Tindall,1972), urban neighbourhood impressions from childhood memory (Lukashok and Lynch, 1956; Cooper-Marcus, 1978, 1992, 1995), aspects of urban area characteristics and extent of knowledge by children (Appleyard, 1970; Andrews,1973), and children's interaction with urban environment and neighbourhood (Moore, 1986; Lynch, 1977). The study by Anderson and Tindall (1972, pp. 1-1-5) attempted to elicit children's home range in form of concrete data concerning the extent or structure of the terrirorial ranges of children. This structure has been explained in form of activity nodes (i.e., recreation, social, and commercial), mean home range (i.e., distant travelled) (Depeau, 2001), and bicycle ownership among children sub-groups of different age and gender.

Ladd's study is exceptionally relevant to this research as she studied the character of urban neighbourhoods as depicted by a specific ethnic group of 60 black boys aged 12 to 17 years-old from low social-economic backgrounds. The main purposes of the study were to answer research questions on how children define areas of neighbourhood; the important "contents" of neighbourhoods based on map drawings. Physical characteristics of neighbourhood and children's individual differences influence neighbourhood maps and their content reflecting children's sense of coherence and complexity of neighbourhood. Children's representation of streets, home and traffic may convey both psychological and physical boundaries. Ladd suggested the length of residence and residential and physical mobility may effect the content of neighbourhood maps. Children's maps of their neighbourhood seemed not to be related to ethnicity at all as "formulation of map-making convention" was influenced by dominant culture, teaching method and neighbourhood's physical similarities (Ladd, 1970, pp. 98).

Other study on home-range have emphasised children's mobility, keeping perception and cognition seprated from spatial activity within home-range. As spatial activity grows with home-range, children are found able developmentally expand several recognisable "home-range" entities such as "free-range," "range with permission," "range with permission, with other children," and "range with related adults," (Moore and Young, 1978). Their work is very much parallel to the objective of this research i.e., integrating the findings with the planning and design process, although slightly different in approach. Moore and Young explored children's environmental experience or their interaction with the existing surrounding within the territorial range and inclined toward home-range "index or measure," (Gester, 1995). This research however, explores the notion that potential concepts built of a place to be created in the future, or "ideal home environment" as prefered by the children can hopefully produce interesting insights to integrate further with planning and design process (Canter, 1977). The importance of home range in relation to this research is the question of: How individual children from different ethnic background and gender perceive, cognise and organise the concept of territory within their ideal home landscape environment? More importantly, in relation to planning and design of urban environments for children, the concepts of home range "appear to have potential for the study of spatial and environmental behavior and important implications for environmental design," (Anderson and Tindall, 1972, pp. 1-1-1).

Many other factors may also contribute to influence the home range such as location of home or neighbourhood, children's developmental stage , and parental restriction that effects the spatial range of children's activities. This parental control is the most important factor which determine permitted range, eventually limit range behaviror of children (Perez and Hart, 1980). Parental restriction is due to environmental factors such as traffic in urban area and natural danger such as river in rural settings. Other factors may be bad influences by other children and adults (e.g. crime, deliquency, truancy, abduction etc.). However there should be a balance between concern for safety and opportunity for child's adventures (Figure 4.1). Suburban environments may be much safer than urban places and the middleclass parents in suburban areas impose different child-rearing values (Moore and Young, 1978). Parent's socio-econimic status is found to have an impact on attitudes toward children's freedom. Freedom of spatial movement as middle-class parents seems to be less restrictive and willing to grant their children with autonomy in travel within the home environment (Van Vliet, 1983a; Appleyard, 1970); Bronfenbrenner, 1979; Depeau, 2001). Aspects of cultural preferences and travel mode are governed by social class and eventually affect travel range.

Generally, for 'Western' children, it can be concluded that home range increases with socio-economic status and other variables related to social-class with regard to children's age, sex, and location of their home (Van Vliet, 1983b, pp. 571-572). Van Vliet put forward four hypotheses in relation to children's home range: First, home range for suburban children is larger than urban children. Secondly, older children have a larger home range than younger children especially in the city. Thirdly, boys have larger home range compared to girls, especially in the city, and finally, the higher the social class, the larger the home range among children. Most of the activities in both city and suburban environmental settings occured beyond 800 metres from home. For teenage urban children, variations in age do not influence the distances travelled but it is significantly different in the suburbs. Girls in suburbs had smaller home ranges than boys. Suburban children from higher social classes had the largest home range compared to the very small home range of urban children from lower social class. Therefore, the larger home range belongs to suburban children, children from higher social classes, boys and older children, not girls and younger children. Smaller home range is expected among urban children of lower social class. It was also found that spatial range had a positive correlation with behavioural range, i.e, the wider the home range, the more varied and diverse activity children can participate in.

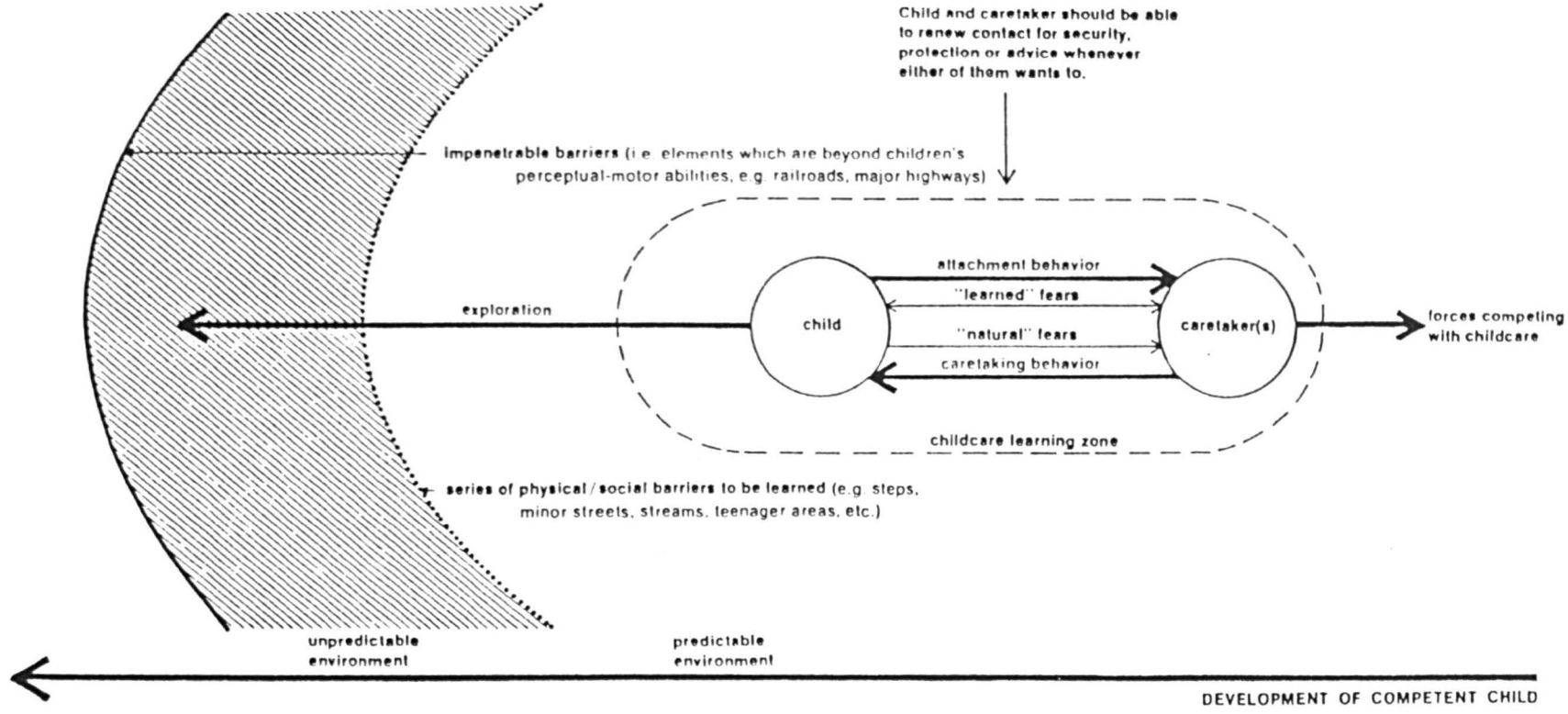

Figure 4.1 Schematic Representation of factors which determined the range of behaviour of a child. (*Source:* Perez and Hart, 1980, pp. 255).

4.5.1 Children's Territory and Behaviour

Children's territorial bahaviour like the adult in the home environment can be described as behaviour that demonstrates control, possesion, use and defense (Lipman, 1968) over certain spaces or places. This behaviour according to Edney (cf. Sebba and Churchman,1983) may be associated with defensible space and the need for control, safety, comfort, role performing places, and privacy (Altman, 1975). Children's territory in the home environment is influenced by social behaviour as a main element for the identification of their territory. In other word, children's territory is closely related to their territorial behaviour or activities, influenced by characteristics of physical environment.

A sense of territory ownership may be displayed by "hospitality" - a symbol of an inviting environment as part of territorial behaviour (Sebba and Churchman, 1983). Children may find that having territorial rights helps to promote their own identity (Cooper-Marcus, 1979, 1995; Rapoport, 1969), to enable them to feel dominant and gain control (Altman, 1975), and to enable them to plan and carry out to plans according to Edney (cf. Sebba and Churchman, 1983).

Sebba and Churchman (1983), focused on indoor home spaces, but their theoretical analysis may still be valid and applicable for outdoor environments. Their conceptual framework of territorial study were based on human attitudes, effective and potential behaviour toward the indoor home spaces. The interaction or link between individual or group with physical spaces influences people's attitudes and behaviours in defining territory. Behavioural and attitudinal expression can be defined into various components of territorial behaviour, e.g. social behaviour - individual's interaction toward others in relation to privacy; spatial behaviour - preference for spaces for various optional activities; and behaviour towards the area - attitude in relation to choice for activities. Attitudes toward a place involve identification of an individual's place; place identification as a symbol of self identity; and places for individual sense of privacy (ibid., pp. 195).

With respect to the above behavioural and attitudinal contentions, in the home outdoor environment, children may define their territory - for instance by displaying a sense of ownership for certain outdoor features or their exclusive uses. Home environments form part of the physical area which is important to children, characterised by their behavoural pattern of activities. A territorial place requires identifiable physical boundaries. Within home space, there are five types of territorial areas ie. individual, shared, public, jurisdiction and activities areas (ibid., pp. 207-208).

4.5.2 Children's Behaviour in and Attitude Towards Home Environment

The social behaviour of children in the home area is related to social control that exhibits the potential for dominant behaviour. Children were found to be dominant in their own spaces but not in shared spaces. Children's inclination toward dominance increases with age. Children's area of dominance is manifested through preferred activities with friends rather than being shared or more public in nature (Ibid., pp. 198-200).

Children normally display positive behaviour towards an area (e.g. in activity participation) and maintenance if they feel the area belongs to them. Participation of children in maintaining spaces increase with age but girls participated more than boys. Sebba and Churchman further observed children rarely describe the whole home environment as theirs but may describe a specific designated children's area as such sense of ownership is influenced by the size of a space. Attachment to certain spaces that give a sense of identity among children depends on whether they are able to exercise freedom for the things they like to do. Having a space for their own use with the privilage to invite others to share or to be with could give a sense of privacy among the children in the home area.

The dwelling unit or home environment may be best presented as a territorial model made up by series of areas or places with different territorial classifications and characteristic behaviours and attitudes. Territory is defined through mutual concensus among users and the behavioural supporting facilities would take place within a physical boundary. As a member of the family or user of the home environment, children are able to define their own territory to avoid conflict or transgression into others behavioural areas. Children's preference to have individual control perhaps can be best observed in the specific designated area for them. This type of area gives access to freedom of self expression and the display of territorial attitudes and behaviours or activity preferences.

