THE UNIVERSITY OF MANITOBA

EARLY ADOLESCENTS PERCEPTION AND
USE OF A GIVEN SUBURBAN ENVIRONMENT

by

DANA GAYLE MALLIN STEWART

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF CITY PLANNING

DEPARTMENT OF CITY PLANNING

WINNIPEG, MANITOBA

April, 1984

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WITH LOVE

TO TAMARA LYNN AND LEAH KATHLEEN MALLIN

from MOM

ABSTRACT

Early adolescents ranging in age from approximately 12 to 15 years were studied in a suburban neighbourhood in Winnipeg, Manitoba, Canada. The study attempted to examine the adolescents' use of their neighbourhood based on their regular activities and to explore their perceptions of the neighbourhood based on places or locations used for those activities. A total sample of 131 early adolescents, 69 males and 62 females, were obtained from a survey conducted in the only school in the neighbourhood accommodating all normal students of this age group.

The instrument used to study the use of the neighbourhood was an open and close-ended questionnaire which focussed on discretionary and obligatory activities carried out in the home and out of the home by each of the respondents. A self-initiated cognitive map became the instrument used to study the adolescents' perception of the neighbourhood. A combination of the two instruments provided a method to explore the interaction between the adolescents' use and perception.

The questionnaire data indicated significant results according to increased age and grade of the respondents. The younger adolescents engage in more varied discretionary activities in different out-of-home locations while the older adolescents carried out less varied discretionary activities out of the home but replaced them with fewer selected discretionary activities in the home. The results of the maps indicated that the younger adolescents drew more developed, detailed maps than the older adolescents. Associations between the results of the questionnaires and maps suggest that increased use and contact with the neighbourhood produces a heightened perception of that neighbourhood when measured by a recalled map.

The findings from this study suggest the need to further refine a method to examine the interaction between use and perception of neighbourhoods by individuals. It also underlines the necessity to further understand the needs of the adolescent in order to better plan neighbourhoods and communities which will contribute to their wholesome developmental growth.

ACKNOWLEDGEMENTS

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INTRODUCTION

Interest in peoples' responses to places and their actions asso-
ciated with given spaces has increased in the last two decades. Experi-
ments in such diverse fields as space and object perception, to those of
distance estimation, and the self-report of subject feelings of
spaces and buildings, have attempted to explain how people perceive
their environment and objects within it, and try to formulate some
predictable indicators of the behaviours likely to occur in given places.

The weakness in much of the work done by psychologists, geographers,
and others working in the design-related behavioural disciplines is the
propensity to assume people to be a homogeneous group who will repond
similarly in given places or spaces. A growing body of research now
recognizes that there are differences in peoples' responses to and
conception of their environments based on differences in their roles
relative to their environment. This suggests that a person's differing
experiences give rise to differing environmental perspectives.

Differing experiences and the roles a person plays relative to
his environment are dependent on the individual's developmental period
and stage in the life cycle. Experiences change and expand from childhood
to maturity and old-age. The child, whose experiences are limited; the
adolescent, whose freedom and physical prowess expand experiences; and
the mature adult, whose opportunity for an active range of experiences
is broad, all have differing levels of interaction with their environment.

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The physical and social environment in which the individual not only exists, but acts and carries out daily routines, are important variables in the developmental process. Successful physical, emotional, and social development from childhood to maturity relies on the physical and social environment for support.

A cornerstone in the development of an individual from childhood to maturity is the period of adolescence, the transition period from the child to adult. This study has chosen the period of early adolescence, i.e., the age period of approximately eleven to fifteen years, because the investigator believed that this developmental period could well be a predicator of behaviours in later years. Little research has been carried out examining the role relationships of adolescents to their physical and social environment with the notable exception of Florence Ladd,[1] who studied black youths and their neighbourhood in Boston. She underlined the need for additional study by saying:

> not only do we need more information about the ways children
> and adolescents perceive, organize, and represent urban areas,
> but we should begin to examine the process of development of
> psychological and social associations (iwth) neighbourhood and
> other places.

This investigation attempts to examine adolescents in their community, to look at the way in which they conduct their daily routines and come into contact with others, including peers, outside the immediate family environment, and to explore the perceptions that they have of their community based on the activities which they engage in on a regular basis.

The primary aim of this research is to explore, as distinct from explain, adolescents' contact with their neighbourhood. In order to do so, an interactive model needs to be developed which examines adolescents'

activities and behaviours in the physical and social environment of the neighbourhood and their perception of that environment.

A secondary aim is to evaluate the model as a tool for planners and designers of neighbourhoods in an attempt to better understand how at least one age group, adolescents, use and perceive their community. The interaction between use and perceptions is an important step in the understanding of the quality and meaning given the physical environment by individuals and groups of people, and a necessary one in providing background for decisions in the planning of neighbourhoods and communities.

Note: The masculine pronoun will be used as a generic pronoun to refer
        to both sexes.

CHAPTER I

THEORETICAL FOUNDATIONS

Developmental Theory and The Role
of the Physical Environment
in Adolescent Development

Dr. Gisella Konopka,[1] a pioneer in the study of adolescents,
addressed the 1978 Conference of the American Association of Housing
Educators and challenged designers, planners, and researchers to examine
the growing body of knowledge on adolescents and to use this information
to better plan and design for this critical period of development. It
was as a result of her challenge that the focus of this thesis emerged.

Why examine such a brief period of time in the life cycle and
specifically the few years of early adolescence, roughly ages eleven to
fifteen? Most adults, among which planners number, traditionally look
on the period of adolescence as one of transition, the "in-between
years." But these are important years, formative years during which the
world of the child widens. The experiences of the world beyond the
family and home shape the future perceptions and competence of that
child as an adult.

The external world and its importance to the child is one of
the major premises upon which Jean Piaget based his Theory of Developmental
Cognition.[2]

> [the establishment of cognitive relations consists] neither of
> a simple copy of external objects, nor a mere unfolding of
> structures performed inside the subject, but rather [involves]
> a set of structures progressively constructed by a continuous
> interaction between the subject and the external world

It is through explorations of, and interactions with, the external world that the child matures and his capabilities evolve. This exploration results not only in an accumulation of knowledge, but also in a continually changing perception of the world and qualitatively changing cognitive abilities.

Piaget's work is complex and voluminous, and will not be dealt with in detail here, but instead, will be referred to for specific references throughout this thesis. Although his work has not dealt with environmental perception in the same way as this thesis explores the topic, Piaget has researched both children's concept of the physical extent of their community and of the world.[3,4] The importance of his work is recognized as the foundation of developmental theory and has clearly influenced the awakening field of environmental studies. Piaget and Jerome Bruner,[5,6] have contributed to a vast amount of research from the field of developmental psychology to the study of environmental cognition. Their contributions will be referred to presently in a review of the research on cognition and the nature and function of the mental image.

A Biological Analogy and Human Development

Prior to the development of this thesis, the investigator wrote an unpublished paper entitled "Families, Values Theory and Planners." In it, she attempted to pull together material on family development and decision-making with value theory as a potential tool for planners. A conceptual framework was created to give a model by which the family was seen "as a dynamic social system consciously evolving through time, maneuvering its way through life experiences by accumulating or eliminating knowledge and behaviour through selected choices."[1] This framework

would appear to be useful in explaining the transition from childhood through adolescence to adulthood.

The framework was based on a biological analogy, namely, looking at the family in a classic sense of couple and child as a living social organism from the time of bonding of the parents through the various stages in the life cycle. A diagram representing the growth of the child from inception through time, as measured in developmental norms of human development, was created (see Figure 1). Although the diagram was extremely simple, it did portray two pieces of information: firstly, the growth of the child in quantity and quality, measured in accepted developmental norms, and secondly, in the developmental process of the child, the accumulation and elimination of selected knowledge, behaviours, and experiences.

DEVELOPMENTAL MODEL OF THE GROWTH OF AN INDIVIDUAL

eliminate

SPERM

OVARY

INDIVIDUAL ⟶ GROWTH

accumulate

TIME (DEVELOPMENTAL NORMS)
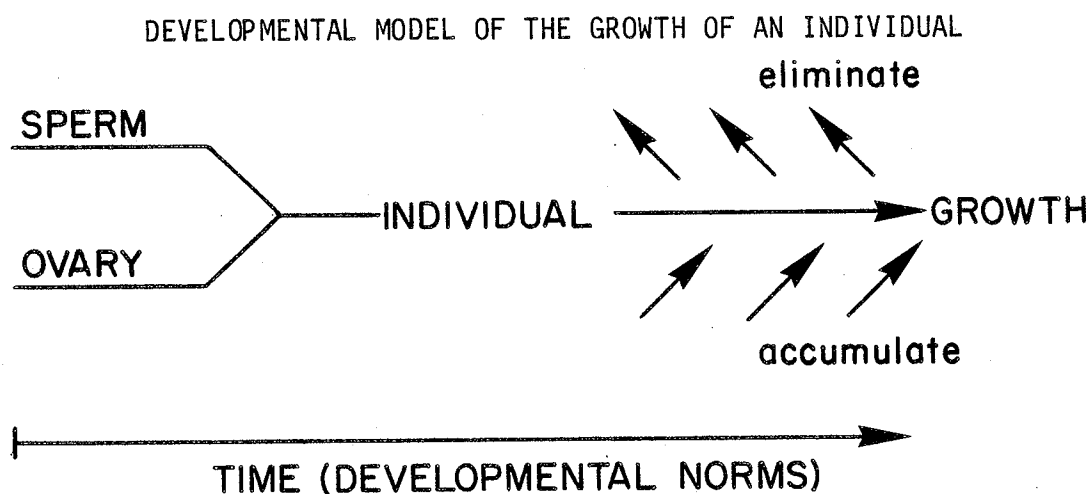
Fig. 1

In this diagram, growth of the child, and subsequently the family as a whole, couple plus child(ren), is presented as a continuously determined linear path. Developmental research, however, suggests that psychological and physical growth does not follow a direct one-dimensional route. On the contrary, through the processes of accumulation and

accommodation the organism increases in size and structural complexity. These aspects of development are sometimes illustrated as a two-dimensional spiral (see Figure 2).

TWO-DIMENSIONAL GROWTH SPIRAL
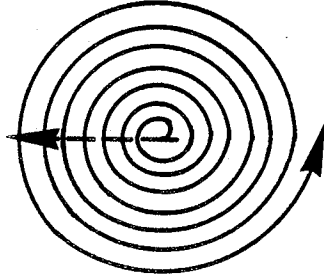
Fig. 2

However, this illustration of the growth cycle is also inadequate for it does not allow for the elimination or rejection of environmental input. The incorporation of this factor, which is essential in making choices or decision-making, requires a three-dimensional model (see Figure 3).

THREE DIMENSIONAL MODEL
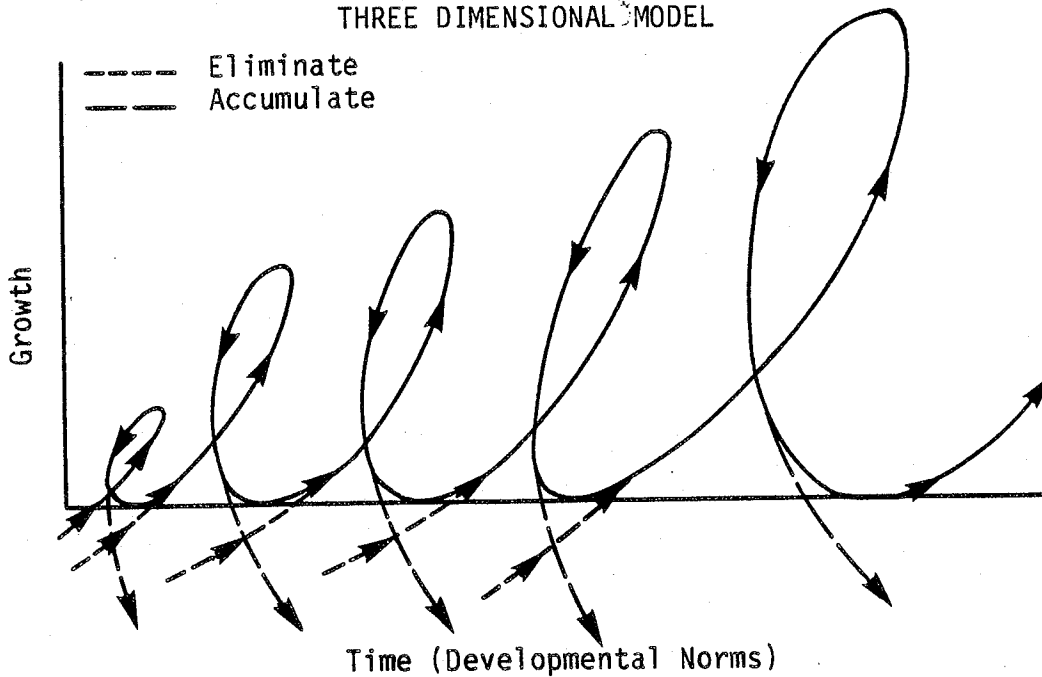
Fig. 3

This diagram, whether for family or child, more clearly illustrates what the others lack: firstly, the growth in quantity and quality of family and individual experiences over time; secondly, the selection

and rejection of life experiences which explain the recessions, pauses, and reversals in this growth process referred to earlier. It also shows a degree of consistency, despite certain redundancies or detours which allow the family and the individual to maintain its integrity as an organism (social), while recognizing changing conditions and "needs". The diagram was intended to illustrate essentially an equilibrium system, open to inputs from the environment (taken in its broadest context), but which is controlled through the exercise of selection and rejection the part of the family and its individuals.

The development of this model relied on material gleaned from a variety of sources, but is particularly influenced by theories in developmental psychology: that of Piaget,[2] Else Frenkel-Brunswik[3] who contributed a view of the life cycle by stages, and Erik Erikson,[4] who described the socialization process of an individual in an epigenetic model with eight phases. For Erikson, the development or growth of personality depends on: firstly, the needs of an individual at a specific stage and secondly, the environments, physical and social, is critical to this theory and should be of particular interest to the planner. Erikson's concept of "psychosocial crisis," which arises as a result of development within a specific social environment and which requires successful resolution in order to handle each successive stage, led to the work of Mayer Spivak.

Spivak,[5] through his Theory of Archetypal Place, integrated the work of psychologists, social scientists, and design professionals, including planners, into a theory which links developmental time in the life cycle with a physically appropriate place for proper support and resolution of behaviours. Thes behaviours are related to central

drive-related tasks or crucial events and life experiences as outlined by Erikson. Spivak describes these as "critical confluence crises," whereby age/stage related "drives" are focused on a specific object of that drive at an appropriate time in the developmental cycle together with an appropriate physical setting or place. When all four of these components. (drive, object, time, and place) are present, successful resolution of this 'critical confluence' occurs and 'wholeaction' results. This is illustrated as follows: [6]

DRIVE   TIME

WHOLE ACTION

OBJECT   PLACE
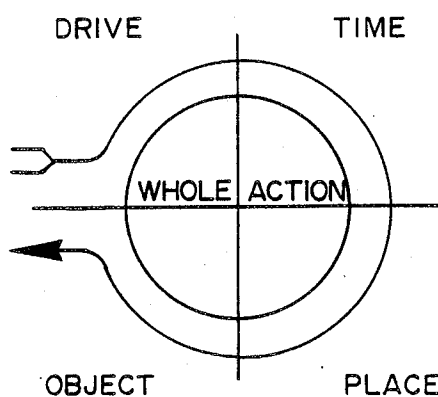
"CRITICAL CONFLUENCE" DIAGRAM
Fig. 4

The role of fitting archetypal place in this theory is important to such an extent that in the absence of appropriate settings, individuals experience "setting deprivation".[7]

Both perspectives, the individual and the family, are necessary if we are to project the implications of the archetypal system and the critical confluence theory into the requirements for the design of houses and communities. It should be the task of the community to provide an appropriately designed variety of spatial types for individuals and families.

There may emerge within the system of the archetypes and the critical confluences, a new predictive theory of individual and social behavior with respect to space, maturational level, and life cycle position. This theory should prove useful at any scale of study, from the level of the individual through to the society, from a single room flat to the receding boundaries of the megalopolis and it should provide a decision-making hierarchy and strategy for investing the physical plans of cities and houses with greater relevance to human life.

Implicit in Spivak's theory is the idea that the physical environment is one of the major variables in the successful or unsuccessful resolution of predictable developmental processes. It proposes that an appropriately designed environment will maximize the 'wholeaction' such that the individual can move on to the next life experience necessary for his personal development. This thesis suggests that the designed environment is of particular importance to the adolescent as he endeavours to move from the world of the child to that of maturity.

Qualities of Adolescents and Goals of the Adolescent Period

To return to Dr. Konopka's conference address, she describes the adolescent as one of a very unwelcome group who exists in an environment which does not suit his needs. The unwelcome nature of this group is often cited by laymen, educators, and especially media persons who frequently report on the vandalism and deviant behaviours of adolescents. Rarely do any of these critics question the "lack of fit" between this age group and its physical and social environment. Dr. Konopka made a plea to educators, designers, and planners to look more closely at the characteristics and qualities of adolescents in order to recognize this age group as one worthy of concern and to provide clues for an environmental response to provide a better fit for them.

Some of the qualities of adolescence which characterize this group, according to Dr. Konopka, are ones which pose threats and are a source of frustration to adults but which are necessary transition steps from childhood to mature development. One such quality, the drive to experiment, combines a mixture of audacity and insecurity. This

drive produces two other qualities, loneliness and psychological vulner-
ability, as the intensity of each attempt at experimentation is often not
tempered with a background of positive experiences upon which to draw.
Physiological and emotional changes lead to another quality, that of
enormous mood swings and feelings of ambivalence, omnipotence, helpless-
ness, impotency, and daring conviction. Often the abrasive qualities of
an argumentative, emotional, and intolerant adolescent overshadow the
underlying attempts at working out relationships within themselves and
with others. Lastly, one of the qualities which is perhaps strongest at
this age period is that of peer group need. At no other time will an
individual exhibit such strong cooperative spirit within a group,
regardless of the positive or negative characteristics of the cooperation.

In an attempt to bridge the gap from childhood to maturity, the
adolescent encounters many emotional, social, moral, and economic problems.
Along the way he forms goals to be achieved and behaviours to master in
order to realize the independence of adulthood. Of course, not all
individuals attain these goals fully, but there are some identifiable
milestones which each individual attempts to reach with varying degrees
of success. Cole and Hall,[1] in their book Psychology of Adolescence,
present a list of nine goals of the adolescent period. Table 1 represents
their work and elaborates on the associated behaviours necessary for
reaching the goals of:

  A. General emotional maturity

  B. Establishment of heterosexual interests

  C. General social maturity

  D. Emancipation of home control

E.   Intellectual maturity

F.   Selection of occupation

G.   Uses of leisure

H.   Philosophy of life

I.   Identification of self

TABLE 1

THE GOALS OF THE ADOLESCENT PERIOD
(Cole and Hall[2])

A.   General Emotional Maturity

From		Toward	
1.	Destructive expressions emotion	1.	Harmless or constructive expressions
2.	Subjective interpretation of situations	2.	Objective interpretations of situations
3.	Childish fears and motives	3.	Adult stimuli to emotions
4.	Habits of escaping from conflicts	4.	Habits of facing and solving conflicts

B.   Establishment of Heterosexual Interests

From		Toward	
1.	Exclusive interest in members of the same sex	1.	Normal interest in members of opposite sex
2.	Experience with many possible mates	2.	Selection of one mate
3.	Acute awareness of sexual development	3.	Casual acceptance of sexual maturity

C.   General Social Maturity

From		Toward	
1.	Feelings of uncertainty of acceptance by peers	1.	Feelings of secure acceptance by peers
2.	Social awkwardness	2.	Social poise
3.	Social intolerance	3.	Social tolerance
4.	Slavish imitation of peers	4.	Freedom from slavish imitation

D.   Emancipation from Home Control

From		Toward	
1.	Close parental control	1.	Self-control
2.	Reliance upon parents for security	2.	Reliance upon self for security
3.	Identification with parents as models	3.	Attitude toward parents as friends

TABLE 1 - Continued

E. Intellectual Maturity

From 1. Blind acceptance of truth   Toward 1. Demand for evidence before
         on the basis of authority   acceptance

      2. Desire for facts   2. Desire for explanation of
                                                     facts

      3. Many temporary interests   3. Few, stable interests

F. Selection of an Occupation

From 1. Interest in glamorous   Toward 1. Interest in practicable
         occupations   occupations

      2. Interest in many   2. Interest in one occupation
         occupations

      3. Over or under-estimation   3. Reasonably accurate esti-
         of one's own abilities   mate of one's own abilities

      4. Irrelevance of interest   4. Reconciliation of interest
         to abilities   and abilities

G. Uses of Leisure

From 1. Interest in vigorous,   Toward 1. Interest in team games and
         unorganized games   intellectual contests

      2. Interest in individual   2. Interest in success of
         prowess   team

      3. Participation in games   3. Spectator interest in games

      4. Interest in many hobbies   4. Interest in one or two
                                                     hobbies

      5. Membership in many clubs   5. Membership in few clubs

H. Philosophy of Life

From 1. Indifference toward   Toward 1. Interest in and understand-
         general principles   ing of general principles

      2. Behaviour dependent upon   2. Behaviour guided by moral
         specific, learned habits   principles

      3. Behaviour based upon gain-   3. Behaviour based upon
         ing pleasure and avoiding   conscience and duty
         pain

I. Identification of Self

From 1. Little or no perception   Toward 1. Moderately accurate
         of self   perception of self

      2. Little idea of other   2. Good idea of other people's
         people's perception of self   perception of self

      3. Identification of self with   3. Identification of self with
         impossible goals   possible goals

Two characteristic behaviours of adolescents trying to achieve these goals are experimentation and value clarification. The first, experimentation, is a necessary component of all stages of human development, but particularly important to this age group as it allows the adolescent to try out his new capacities of physical, mental and emotional strengths. This desire to experience the new, formerly unattainable feats and relationships is weighted with unknown risks. Taking of risks or "dares" gains respect of the peers and becomes less frequent as age and competence increases. The rate of the second behaviour, values clarification, peaks in adolescence as individuals try to examine themselves in relation to others and impose a moral framework, often uncompromising, of "good" and "bad" on things in their world.

An individual's exposure to values comes from two major sources: (1) from adults who are perceived to have prestige, and (2) from one's own peer group. Extremely important to the adolescent is the "adolescent peer culture,"[3] which sets certain acceptable standards and practices of morals, dress, and speech behaviours, and which are important factors in character formation. The locus for the adult influence on values and morals may be in the home with parents and/or in the community with elders; the locus for adolescent peer culture is more commonly outside of the home in the school, neighbourhood and community places.

In summary, the adolescent must solve a number of problems, reach and master certain goals, learn to control physical and emotional behaviours, develop a sense of competence based on experimental experiences, and develop and reassess his values relative to others in preparation for adulthood. These tasks are carried out in a physical and social environment which can either contribute to or block successful resolution of these necessary life experiences.

Human Behaviour, Interaction with the Physical
Environment, and Environmental Response

Although both the home and community influence the adolescent in

his attempts to reach physical and social maturity, it is in the community

that the adolescent tries out many of the behaviours which are important

stepping stones to this goal. It has previously been stated that the

physical and social environment surrounding an individual is an important

variable in human development. With this knowledge, designers and

planners might then believe that they could achieve successful resolution

of life cycle behaviours through a particular building design, site

plan, or neighbourhood arrangement. This physical deterministic view is

widely held among the design and planning profession.

Constance Perin[1] provides an unsightful discussion on the various

models which designers and planners use when attempting to design for

human behaviour and interactions. Aggregate characteristics of potential

users, which are often the base for decision-making in the design profes-

sion, lend a veil of credence to an otherwise intuitive process. Perin

warns, however:[2]

> The social networks we might try to explain depend less on
> static characteristics or people and more on the various means
> of physical mobility, in getting to work, shopping, attending
> school, visiting, and on their various degrees of economic
> mobility, depending on age, education, race and income. And
> so, when the designer thinks about creating a 'neighbourhood'
> where social organization and interaction might flourish, he
> may need, but not yet find, fresh concepts and data about the
> quality and meaning to people of neighbourhood interactions
> compared with those maintained despite geographical distance.

This pragmatic approach to planning leads Perin to question how one

might study everyday behaviours of people in order to begin to understand

the quality and meaning given the physical environment in which these

activities and interactions are carried out.

Inherent in the work of Perin and other researchers interested
in human behaviours and activities is the concept of the individual not
only being in an environment, but doing things in it.[3]

> Environments ... are not and cannot be passively observed; they
> provide the arena for action. They define the probabilities for
> occurance of potential actions, they demand qualities which call
> forth certain kinds of actions and they offer differing opportu-
> nities for control and manipulation of the environment itself.

The ability to control, rather than be controlled, and the ability to
manipulate, rather than be manipulated by the environment, is one of the
major steps in the development of the adolescent in his attainment of
physical and emotional maturity. All individuals, but epecially adoles-
cents, learn to adapt their behaviours through their every day activities
in an attempt for this control.

That man adapts is an accepted factor in social science theory.
One of the reasons he adapts is for control and independence from the
physical environment. He does so at varying costs to himself and to
society as a whole; costs, in terms of energy, time, physical and mental
health, self-esteem, money and values. But he also makes human demands
to which the physical environments respond with varying degrees of
success, from the "undermining to supportive, absent to present, rare to
ubiquitous."[4] Dr. Konopka suggests that the response of the environment
to adolescents is less than successful.

Perin has developed an environmental response continuum[5] in
which she relates examples of the physical environment with an observable
human cost of adaptation according to the demand placed on that environ-
ment. For a clearer explanation of this concept see Table 2.

TABLE 2

ENVIRONMENTAL RESPONSE CONTINUUM
(derived from Perin[5])

Kind of Environment	Example of Environment	Behavioural Cost to Participate
structured, directive, authoritarian	theatre, air plane	highly adaptive cost which people are willing to pay
(specific)	private schools	cost of unquestioned understanding of aims and methods of institution
	housing for elderly, facilities for the handicapped	cost of assuming the physical environment can act as a prosthetic resource
captive (diffuse)	slums	cost of lack of immediate control over the environment
congruent (particularized)	[ ]	no cost matched with a place to participate
minimally articulated, open, flexible	dual purpose rooms, squatter housing, indigenous housing	low adaptive cost
overly unarticulated	open space	full range of purposes difficult to accommodate

The continuum developed by Perin contains a middle term of
particular interest--congruency. This concept is not unlike Spivak's
theory of critical confluence which also links the physical environment
and human behaviour.   A congruent environmental response is "a plan
that uses the behaviours of future inhabitants as the imperatives of
design".[6]

> As more persons find the opportunity to express their biological
> endowment under diversified conditions, society becomes richer
> and civilizations continue to unfold. In contrast, if the
> surroundings and ways of life are highly stereotyped, the only
> components of man's nature that flourish are those adapted to
> the narrow range of prevailing conditions. Hence the dangers
> of many modern housing developments, which, although sanitary,
> are inimical to the development of human potentialities and are
> designed as if their only function was to provide disposable
> cubicles for dispensable people ... irrespective of genetic
> constitution, most young people raised in a featureless environ-
> ment and limited to a narrow range of life experiences will be
> crippled intellectually and emotionally.