In shared places, children's attitudes are marked by lower preferences for use of the area and a decrease in social dominance. However, within shared areas, children's ability to have control is determined by the size of the area. The bigger the shared area, the more likely they are to have the opportunity for control, in creating personal, private space. Public or common areas limit children activity, and supress the feeling or opportunity for social dominance. Certain formally designated children's space within the home environment may be an area of jurisdiction as it allows children activity and social dominance. Based on territorial models by Altman (1975), Rapoport (1978) and Sebba and Churchman (1983), Depeau (2001), home environment is characterised as a primary territory that gives children

opportunity for spatial control over activities and behaviour. On the positive note, children's territorial behaviour is not only represented by desire to be in isolation but also motivated by the need to interact with others e.g. parents,siblings, friends, and neighbours as their behavioural pattern is determined by preferred play activity with others.

4.6 PROVISION AND CHILDREN'S USE OF LANDSCAPE SETTINGS

How children's environments are planned and provided, and how different landscape settings are used by children are important issues and fundamental to environmental research and design questions. Equally important is how proper provision can meet the needs of children and result in maximum utilisation. Understanding children's use of their environment and provision underpins many common but vital linkages: the planning and design of children-oriented environments, children's spatial cognition, perception and preference of environment around them.

Some of these areas are not well researched, and yet such knowledge provides crucial information in guiding the planning and design of urban environments. The past and present informations under the above headings demand a review and presented in a coherent and cohesive manner highlighting the current development and knowledge of children environment: privosion and use. This knowledge has implication for understanding children's concepts for their ideal environments and preferences for spatial activities serving to formulate guidelines in environmental planning and design of urban environment with children in mind.

In order to fulfill this reviewing task, this research has to bring together various material scattered accross a wide range of literature written from different disciplinary approaches. In doing so, it helps to demonstrate both the importance and generality of underlying environmental research on children and potential to apply this in research on children environments. The focus of interest here is concerned with children and better designed environments for children as a whole.

4.7 CONCLUSION

Some of the important issues pertinent to children's environment have been highlighted in this chapter. The review has focus on the provision of children's environments generally although play environments have been emphasised as they have attracted the interest of wide range researchers from various disciplines in the past. Recent developments recognise that children's play is not confined to playground alone but to more diverse and richer environments in urban areas (some not specifically planned or designed for them). This chapter has attempted to piece together information regarding the provision of children's environments with respect to play spaces within a larger context of urban open space planning and children's use of the environment both planned or unplanned.

The information in this chapter serves as a good starting point in building a foundation for the next stage of investigation into children's concepts and their preferences. The main purpose of this chapter has been to highlight the concerns of planners, designers, policy makers, and the authorities responsible in the provision of children's environmental facilities then to relate these concerns with children actual use of the environment in question regardless of cultural and environmental settings. In other words, it is an effort to fit between provision and use or provider and user. The important issues to deal with will be how the children as user think their environment should ideally be? In addressing this question, there is an opportunity to bridge the gap between the provider and the user, by incorporating the voice of children into the planning and designing of urban space.

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Chapter 5

CHILDREN'S ENVIRONMENTS IN THE CONTEXT OF URBAN OPEN SPACE PLANNING IN JOHORE BAHRU,MALAYSIA

5.0 INTRODUCTION

Generally, urban planning activity in Malaysia involves designing new urban settlements, promoting urban growth, or regulating urban growth. It has been practiced since as early as 1921 with the purpose of promoting a healthy, safe and effective living urban environment for the people in the city to carry out daily activities (Lee, 1991). Through planning, many factors that affect the outcome as well as the possible impacts of development are considered to fulfill both the current and future needs of the people. Urban planning in Malaysia incorporates various key systems in shaping the physical form of the city, i.e. activity, development and environmental systems. In activity systems for instance, the needs for various urban development in housing, urban facilities and infrastructure, commercial, and open space and recreational facilities is evaluated and planned for (Ngah, 1998, pp.2).

There are no definite statements or clauses that link directly children and the planning system although general provision of children facilities is a related part of planning processes, corresponding loosely for instance in provision of play spaces, recreational facilities,schools and other community amenities in neighbourhood planning. Within the urban planning system, the structure plan requires a good understanding of factors of urban development, urban structure, forms and roles of town centre and the surrounding areas. At local level, planning requires understanding and knowledge and sensitivity to the needs and aspirations of community (Lee, 1991), including children.

5.1 DEVELOPMENT OF URBAN PLANNING IN MALAYSIA

The urban planning system in Malaysia was introduced as early as colonial times in 1921 and it was based on the British model, spearheaded by the enactment of the Housing, Town Planning, Etc. Act in England in 1909 (Lee, 1991). It has been practiced through out and changed over time to meet with new challenges and to suit current social, economical, and political structures. The important milestone in urban planning development in Malaysia was

the enactment of the Town and Country Planning Act of 1976. With this act, the concept of the Structure Plan based on 1905's England and Wales Structure Plan (see Appendix 1 for detailed discussion on development of urban planning system in Malaysia).

As Malaysian society is becoming more urbanised, urban planning has become increasingly important to deal with various social and physical urban environmental problems such as degradation of the natural environment and resources, and the disappearance of open spaces in urban areas. Thus, the government has taken certain measures to consider environmental factors in development. For instance in 1996, the amendment of the Town and Country Planning Act of 1976 amongst other things included the provision for green open spaces, the preservation of the natural topography, tree protection, the conservation and preservation of historical and significance buildings, and the requirement for Development Proposal Reports in planning applications. Almost all local authorities have completed structure plans to serve to guide planning and development in their district or council as Peh (1997) explains:

> ..... the government has undertaken the preparation of development plan (Structure Plans and Local Plans) for all local authority areas under the provision of the Town and Countary Planning Act 1976 (Act 172) and its amendments 1995 (Act A933). Structure plans basically contain policies and proposals for development and use of land, thus provide a framework to local planning authorities for the continuous process of making development planning decisions, while local plans are concerned with more specific and detailed implementation of the proposals of the structure plans. (pp. 3)

Despite detailed planning to deal with more people of different needs and expectations hoever, planning for children's environments and incorporating child's needs has not been considered primarily important or effectively implemented. Urban planning for children's environments is merely incorporated in open spaces for recreation within general urban open space planning and the needs of children are not specifically addressed. Much of the concern of urban planning and development is to ensure the sufficient provision of public facilities, that encourages social interaction and bondage among the various ethnic groups in a multi-racial society (Muhammad, 1996).

Urban planning has been identified by planning authorities as an important instrument in community planning and development to enhance society. The provision of facilities, for example in the creation of 'environments that are less stressful, more user friendly, child friendly, safe and crime-free and environment friendly' (Peh, 1977, pp. 5).

5.1.0 A Need for Child Related Planning

Children normally have strong ideas about environments and spaces around them. There is a need for child related planning in provision of children's environments, their needs and expectations are crucially important to be incorporated in planning process. Unfortunately the present planning system in Malaysia failed and overlooked issues and matters of children's interest. Children have no formal ways to channel their views on environmental issues that concerned and influence them in planning of urban environments.

Despite calls to create better environments for children, no local planning authorities have taken into account the need for child related planning to ensure children's needs are considered in planning process, let alone to make provision for children to be consulted about local planning issues. Proposals for urban planning and development in housing, transport, leisure and recreational will affect children. However, provision for these needs of children do not feature prominently. Local authorities like Johor Bahru City Council, prepare structure plans addressing strategic policy issues. These only serve to provide a basis for guidelines and policy in urban planning to consider needs to improve and protect quality of environment and land uses matter generally. There is no effort to review policies and guidelines in structure plans in order to incorporate the needs of children in more detail so that the policies reflect their needs. Children's issues have never been considered seriously at local planning level. In the structure plan, policy and guideline reflect the adult's perceptions of what they thought fulfilling children's needs through the provision of open spaces for play and recreational activities in a various settings especially in housing or neighbourhood planning.

5.2 HISTORICAL DEVELOPMENT OF JOHORE BAHRU

In Johor Bahru Central Distric Development Master Plan (ISI, 1996), the historical development of Johore Bahru was briefly outlined. Johore Bahru is the capital of the state of Johore and well known for its role as a southern gateway city of Malaysia. It was founded in Tanjung Puteri in 1885. Prior to 1886, it was known as Iskandar Puteri. During that year, the Istana Besar was officialy opened and the government moved over from Telok Belangah in Singapore. In the following years, roads were laid out which still form the framework of the Central District today and public buildings were constructed which now comprise the heritage buildings of the city. Johore Bahru in the 19th. century showed many of the characteristics of a traditional Malay capital with the palace of the ruler and the seat of government in the centre surrounded by the residences of the Sultan 's Chief Officers, with Mosque of Sultan Abu Bakar on the west and the headquarters of the Johore Military Force on the east of Bukit Timbalan where a flagstaff was erected (ISI, 1996) (Figure 5.1).

Figure 5.1 Johore Bahru City with old city centre at the bottom. Among the important landmarks include the Palace, Sultan Abu Bakar Mosque, and the State Admnistrative building at Bukit Timbalan.

During the early years, there were only a few fishermen's huts on the shoreline. The mouth of Sungai Segget was the harbour. Small boats could bring produce into the river while larger boats were moored outside. In 1860, the Johore Steam Sawmills was set up at the present immigration entry point and was the first industry to be established. From between1900 and1940 the Chinese came and settled around the Sungai Segget (Figure 5.2), establishing shops and warehouses to service the pepper and gambier plantations which were then the mainstay of the Johore economy. Around this centre, Johore Bahru was made up of a number of villages which formed the residential areas. Present day maps still mark the Central District surrounded by villages, the oldest of which were Kampung Kubur, Kampung Tarom and Kampung Baru. The business district continued to grow around the Sungai Segget area (Figure 5.3).

The completion of the Gemas-Johore Bahru line in 1909 linked Johore Bahru by rail to other states. The completion of the Causeway in 1924 made Johore Bahru the southern gateway to the Malay Penisular. By 1941, Johore Bahru had a population of about 30,000. The Bukit Serene Palace, the state government building and an impressive modern hospital were completed at that time. It was an attractive seaside town, well known for its distinctive architecture and the scenic road along the sea front. This sea front area for instance the Lido beach front is one of the most popular sites for the public recreational activities until today (Figure 5.3).

Independence brought an awareness of the need for development. After the death of Sultan Ibrahim in 1959, two large tracts of land on the outskirts became available for development. The Ulu Molek Estate was obtained by the State Government which made possible the development of Larkin Industrial Estate, Johore Bahru's first industrial estate. The Sultan's heirs released Pelangi Estate into the market which led to the development of Taman Pelangi, the second major housing estate in Johore Bahru (Figure 5.4).

The 1970's saw the development of shophouses and three-star hotels along Jalan Wong Ah Fook and Jalan Tebrau with the completion of Tun Abdul Razak Complex as the landmark building of that period (Figure 5.5). By the 1980's, the development of a port and industrial township at Pasir Gudang began to make an impact on Johore Bahru. There after, the government's economic policies and planning strategies led the way to rapid growth from state capital to metropolis. It aspires to become a city of international standing by the 21st. century as it has potential as gateway city to Malaysia for excellent business centre and pleasant living environment with cultural diversity, and where children will be able to receive the best education (ISI, 1996). It has been claimed by local authority that future planning in urban central district adopts a holistic and balanced approach to development which take care of social needs within urban society.

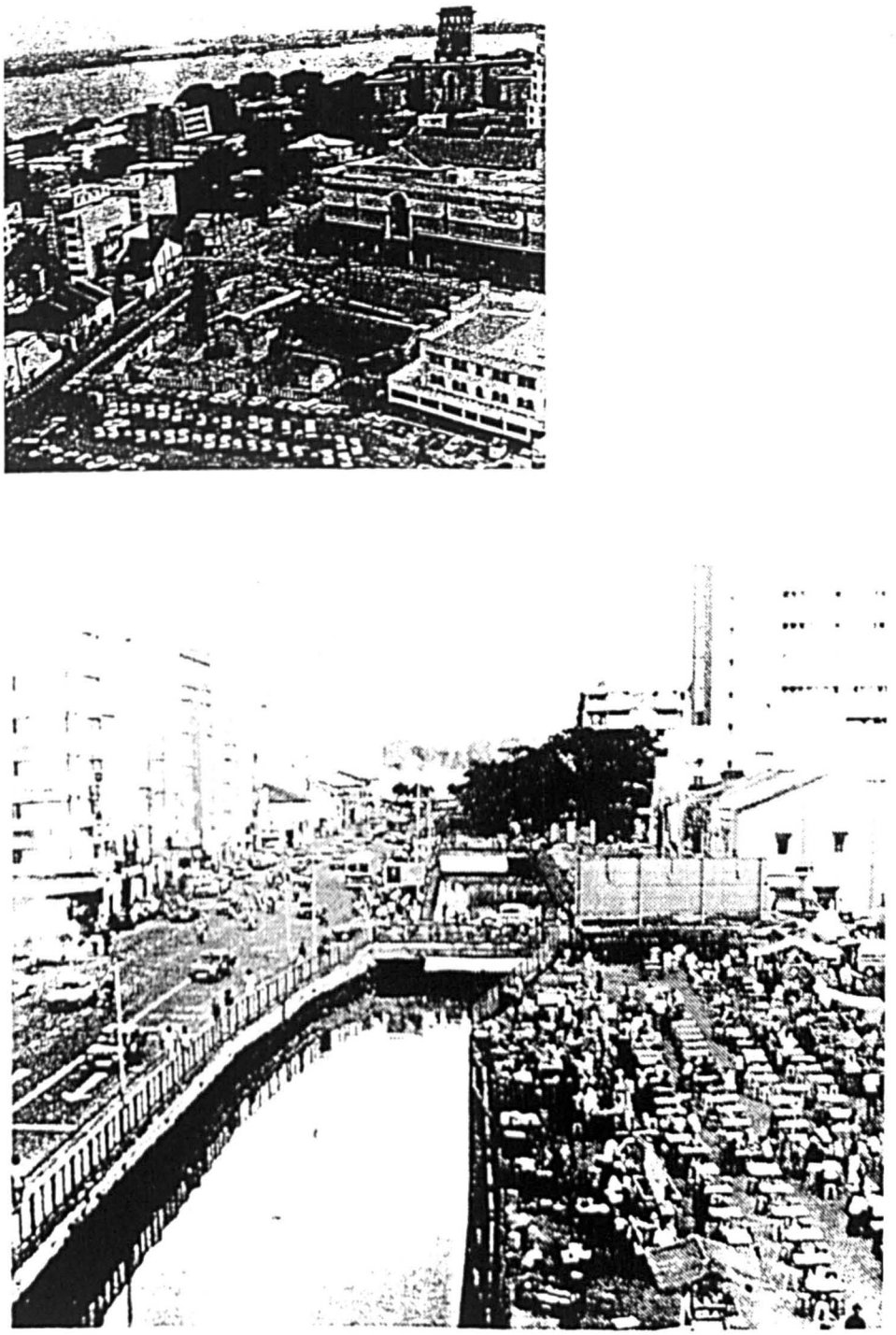
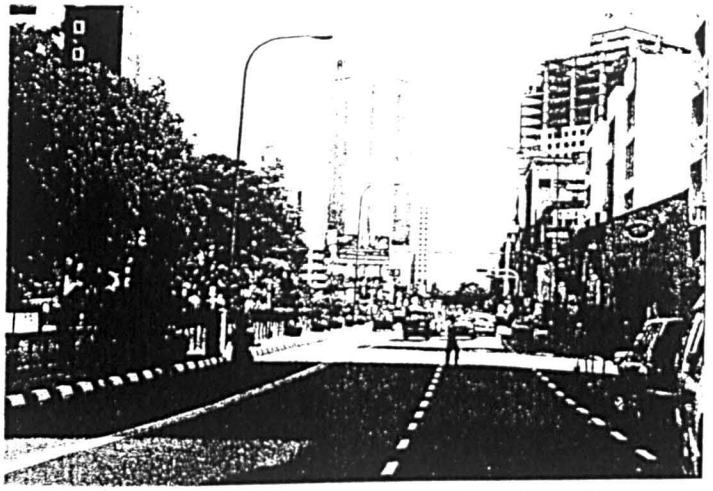


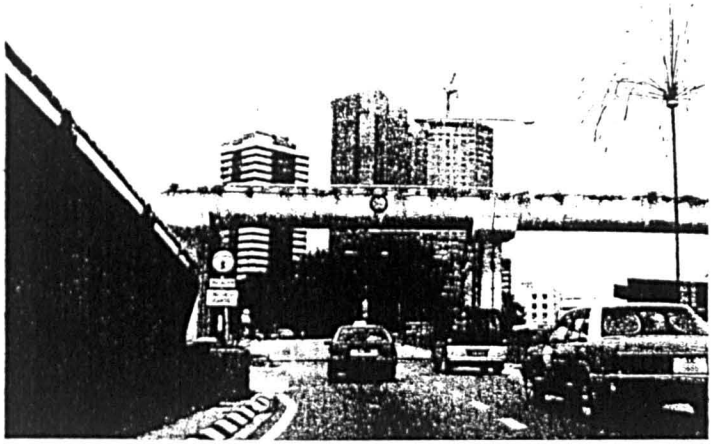
Figure 5.2 The State Secretariat building can be seen in the top far right (top). Sungai Segget area (bottom) once was an important trading port, but now serves as a drainage channel.

Figure 5.3 An early village settlement surrounding Central District of Johore Bahru. Note the organic nature of planning layout surrounded by urban green. Lido beach stretches the whole length at the bottom of the map.

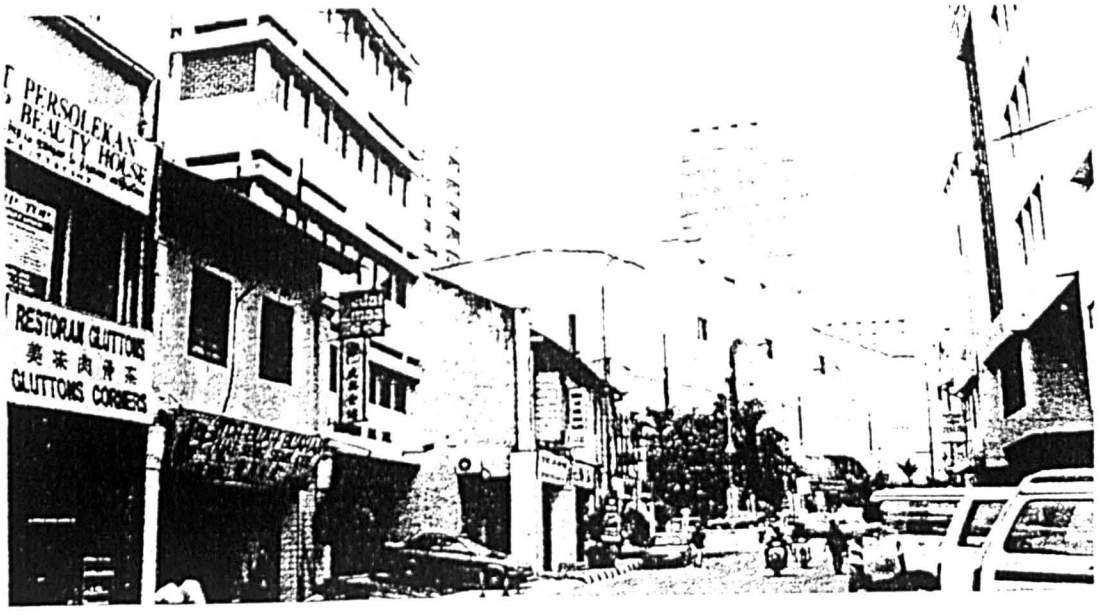
Figure 5.4 Taman Pelangi, a major urban housing development in Johore Bahru. Note the grid-iron planning dominated by streets with distribution of open spaces scattered throughout whole development.



a. Tun Abdul Razak complex as a landmark can be seen in the background along the busy street of Jalan Wong Ah Fook.



b. Streets are dominated by cars. Pedestrian access is limited. Provision of overhead pedestrian bridge is to facilitate crossing over.



c. Johore Bahru old town. Pedestrian path is provided by "*kaki lima*" or "five-foot way" - covered walkway along the front of the shophouses.

Figure 5.5 Street scenes in Johore Bahru city.

5.3 PATTERN AND NATURE OF JOHORE BAHRU EXPANSION AND GROWTH

5.3.0 Issues and Problems

Though it has improved since the early 60's and 70's, many aspects of planning for urban growth in Johore Bahru have yet to be seriously considered. Piecemeal planning approaches as a result of sudden and quick growth rate of the city development failed to scrutinise the planning decisions and study their implications. Furthemore, the reliance of public sector on the open market and private sector resulted the failure in the provision for public demand for certain facilities and infrastructure. The planning and development of private housing and commercial development though controlled, are fragmented developments. Consequently, the city appears as though it is made up of many districts instead of a more holistic, cohesive appearence, and integrated development.

Development control at the structural plan level cannot work as an effective tool without detailed local plans. Planning guidelines and development control only serve for many sub-divisions as individual developers need to abide by them. They do not help to promote a continuous sense of harmony, unity for cohesive urban fabric. The developments of the private sector failed to provide public facilities in a more integrated manner. More often than not, private interests in Johore Bahru override the public interest. This practice has a negative impact on the planning process leaving the public to deal with consequences. With this approach, if continuously unchecked the development of Johore Bahru can seriously affect children's environment. The effect and implication on children's environments has not been considered from the physical planning perspective but rather from social-cultural and psychological agendas for more organised various group recreational and educational activities, for instance through the introduction of "*Rakan Muda*" programme in 1994 for young adolescents.

5.3.1 Recent Population Growth

In the past few years Malaysia has experienced a period of tremendous socio-economic growth. In the state of Johore, the focus of area experiencing a period of rapid growth is in Johore Bahru itself. The 1991 population of Johore Bahru City Council (old boundary) was estimated to be around 329,000, an increase of 82,000 since 1980, giving an annual growth rate of 2.7% over the past twelve years. In the extension areas are an estimated 100,00 residents, bringing the total 1991 population of Johore Bahru City Council and extension to 420,000. Within Johore Bahru District the population rose from 406,00 to 705,000 between 1980 and 1991, an annual increase of 5.1% (Jabatan Perancangan Bandar, 1994).

The projected population for Johore Bahru City Council for the year 2010 has taken into account the projected population growth for the state as a whole and the developments that are expected to take place elsewhere in the state outside Johore Bahru City Council. Given the state policy of spreading development more equitably in all regions in the state and the commitment to develop major new growth centres, a moderate pace of population growth is projected for Johore Bahru City Council.

A target figure of 760,000 people has been selected, this being based on continuing relatively high levels of in-migration and slowly declining natural increase in population. The growth rates to reach this target would be 4% between 1991 and 1995, declining to 3.4%, 2.9% and 2.5% over the subsequent 5 year-periods. When this figure is combined with populations for the rest of Johore Bahru District a total figure for the district of 1.58 million people by the year 2010 results as shown by the following table:

	1991	1995	2000	2005	2010
Johore Bahru City Council	420,000	490,000	580,000	670,000	760,000
Average Annual Growth Rate		3.9%	3.4%	2.9%	2.5%
Rest of Johore Bahru District	285,000	370,000	507,000	665,000	820,000
Total of Johore BahruDistrict	705,000	860,000	1,087,000	1,335,000	1,580,000
Average Annual Growth Rate		5.1%	4.8%	4.2%	3.4%
Percentage of DistrictPopulation In Johore Bahru City Council	60%	57%	53%	50%	48%
Johore State	2,074,297	2,346.502	2,724,468	3,080,000	3,424,756
Average Annual Growth Rate		3.1%	3.0%	2.5%	2.1%

Table 5.1 Projected Population of Johore Bahru City Council 1991-2010
Source: (From Explanatory Document, Published by Jabatan Perancang Bandar, Majlis Bandaraya Johore Bahru, 1994)

5.3.2 Implications for children in city and for development

The age structure shows that children below the age 15 forms about 35 per cent, i.e. 203,000 from total population within Johore Bahru city. With the increase of children population living in the city, the demand for better quality life means goverment has to continuously provide and upgrade various physical and social infrastructure facilities such as educational, cultural, sports and recreational facilities. However, the increase of population and growth of urban centre, has led to increases in congestion, traffic, and environmental problems. Children are likely to be affected most by negative environmental impacts.