A congruent environmental response, on the other hand, is one which

responds to the stimuli of human demands, depending upon the stimulus
properties endowed on it by the individual, in order to carry out effec-
tive behaviour using the object as a resource.

Effective behaviour is a personal evaluation and depends on age,
sex, culture, etc., and implies competence. "Competence is the cumulative
result of the history of interactions with the environment."[7] A person
subjectively feels a sense of competence, consciously or unconsciously,
when dealing with the environment in carrying out everyday behaviours.
Sense of competence and one's objective measure of it, can be determined
"relative to the availability, extent, quality, and placement of environ-
mental resources."[8]

Sense of competence is a realistic measure which can be used in
determining congruent environments and is more reliable than preference
in achieving effective behaviour. Because it is cumulative, competence
in one area reinforces efforts to become competent in others, leading to
self-satisfaction or a sense of interpersonal competence on the part of
the individual. This sense of competence in everyday activities leads
the individual, and especially the adolescent, to experiment with new
activities and behaviours and provides a well of positive experiences
upon which to draw.

Groups of people can be sorted out according to the way they
view themselves on various measures of competence and their expectancies
of success with certain behaviours in a variety of environmental circum-
stances. Some groups view themselves as more or less in control of
their behaviours and the resulting environmental responses; others, who
see themselves dependent on luck or fate, may experience very different
"costs" depending on their behavioural expectations.

The role of behavioural expectations in human behaviours and
environmental response is supported by the concept of "schemata".
"'Schemata' refers to the active organization of past reactions,"   and
led Perin to believe:[9]

> The ways in which people have organized their behavior patterns
> in the past are likely to coincide with their expectations of
> their behaviour in the future. People can be asked how they
> would want to change their behavior in the future, if at all,
> to discover what now hinders them from fulfilling their own
> behavioral expectations. But although we might presume con-
> stancy to the behaviors, there is no necessity for presuming
> that the kinds of spaces in which the behaviors take place have
> to stay the same. For this reason, the emphasis on behavioral
> expectations is intentionally a departure from 'preferences',
> in that behavior that is satisfying is likely to be preferred,
> and people are more likely to have ideas about alternative ways
> of achieving satisfactory behavior whereas they may be lacking
> in preferences for what they have never experienced.

Perin says "to do what you expect, you make plans"[10] and quotes
Miller, Galanter, and Pribram:[11]

> Consider how an ordinary day is put together ... whether it is
> crowded or empty, novel or routine, uniform or varied, your day
> has a structure of its own--it fits into the texture of your
> life. And as you think what your day will hold, you construct
> a plan to meet it. What you expect to happen foreshadows what
> you expect to do.

She continues, "if the designer knows what people want to be able to do,
leaving aside what they prefer, he can design things to help them."[12]

One way of determining what people want to do is to observe,
record, and analyse "enacted behaviours" or past behaviours of individuals[13]
and groups that use "space, place, frequency, duration, extent, objects,
and other people,"[14] as information on the physical support or response
demanded of the environment.

Perin developed a method by which to study what people do and expect to do by separating enacted behaviours into "behavioural circuits".[15] Her work builds on research by Barker[16] in ecological psychology, Harris[17] in anthropology, and Aas[18] in sociology, and complements other research on how people apportion their time and activities. For a brief survey of these other examples of research see Table 3.

TABLE 3

RESEARCH IN TIME AND ACTIVITY PATTERNS
(derived from Porteous[19])

	Theoretical Concept	Method or Technique	Author
1.	Definition of activity systems, behavioural units, episodes, locales	Time allocation studies	Chapin and Brail
2.	Time budgets of individual and daily and weekly routines	Questionnaires on how time spent, diary use, activities coded according to predicted classifications	Sorokin and Berger Szalai Martineau Chapin Chapin and Hightower
3.	Behavioural settings and activities	Following and observing subjects, behavioural setting records	Barker and Wright Barker and Wright
4.	(O & D) Origin and destination surveys	Questionnaires on purpose, duration, locales, of everyday trips from home	CATS Chicago Area Study Mitchell and Rapkin
5.	Home base and its importance surveys	Questionnaires on home and neighbourhood use	Pappas
6.	Functional neighbourhood and activity systems	Use of base map to locate friends, relatives, work, shopping, etc.	Stea
7.	Activity based models for planning accessible recreation sites		Maw Burton Janisova Bull Bell et al.
8.	Other uses of activity patterns	Cumulative time budgets Mobility studies Performance standards Structured land use models	Meir Chapin Polloway and Bergman MacMurray
9.	Overall analysis of activity patterns		Barker Kasmar

Environmental Psychology, Environmental Perception and Cognition

In the last ten to fifteen years, man-environment research has increasingly concerned itself with an understanding of human behavioural patterns. The interrelationship between human behaviour and its environmental setting has been studied by a variety of professional researchers, psychologists, geographers, planners and designers in architecture, urban studies, landscape architecture, regional planning, natural resource planners, sociology, and many other areas. Such multidisciplinary work has brought together the study of perception, cognition, and behaviour into an interdisciplinary area known as "environmental psychology."

An adequate definition of environmental psychology proves to be elusive as evidenced by Proshansky,[1] who questioned whether it actually can be defined; Hemstra and McFarling,[2] who use an operational approach based on Proshansky, "environmental psychology is what environmental psychologists do"; and Porteous,[3] who underlines the wide variety of sub-disciplines involved in the field and claimed that there is not even agreement on the words "environment" and "behaviour." Nonetheless, this thesis does accept an aim of environmental psychology as outlined by Spencer.[4]

> Environmental psychology aims to build a predictive scientific theory which will illustrate the consequences for human behaviour of alternative decisions concerning the structure of the built environment.

As indicated earlier, research has been prolific. Contributing to the communication of published works on various facets of environmental psychology are such journals as Environment and Behaviour, Human Ecology, Design and Environment; conference proceedings such as those of the Environmental Design Research Association (EDRA) and Behaviour and Environment; newsletters such as Man-Environment Systems and

Architectural Psychology; directories such as International Directory
of Behaviour and Design Research; and bibliographies by Bell et al.,[5] Craik,[6]
and Goodey.[7]

The aim of environmental psychology to build a predictive
scientific theory to relate human behaviour and environmental settings
is of special interest to those professionals who plan, design, and
manage those settings, and to psychologists who are concerned with the
environmental context of human behaviour. Environmental assessment has
been one major focus of the environmental psychology field. Craik[8]
identified research in environmental assessment as falling into five
fields:

1. Assessment of the physical-spatial properties of places,
e.g., Shafer and Thompson[9]

2. The organization of material artifacts in places, e.g.,
Living Room Checklist, Laumann and House[10]

3. Assessment of traits of places by human observers, e.g., Use
of adjective checklists, bipolar rating scales, Q-sort decks, etc.

4. Assessment of the enduring behavioural attributes of places,
e.g., Barker[11] and Kasmar[12]

5. Assessment of the institutional attributes of places,
e.g., Moos[13]

Another key area of research in environmental psychology is
that of environmental perception which focuses "upon the psychological
and environmental factors which affect the impressions observers form of
places." [14]

> In summary, current work in environmental perception represents
> a coherent body of studies which have re-defined the concept of
> perception to include perceptual, cognitive, imaginal, affective
> and value aspects studied by a wide range of methodologies and
> techniques. Environmental perception is not only dependent upon
> the physical, interpersonal, and cultural aspects of the environ-
> ment, but also upon the status of the person, including needs,
> actions, motives, cognitive processes, and so on.[15]

Environmental perception defined in this way does not deal only with space perception or object perception, nor with perceptual learning or adaptation. "Environmental perception, in short, includes many aspects that are not traditionally treated as perception."[16]

The literature on environmental psychology at times uses the terms "environmental perception" and "environmental cognition" separately, and at times interchangeably. Cognition, however, really refers to all forms of knowing with perception being a substage of the entire process. Taken in this way, environmental cognition is a broader concept and "refers to the awareness, impressions, information, images and beliefs that people have of environments."[17] It is important to note that these environments do not necessarily have to be experienced-- they may have been heard about, or imagined. Nonetheless, whether experienced in actuality or vicariously, these environments are imbued with information, images, impressions and are given meaning and significance according to the manner in which each person selectively perceives them. The question of "how are these environments perceived?" is an area of major theoretical and analytical concern of those interested in man-environment research.

In an attempt to answer this question, researchers, but especially geographers, have borrowed heavily from the field of psychology to develop a range of techniques to either measure or describe aspects of the perceived environment. Saarinen,[18] in his article "The Use of Projective Techniques in Geographic Research," uses a framework identified by Lindzey and Thorpe,[19] whereby groups of techniques fall into five main categories: (1) association techniques, (2) construction techniques, (3) completion techniques, (4) choice or ordering techniques, and (5) expressive

techniques. Table 4 describes these techniques more fully and gives

examples of research characteristic of each category.

TABLE 4

PROJECTIVE TECHNIQUES USED IN GEOGRAPHIC RESEARCH
(derived from Saarinen [18])

Kind of Techniques	Task Required	Example of Technique	Example of Research using Techniques
(a) Association techniques	immediate response of the subject to stimuli	word or phrase association of various countries	Haddon
(b) Construction techniques	construction of a more elaborate story or picture from stimuli	Thematic Apperception Test (T.A.T.) Modified T.A.T. Test	Murray Saarinen
(c) Completion techniques	completion of an incomplete product in any way respondent chooses	Rosenerig Picture Frustration Study (Modified)	Barker and Burton
(d) Choice or Ordering techniques	respondent chooses from alternatives to fit a specific criterion	Szondi Test Picture Arrangement Test Place Preference Card Sorting	Zannaras Gould Cox and Zannaras
(e) Expressive techniques	product produced, but manner and style as important as product itself	play, drawing, painting techniques, human figure drawing tests scale models with movie or T.V. camera pick-up drawn map on blank sheet	 Appleyard and Craik Saarinen

Saarinen discusses the advantages and disadvantages of projective

techniques in research aimed at answering how individuals perceive their

environments. He sees them as useful for "tapping the subjective world--

something difficult to do by other means" [20] and feels they have distinct

advantages for cross-cultural work and for transcending language barriers.

On the negative side, Saarinen recognizes the great difficulty with

interpretation of the results and implies that geographers without assist-

ance of other professionals like psychologists, may be unlikely to under-

take research using these techniques.

Environmental Knowledge

The previously cited categories of techniques are merely a small

indication of some research interests in environmental perception and

cognition. At the very centre of controversy and confusion in this vast field is a basic disagreement on the term "representation" which is a critical concept in the study of environmental knowledge. Moore and Golledge use the concept "in the sense of a hypothetical construct to refer to hypothesized, not directly observable subjective knowledge of the environment."[1] They point out in an excellent discussion, the general sense in which representation is used: firstly, to "refer to the symbolic evocation of absent realities, that is, the representation of something absent from the perceptual field through some other means that stands for, or symbolizes the absent thing";[2] and secondly, the use of the term "to refer to knowledge or thought itself (Piaget)."[3]

> It is this latter meaning of representation that seems to be
> implied when various writers have spoken of the 'images' people
> have of their environment (Lynch, 1960; Strauss, 1961, 1968),
> of the 'personal constructs', by which one organizes knowledge
> of the environment (Harrison and Sarre, 1971), or of the ways
> of which one 'construes' the environment.[4]

The discussion of the two ways of using the term "representation" is of interest as it recognizes specifically "cognitive representation" as a hypothetical construct which seeks to explain the non-observed processes and organizations of elements of knowledge as a shorthand notation system which researchers have reason to believe exist and which account for observable spatial behaviour. Synonymously, Piaget[5] appears to be referring to representation in this way when he refers to "schema" or "structure" and Kaplan,[6] and Downs and Stea[7] when they refer to "cognitive map."

It is clear that noted researchers in the field recognize "environment" as some form of mental construct. How this construct is fabricated is a complex topic which will not be discussed here, however all theorists

and researchers do agree that the product of the fabrication is based on
the nature of and fashion in which an individual processes information.
The structure and processes are, of course, dependent upon the kinds of
knowledge the individual has available to himself. In terms of environ-
mental knowledge, Stephen Kaplan hypothesizes that there appear to be
four kinds of knowledge which would be useful for survival in the environ-
ment, knowledge of: (1) where one is, (2) what is likely to happen next,
(c) whether a predicted situation is 'good or bad', and (4) some possible
courses of action.[8]

> Thus the knowledge man requires for survival includes familiarity
> with the objects and situations characteristic of his environment
> and with the array of actions he can undertake. In addition, he
> must be able to anticipate what is likely to come next. This
> requires that man store in his head a great deal of information
> concerning what leads to what. He must have in his head a great
> deal of information about many possible situations and the
> relations between them.[9]

That overt spatial behaviour of individuals is a result of such
a complicated data base and complex decision-making is a relatively newly
accepted theory by researchers, especially geographers. Research on what
information is stored in the head of individuals has taken many forms.
Research specifically on urban environments, according to Golledge and
Zannaras,[10] can be divided into three areas: firstly, micro-level studies
such as those which attempt to find out how well people can locate speci-
fic points in urban areas; secondly, distance studies; and thirdly, macro-
level studies attempting to reconstruct maps of urban areas from the know-
ledge that individuals have about places. As indicated earlier, study in
these fields are important to professional planners, architects, designers
and resource managers in order to enable them to develop a predictive
theory linking human behaviour and environmental settings.

Perception of complex environmental situations have led to studies

at the micro-level of rooms through to the macro-level of entire cities

and natural environments. Generally, these studies have been in existing

real world environments, e.g., recollection of actual routes taken in a

city, with fewer studies being done in a controlled laboratory setting.