The local authoriy of Johore bahru City Council has to play important role in meeting increasing needs of urban populaton for a better quality of life especially children in urban neighbourhoods with wider range of community facilities. The constraints of funds and manpower may affect local authority's capacity and efficiency in fulfilling obligations for better services (Director General EPU, 1996, pp. 156).

5.3.3 Development and Land use strategy

Johore Bahru has both advantages and assets, and major development problems. In Draft Structural Planning, Johore Bahru City Council (1997), priority for developments were outlined, forming part of revised development strategy for the future. Residential development has occured in the western part of the city, but otherwise little change in the broad distribution of land uses has occured. There are number of physical characteristics of Johore Bahru which can be taken advantage of including areas for expansion, a beach front with recreational potential, large tracts of recreational open space, and historically important buildings.

The city is not densely developed and therefore has considerable capacity for change and improvement. There are still development sites in prime locations and opportunities for redevelopment and intensification of development. There is the ability to provide for low rise development on spacious sites. As a major asset, the water frontage is not fully exploited and there are also river inlets penetrating the urban area. Throughout the urban area, open spaces, areas of natural vegetation and matures trees still exist abundantly. Within the older part of city, some fine buildings of historical significance as well as traditional Malay architecture can still be found.

5.3.4 Town Centre

The town centre is confined to a small area by the physical barriers of the railway line, the Staraits of Johore and Bukit Timbalan. This area is generally unpleasant and suffers from noise and air pollution as well as dirt and smells. It is congested with traffic, is visually unattractive and activities within it are poorly related to each other.

Within these confines, a number of new high-rise buildings have been erected and several more large developments are proposed to be introduced into this unsatisfactory environment, further exacerbating the situation. The lack of available sites has caused town centre development to spill over into the Pelangi area, which is a fully built-up residential area, not designed to accomodate such intensive activity. The area on the west is now starting to experience pressure for commercial development.

5.3.5 Children and Town Centre

Children's use of the town centre is related directly to their perceptions of safety and danger. For younger children, aged 10 years and below, the opportunity of utilising the town centre relies on the presence of adults (usually parents), particularly for using town centre in shopping purposes rather than to living in. Although there are no studies or reports on how children use and experience the town centre in Malaysian towns, recent trend was however observed with the increase number of children frequenting shopping complexes rather than conventional shops. Shopping complexes layout in town centre offer a sense of security, comfort, convenience (most of them are fully air-conditioned and covered), entertainment and protection from unfavourable climatic conditions: hot-humid, heavy rain, dust and air pollution outdoors.

It must be stated that parental restriction, traffic dangers and difficult accessibility to parts of the town centre contribute to negative values of town cntre. Young children's dependence on adults for mobility limit their opportunity to explore the town centre especially for those living on the fringe of the town. More importantly, the planning of the town centres may not include children as important users although they are frequent users of town centre. It can be assumed, from children's point of view, Johore Bahru town centre is lacking in aspects of safety, accessibility, creation of safe space for them, and provision of various facilities, events and activities that the accomodate needs of younger citizens. Most of facilities designated for children in town centres are limited to only playgrounds within open spaces made available to them to explore and play in.

5.3.6 Traffic

The highway network is already heavily trafficked and junctions are inadequate and dangerous. Main traffic arteries are overloaded and long delays occur during peak hours. Large volumes of traffic pass through the town centre, much of it to and from the causeway. Major developments are being carried out all around the town and in the surrounding area in advance of improvements to the road network and public transport system. As these schemes are completed and fully in operation so the traffic situation worsens.

5.3.7 Children and traffic

The above improvements are merely to facilitate in channeling an increasing voluminous traffic flow and not to incorporate need of other users such as pedestrians and children for better safety from danger of traffic. Therefore, traffic problems continuously tarnished the image of Johore Bahru city centre with an increasing number of cars on the road, making city centre congested, polluted, and hazardous to health especially for children. The conflict

with pedestrian and other street users is becoming more serious, and physical dangers leaving no safe space for a child to use the street. At neighbourhood level, though traffic volume is lesser, streets are by no means safer places for children. This is due to their physical and limited cognitive ability in anticipating various dangers from cars.

Neighbourhood planning always give priority for streets and cars to dominate the layout with no effort to segregate between pedestrians and vehicles to make neighbourhood safer for pedestrian and children. This adult attitude toward planning has the notion that street primarily belongs to vehicles, and pedestrians and children are secondary users. It was observed that some children in neighbourhood having no other options, found the street outside their homes attractive for play and cycling although fear of cars limits the use of street as play spaces. Certain streets in the neighbourhoods have introduced the building of "*humps*" to slow down fast moving vehicles but this physical solution is an *ad hoc* solution and does not help in alleviating traffic problems.

It was also observed that in urban areas and residential neighbourhoods, children are living in anxiety and fear as car traffic is dominating and ever-growing. Children are prone to physical accident risks, air and noise pollutions, deprived from exploring outdoor environments. Parental restrictions and controls limit their freedom of mobility as well as restrict their social interaction with peers and adults. One can assume that all those restrictions affect children living in urban areas in Johore Bahru: activity range is smaller, limit modes or means of travel and lower feeling of self-esteem and control or sense of dependence. Rapid development and changes in Johore Bahru city centre have implications for children. The expansion and growth of city centre and the increase of private vehicles, limit children's mobility and access to the urban environment severely. This restriction on children is equivalent to what "Western" children have experienced as Bjorklid (1994) acknowledges children 's mobility and access to environment:

> Traffic environments create numerous difficulties relating to the conditions in which children and young people grow up. A central result emerging in our projects is the anxiety and fear related to children's upbringing which arise from the ever-increasing car traffic. The anxieties and fears concern the risk of physical accidents, air emissions, noise, curtailment of children's outdoor environments, restrictions on their freedom of mobility, isolation from other children and adults, greater necessity for parental supervision and control, and so on. The anxiety concerns the environment's conduciveness to promote a good social and physical development of children. One frightening scenario is that we are adapting to environments that are injurious to our children, both in the short- and long- term. The concept of "risk" ought, accordingly, to be expanded. (pp. 403-404)

5.3.8 Housing

In 1980 the Johore Bahru City Council housing stock was estimated to be 49,000. In 1992 this has risen to an estimated 77,800, an annual increase of 2,400 units. If a vacancy rate of 14% and an occupancy rate of 5 persons per unit is assumed, a total of 176,700 housing units will be required to house the target 2010 population of 760,000. When this is compared with the total of existing and approved units, there is already a potential oversupply of over 10,000. However, the current vacancy of 14% is higher than the normal rate of around 5%. The housing requirement to 2010 would therefore be similar if the occupancy rate and the vacancy rate both decline, so say 4.5% and 5% respectively. Table 5.2 below lists the housing stock required from 1992 through 2010.

	1992	1995	2000	2005	2010
Population	420,000	490,000	580,000	670,000	760,000
Houses	100,900	114,000	134,900	155,800	176,700

Table 5.2 Housing Units Required to Accomodate the Projected Population
Source: From Explanatory Document, Published by Jabatan Perancang Bandar, Majlis Bandaraya Johore Bahru, 1994.

One of the issue and problem is an over emphasis on the provision of housing in large scale residential schemes. These developments serve a relatively narrow sector of the market and, particularly they are poorly designed with a lack of attention to the environment and the varied needs of a residential community.

Approval has been given to a large amount of development (houses, shophouses, shopping complexes, office blocks, hotels, industrial estates, golf courses) both within Johore Bahru city and the surrounding district. The approval of so much development causes many problems such as speculation and lack of implementation, difficulty in estimating future demand, and uncoordinated development. There is also lack of certain types of development for instance, to cater the need for leisure facilities, and places for large gatherings of people.

5.3.9 Superseded settlement pattern

Johore Bahru has grown over the years from a small settlement to a city. The original town with its logical layout and distribution of activities has been engulfed by subsequent development. This has led to two major land use problems. Firstly, some uses are no longer in the most appropriate locations, and secondly, existing activities are no longer able to expand to a size which caters for the increased demands.

The city centre in particular suffers from both the problems. There are a number of long established activities which occupy large and valuable sites, such as police, army, utility services, schools, burial grounds, State and Local Government offices. Commercial uses which would normally be concentrated in the central area have been unable to locate here and instead have scattered into surrounding areas and along main roads. As a result there is no definite focus of commercial activity and a conventional hierarchy of commercial centres is not developing. The development of conventional hierachy of commercial centres is thought important and desirable as part of visionary ideas 'to promote a rational land use development pattern for commercial, residential, recreational and other community facilities,' and 'to develop a high density, compact, activity-filled, convenient Central District, containing a pedestrian-friendly environment in a cool, shaded, landscaped atmosphere,' (ISI,1997, pp.8).

5.3.10 Land use zoning

The practice of giving all land a use zone causes difficulties. The system is not flexible enough to allow for unforceen changes in land requirements, and therefore plans quickly become out
of date. There is no indication as to the phasing of development so that it is difficult to anticipate when and where different activities will occur. Land is not safeguarded for long term requirements. Land can be given a zoning because of its physical suitability, without regard to the total amount of land that is being allocated to that particular use. This can lead to an over-allocation of certain categories of land use and an under provision for others.

5.3.11 Development Control

At the local authority level, much of the development control involves various technical aspects such as layout planning. It has been used as a tool for controlling land use, philosophically in taking care of public interset for instance in the provision for public facilities and infra-structure: park, open space, and utilities. This provision is controlled using development control instruments like plot ratio, open space and recreation and landscape, community facilities and environment.

The current practice employs the guideline that 10 percent (7 percent for formal recreational reserved and 3 percent for other utilities reserves) ia a requirement for open space and recreation in the total area for housing development. The requirement that about 10 percent of the area would be allocated to recreation perhaps was based and adopted from American neighbourhood definition (Gallion and Eisner, 1975). For a new town development, an

additional requirement for urban and metropolitan park to be provided in the planning. The content of a local plan with respect to development control for open space and recreation has basically culminated in details of related aspects but excludes children's environmental needs. The requirement, guidelines for distribution and provision of open spaces strictly adhere to planning standards of size, population capacity, and distance. The landscape guidelines on the other hand emphasis environmental aspects like preservation of natural resources, environmental visual quality, conservation of historical areas, and a planting programme.

5.4 PRIORITY REQUIREMENTS FOR THE FUTURE CITY OF JOHORE BAHRU

Johore Bahru is perceived to be a city with many advantages both now and in the future. This has led to an unprecedented rush of development projects, a stepping up of housing completions and an influx of migrants and visitors. Currently, these activities are being added into a settlement form which was never intended to accomodate this scale of change and this has many repercussions.

The future success of Johore Bahru is dependent upon the degree to which it can be transformed from a sprawling suburb into an efficient, dynamic and attractive international city, which possesses its own unique character and which possesses good access to well-developed recreational facilities. Some key requirement in relation to open space planning for bringing about this transformation have been identified for instance, to develop a complete range of services, facilities and attractions, and to create and sustain a high quality environment.

5.4.0 City of Johore Bahru Planning Strategy

Another forseen and advantageous strategy is rationalisation of development built upon the existing strategy of balanced development. The elements of this strategy includes the expansion of the town centre beyond the current confined area: a need for suburban centres to the north of the city that would serve existing and proposed industrial and business areas as well as residents. This planning strategy also includes the relocation of institutional and government uses. Some of the original non-commercial activities in the town centre which no longer need to be located there could find it advantagous to move out to suburban or edge of town locations, where they would have convenient access for the public and a wider space to build.

5.5 OPEN SPACE PLANNING IN JOHORE BAHRU

The planning strategy sees the waterfront as a resource which needs to be considered as a whole. It forms an important part of the development strategy for the future city of Johore Bahru. It will be conserved wherever possible and enhanced as a city wide recreational, tourist and amenity facility supported by a wide range of mixed urban uses for the benefit of resident and visitors alike. The preservation of land for long term purposes is seen as an effort to improve the problem of lack of public open space in the city. The allocation of land for such purposes has been the first priority, together with the reservation of land for other community
facilities and utilities. As a holding measure all uncommitted land is zoned for recreational and amenity use.

5.5.0 Issues and Problems

There is a lack of public open space within the urban area, making it unfriendly and unattractive. The provision of public space especially in the city centre is unsatisfactory, both in terms of quantity and quality. Large public spaces which do exist are concentrated in a small area in the south of the town. There are a number of private open areas which are not physically accessible to the public but nevertheless are important as visual attractions and act as green lungs. There are also areas proposed as open areas in development plans are not being developed for public recreational use. In particular, the waterfront, which is one of Johore Bahru's major assets is under utilised. It has been recognised that in order to present an attractive and unique image, an abundance of trees, planting, parks and open spaces is essential (Jabatan Perancangan Bandar, MBJB, 1994).

At the neighbourhood level, other problem with regard to open space in Johore Bahru are unequal distribution, poor accessibility, lack of facilities and poor maintenance and management. Some existing low density housing neighbourhoods e.g. Kg. Nong Chik, Kg. Ngee Heng, Kg. Tarom and Strait Views have benefited from natural and mature vegetation at nearby parks and recreational facilities such as Lido Beach, Lagun Puteri, Kebun Bunga Zaharah and Hutan Bandar (Figure 5.6 on page 173). These open spaces are easily accessible within the neighbourhood range. Unfortunately in contrast, the population at the new dense housing schemes such as Taman Pelangi, Taman Maju Jaya, Taman Sentosa, Taman Melodies, and Taman Century are not planned and oriented toward positive alternative to open space provision, with less priority for pedestrian. This has actually produced neighbourhood tension instead of neighbourliness (Biro Innovasi dan

Perundingan, 1999). More importantly these new housing developments were approved based on standard planning requirements including the standard guideline for provision of open space and recreational facilities. Clearly the weakness is the question of what will it be planned for as a measure that satisfies the users needs? How will the open spaces be distributed within development sites? Gallion et al., (1975) clearly state the problem of using standard, planning, and distribution of open space:

> Open space in the city is usually considered as the area for recreation, and appropriate so. However, this space falls into a number of categories. There is space devoted primarily to active playgrounds for children, youths, and adults; there is also space arranged for the more passive relaxation of adults. These spaces are those to which reference is generally made in a consideration of recreational facilities. Another classification should not be overlooked: the conservation of natural areas within as well as without the city.....The standards of open space cannot adequately specify the required areas in a city for all these classifications; part of the distinction of cities derives from the way in which the natural site is shaped and planned. The specified spaces for defined recreational uses are not the full measure of adequacy of arecreational program under any circumtances; and abstract area of land in proportion to the population is but a part of the planning for reacreation space in the city. It is the distribution of this space which measures the adequacy, not the amount alone. (pp. 287)

5.5.1 Open Space Requirements

Currently there is 560 hectares of public and private recreational space in Johore Bahru City Council boundary. A planning standards of 0.16 hectare of open space for every 1000 population is used as a guide for the projection of open space requirement in the future. This requirement as shown in the table relates to the projected population growth (Table 5.3).

	1992	1995	2000	2005	2010
Population	420,000	490,000	580,000	670,000	760,000
Open space requirement (hectares)	690	800	950	1,100	1,240
Additional land required (hectares)	130	240	390	540	680

Table 5.3 Open Space Required to Accomodate the Projected Pupulation
Source: From Explanatory Document, Published by Jabatan Perancang Bandar, Majlis Bandaraya Johore Bahru, 1994.

5.5.2 Open Space Policies

It has been acknowledged although the earlier 1985 Structure Plan of Johore Bahru contains a series of policies relating to recreational provision, the lack of implementation to bring the policies into effect however, showed less priority in the planning and design of urban environment generally. Thus, the provision of recreational open spaces, a green environment and the promotion of the waterfront as a high quality public asset should be given a priority (Ibid., pp. 6-3 - 6-6).

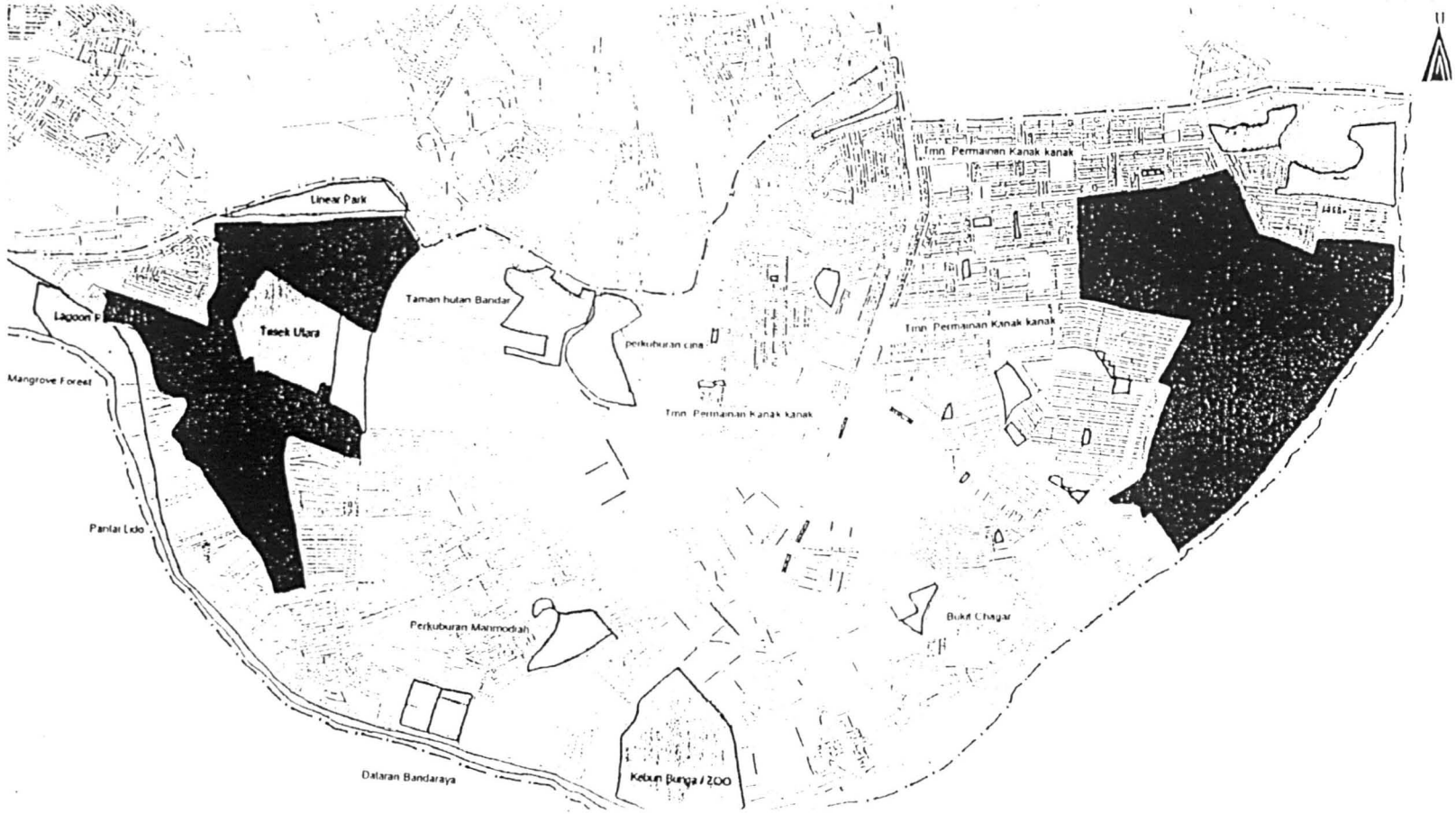


Figure 5.6 Distribution of green open space in urban Johore Bahru in form of parks, sports fields, golf courses, Palace grounds, and playgrounds in urban housing neighbourhoods.

The Explanatory Document for the amendment of 1985 Structure Plan has laid out several amended policies related to open space and recreational provision within the city boundary. Amongst the policies, the need for conservation and development of natural environments, such as forests, riverside and coastal area for recreational purpose is recognised. There is also a recommendation for priority for the development of regional public recreational facilities. A few policies specifically give emphasis to the development of waterfront areas, to provide public access as part of comprehensive leisure and water-based recreational activities especially along the Johore Straits, Skudai River and Tebrau River. An aspect of conservation and preservation has also been part of the policies with the acknowledgement for requirement to preserve and conserve the existing eco-system, the existing trees and vegetation, and the need for the protection of mangrove forest and traditional villages along the waterfront (Jabatab Perancangan Bandar, MBJB,1994 pp. 6-3 - 6-7).

Within the specific Central Planning Area (CPA) of Johore Bahru, the main objective in relation to the natural environment is "to protect and preserve the natural vegetation within the town centre so as to balance and maintain the ecosystem of the city environment." There is also acknowledgement to protect and preserve the waterfront open space and make improvements to its utility and its connection to the city centre in the planning objective.

The open space policy calls for the provision of sufficient usable open spaces such as town squares and urban parks in the city centre. Then there is a new policy to link all activity nodes, such as proposed urban parks, town squares, plazas and waterfront development that requires a comprehensive proper pedestran circulaton network. These practical linkages are seen as supporting the function of all the facility areas (Biro Inovasi dan Perundingan, 1999).

5.5.3 Hierarchy of open space in Johore Bahru

Of equal importance is the hierchy of open space in Johore Bahru seen as a result of the growth unit of several urban developments. In each development, different types of open spaces can be provided such as formal parks and garden, waterfront recreational parks, followed by urban parks, neighbourhood and pocket parks, and finally in a highly urbanised areas, a plaza or a square. With the development of new housing schemes, open space provision has been stressed as part of planning requirements, with the idea of neighbourhood parks, provision for play and recreational facilities, natural boundaries and community facilities.

5.6 MALAYSIAN CHILDREN'S CULTURAL LIFE IN GENERAL

Children's cultural life in "Third World" countries, especially in Malaysia varies greatly from that of children in the "Western" world. Many factors may contribute or influence this such as climatic aspects, culture or way of life or upbringing, parental restriction, religious belief, taboo etc. Adults expectations of what childhood is may also restrict what children are allowed to do with their time. With the increase of childhood period, children are able to spend more time learning before shouldering responsibility in adulthood period. The current educational policy requires every child to get access to at least eleven year of formal education.

During the previous decades, rapid economic development in Malaysia has been a pre-requisite for creating opportunities for improving quality of life, incorporating social, cultural and psychological aspects in the overall development process. It was the goverments aim to provide opportunities for personal improvement, healthy way of life, better education, housing and health facilities, cleaner environments and adequate leisure and recreational amenities for all citizen including children (Director General, EPU, 1996, pp. 26).

In this chapter, there is no intention to focus in details aspect of cultural behavior in domains such family structure, child rearing, gender and kinship for each of the different ethnic groups of Malay, Chinese and Indian. It is sufficient and appropriate for brevity purposes to discuss briefly on general "Eastern" cultural views on children and childhood because these ideas are potential factors that affect the children's culture and environment in general. Children in environments interact with peers and older members of the society, and how adults conceive of and interact with children is influenced by cultural 'specific child-raring practices, values, and expectations of child behavior,' (Holmes, 1998, pp. 83).