As well, relatively few studies have looked at a broad consideration of

environmental perception, Craik[11] and Lowenthal[12] being exceptions.

Joel Kameron in "Experimental Studies of Environmental Perception,"[13]

offers an excellent review of research on the four environmental classi-

fications of: (1) architectural forms, (2) cities, (3) cities, highways

and streets, and (4) natural settings. For a synopsis of Kameron's

discussion, see Table 5.

TABLE 5

SYNOPSIS OF RESEARCH ON EXPERIMENTAL STUDIES
OF ENVIRONMENTAL PERCEPTION
(derived from J. Kameron[13])

Environmental Classification	Research Authors
1. Architectual Forms:	
(a) lack of congruence between perceptions of designers (as reflected in the designs) and those of user groups	Izumi Rasmussen Canter Osmond Hershberger Environmental Research Foundation Halldane Payne Ittelson Venturi, Brown and Isenour
(b) attempts to determine "meaning" in architecture	Beck Hesselgren Collins Hershberger Sanoff Wohlwill Burnham and Grimm

TABLE 5 - Continued

Environmental Classification	Research Authors
(c) investigation of rooms	Maslow and Mintz Birren Kasmar Holmberg, Almgren, Soderpalm and Kuller Holmberg, Kuller and Tidblom Spivak Kasmar, Griffin and Mauritzen
(e) environmental perception of building	Canter and Wools Canter Collins
(f) exterior quality of housing and its perception	Chermayeff and Alexander Goodman Peterson, Bishop and Fitzgerald
(g) site plan and perception	Lynch Weiss and Boutourline Newman Downs
2. Cities: (a) general discussion	Lynch Van der Ryn and Boie Wohlwill Swinburne Carp Steinitz Strauss Rappaport and Hawkes Field
(b) measurement of urban preferences	Michelson Webber and Webber Lowenthal Lansing and Marans Southworth Saarinen

TABLE 5 - Continued

Environmental Classification	Research Authors
(c) Urban "images" and "mental maps"	Lynch Carr Blaut and Stea Stea Stea and Downs Downs and Stea
(d) psychological effects of city forms	Alexander Milgram
(e) elements of mental maps	Firey Lynch DeJonge Wastlund and Wihervouri Guliuk Ekman and Bratifisch Passoneau Stea Lee
(f) effect of observer variables on the nature of the urban image	Carr Appleyard Blaut, McCleary and Blaut Blaut and Stea Ladd Stea and Blaut

3. Perception of highways and Streets:

(a) travel and perception	Appleyard, Lynch and Meyer Carr and Schissler
(b) individual differences and roadside response	Lynch and Rivkin Vigier Little Winkel, Malek, and Thiel Appleyard and Lintell Golledge and Zannaras

4. Perception of natural environments:

(a) broadly defined "geographic perception"	Spout and Sprout Lowenthal Campbell

TABLE 5 - Continued

Environmental Classification	Research Authors
(b) Small scale natural environments and landscape	Lowenthal Craik Shafer
(c) distinct population differences	Sonnenfeld
(d) hazard perception	Kates Saarinen Burton Craik Sewel

Cognitive Mapping

As can be seen in Table 5, environmental perception of complex environments covers a wide range of research interests from land utilization and geographic behaviour to those of differences in aesthetic perception between professionals and laymen. The field of "environmental learning" itself has received relatively little attention. This form of learning uses, it appears, cognitive representation of geographic space and is linked to overt spatial behaviour. These representations specifically of geographic space are generally referred to as "cognitive maps," a term coined by Tolman in 1948.[1] The process of forming these representations or maps is referred to as "cognitive mapping." After Tolman's work in generalized cognitive mapping, interest in human spatial imagery dropped off until the publication of Boulding's seminal work The Image in 1956.[2] This work suggested relations between non-visual imagery and cognitive mapping and inspired two other major contributions to the field: Plans and Structure of Behaviour (1960)[3] by Miller, Galanter, and Pribram, and The Image of the City (1960)[4] by Kevin Lynch. Anselin Strauss's Images of American Cities (1961)[5] continued to carry this field of interest further.

Downs and Stea define cognitive mapping as "a process of a series of psychological transformations by which an individual acquires, codes, stores, recalls, and decodes information about the relative location and attitudes of phenomena in his everyday spatial environment".[6] They also see cognitive maps, the products of the mapping processes, as "convenient sets of shorthand symbols that we all subscribe to; recognize and employ: these symbols vary from group to group, and individual to individual, resulting from our biases, prejudices, and personal experiences."[7] Underlying these definitions is the theory that "human spatial behaviour is dependent upon the individual's cognitive map of the spatial environment."[8]

The cognitive map is a theoretical entity which is assumed to exist but is unobservable.[9] The map itself is a product of cognitive activity whose nature is not clearly known or understood but which does have a known effect on function. While the "map" of representation, as discussed earlier, functions as a regular map, it does not necessarily have the properties of a pictorial mental image in cartographic form. It is now generally accepted that Tolman's idea of a "cognitive map" is really a metaphorical use of the term "representation". In fact, Downs and Stea argue that when comparing people's sketch maps of environments with actual aerial or cartographic maps, there are always inaccuracies. "Cognitive mapping does not lead to a duplicative process with three-dimensional color pictures somehow 'tucked away in the mind's eye', nor does it give us an elaborately filed series of conventional cartographic maps as varying spatial scales."[10] They quote Kates and Wohlwill: "we must realize that the individual does not passively react or adapt to environmental forces impinging on him, but brings a variety of cognitive activities to bear--expectancies, attitudes,

even symbolic elaboration and transformation of the world of reality
which comes to mediate and moderate the impact of the environment."[11]
Downs and Stea "characterize cognitive maps as incomplete, distorted,
schematized, and augmented, and ... find that both group similarities and
idiosyncratic individual differences exist."[12]

Individual and group differences (and hence similarities among
members of a group), in environmental cognition, as evidenced by cogni-
tive maps of subjects, have been summarized in an excellent article by
Gary Moore, "Environmental Cognition" in Environment and Behaviour.[13] In
Table 6 Moore's material is adapted in a synoptic form in which a number of
the explanatory variables are outlined. Moore's caution of drawing causal
inferences or dynamic explanation about the variables is worth noting.

TABLE 6

EXPLANATORY VARIABLES IN ENVIRONMENTAL COGNITION
(adapted from Moore [14])

A. Types of individual differences

(1) Content, quantity and structural differences

a) size of area known .... Gould

b) types of areas known well
    enough to include on map .... Orleans

c) elements chosen to include
    or exclude .... Maurer and Baxter

d) age-related differences in quantity
    of environmental knowledge .... Andrews

e) structural differences
    ie. egocentric vs. domocentric
        personal preference system .... Throwbridge

f) route vs. survey map differences .... Shemyakin

g) styles of structuring environment
    representation of unfamiliar cities ..... Gittins

h) different modes of conceptualization
    of professional and academic groups ..... Barker

i) structural developmental differences
    in cognitive mapping of teenagers .... Moore

TABLE 6 - Continued

A. Types of individual differences - Continued

  (2) <u>Between-individual and within-individual differences</u>

      a) developmental parallelism between
         brain demaged and normal persons ...... Siegel and White

  (3) <u>Stylistic differences</u>

      a) "aesthetic poetic" modes vs.
         "scientific Function" modes of
         organizing environmental information ... Gittins

      b) socioeconomic related stylistic
         differences .... Stea and Taphanel
                                       Stea

  (4) <u>Developmental differences</u>
      <u>a) ontogentic developmental</u> changes .... Blaut et al.
                                        Blaut and Stea
                                        Piaget et al.
                                        Hart and Moore
                                        Moore and Golledge
                                        Acredolo
                                        Carnitello
                                        Mark and Siverman
                                        Ladd
                                        Bycroft
                                        Moore

      b) microgenetic developmental changes ..... Follini
                                        Appleyard
                                        Wood
                                        Beck and Wood

B. Individual and group differences: Explanatory variables

  (1) Differences due to specific
      cognitive abilities .... Mark and Silverman
                                      Appleyard
                                      Ladd
                                      Bycroft
                                      Moore

  (2) Age-related individual differences .... Piaget
                                        Acredolo
                                      Moore
                                      Kaplan

  (3) Sex-related individuals .... Everitt and
                                           Cadwallader
                                    Orleano and Schmidt
                                    Tindal
                                    Saegert and Hart
                                    Hart

TABLE 6 - Continued

B. Individual and group differences: Explanatory variables - Continued

    (4)   Length of residence and familiarity ..... Appleyard
                                                                   Moore
                                                                  Francescato and Mebane
                                                                  Beck and Wood
                                                                   Devlin
                                                                   Zannaras

    (5)   Travel mode and
          dimension .... Lee
                                                                              Appleyard
                                                                           Zannaras
                                                                          Strauss

    (6)   Effects of role and lifestyle
          in the city .... Francescato
                                                                               and Mebane
                                                                           Gans
                                                                         Canter
                                                                          Barker
                                                                          Strauss

    (7)   Ethnic and cultural groups values,
          lifestyles and environmental meaning .... Rapoport
                                                                               Gans
                                                                          Fried and Gleicher
                                                                         Rainwater
                                                                          Duncan
                                                                          Cooper
                                                                         Moore
                                                                         Duncan and Duncan

    (8)   Race and culture (Porteous) .... Lynch
                                                                               Lowenthal
                                                                               Tuan
                                                                               Hall

    (9)   Value systems (Porteous) .... Firey

Also of note is the importance of the environment itself as a variable--both social and physical. In terms of the physical environment and environmental cognition, Lynch[15] suggests cities are imageable at least in terms of their paths, edges, nodes, landmarks and districts. Appleyard [16] identified three major characteristics by which landmarks or buildings are known:

1. _use significance_ - what you do there (high positive loading on use intensity and use singularity and high negative loading on symbolism and newness)

2. _visibility_ - where it is (high positive loading on commanding location especially at decision points and immediacy to the cone of vision)

3. _physical form_ - (least important) what it looks like (high positive loading on movement of people, isolation from surroundings, size, overall uniqueness or shape; high negative on surface textures, simplicity versus complexity, brightness).

Carr and Schlissler[17] studied perception and memory of car trips and found that time in view, ease of labelling, and object dominance determined which features would be remembered. Lowenthal and Riel,[18] in a study of English hilltop towns, discovered that the structure of what is to be seen is important to what is seen. Hassan[19] determined that the visual exposure of image elements predicts how dominant those elements will be in the public image. Similarly, Appleyard[20] found errors in the products of cognitive sketch mapping when there was an unclear functional use of an area, low visibility, and ambiguous form, in descending order of importance. It is generally accepted that the public or group image is more useful for planning and physical environment than individual ones. These studies have given some direction to planners and designers of those environments in terms of important environmental variables and cognition.

Before leaving the topic of cognitive mapping and variables important to the development of environmental knowing, a brief discussion of the development of spatial cognition is necessary. From examples of studies in _Image and Environment_ by Downs and Stea[21] and from work mentioned in this review, it is clear that "adults form cognitive maps, and images of spatially extensive environments, orient themselves in a

variety of such environments, execute judgmental preferences, and form
impressions concerning distances, boundedness, and other metric charac-
teristics of spatial environments."[22]   This thesis accepts the theory
that children, especially those in the early adolescent years of eleven
to fifteen, have the same ability. Evidence to support this view can be
found in research by Blaut et al.,[23] who suggest very young children,
from six years of age, can exercise three fundamental cognitive mapping
abilities: (1) reduction in scale, (2) rotation of perspective from the
familiar horizontal reviewing position to that of an unfamiliar overhead
or plan perspective, and (3) abstraction from the three-dimensional
color environment to a two-dimensional monochromatic black and white
photograph. Other studies, Stea and Blaut,[24] Piaget et al.,[25] Hart
and Moore,[26] Moore and Golledge,[27] Acredolo,[28] Cannitello[29] and Mark
and Silverman[30] all confirm in one way or another that children, by the
age of twelve,can perform cognitive mapping and do exhibit enviromental
learning abilities.

Development of the Recognition of Places

This thesis, firstly, has attempted to support the theory that
differing experiences and the roles a person plays relative to his environ-
ment are dependent upon the individual's developmental period and stage in
the life cycle. In other words, development from the egocentric perspec-
tive of the baby to the adult viewpoint of the world, in an abstract sense,
can be thought of as another aspect of role differentiation in which exper-
iences from childhood to maturity and old age are inherently different. Not
only are the adult's experiences different, but so are the possibilities
for experiences different. Only with maturity do the maximum options for

experiences become available. As experiences widen the adult's perspective, so too do they influence his response to and conception of his environment.

A second major theoretical foundation on which this thesis is based is one which suggests that individuals can and do form "images" or "personal constructs" in which they organize knowledge of their environment and that these cognitive representations of geographic space are linked to overt behaviour. Tying these two theoretical concepts together, Perin's work suggests that there is a difference between being in an environment and doing things in it. Clearly, the opportunities for action are dependent upon physical access to varying environments and the roles one plays vis-a-vis the environment. Behaviour, physical and social, is linked to developmental age and stage, as are environmental conception and response.

It has been stated that research done with young children indicates that they can recognize places as coherent wholes, give evidence of environmental learning, and have the ability to represent these in cognitive mapping experiments. As the type and range of places the child knows about and uses grows, it is expected that the conceptual systems which are formed change. It would appear then that the environmental needs of individuals at varying times change in relation to their conceptualization of their environment. One could hypothesize that the environmental needs of a child, an adolescent, and an adult are different just as the conceptualization of their environments are different.