Malaysia is a multi-cultural society with cultural diversity reflected in various ethnic groups that shape Malaysian culture. The discussion on children, need to recognise this diversity as the population shares both the same and difference aspirations, values, and goals. This aspect can be seen through the cultural ecological framework model by Bronfenbrenner (1979) as discussed earlier that suggests the significant of ecological context influencing child's development. At a broader ecological context of macrosystem, it involves "ideologies and attitudes of a culture such as religious beliefs, notion about child rearing and ethics." At the microsystem it involves an immediate environment and situation such as the home, school, street, working and neighbourhood environments that can have direct influence on children (see Section 1.0.4 in Chapter 1).

The concept of childhood is a psychological, philosophical and social construct and like conceptions of children, the place of children in society, and expection for their behaviours are culture specific constructs. The perspective of society on concepts of childhood and children are changing from historical, cultural, social, and biological and individual point of view (Hwang et al., 1996; Holmes, 1998). Different ethnic images of children and childhood in Malaysia are influenced by social, cultural, and religious practices. This "Eastern" view is distinct to "Western" views on childhood and children. Traditional and cultural values are still being practiced in Malaysia regardless of different ethnic groups for instance the Malays is based on Islamic teaching, Chinese on Buddhism, and Indian on Hinduism. It was observed despite rapid urbanization and industrialization and the increase in nuclear families (Director General, EPU, 1996, pp. 571), that the traditional extended families still exist. Malaysian society recognised the family as the basic unit of society so that family development program is among government's priority in social agenda aiming at the establishment of strong and resilient family by providing a stable, healthy and happy family environment with positive values inculcated among the children. Some Malaysian children living in urban areas still spend their formative years as members of joint and extended families with the immediate members of family, each member contribute in playing a role in a child's socialization.

Social and religious factors guide a society's view of children and childhood. Sons play important social roles in family obligation compared to daughters that are viewed to be able to play motherly role in bringing family and bearing children. Such views influence child-rearing and parental responsiblities. The Hindus for instance believes a woman 'has special responsibilities and special duties,' which can contribute to the world (Radhakrisnan, 1964, pp. 63). A dichotomy still exist in both modern and traditional Malay, Chinese, and Indian practices - women are associated with the home and physical care of children and fathers are associated with the economic viability of the household. Thus, mothers are the primarily care-takers of their children. Parental interactions with children involves a great deal of holding, cuddling, and tactile stimulation that reflect cultural values of calmness and tranquility. Religious beliefs are important when interpreting children's experience as these beliefs have been adopted to become partially way of life.

In comparison perhaps, by viewing "Western" notions toward children and about childhood a better picture of the differences with "Eastern" views in a broader contextual understanding will be provided. It is also because of a paucity of research on childhood children in Malaysia. Specific historical periods coincide with the changing ideas about children in the West that have shifted considerably over the last few centuries (Brown, 1995, cf. Holmes, 1998; Humphries et al., 1988). During medieval Europe, children were viewed as miniature

adults with no distinctions was made between the two (Aries, 1962, cf. Lamb and Hwang, 1996, pp. 1-12); Huges, 1995). In the views of Romanticism, children are viewed as innately good and innocent (Postman, 1982, cf. Holmes, 1998), they need care, protection, and should be appreciated for who they are. This view serve as the foundation for contemporary "Western" views on developmental study of children as Holmes (1998) puts:

> By the 19th century, children were seen as requiring adult protection and supervision, and children were segregated from the adult world. Changing attitudes of childhood were linked to economic factors. Children were no longer viewed as an essential part of labour forces. They were now viewed as objects of nurturance that needed adult protection (Hareven, 1992). Children were believed to represent the future, a review that has been rekindled in recent years (Finkelstein, 1985) ... In the 20th century, children have been viewed as creatures who need to be loved. This is due in part to the emergence of developmental psychology, which emphasizes the emotional and psychological well-being of the child (Ashby, 1985). According to Elkind (1987), American children are viewed as a blessing, to be loved and admired for their childlike qualities, yet they are also viewed as lacking discipline (ramnants from our Puritan past). American are often accused of trying to prolong the period of childhood. (pp. 88)

In Islamic Malay society, children were viewed as a gift of blessing from god with shouldering sense of responsibility and trust to take care of. Children were viewed as clean as white cloth when they first born, possesing *"fitrah,* or primordial conformity with truth and nature; then their parents turn them into Jews, Christians, or Muslims." (Sander, 1996), pp. 18). This *"Al-hadith"* or words of Prophet (peace and blessing be upon him) were parallel to the core of religion of Islam that 'states many codes, behaviours, principles, and acts or worship' fundamental to family as basic unit of society. Sobaihi (1995), in viewing Islam and child-rearing states:

> ... child rearing in Islam aims at making the child a good Moslem, and to Moslems this means making the child the best human being possible. The means to reach this goal are varied and complicated to say the least. Islamic childrearing, according to Qutb (1989) and Ulwan (1985), aims at four manin developmental objectives: developing the child's spiritual beliefs; developing the child's intellectual and mental abilities; developing the child's physique and physical abilities; and developing the child's love and respect for others and society as a whole.
>
> Hence, developing the child in spirit, mind, body, and social responsiblity and/ or love is what Moslem parents and societies hope to sow in the child. Such a task is one of enormous weight, hoever, by employing some of the techniques the Prophet (peace and blessing be upon him) used in rearing the young Islamic nation at the dawn of Islam this noble goal may be reached. Qutb (1989) points out a few of these techniques which include: the setting of an example in one's self for others to follow (role model); the use of stories, events, and other means available to communicate a message; the use of traditional methods of childrearing (or their principles/ concepts) as long as they do not contradict Islam's teachings; and the use of punishment when all else fails. (pp.330-331)

The Holy Qur'an also placed important foundation for way of life to follow. Ali (1973) in explaining and interpreting these rules and guidance for society to follow based on Qur'an states that:

> The Society thus organised
> Must live under laws
> That would guide their every-day life, -
> Based on eternal principles
> Of righteousness and fair dealing,
> Cleaniness and sobriety
> Honest and helpfulness
> Into concrete forms, to suit
> Times and circumtances
> And the varying needs
> Of average men and women
> The food to be cleaned and wholesome;
> Blood-feuds to be abolished;
> The rights and duties of heirs
> To be recognised after death,
> Not in spirit of formalism,
> But to help the weak and needy
> And check all selfish wrong-doing;
> Self-denial to be learnt by fasting;
> The courage to fight in defence-
> Of right, to be defined;
> The pilgrimage to be sanctified
> As a symbol of unity
> Charity and help to the poor
> To be organised; unseemingly riot
> And drink and gambling
> To be barnished;
> Orphans to be protected;
> Marriage, divorce, and widowhood
> To be regulated;
> And the rights of women,
> Apt to be trampled under foot,
> Now clearly affirmed.
>
> *Source*: (Interpretation from The Glorious K'uran
> by Abdallah Yusuf Ali, 1973, pp. 65-66)

As for the Chinese, all children are viewed positely but like Indians, boys or sons are much desirable and preferable to daughters as the sons can perpetuate their family's name and legacy and fulfill religious obligations (Klostermaier, 2000, pp. 39). Daughters are viewed as burdensome, a consequence of the dowry marriage practice (in Indian culture) and leave the family to follow their husbands soon after marriages. From all those ideological beliefs point of views, Malaysian society generally is characterised as patriarchal and authoritarian in social-cultural and religious attitudes and well-being. Consequently, whatever one's beliefs, 'children all over the world have different experiences of childhood as a consequence of gender, class, ethnicity, and religious beliefs,' (Holmes, 1998, pp. 89).

In Malaysia, children generally experience parental pressure to achieve recognition especially in educational achievement as this will ensure better job opportunities that lead to family improvement in the ladder of social and economic-status. A child enters into an adult's world only upon completion formal schooling and possess basic adult skills. The provision

for a better educational system and the need for all younger citizen to be well educated and capable for a better job, means the period of childhood has been prolonged. The age of marriage has also been extended for both sexes especially among the male population as they need more time to prepare educationally and financially before settling down. The family structure is becoming more toward nuclear families, compared to traditional extended family which is becoming rare in urban population. Most new housing schemes are designed for fulfilling nuclear family changing needs as the family in new generations is more mobile and constantly moves from one residential area or town to the next whenever opportunity for a better job and living environment is available. This family mobility does not promote a "sense of social cohesion" or "sense of belonging" and strong neighbourhood bonds between members of community. This lack of social integration has led to development of household isolation within a neighbourhood, a sense of prejudice, fear and anxiety and apprehension towards the outdoor environment in urban areas. Building of high security wall along the perimeter of property perhaps is one of reasons for this phenomena.

Frequent household mobility, fear for safety of outdoor environment have negative impact on children as they will not have the opportunity to be familiar with surrounding environment and not be able to establish social context with other children within neighbourhood. As a result of lack of familiarity, children are not able to utilise, understand and are less knowledgeable about the environment they live in, and their cognitive development is hindered. Consequently, their home range behaviours become restricted (see Section 4.5.1 in Chapter 4). Their everyday activities may also restricted or rigid as during weekdays more hours are spent at school, followed by homeworks or attending extra tution classes after school. At weekends, less time is spent at school and children probably have more time for outdoor activities. Since a higher percentage of children play everyday, the weekends are spent on special activities that require more time either for planned or unplanned, fully organised and under adult control activities. It is very likely weekend activity include travelling with family members away from home to park, visiting family friends, to city centre for shopping activity, or to specific places for recreational activities such as beach or forest reserve. This trend is based on personal observation as there is no study up to date to verify emerging recreational patterns statistically.

It can be concluded that an expectation and notions and experience of childhood of multi-racial community in Malaysia are inevitably 'entwined' with variety of factors such as social-cultural, religious beliefs and socio-economic status.

5.7 CHILDREN'S ENVIRONMENT: USES AND PROBLEMS

Discovering how children use their environment should be of major concern for the planner and designer whose work is concerned with improving the quality of children's environment especially in the urban areas. The planning of urban spaces affects children in many ways. How do children use and value their spatial environments? One can imagine how children (under the age of 19) as users that make up more than 40 percent of the whole 580,000 population (Majlis Perbandaran Johor Bahru, 1994) use the urban environment whether designed for them or not. According to Hock (1995), in the early days, during 1960s, based on his childhood memory, children living in urban areas were able to get access to natural environment offering vast range of activities to do with a lot of fun.

There is a question: do the younger generation of today have a better quality of life compared to that of older generations? One cannot deny that with the progress of technology and communication, children are able to get access to facilities such as telivision, computers, electronic games etc. Many of them today are exposed to various outdoor facilities designated for them including playgrounds and sporting facilities. Children in the early days during 1950s or 1960s may have learnt how to appreciate nature, plain fields, sloping sites as a place to venture, play, and improvisation or involved in traditional games such as kite flying, spinning top etc. The use of natural materials like bushes, forests, hilly sites, rivers or irrigation channels for paddy fields as play areas were common for their adventurous pursuits. They also had more opportunities to associate with natural environment through activities like gardening, tree climbing, harvesting fruits from orchards, fishing etc.

Children of today perhaps spend more time with toys, electronic games, play with computers, watching television, visiting fast food restaurants and less time spend to interact with peers outdoors. It is uncertain with these facilities, children have less fun, less quality of life, less able to learn about friendship and competitiveness that helps to "grow up into balanced and well-rounded people," (Hock, 1995). As the city changes dramatically over time from 1970s onward with rapid urbanization process, urban development and social changes, physically, economically and technologically affect the whole society (Aiken et al., 1982). These changes will eventually affect children's environments, and in turn will affect the quality of their lives too.