Neighbourhood Theory

As an individual develops, the locus of his daily activities increasingly shifts from home, to home base, to neighbourhood, and to the

broader realm of city and country. Home, of whatever physical form, is
where personalization and defence occur. "Home base" is "a territorial
unit which provides territorial satisfactions, security, identity, and
stimulation."[1]   "Neighbourhood," by simple definition, refers to "home
base at a collective level ... an area with which one closely identifies
or feels at home."[2]   The classical definition of neighbourhood according
to planners is one of "a small, recognizable subunit of the city existing
at a scale between the individual house and the city as a whole ... a
physically well-defined entity, with a selection of low order emenities
sufficient to satisfy the bulk of the inhabitants whose mutual inter-
relationships ensure a modicum of social control and community feeling."[3]
Implicit in this definition is the ecological approach of recognizing
neighbourhoods as social entities, and the planning approach of empha-
sizing the neighbourhood "as a physical construct useful in the layout of
residential areas."[4]

It is now generally accepted that neighbourhood is something
more than a geographically defined area with physical boundaries, social
networks, concentrated use of facilities, and special emotional and
symbolic connotations for the inhabitants, but consensus on recognition
and definition of the term has been impossible. What appears to be an
essential element in the constitution of neighbourhood is whether or not
the residents perceive an area as a neighbourhood unit and whether or
not they perceive themselves to be part of the unit.

Golledge and Zannaras[5]   hypothesized that a combination of
social and physical spaces constitute a perceived neighbourhood. They
suggested some characteristics which appeared to influence neighbourhood
perception:

1. close identification of an area by an individual,

2. identification with others of similar social and economic characteristics,

3. choice of location frequently determined by these "compatibles",

4. boundaries perceived are sometimes unclear usually consisting of a transition zone, partially claimed and partially repudiated,

5. identification with the area could be a function of level of aspiration rather than a function of actual belonging, and

6. the neighbourhood consists of two parts: the social neighbourhood where the individual lives, interacts, and involves himself with friends and community activities; and the physical neighbourhood, capable of being delimited on a map and distinguished from other areas.

The linkage of the physical and social neighbourhoods is of particular importance in defining perceived neighbourhoods. Among other researchers, Lee[6] claimed the two were inextricably linked and perhaps impossible to separate; Keller[7] felt they were indistinguishable. Golledge and Zannaras concluded as a result of their work:

> Both physical and social neighbourhoods do exist in the minds of respondents and can be identified as such; and despite the fact that the physical and social neighbourhoods can be distinctively identified, the degree of overlap is sufficient to warrant the statement made by other researchers, that the two are very closely linked in the mind of the urban dweller.[8]

Importance of Neighbourhood to Adolescents

Margaret Mead, in a short essay on "Neighbourhoods and Human Needs,"[1] indicates that "the neighbourhood is the place where children are brought up to become members of their own society ... and to learn to meet basic human needs and to move toward the use of higher human capacities."[2] The adolescent years are the critical ones in which learning takes place and competence develops with environmental experiences outside the home and in the neighbourhood.

The neighbourhood provides the setting for the adolescent to carry out the various behaviours and roles necessary to move toward adulthood. Many of the behaviours associated with the goals of the adolescent period discussed earlier take place in or around the school, at a recreation center or rink, on the street or playing field. The physical and social environment in which the adolescent meets with peers and adults, engages in social participation, develops group loyalties strengthens individual achievement and learns responsibility is provided at the neighbourhood level.

Reviewing the goals of the adolescent period in each of the categories mentioned earlier, the attempt to move from childhood to maturity requires behavioural experiences outside the home, specifically in the neighbourhood. To attain general emotional maturity, the adolescent learns emotional control and more objective interpretations of situations by contacts outside the family. He develops heterosexual interests by including members of the opposite sex in his peer group. General social maturity occurs as the adolescent learns to break away form constant peer pressure, gain more secure acceptance of selected peers, and learns social tolerance. By increasingly becoming emancipated form home control, he learns to rely on himself for security and also develops self-control. Intellectual maturity causes the adolescent to move from a wide range of temporary interests to a few selected stable interests. Although the adolescent is not yet actively selecting an occupation, he may be focusing his attention in such a way as to more accurately estimate his activities in selected areas of interest. This coincides with his use of leisure time for fewer activites, but ones which require more intellectual skill or team cooperation. Perhaps most

importantly, the period of adolescence is one in which the child learns to develop his own philosophy of life especially with respect to values clarification. As has been stated previously, values are formed through association with parents at an early age, but in this period, the adolescent has more opportunity in the community of being exposed to the values of other adults and peers. By learning to set realistic goals, developing self-control, and internalizing certain values, the adolescent moves toward a sense of social competence. This sense of competence is linked with an identification of self and self-image.

Summary

This thesis has looked at the adolescent at the critical cross-road in the developmental journey from childhood to maturity, and has attempted to outline the importance of the physical and social environment in making the transition from one stage to the next. It is in the home, but especially in the community, that the adolescent tries out new behaviours, gains varied experiences, develops environmentally appropriate or inappropriate responses, and forms conceptions of those environments. The physical and social response of the community or neighbourhood to the experiences and demands of the adolescent is important to vault this developmental hurdle from childhood to maturity.

This thesis will now attempt to examine the interaction between the adolescent and his neighbourhood to determine if, in fact, the neighbourhood does contribute to his normal development in some, or any, of the ways previously discussed. It will explore this interaction by attempting to determine the perception the adolescent has of his neighbourhood and the activities that he carries out there.

CHAPTER II

THE INTERACTIVE MODEL

Development of the Model

From research previously cited, it would appear that an individual's perception of his neighbourhood and the activities which he carries out there are closely linked. In order to examine the perceptions and uses of a specific neighbourhood by a group of early adolescents it was necessary to develop a model to investigate the interaction between these two variables.

Use or activities carried out in certain areas have been researched using a variety of techniques from exhaustive following and recording the behaviour of subjects to questionnaires on time budgets. Perception of areas has been examined using an even broader array of techniques from large scale model manipulation to map drawings of route recollections. With the exception of Ladd,[1] little work has been done examining the link between use and perception.

This study attempts to explore the interaction between use and perception of a neighbourhood by creating and applying a research model which combines two techniques capable of being analysed separately and then in association. Firstly, a questionnaire was developed which focused questions on activities, the place or location of those activities, the frequency with which those activities were carried out, and other persons with whom the activities were carried out. Secondly, a self-initiated

cognitive mapping technique was used to generate a drawing of the recalled neighbourhood. The questionnaire was analysed using a content analysis technique. The map drawing was analysed by recording the physical features spontaneously drawn. The questionnaire responses of activities and locations were then associated with the drawn responses of places and features to examine the relationship between the use of the neighbourhood, as indicated by activities and places mentioned, and the perception of that neighbourhood, as indicated by the cognitive map drawn.

In developing this model a number of studies were analysed in detail to support the use of specific techniques and methods to generate desired responses. These studies by Chapin and Brail,[2] Lynch,[3] Appleyard,[4] Ladd,[5] and Pocock,[6] will be discussed to indicate the similarities and differences between them and this study and to recognize their contribution to this work.

Chapin and Brail

In reviewing research in activities people carry out in their daily lives, the work of Chapin and Brail was examined for its contribution of the conceptual distinction of three aspects of human behaviour: (1) level of interaction, or with whom activities are carried out, (2) location, or activities occuring in-home and out-of-home, and (3) obligatory/discretionary activities, or activities which one is compelled to do or does at one's discretion.

The Chapin and Brail study sampled 1,476 persons in 43 United States metropolitan centers. Respondents were asked to detail time and space budgets for a single weekday. Although the results of the amount

.of discretionary time available in a typical adult's 24-hour day were
interesting, the most useful findings were that sex, stage in the life
cycle (age, family responsibilities, household size), and status (income,
education) were the most useful activity predictors.

The distinction of level of interaction, location, and obligatory/
discretionary activities were incorporated into one method of retaining
and analysing the responses for this particular thesis. The time and
space budget diary technique was used in early pretests, but dropped in
the final method. The results of sex and age differences were thought
to be of particular importance to this study and as a result were used
as major independent variables.

Kevin Lynch

Kevin Lynch made the first major contribution to the study of
cognitive mapping with his study "Image of the City". His work attempted
to find methodologies for conceptualization of urban images and for
describing them. His concern was for the application of a methodology
which would allow planners to use imagery findings in the process of
urban planning and design.

Lynch suggested that the image one has of the city could be
analysed into three components: identity, or the individuality of an
object; structure, or the relationship of the object to other objects or
the observer; and meaning, or full comprehension of the object.

Lynch sampled a total of 60 professional and managerial class
adults; 30 in Boston, 15 in Jersey City and 15 in Los Angeles. He used
a series of methods for eliciting images from these respondents. He
asked them to draw a quick map of central Boston "just as if you were

making a rapid description of the city to a stranger, covering all the
main features".[7] Critics of this method argue the word "stranger"
suggest emphasis may be placed on elements being chosen for inclusion
which may not be representative of the respondent's personal image.
Lynch also asked his subjects to list elements of the city thought to be
distinctive and to locate, describe, and express emotional feelings of
particular urban features. He also had them provide detailed descriptions
of trips through the city.

Lynch used a form of content analysis to pull out repetitive
elements found in the maps and the lists. He then classified these into
five types: paths, edges, districts, nodes, and landmarks. He found
that none of these were isolated entities, but instead overlapped one
another. Lynch's typology, with variation, is used today.

Lynch also noted two major conclusions: firstly, that there
were significant differences in the elicited maps of respondents compared
to those of trained professionals, and secondly, that the sketch-a-map
technique was useful for eliciting responses difficult to obtain by
other means. In addition, he discovered five major ways or processes by
which the maps were drawn. Of particular interest is his observation of
maps drawn by a path or route orientation as opposed to those of space
or area orientation.

Some of the techniques and observations of Lynch formed a central
part of the methodology for this thesis. The use of the sketch-a-map
device to elicit a response associated with perception of the neighbour-
hood was used in pretests and retained in the final method. Instructions
to initiate the map were similar with some word modifications and the

replacement of the word "stranger" by "new friend." Listing of elements and other methods used by Lynch were replaced by a questionnaire on activities and places with both closed and open-ended questions. The classification of the five types of elements proved useful in analysing the content of the maps, although additional categories were developed. The processes by which the maps were drawn were not observed as Lynch has done, but the differences of path or route styles versus space patterns were noted using a combination of Appleyard and Ladd categories.

Appleyard

Appleyard, in an attempt to assess the environmental perceptions of the inhabitants of Ciudad Guayana in Venezula, developed a study with a total sample of 320 subjects representing four different types of district environments. He wanted to "test the effectiveness of different environments and measure the role of various environmental factors - physical, social, and functional - in the inhabitants' urban perception, and to learn if there were significant group differences in environmental attitudes and knowledge".[8]

Appleyard used a variety of methods including interviews, map drawing tasks, recollections of well-remembered features, descriptions of a journey through the city, and opinions of current needs and preferences, as well as recent and predicted changes. The respondents were also asked to describe their ideal and worst city, to compare their city with others, and to rate their satisfaction with Cuidad Guayana.

Similar to the findings of Lynch, Appleyard found marked differences in the knowledge and perceptions of planners and designers

and those of the inhabitants. In attempting to discover the recalled
knowledge of these inhabitants, Appleyard developed the three main
attributes of (a) form, (b) visibility, (c) significance, to calculate
the conspicuousness of landmark buildings. Various differences occurred
between respondents, however,Appleyard concludes,"the critical variables
in designing a city should relate to the actions and movements of the
inhabitants, to the visible form of the environment, and to the patterns
that are significant to the various population groups".[9]

The method of structuring the maps came under scrutiny by Apple-
yard. He developed a range of styles from topological to positional in
two parallel frameworks based on either a sequential method of roads and
river barriers, or spatial method of buildings and districts. Examples
of these structural types are found in Figure 5.

As a result of his study, Appleyard concluded that urban percep-
tion was more than imageability of distinctive environmental features.
He found:

> Perception is guided also by a person's needs, purposes
> and actions, by his past experience, general and particular,
> and by his conceptual abilities to process information.
> Finally environmental information is mediated either
> directly through a person's modes of travel - a car and
> a bus mediate different information - or directly through
> the mass media, drawing attention to events and places
> that might otherwise pass unnoticed. [10]

Appleyard's classifications of structuring styles of cognitive maps
were used in the analysis of the cognitive maps produced for this thesis.
As Appleyard found considerable differences in the styles and content of
maps depending on socioeconomic status, experience or familiarity with
the city, and sex differences, as well as mode of travel, it was felt

MAP TYPES AND STYLES ADAPTED
FROM APPLEYARD'S TYPOLOGY
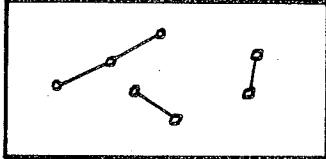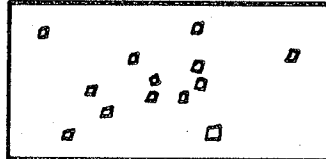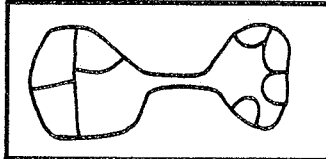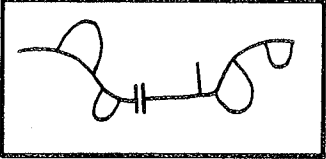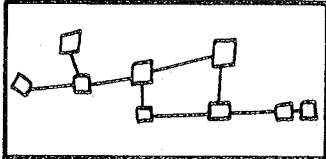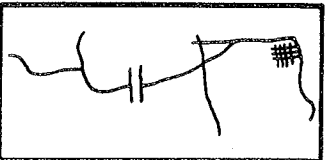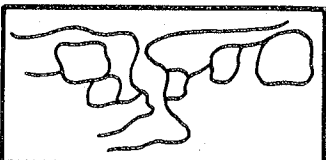
Fig. 5

that sex, age or developmental level, and length of residence may similarly produce differences in the maps produced by the early adolescents in this study. Because mode of travel on a routine basis is uniform for this age group - walking or bicycling, it was anticipated that local neighbourhood perceptions would not be as effected by transportation methods as was evidenced by Appleyard's work, however, questions on mode of travel for activities were included in the questionnaire.

Ladd

Florence Ladd is one of the few researchers to examine a non-adult North American population, specifically, of urban adolescents. Her work attempted to:

1. to develop an understanding of areas subjectively defined as neighbourhoods,

2. to discover the socially and psychologically significant aspects of the "contents" of their neighbourhoods as reflected in their maps, and

3. to explore the potential informational value of map drawing to social scientists and planners who need varieties of data on the significance of urban living to persons of different age, ethnic, and socioeconomic groups[11]

Ladd's study consisted of 60 adolescent black boys ranging in age from 12 to 17 years. After completing an interview schedule called "Neighbourhood, House and Travel", tape recorded interviews were conducted. The boys were first asked to describe their neighbourhood and then asked to draw a map of the neighbourhood with a black felt-tipped pen on a sheet of white illustration board (14" x 22"). Corrections were allowed and additional sheets were provided where necessary. After completing the drawing, the subjects were asked

questions on their awareness of certain areas and their housing and
travel patterns.

Of particular interest was Ladd's development of descriptive
categories of maps which "took into account form and content elements as
criteria in the drawings".[12] Four categories were selected:

1. pictorial drawings, eg.,house,

2. schematic drawings, eg.,unconnected lines or areas,

3. map-like drawings, eg.,capable of being used for orientation, and

4. map-like drawings with identifiable landmarks.

In addition to the above categories of map, Ladd also assessed:

1. estimate of area represented,

2. number of streets,

3. number of landmarks,

4. map organization,

5. identification of position of subject's residence, and

6. accuracy of maps.

All maps were assessed in relation to subjects' age, grade level, and length
of residence in neighbourhood.

The results of Ladd's work are simple and somewhat inconclusive.
A wide variety of maps were drawn by the respondents reflecting not only
physical differences in the neighbourhoods, but also individual
differences between the youths. Despite a wide range of street and
residence patterns, no social or psychological significance could be
drawn. As well, there appeared to be no particular elements in the
drawing relating to race. Ladd suggests that dominant culture, and
standard methods of teaching geography may cause early formation of
image-making coventions.

Ladd's work has led her to suggest a number of areas for future study. In terms of technique, she believes more than one descriptive mode may elicit fuller responses and that analysing map information prior to verbal description of neighbourhoods may reduce biased interpretations on the part of the researchers. In order to understand the social and psychological significance of places, she suggests interviewing the subjects on the maps they have drawn or employing a more complex map procedure than she used. She questions the influence of age or developmental level with regard to the cognitive mapping technique and urges studies of several age groups for more information. She states, "Not only do we need more information about the ways in which children and adolescents perceive, organize, and represent urban areas, we should begin to examine the process of the development of psychological and social associations with neighbourhoods and other places. The nature and stages of the 'environmental learning' process and factors which influence the process should be studied".[13]

This thesis adopted a number of techniques and suggestions from Ladd's study, particularly those associated with the mapping exercise. Her four categories of maps were used for analysis in combination with the eight structuring styles of Appleyard. Additional recording of map details such as number of streets, were also used as an indication of level of complexity of maps drawn for this study. Ladd's suggestion of combining the mapping technique with another descriptive mode was an important element in this study, however, a written questionnaire was used as opposed to verbal interviews. Her concern for more information on the role played by developmental level in experience and perception is at the crux of this thesis.

Pocock

D.C.D. Pocock, in an empirical study on characteristics of
mental maps, combined both questionnaire and free-recall sketch mapping
techniques on three sample populations in Durham, England. His near-
identical questionnaires were given to 94 "insiders" or residents, 59
visitors, and 59 tourists to the area, asking socioeconomic questions
and other information such as familiarity with the area.

Pocock termed his cognitive mapping technique "invitation to
map." He placed a high degree of importance on the instructional set
which he felt determined to a great extent the attributes which are
elicited or emphasized by respondents. Firstly, he chose to do the
mapping exercise after the questionnaire. Next, he stressed that he was
interested in physical attributes which were mappable. His emphasis was
on composition and arrangement, not content. Throughout, Pocock
attempted to minimize the intrusion of the researcher.

Pocock analysed the map drawings in a number of ways. He chose
Appleyard's structuring styles over those of Ladd, even though he
questioned the universality of Appleyard's scheme. He felt the physical
complexity and the areal extent of the particular environment being
mapped would influence the product. He pointed out the physical
attribute of a dominant city center with radial routes, as was found in
Durham, would produce different styles of maps than those produced in the
Cuidad Guayana study which did not have a dominant center. In addition
to map classification, Pocock emphasized a discussion of "good figure"
or sophisticated styling with good drawing tendencies. He looked at map
orientation and such features as entry points of major arteries.

In general, the results of Pocock's research indicated that there

was an overall tendency to use sequential maps. Age did not appear to be related to style of map drawn.

The variable of sex did produce a difference in the degree of sophistication of maps drawn, with males exhibiting a higher proportion of sophisticated and "good figure" drawings. Pocock concluded that perhaps map-drawing ability may be considered an unfeminine ability. The effect of class distinction and education was seen with an increase in sophistication in the middle and upper class and with increased education. Orientation tended in the direction of city center or primary path leading away from home. Conventional or north orientation of drawings correlated with increased age, length of time in area, and frequency of visits. This familiarity variable was supported by the importance of the three entry points to the area, the number of activities done there, and the extent of the map portrayed. Overall, Pocock concluded "arrangement of elicited maps reflects a strong experiential bias ultimately linked to the 'view from the road'".[14]

Pocock's study provided useful techniques for this thesis, in particular, the detail of his "invitation to map" technique helped influence decisions in the mapping exercise. In contrast to Pocock's, this study chose to emphasize content over graphic skills particularly because of the age differences in the two groups of respondents. Other features such as orientation and entry points were included in this study's analysis. Perhaps most importantly, Pocock's strong conclusion of the effect of familiarity and usage of a community served to reinforce this study's attempt to highlight the interaction between use and environmental perception.

Summary

The various studies discussed provided many insights and suggestions which were used in the development of the interactive model for this thesis. The three aspects of human behaviour conceptualized by Chapin and Brail, along with the findings on activity predictors, gave a method of breaking down the nature of the activities of the adolescents being surveyed in this thesis. It also suggested that differences in those activities may vary according to age and sex of the respondents. The work of Kevin Lynch gave both a method of collecting and of categorizing information elicited from cognitive map drawing techniques. Appleyard's structuring styles of maps added to the categorization methods of Lynch. Although Ladd also gave map classifications, perhaps her most useful suggestions were that more than one descriptive mode may elicit fuller responses from subjects and that developmental level may play an important role in environmental learning. Pocock's study gave various techniques for use in this thesis, but more importantly, his work had already critically examined that of Appleyard and Ladd and, therefore, helped give direction in choosing one type or aspect of methodology over another.

Numerous studies were examined in the review of literature for this thesis. Those which have just been summarized gave the most insight and direction in the exploring the problem posed in this thesis. They helped to clarify the question of how best to attempt to elicit the adolescent's perception of his neighbourhood, and to record and quantify the activities which he carries out there. The collection of this information is essential to explore the interaction of the adolescent and his neighbourhood environment, and to acquire data upon which to base

some assumptions into the relationship between this stage in the life cycle and a congruent environmental response.

Statement of Problem

Throughout this thesis reference has been made to the interaction of an individual with his environment. The concept of an individual not only being in an environment, but also doing activities in it, has been stressed. The focus of this study is specifically on the young adolescent in a suburban neighbourhood and his relationship to that environment.

As this thesis was an exploratory study of the interaction between adolescents and their neighbourhood environment, the purposes of the investigation was not to test hypotheses, but instead, to examine the following questions:

1. How does the adolescent use his neighbourhood?
2. What is the early adolescent's perception of his neighbourhood?

Use of the environment can be measured by determining (1) where the adolescent carries out certain behaviours or activities, (2) when, or at what stage he uses some places and not others, and (3) how and for what reasons he uses some places. By determining the answers to these questions, it may be possible to judge to what extent the neighbourhood environment coincides with the timing and development of predictable adolescent needs and drives.

From a planning point of view, results from such a study would not only indicate what is provided for this age group, but also, what could and should be provided, and what adaptations and re-organization of behavioural patterns occur as a result of any missing neighbourhood resources.

Perception of the neighbourhood environment is tied into use. As an individual goes through various stages of development, his transactions with the environment changes. Ladd is just one writer who suggests this. How an individual organizes and selects his exchanges with the environment outside of the home is important to this study because this thesis suggests that use influenes perception, and perception affects use.

CHAPTER III

METHOD

Major Independent and Dependent Variables
and Testing Techniques

For this study the major independent variables were age, grade,

and sex of the subjects in the early adolescent age range of approximately

eleven to fifteen years. Age and grade level were taken to be an indica-

tion of normal developmental level and it was anticipated that increased

developmental level would bring a concomitant increase in use and change

in perception of the neighbourhood. Sex was selected as a major variable

as a result of previous research by Pocock[1] and others discussed earlier

who found sex-related differences in their studies. It was anticipated

that kinds of activities carried out by boys and girls would be different

and, therefore, the use and perception of the neighbourhood would be

different according to sex. Socioeconomic status would have been a

major independent variable based on research discussed earlier, however,

clear and reliable information could not be obtained as a result of

concern on the part of school officials for respondent privacy.

The major dependent variables were perception of the neighbour-

hood environment and use of that environment by early adolescents.

Aspects of perception were measured using a self-initiated

cognitive mapping technique. It was expected that the cognitive map

produced by each subject would elicit information of the individual's

perception of the content and structure of his neighbourhood. The

specific aspects that might be derived from this technique included:

1. Breadth or size of the perceived neighbourhood as measured
    by the area represented in the map drawn,

2. Nature and amount of detail perceived as indicated by the
    number of natural and man-made elements drawn,

3. Accuracy of perception when compared to an actual cartographic
    map of the area, and

4. Organization of spaces and/or routes as indicated by the style
    of map produced.

The adolescent's use of the neighbourhood environment was measured by a questionnaire asking closed and open-ended questions. Some of the questions asked were derived from Chapin and Brail classification of three aspects of human behaviour.[2] Closed questions were used where a response could be measured on a scale or quantified easily. Open-ended questions were used to probe for fuller information or elicit spontaneous descriptive information. Questions dealt with the following:

1. Type of use - activities carried out in given places, places
    chosen for certain activities, preferred and disliked activities
    associated with certain places,

2. Frequency of use - intensity with which certain activities were
    carried out in given places,

3. Reason for use - why certain activities are carried out in given
    places, and

4. Level of interaction - with whom activities are carried out in given
    places.

The questionnaire also obtained demographic information on city and country of birth, dwelling type, availability of transportation, along with family life style information.

Based on previous research cited, it was anticipated that a combination technique for obtaining information from the respondents would prove useful. Ladd cited Lynch saying, "There is evidence (Lynch

which suggests that the content of an individual's graphic and verbal descriptions of the same area differ. No doubt, each descriptive mode supplements the other".[3] Spencer, in his synopsis of his work "An Evaluation of Cognitive Mapping in Neighbourhood Perception", was even more explicit saying, "Unless supplemented by other techniques, cognitive mapping does not appear a viable method for planners to focus upon images of the urban environment held by all sections of the public".[4] Therefore, it was anticipated that the mapping technique would elicit information on perception of the given neighbourhood which could not be elicited through the use of a questionnaire. Conversely, the questionnaire was expected to provide information on specific places which would not be evident from the cognitive map. Associations of the information derived from both the map and questionnaire were expected to give a more detailed data base than could be obtained using one technique only. This combination of techniques is an important feature of this thesis.

An additional component added to the study was that of a second map administered after completion of the questionnaire. It was anticipated that this map would provide further information to the first map after the subject had focused his attention on responses relating to the everyday use of the neighbourhood. Associations between the features produced in both maps were expected to elicit elements not recalled in the first mapping technique.

The Suburban Community

Description of the Community

Waverley Heights is a suburban community in the southern section

of Winnipeg, Manitoba. The community was built in stages from approximately 1974 to 1980 by three different development companies. It is bound by the major arteries of Pembina Highway on the East, Waverley Street on the West, an extention of Waverley Street known as Bison Drive on the South, and by the Manitoba Power Corridor on the north (as shown in Figure 6).

The community contains single family homes catering to moderate to high income families, a mix of duplex and low-rise family units, some three to five-story apartment units bordering on the major artery of Pembina Highway, some of which accommodate lower income families.

The most predominant feature of the community from a planning and marketing point of view is the provision of four man-made water retention lakes around which the roads and homes are placed. Although the land bordering each lake is public property, many of the lakeside homeowners have fenced their property to the water's edge. Pedestrian corridors, a bridge, and an underground tunnel are provided at points where access from one part of the community to another is cut off by one of the lakes.

The road system, other than the three main arteries on the perimeter of the development, reflect the placement of the lakes with one collector street, Chancellor, having a feeder bus service looping around the outer edge of the area. The other main street, Markham, bisects the loop. These two streets provide the four exit and entrances for the community's bus and car transportation systems. Chancellor also becomes a secondary street in three locations. The tertiary streets follow the lake configurations for the most part and often contain cul-de-sacs or "places". Sidewalks are confined to Chancellor Drive.