5.8 CHILDREN'S ENVIRONMENTS IN THE CONTEXT OF URBAN PLANNING

5.8.0 Provision for children's play in residential planning and development

In residential planning and development programmes, the Government emphasies on provision of adequate, affordable and quality housing. Seventh Malaysia Plan (1996-2000) put a target of 800,000 units of houses to be built especially for working class group with the low income as part of important agenda for enhancing quality of life of urban dwellers. This is in view with the expanding population and the growing number of new households, and demand for houses is increasing every year. This demand, especially for public low-cost housing has allowed the increase of land plot utilization or density from 26 to 41 units per hectare (Director General, EPU, 1996, pp. 574). The provision of urban services and recreational facillities is the role of local authorities execute through preparation of local plans.

Within the framework of strategy for garden city vision in Malaysia promoted by Department of Landscape, one of the concern is provision of open space and landscape environment in landuse planning. It was suggested that the need for open spaces can be fulfilled through long term planning in the form of structure and local plans (Ngah, 1997, pp. 9). In supporting this idea, Town and Country Planning Act (Alteration) 1995, Act A933, Section 2(F) for instance has come up with "Manual for Local Plan" outlining various output for preparation of children playground and open spaces in residential areas (Jelani, 1997). This include requirement for 30 per cent green open spaces and 10 percent effective usable area for recreational needs from the total development areas (e.g., see Figure 5.7 and Figure 5.8).

Provision for children's play spaces in residential development is controlled through open space and recreational requirement in form of 'Development Control' and the recent guidelines for provision of open space and recreation (Ibid., 1997, pp. 32-35). In addition, planning standard for open space and recreation is provided by Department of Town and Country Planning in guiding the state and local authorities to plan for their needs of open space in all developments (Department of Town and Country Planning, 1997). This planning standard defined open space as "any land either open or enclosed, reserved wholly or partially as public park or garden, sport fields and public recreation place, for resting, public path or as a public space," (Department of Town and Country Planning, 1997, pp. 1). This standard, among other things suggests that active recreation is to include children playground to serve as a place for children's play, social interaction in meeting their mental, educational and developmental needs. In spite of comprehensive outline of types of recreational needs and purposes, as a basis for planning and its principles and general

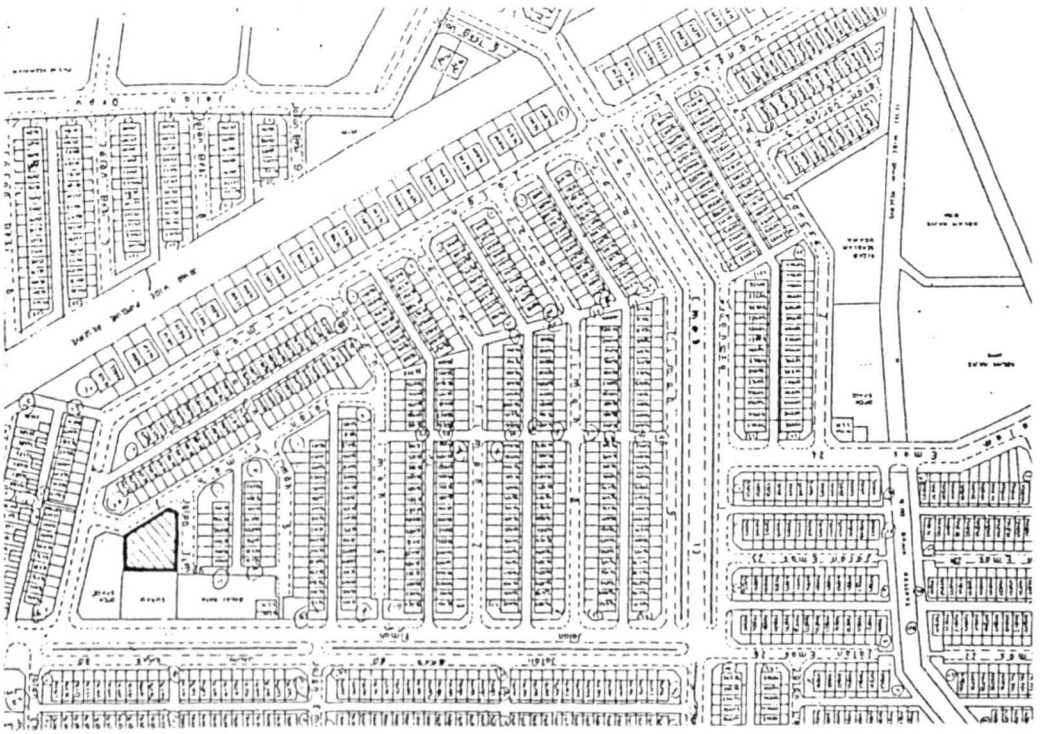


Figure 5.7 Typical grid-iron layout of urban housing neighbourhood planning. Note the provision 10% green open spaces in meeting requirement of planning regulations.

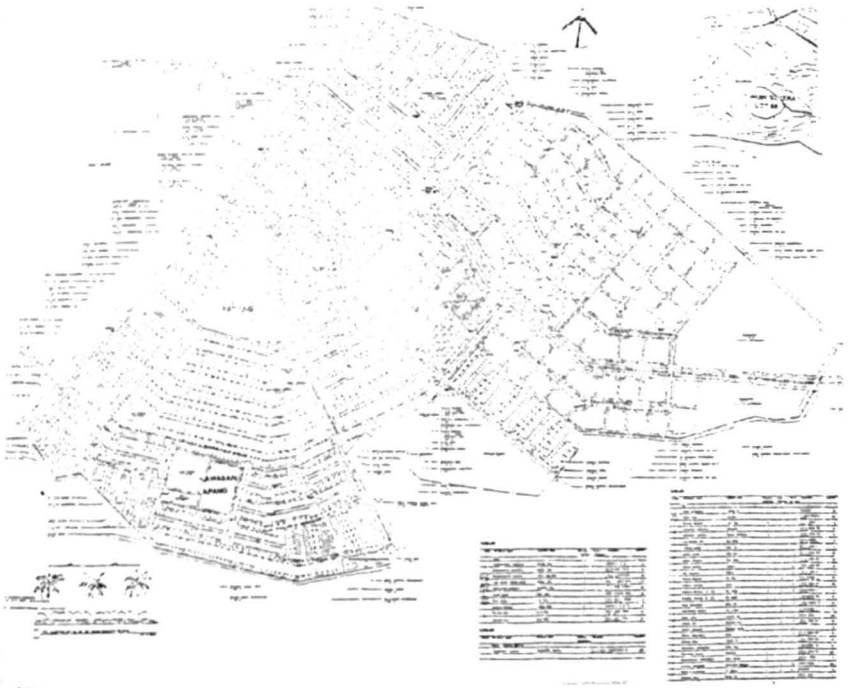


Figure 5.8 Landscape master plan prepared by Landscape Architect based on pre-planned layout.

and distributional needs of open spaces and recreation (Table 5.4). However, current issues and problems in relation to children's play , recreational and developmental needs in guidelines, the emphasis however, is more on standard provision of areas or spatial needs e.g. hierachy residential neighbourhood planning is not fully explored and addressed in the formulation of standards, policies and guidelines.

5.8.1 Provision of open spaces in urban development

The very rapid development of Johore Bahru over recent decades has serious implications for children and their environments. It has become clear that current planning approaches and procedures have failed to accomodate the changing needs and expectation of the younger population adequately. It was observed that children's access to spaces, and opportunities to interact freely with natural environments has decreased, or been limited or restricted. Playgrounds and formal recreational facilities intentionally designed for children at designated areas were thought sufficient to fullfill children's "hunger" for experience and interacting with the environment. It was later found that instead of using special planned facilities such as play spaces, sport fields, Multi-Purpose Centre (Tapian Gelanggang) (Deraman, A. Aziz, 1984/ 1985, pp. 32.), children frequently loitered at commercial and shopping complexes (Kerry, 1997; Keng, 1997).

The provision for children's play spaces are formally designated through the urban open space planning. Children's environmental needs are associated with play, thus, play spaces and facilities are essentially important part of elements in open space. "on the playing field, children of all ages, no matter what games they are up to, expand their boundless energy and, in the process, learn to make friends with the rest on the field (Kerry, 1997). To a resident, playgrounds are seen as caring places that provide social needs and better place to nurture their young childs. In most cases, in the new housing development, planners and developers view the social obligation of a neighbourhood open space in term of fulfilling planning guidelines and requirement of ten percent of open space for any development.

This standard requirement has led to the physical aspects of housing environment to become sterile, soulless (Lee, 1991), unrelated to social aspects, the needs of children, are therefore not successful or useful. This phenomena sees urban planning as a tool to ensure urbanization process of accumulating capital between individual people and firms, leaving urban problems as by product of this financial gain. Thus, social and environmental obligation is not a priority for instance, in developing residential or housing schemes, social and environmental aspects are lefr to a minimum as they are not profit oriented in approach. Provision for habitual environment with green spaces, the presence of natural environment

TYPE AND HIERACHY	MINIMUM REQUIREMENT	SIZE OF AREA	TOTAL POPULATION	DISTANCE OF SERVICE	AREA OF SERVICE	LOCATION	RECREATIONAL FACILITIES
1. Play Lot	0.2 hectare (0.5 acre)	0.2-0.6 hectare (0.5-1.5 acre)	i. Every 300 population; and ii. Every additional 300 population require 0.2 hetare (0.5 acre)	Within 0.5 km (0.3 mile)	Neighbourhood centre	Small neigbourhood centre within walking distance	i. Grass area ii. Sand area iii. Sheltered area and seating iv. Play equipment for pre-school children
2. Playground	0.6 hectare (1.5 acre)	0.6-2.0 hectare (1.5-5 acre)	i. Every 1000 population; and ii. Every additional 1000 population require 0.6 hectare (1.5 acre)	Within 1.0 km (0.6 mile)	Neighbourhood centre	Small neigbourhood centre within walking distance	i. Sheltered park; ii.Paved area and lighting for sport and playground;i ii. Playground; iv. Adventure ground iv. Parking lots v. Public telephone booth
3. Neighbourhood Field	2.0 hectare (5.9 acre)	2.0-8.0 hectare (5-20 acre)	i. Every 3000 population; and ii. Every additional 3000 population require 2.0 hectare (5.0 acres)	Within 1.5 km (0.9 mile)	Neighbourhood centre	In or near neighbourhood centre within cycling and walking distance	i. Children playground; ii. Football field; iii. Badminton court, tennis, takraw and others; iv. Jogging area; v. Park and sheltered area; vi. Resting area,Parking lots; vii. Public telephone booth;viii. Bus stop; ix. Public toilet.
4. Local Park	8.0 hectare (20 acre)	8.0-40.0 hectare (20-100 acre)	i. Every 12000 populatio; and ii. Every additional 12000 population require 8.0 hectare (20 acre)	Within 3.0km (1.8 mile)	Service centre	In or near the service centre. Accessible by walking, cycling and public transport or privately.	i. Various play courts in form of small sport complex; ii. Swimming pool; iii. Park and children playground; iv. Picnic area and adventure game; v. Paved area; vi. Food stall; vii. Public toilet viii. Shelters; ix. Telephone booth; x. Bus stop; xi. Parking lots.
5. Town Park	40 hectare (100 acre)	40-100 hectare (100-250 acre)	50000 and above	Within 0.5 km (0.3-6.0 mile) Half-an-hour journey	Town centre	n town centre	i. Field for annual sport; ii. Play courts; iii. Sport complex; iv. Swimming pool v. Golf Practice range; vi. Children playground; vii. Picnic and camping areas; viii. Water sport; ix. Garden and recreational forest; x. Shelter or praying facilities (*Surau*); xi. Public toilet and telephone booth; xii. Lodging facilities; xiii. Shops and food stall; xiv. Bus and car parking; and xv. Bus stop.
6. Reginal Park/ State Park	100 hectare (250 acre)	100 hectare (250 acres) and above	Whole town and region population	Within one hour journey with vehicle.	Reginala centre	At the fringe or outside of Tdensed own area	i. Facilities such as picnic area, camping, hiking, boating etc. ii. Open sport complex iii. Limited sport such as golf iv. Natural attraction area for population such as lake, waterfall etc. v. Having natural environment for recreational such as jungle tracking, recreational forest and area for nature environmental research vi. Lodging facilities viii. Shops and stall; viii. Toilet and public telephone and praying facilities; ix. Parking lots for cars; and x. Bus stop.
7. National Park	No limit	No limit	Whole country	Whole country	No limit	Located at suitable area which is unque for the wildlife and resources for environmental research	i. Resources for environmental conservation; ii. Lodging facilities and transportation without affecting ecologiy and wildlife; iii. Parking for cars and buses; iv. Praying facilities and shelters; v. Toilet and public telephone; vi. Bus stop.