MAP OF WAVERLEY HEIGHTS NEIGHBOURHOOD
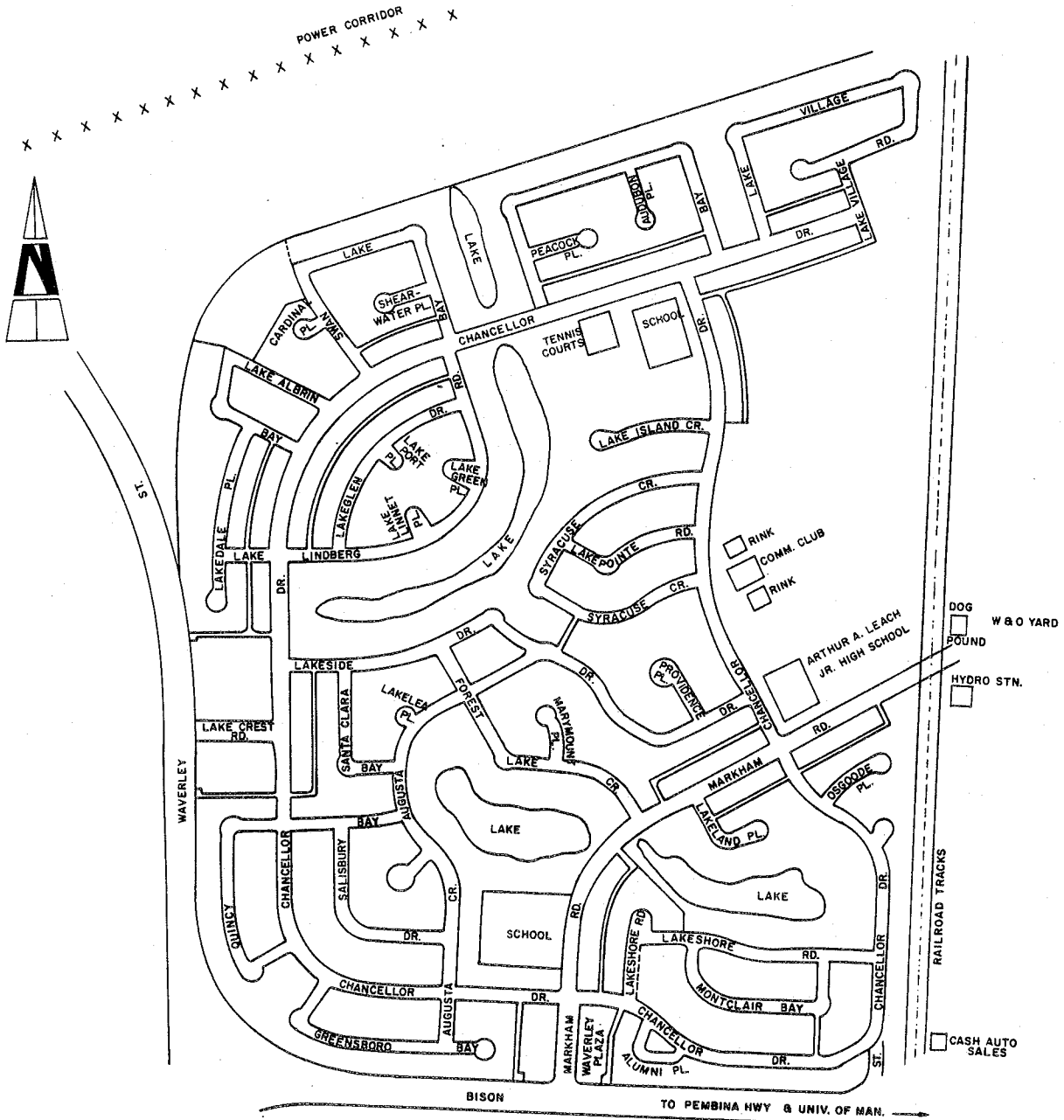
Map #1

Fig. 6.

There are three secondary schools in Waverley Heights with
Arthur A. Leach School being the only Junior High School. High School
students attend schools outside of the community in areas both north and
south along Pembina Highway.

Commercial development occurs on a linear path along Pembina
Highway giving a wide assortment of stores, hotels, banks, shopping
centers, fast food outlets, and other businesses. A small plaza is
located on the south edge of the community where Markham meets Bison
Drive.

The community contains few recreational places other than the
community club and skating rink, and a tennis court. A large roller
skating rink is located outside the community a few kilometers away to
the north. Areas around the lakes are partially landscaped with a tot
lot at the edge of President's Lake.

Contained in the community are some features which may be described
as landmarks - a Hydro station, a dogpound, a City of Winnipeg Works and
Operations yard, as well as an auto salvage establishment. Three major
landmarks are nearby, but not within the boundaries of the area: Victoria
Hospital, the University of Manitoba, and a sugar beet manufacturing
plant.

Boundaries, other than roads, occur on the east with the railway
track which parallels Pembina Highway, on the north with the power
corridor, and on the south and west with prairie fields.

Reason for Choice of the Community

Waverley Heights was chosen as the focus of this study for a
number of reasons. Firstly, the area itself was such that the investi-
gator could distinguish the neighbourhood limits by a clearly defined

set of boundaries. Secondly, the socioeconomic background of the residents gave a broad range of family lifestlye and income levels as judged by the dwelling types available. The community contained a heterogeneous mix of people with clusters of homogeneous sub-groups. Thirdly, the community contained only one Junior High School accommo- dating all of the normal early adolescent aged children from the area. With the generous support of the Fort Garry School Division and the Arthur A. Leach staff, it was possible to draw the research sample from the total population of this age group. This total population was expected to give a broader comparison of responses on the neighbourhood use and perception than work done by Ladd, for example, who focused only on low income black adolescents. Using the school as the center for testing eliminated potential bias which could have occurred by using another location such as the community club where only those adolescents interested in club activities would congregate. As well, the cooperation of the school staff allowed testing of a large number of adolescents in comparatively short time. Lastly, the community was chosen because it was relatively new at the time of the study; approximately four years old. Thus, the length of residents of the adolescents being tested was fairly similar. Few subjects had any differing long-range familiarity with the area.

It is important to note that this thesis looked at only the one suburban develoment of Waverley Heights and did not attempt to compare one neighbourhood with another. By purposely limiting the study to one area, it was felt that the development of the interactive model would remain the priority, and the exploratory nature of the thesis could be better controlled.

Subjects

A potential total of 271 students enrolled at Arthur A. Leach

Junior High School in grades seven, eight, and nine, were sampled in

their home room classes. With the exception of those students away due

to illness or other reasons, all the students present voluntarily

participated in the study and handed in the research materials. One

student was excused for a medical appointment and did not finish the

questionnaire.

A final total of 131 respondents were obtained from the original

population on the basis of the following three criteria:

1. The student finished the first map, all of the questionnaire
   including the last page, except where choosing to supply a "no
   response", and some attempt was made at the second map.

2. The student lived in the area of Waverley Heights defined by Pembina
   Highway, Waverley Street/Bison Drive, and the power corridor, as
   judged by the area drawn in the first map. (A small number of students
   attend the school but reside outside the area defined as Waverley
   Heights.)

3. The student lived in the community of Waverley Heights for at least
   six months according to his response to questions on length of
   residence in the area.

All of the 131 students who conformed to the above three criteria

were accepted to form the sample based on school grade, being the summary

variable. As grade level represents both formal and informal contribu-

tions of the education system, it was assumed that a child at the grade

level considered by the school system normal for his age, was an average

child in terms of maturation and experience.

Of the 131 subjects, there were 44 grade seven students, 54

grade eight students, and 33 grade nine students who met the sample

criteria. There were 69 boys and 62 girls who ranged in age from 11 to

16 (mean age: 13.1 years).

The subjects represented all of the 13 home room classes in grades seven to nine. Table 7 indicates the number of sample students obtained from each home room according to grades (Note: The school randomly allocates students to classrooms and does not base allocation of level of educational achievement.) As can be seen in Table 8, there is considerable variation in the number of valid cases derived from each home room, however, the total numbers per grade are relatively comparable. It is assumed that the low incidence of cases obtained from home rooms with teacher #3 and #12 was a result of any or a combination of: the testing conditions, amount of supervision given by the teacher and/or general teacher effect, and the level of authority exercised by the testors, and was not due to any intellectual or developmental differences in the classroom of the subjects. Although four of the classrooms were "closed", the effect of the classroom situation itself was minimized by applying identical testing circumstances and the behaviours of testors were the same irrespective of physical layout.

Although questions regarding socioeconomic status of the students were not included in the questionnaire portion of the research instrument at the request of school officials, some additional descriptive responses were obtained regarding country of origin and city of birth, language spoken in the home, and family size. As can be seen in Table 8, the country of birth was primarily Canada (72.5%), followed by Great Britain (8.4%); and city of birth was Winnipeg (38.2%), followed by another city in Canada (25.9%). The predominant language spoken in the home was

Table 7

TOTAL NUMBER OF ADOLESCENTS BY GRADE AND CLASS AND
TOTAL NUMBER OF VALID CASES OBTAINED FROM EACH

Home Room Teachers	Number of Adolescents in Class	Number of Valid Cases Obtained
Grade 7		
one	27	18
two	22	12
three	19	2
four	14	6
five	14	6
TOTAL	96	TOTAL 44
Grade 8		
six	24	13
seven	24	16
eight	24	14
nine	23	11
TOTAL	95	TOTAL 54
Grade 9		
ten	22	10
eleven	20	8
twelve	18	4
thirteen	20	11
TOTAL	80	TOTAL 33
TOTAL	271	131

TABLE 8

DESCRIPTIVE DATA ON STUDENT SUBJECTS

	Frequency	%
A. Language spoken in home		
English	115	87.8
French	1	0.8
Ukranian	8	6.1
Iloxano, Philipine	1	0.8
No answer	6	4.6
	131	100.1
B. Country of birth		
Canada	95	72.5
U.S.A.	4	3.1
Carribean	2	1.5
Phillipines	1	0.8
Great Britain	11	8.4
Europe	5	3.8
Other	8	6.1
No answer	5	3.8
	131	100.0
C. City of birth		
Winnipeg	50	38.2
City in Manitoba	5	3.8
Town or Rural Area in Manitoba	5	3.8
City in Canada	34	25.9
City in U.S.A.	4	3.1
City outside Canada and U.S.A.	27	20.6
Personal, cross out	2	1.5
No answer	4	3.1
	131	100.0

Table 8 - Continued

	Frequency	%
D. Type of dwelling unit		
Single family dwelling	91	69.5
Duplex	18	13.7
Triplex or Row House	11	8.4
Apartment	9	6.9
No answer	2	1.5
	131	100.0
E. Vehicle ownership		
Yes	125	95.4
No	5	3.8
No answer	1	0.8
	131	100.0
F. Number of vehicles in family		
None	5	3.8
One	57	43.5
Two	55	41.9
Three	9	6.9
Four	4	3.1
Five	1	0.8
	131	100.0

English (87.8%). The number of people in the household other than the respondent indicate family size of three (36.6%) and four (22.9%), which would be charateristic of the Canadian norm.

Range of income, number of persons employed in the household, and other indicators of economic status were similarly deleted from the questionnaire, however, dwelling type and vehicle ownership could indicate a pattern characteristic of many relatively new suburban neighbourhoods in Canada. The type of dwelling unit was determined by stylized drawings of the forms known to exist in the neighbourhood and was checked off by the student; (69.5%) indicated the single-family drawing; (13.7%) indicated the duplex drawing. In response to the question of vehicle ownership, (95.4%) indicated that their family owned a vehicle, while (43.5%) and (41.9%) indicated ownership of one and two vehicles, respectively. The total responses of those indicating ownership of three or more vehicles may be due to some of the vehicles not being in service. Taken together, these responses suggest a typical Canadian suburban neighbourhood of predominantly single-family dwellings and one or two-car families.

Instruments

Three instruments were combined to form a package given to each student: (a) a blank sheet of 8 1/2 x 11" white paper and lead pencil with eraser for drawing a self-initiated recalled neighbourhood map, (b) a questionnaire containing open-ended and closed questions, and (c) a second blank sheet of paper for a second map. Face sheets of instructions were combined with each of the three instruments, stapled together, and the questionnaire itself was fastened with an adhesive label to prevent the student form reading the questions prior to drawing

the first map. No identification of names were placed on any of the instruments, however, each package was coded with a number throughout such that each instrument in the package could later be compared for associations.

Map #1. Decisions regarding the size and nature of the materials given to each student to be used for Map #1 were made on the basis of research cited previously and especially influenced by Ladd and Pocock. It was expected that a blank sheet of paper would most accurately produce the recalled perception of each subject's "neighbourhood" as was used by Pocock[5] in his "invitation to map" technique while minimizing the intrusion of the researcher. The size of 8 1/2 x 11' paper was an arbitrary decision to conform to the size of the questionnaire, but as this size is a common one used for regular school assignments, it was assumed that it would produce a uniform reduction in scale for all students. A lead pencil with eraser was chosen for the drawing tool to provide uniformity and students were encouraged not to use pens and rulers so as to produce a more spontaneous drawing.

Instructions for Map #1 were refined on the basis of two pretests. In both instances, the term "neighbourhood" or "community" generated drawings that the respondents later felt were indicators of their recalled neighbourhoods as they perceived them. (Note: Similarly, Ladd[6] had no trouble with the term "neighbourhood" in her study with adolescents.) As a result, this combination of terms was used in the final testing. The instruction for drawing of a map, "just as you would describe it to a new friend moving into your area", is a variation of the instructions given by Lynch[7] in his Boston study and avoids the term "stranger" which he used and for which he has been criticized by other researchers.