Table 5.4 Planning Standard for Open Spaces and Recreation
Source: Adapted from Planning Standard, Department of Town and Country Planning !997, Ministry of Housing and Local Government Malaysia.

poor quality of housing environment - the soulless housing estate. This characteristic of unsafe, lack of access, no sense of place are actually manifestation of urban planning problems that failed in meeting public needs especially children (Figure 5.9 - Figure 5.14).

Most of play spaces in housing schemes are poorly planned. This situation is aggravated by lack of proper maintenance, making play facilities neglected by children, vandalised and unsafe for children. Underpinning the whole development of open space planning was the political nature of open spaces provision: less priority, minimum provision, poorly planned and designed, lack of maintenance, make it vulnerable to lose at the expanse of "profitable" developments. All these issues prompted public cries and evidenced by public demands for a more user-friendly and a collective responsibility to safeguard the existing open spaces (Shen-li, 1998).

5.9 THE IMPORTANCE OF ESTABLISHING CHILDREN'S CONCEPTS OF AND ACTIVITY PREFERENCES IN OUTDOOR ENVIRONMENTS IN JOHORE BAHRU

As a major user of the environment, children have unique needs and ways of expressing and fulfilling those needs. Children's idiocyncratic needs generated by environmental concepts and activity preferences and their interaction with environments could inform the holistic planning and design of environments in Johore Bahru. Their activity needs are naturally related to play, crucial to their development and not supposed left to chance. Rapid development and changes in urban area has created many known social ailments among children of various age groups as "substance abuse, promiscuity, gambling, running away, night clubbing and video games addiction are all manifestation of the covert, personal malfunction in children and adolescents," (Keng, 1997).

The provision for children's environment and facilities in the urban area need to address different approach, a change from present practice of standardisation open space allocation. A search for contemporary issues, problems and understanding of how children conceptually perceive their outdoor environments and activities they like to get involved with perhaps, serve to guide towards positive approach in planning and design or urban open spaces. Knowledge of children's needs can be manifested through their concepts of environment around them and activity they prefer. This manifestation is a child's developing awareness of their growing complex environments. It provides us with strong messages to the child's developing needs with respect to neighbourhood environment since children's concepts of and preferences for environments are influenced by uses and their interactional experience. It would be appropriate if these concepts and preferences can be readily formulated to be integrate in planning and design policies and guidelines of environments.

a. Provision of open spaces with minimum facilities for children as a result of poor planning and design.

b. Streets dominate the planning leaving children without proper access to neighbourhood facilities.

c. Modern play equipment in a children's playground.

Figure 5.9 Views of various facilities in urban housing neighbourhoods.

a. Pedestrian paths serve to link various facilities within playground.

b. Play equipment in sand pit area for children's play.

c. Swings, traditional play equipment in a children's playground.

Figure 5.10 Various facilities of children's play equipment in neighbourhood open spaces.

a. Ball games.

b. Path in playground.

c. Path in urban neighbourhood park.

Figure 5.11 Pedestrian paths are designed in open spaces but not to provide a link between houses to various facilities for better and safe access for children.

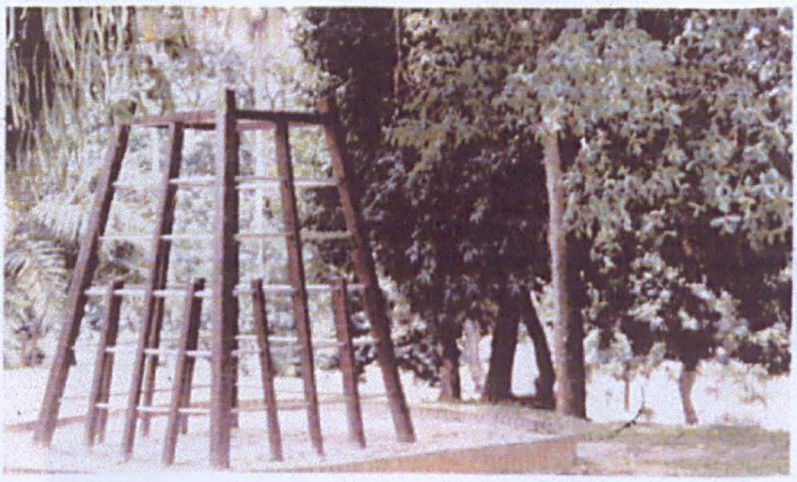
a. The presence of bicycles in playground suggest children's mode of movement or mobility.

b. Children seem to enjoy cycling but with poor access, danger from traffic, and parental restriction limiting their home ranges.

c. Cycling creates opportunities for children to socialise with peers.

Figure 5.12 Children's cycling activity is limited in parks and playground.

a. Vegetation elements (palms, trees, shrubs and grass mounds) as part of children's play.



b. Climbing apparatus in children's playground.

c. Play equipment in the form of a hanging timber bridge.

Figure 5.13 Common physical landscape elements in Bukit Chagar children's playground, one of the earlier urban neighbourhood parks in Johore Bahru.

a. Water logged area at the swings.

b. Vandalism in the form of graffiti.

c. Lack of maintenance of rubbish bins in park.

Figure 5.14 Examples of poor local authority maintenance and management of open spaces.

Thinking about an ideal home landscape environment, children's ideas of important factors of places or spaces may indicate a pattern of their personal preferences. These patterns may provide information, if further defined applicable to the planning and design of environments. Amongst important concepts of environment considered by children are activity settings, relationship to and interaction with the natural environment, dimensions of affective or expressive aspects of environmental qualiy.

It is importance to establish children's concepts and preferences for landscapes for planning with user's criteria. It has been discussed earlier that provision of children's environments is governed through urban open space planning guidelines and policies. As such, the opportunity for change and successful children's environments provision in the future can only materialise if children's needs are readily integrated in guidelines and policies of the planning and design of urban open spaces. In Johore Bahru, the basis for such important consideration has to come from the current consequences of planning practice augemented by issues and problems faced by the children in the urban community (Figure 5.15 and Figure 5.16). The findings from this research offer a door for a next course of action through supported evidences and symphathetic plausible explanations of the children's environmental preferences.

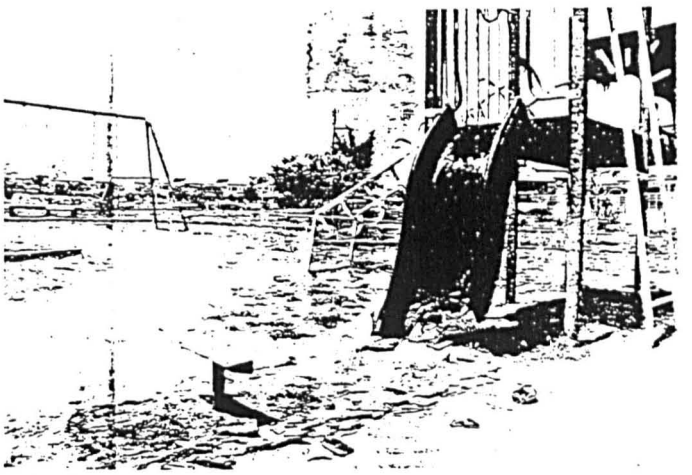
5.10 CONCLUSION

The issues and problems associated with children's environments in Johore Bahru are related to the need for a more coordinated development at the local level. This will in turn served a platform for a more organised design of spatial environments that will create a hierarchy of spaces to supporting children's needs. Various public and private agencies have not placed children's developmental needs first for better provision for children. A lack of cooperation and coordination has hindered better solutions to the above mentioned issues and problems in Johore Bahru.

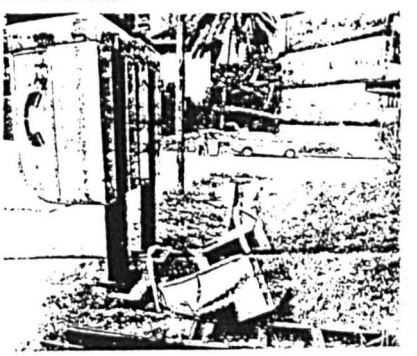
At present, the provision of open space especially in housing and neighbourhood are only seen as necessary to fulfill requirements for planning approval. There is no detailed consideration for creating settings for children's activities in residential areas, responsive and functional to their behavioural needs, scale and above all having to provide a better sense of place for children. Thus, the quality of open space provision is tokenistic rather than serious and well-designed, socially suitable, liviable urban space that allows for the growth of individual children, and consider the open spaces planning in a context of holistic users development especially children.

Social ills – who is responsible?

CHIAM HENG KENG argues that not only parents, but society too, has a role to play in helping to mould a child's character during its formative years.



ACT OF MISCHIEF ... The slide at a playground that has been partly destroyed



SENSELESS ... A telephone booth wrecked by vandals

Figure 5.15 Vandalism in urban neighbourhood park as a result of poor maintenance and management (*Source*: NST newspaper cuttings).

Concept of modern day housing has robbed us of nature's joys

WHEN I was a little girl in the 1950s, I lived in a home that wasn't large but it was a pleasure to step out of the house through the back entrance, front entrance or through any of the windows (grilles were not common then), and land on the grass amidst plants and trees.

Neighbourhood kids would perch with me on the full grown red *jambu* tree where we had the stupidest arguments to the most serious discussions. Joy knew no bounds when the *jambu*, red and juicy, hung in bunches.

At other times I would laze among the many vegetable and flower plants nurtured by our family. It was sheer joy to pluck chillies or tomatoes as and when the need arose. There was a variety of colourful butterflies and dragonflies and other interesting creatures.

It's a feeling I can't seem to find words to describe, as I see the drastic contrast in the layout of houses these days. The concept of link and terraced houses is boring and an absolute eyesore. It reminds me of old military barracks.

What irks me is that lush greenery is totally erased without a trace and replaced with monotonous concrete structures with absolutely no space for any form of outdoor activity for the dwellers who are sandwiched between the front and back roads and side walls.

The privileged get the corner lots and the not so privileged get the end lots. Such being the state of 80 per cent of houses today, what do we expect our young ones to do? They don't know what it is like to walk around the house bare feet, plant and watch the vegetables flower and mature, chase butterflies, catch dragonflies, curiously observe a bullfrog, or peek from a distance at a caterpillar, all the while experiencing nature and learning what no books can teach.

At the rate houses are being built, I can't help but feel that developers are absolutely exploiting the innocent helpless buyers. At least build semi-detached houses even if they are slightly smaller and provide some land space around the houses.

Shakthi Kiang

Figure 5.16 Issues and problems related to open spaces planning and design in Malaysia. (*Source*: NST newspaper cuttings).

The existing pattern and nature of city expansion and growth poses a restriction and is a major problem in addressing the provision of children's environment. This is mainly due to economic demands and the perceived attitude and understanding of those responsible whether professionals, policy makers or the general public. Another contributing problem is the weakness of the current urban planning practice that lacks of clear guidelines and policies concerning the provision for quality children's environments and facilities. The need for adequate and supportive information and evidence that can help towards formulation of holistic and cohesive guidelines and policy on the provision of children's environment is crucial and urgent.

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