Unlike other studies by Michelson[8] and Lynch[9] the subjects were only

given a slight suggestion as to the content desired in the map, ". . .

places you go, your school, your home, etc. . . " and were not required

to locate any points of reference. It was expected that by leaving the

instructions vague the instructional set would be as free of bias as

possible.

Unlike Pocock's instructional set, the students were advised to

not concern themselves with their drawing skills and the assistants were

told to underline this point in order to encourage any form of map drawing

the student wished to produce.

Pretests indicated the time limit of ten minutes to be adequate

to perform the mapping task giving a reasonal amount of information,

while also producing a spontaneous result. Each map was collected as

soon as the subject finished or at the end of ten minutes such that

there was no opportunity to correct or change any details after having

seen the questionnaire.

Questionnaire. The questionnaire consisted completely of written

questions designed to elicit biographical information, data on independent

and dependent variables as shown in Appendix A.

The questionnaire was developed by the investigator drawing

liberally from the work of other researchers with special advice obtained

from Martha Friendly and Fred Hill[10] of "The Child in the City Program",

Toronto. Numerous revisions were made during two pretests for focus and

clarity of questions with specific regard to time, economy of wording,

and applicability of coding. Questions asked were both of an open-ended

and closed nature in the following broad categories:

1. Activities: Nature and frequency of everyday activities; preference
   and aspirations toward certain activities and places;

2. Locations: where activities were carried out and the reasons why
   those locations were used;

3. Interactions: others with whom the subject performed certain
   activities;

4. Specific activities and mode of transportation;

5. Demographic data and personal history;

6. Neighbourhood charateristics: likes, dislikes, fear of using certain
   places; and

7. Familiarity: length of time in neighbourhood and former residence.

      Instructions for the questionnaire indicated a time period of

twenty minutes for completion which had proven reasonable in pretests.

The questionnaire was collected as the subject finished or at the end of

the time period. The phrase "any and all answers will be helpful" was

included to encourage the subject to answer all questions and prevent him

from anticipating a desired response.

      Map #2. Materials given to produce Map #2 were identical with

those of Map #1. The time period of ten minutes to complete the task was

also the same.

      Printed instructions advised the subjects to draw another map

"now that you have had time to think about what you do, places you go,

and don't go". The instructional set was chosen to focus the subject's

attention on the activities which he had given responses about in the use

questionnaire. No indication was given to suggest the second map should

be like or dislike Map #1. Assistants were briefed to encourage subjects

to finish the second map as it was anticipated that there might be some

reluctance on the part of the subject to duplicate the task.

Pretests

The first of the informal pretests was carried out on six volunteer girls,ages 12 to 13, in a residential setting. This contributed to a major revision in content. At that time, the pretest subjects were being asked to draw a first map, complete a retrospective diary sheet based on previous day's activities adapted from Chapin,[11] fill in open-ended preference and biographical questions, and complete a second map. A decision based on the responses obtained and the time taken to carry out these procedures was made to drop the retrospective diary technique in favour of a more focused activity questionnaire. Additionally, numerous techniques were noted to speed handling of materials.

An additional pretest was carried out on eleven university girls enrolled in a Research Methods course during a fifty-minute class using revised format and content from the first pretest. Suggestions as to timing, clarity of working, and handling methods of materials were obtained. The suggestion to draw the type of subject's home was adopted in favour of written descriptions as a result of this pretest. A number of open-ended questions were re-phrased to focus on the one most common or desired characteristic asked about in the question to provide for ease of coding. A semantic differential scale describing neighbourhood characteristics was replaced by some open-ended questions on neighbourhood likes and dislikes. The Blishen Occupational Scale was not used due to time constraints and all questions associated with occupation or economic data were deleted after this pretest at the request of school officials.

Procedure

Administering the Instruments

The combined instruments were administered to all the students in grades seven, eight, and nine, at Aurthur A. Leach School on Thursday, March 15, 1979. The date was chosen in consultation with the school principal and vice-principal to provide the best conditions that were possible for serious attention by the students to the task -- after the week of the school science fair, before spring break, and before a change in weather and season. The time chosen for testing was from 3:05 to 3:50 p.m. when the schedule permitted all the classes to be tested simultaneously in a double class period and was one in which the students would not have to miss popular options. It was anticipated that the last class period before school ending would be interpreted by the students as a bonus by "getting out of" less popular classes and would promote a positive attitude for testing.

In preparation for the testing, the principal and vice-principal briefed the teachers on the nature of the study, their role as supervisors, and the conditions under which the study would be carried out. Additionally, a letter was sent to all the parents of the students, informing them of the forthcoming research, but not the content of the research, and making clear to them that participation in it was voluntary.

Thirteen volunteer graduate students and associates conducted the testing to the thirteen home room classes; nine classes in the open area of the school, four classes in the closed area. The assistants were briefed prior to the actual testing period on their role and function

with the classes, anticipated questions and suggested responses to the students and timing considerations. Appendix contains a list of printed instructions to the assistants used in the briefing session. Classroom teachers were previously instructed to remain in view of their class, but not to participate in the testing. Assistants were told to encourage students to finish their tasks, but were instructed to let any subject drop out of the testing if desired. With the exception of one student who left for a medical appointment, all the students finished their tasks to varying degrees.

Immediately following the end of the testing period, each assistant collected all materials used by the students with the exception of the pencils which were left with them. Care was taken to prevent any of the students from discarding any materials.

Coding of Maps and Questionnaires

Once the instruments had been collected, the three sets were re-assembled by matching the student code numbers. Instruction sheets were discarded, and each set was reviewed for inclusion using the criteria of length of residence, location, and completion of instruments.

For Map #1, where it was unclear if the drawing represented residence within the boundaries of Waverley Heights, residence question #38 of the questionnaire was used to support or deny inclusion in the study. Based on the known age of the community, a length of residence response of no less than six months and no more than four and one-half years was taken as an acceptable response.

Completion of the questionnaire was judged on responses to most questions on most pages.

Along with Map #1, answers on the last page of the questionnaire and some attempt at Map #2 were accepted as criteria for a completed set of instruments. This process produced sets of data from a total of 131 students.

Content Analysis of the Questionnaires

All of the questionnaires from the sample were analysed, taking each question and listing the range of responses received. Close-ended questions had been pre-determined to produce a limited range of responses, i.e., questions regarding frequency or activities allowed for response of (a) no response, (b) always or regularly, (c) sometimes, or (d) never.

Responses for open-ended questions were grouped into similar categories of answers. As each of these types of questions asked for ONE response, the first response listed irrespective of the number of other responses given, was coded. By grouping similar responses, i.e., listening to the radio, listening to the stereo, it was possible to reproduce master codes for each type of question. Out of questions concerning activities engaged in by the subjects, for example, a master activity code of 00 - 22 responses was derived from the 131 students. See Appendix C for variable responses and coding of questionnaires.

Additional Labelling and Categorization
of Questionnaire Responses

In anticipation of the data analysis, a decision to group variables into broad categories which could be subdivided and re-grouped for various forms of analysis was made. Accordingly, the following groupings of information were obtained:

A. <u>Kinds of information:</u>

1. Activity or kind of behaviour,
2. Frequency or intensity of activity or behaviour,
3. Reason for activity or behaviour,
4. Location or place where activity or behaviour occurs,
5. Level of interaction or persons with whom the activity or behaviour is carried out,
6. Subject identification and lifestyle information,
7. Factual information -- yes/no,
8. Transportation mode, and
9. Specific responses to particular question (i.e., neighbourhood likes).

B. <u>Behavioural information:</u>

In addition to the previously mentioned kinds of information, activity and location information was grouped in another way. Of the range of 22 activities mentioned by the subjects, each activity was judged to be an obligatory or discretionary behavour which took place in the home or in out-of-the-home settings. Obligatory activites were those which the student was bound or responsible to do. Discretionary activities were those which the student chose to do at any particular time. As a result, all activities also fit under four behavioural categories:

1. In-home discretionary (i.e., watching T.V.),
2. In-home obligatory (i.e., doing chores),
3. Out-of-home dscretionary (i.e., bicycle riding), and
4. Out-of-home obligatory (i.e., delivering papers).

C. <u>Place information:</u>

Places mentioned within a range of 18 locations were grouped by a similar method as the behavioural categories. Home responses included activities which also took place in the yard. Out-of-home places did not include the respondent's yard, but did include the street or "place" (name of cul-de-sac). Place information fell into three categories:

1. In-home,
2. Out-of-home discretionary places (i.e., community club), and
3. Out-of-home obligatory places (i.e., school during hours).

A further grouping of responses divided spaces in which behaviours or activities occurred or could occur into three further categories: behaviour space, knowledge space, and aspirational space. However, these three space categories proved to be difficult to clearly differentiate, as many responses fell into more than one category. As a result, further analysis of this method of grouping information was deleted.

The various grouping of categories of information and the coding of responses were checked three times for accuracy: by the investigator, the research assistant, and the computer programmer. Discrepancies were resolved by concensus among the three people.

Content Analysis of the Maps

Each one of the student's maps was coded separately. The first and second maps were examined several weeks apart and analysed for (a) the type of map drawn using the Appleyard typology, (b) locational information judged on area, distance in blocks, and orientation of the drawing, (c) attributive information using Ladd's classifications, and (d) features of the environment using broad categories of Lynch along with other features. See Appendix   for response variables and coding of the maps.

The analysis of map characteristics using the Appleyard typology was done by each student in the "Research Methods" course used previously for a pretest of the instruments. A concensus of agreement on type and style of each map was reached and used to support the coding decisions of

the three other research assistants.

The coding of all the other map variables was checked by the investigator and the research assistant.

The Data Analysis Plan

Questionnaire - descriptive review. As this study was exploratory in nature, various levels of data analysis were used. The data from the questionnaire was reviewed first to give basic descriptive information on the 131 respondents. Frequency distributions, chi squares, means and standard deviations were obtained for the following data:

1. Demographic material

   a) Age,
   b) Sex,
   c) Grade,
   d) City and country of birth,
   e) Language spoken at home,
   f) Number of people at home, and
   g) Length of residence in community.

2. Socioeconomic material

   a) Type of dwelling unit, and
   b) Number of vehicles owned.

3. Additional material

   a) Parental supervision,
   b) Jobs and allowance,
   c) Mode of travel, and
   d) Neighbourhood likes and dislikes.

Questionnaire - activity/behaviour score. Measures for the major dependent variable in this study, namely, the use of the environment by adolescents, were derived from the range of different activities over all of the respondents. Each respondent received a behavioural score obtained by counting across all the different activity items mentioned in his questionnaire relative to the total number of different activities

mentioned by all of the 131 subjects. Repetition of an activity or behaviour was not counted. This behavioural score was used to examine differences of age, grade and sex of students in the various activities. The range could also be subdivided into out-of-home and in-home discretionary and obligatory activities and the frequency of those activities.

Questionnaire - place score. Critical to the study of the use of the environment is the location or place at which adolescents carry out their activities. Employing the same method as was used to derive the "behavioural score", it was possible to calculate a "place score." The total number of different places mentioned by each subject was calculated out of the total possible range. Further breakdowns of place information could be done in the same way as the activity/behaviour analysis.

Map #1 - descriptive review. The basic features drawn on each of the 131 respondents' maps were counted, grouped, and coded, based on the categories which had been derived from the content analysis of the maps. The map features were coded within the following broad categories:

1. Map characteristics

   a) Kind of map using Appleyard's typology,
   b) Locational information, and
   c) Attributive information.

2. Major elements drawn or mentioned

   a) Vehicular/pedestrian networks,
   b) House forms,
   c) Schools,
   d) Community club,
   e) Commercial establishments, and
   f) Recreational places.

3. Major landmarks drawn or mentioned

4. Major boundaries other than roads drawn or mentioned

5. Major landscape elements drawn or mentioned

    a) Hard landscape elements, and
    b) Soft landscape elements.

6. Additional symbols drawn.

Map #1 - style analysis. When the content analysis of the maps
was done, a problem occurred in using the Appleyard typology. The Research
Methods class students as well as the three research assistants were
able to reach concensus on the broad style of map drawing; sequential or
spatial, but further definition into the eight substyles used by Appleyard
could not be done. The types of maps drawn were, however, judged on
their degree of "development." While the actual typing of a map into
eight clear sub-categories was not possible, all the researchers felt
the maps could be judged on a rough continuum. This ranged from a
rather simplistic drawing lacking detail, similar to Appleyard's frag-
mented and scattered styles, to more developed drawings, similar to the
network and patterned styles.

Map #1 - detail and place analyses. Each map was analysed using
the additional categories of information for two broad measurements,
detail and activity places. The amount of detail of a map was calculated
by adding all of the elements, landmarks, boundaries and landscape
elements drawn or mentioned.

From the details drawn or mentioned, all categories that could be
associated with an activity place were calculated. An activity place
was determined to be a place where activities could be carried out (i.e.
a physical place that a respondent could use).

Map #1 - additional analysis. Analysis of the style of map,
amount of map detail and the number of activity places of each map was

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carried out using the independent variables of age, sex, and grade of each of the respondents.

Map #2 - descriptive review. An attempt to analyse the second map in the same manner as Map #1 proved to be impossible. The number of respondents who made a serious effort to produce a second map were few. Although some attempt to do the second mapping task was criteria for inclusion in the study, the maps which were produced did not generate enough data to be analysed. A decision to delete further analysis of the second maps was taken.

Summary

Due to the exploratory nature of this study, it was necessary to prepare the data in such a way as to allow it to be analysed in a variety of methods and groupings. Data obtained from the questionnaire was used to provide the basis of information on use of the community by the adolescents. The map data was the basis of information on the adolescents' perception of their community. Assocations of the questionnaire and map data were expected to provide the link between use and perception. By analysing the data from the combination of techniques it was hoped that the two basic questions of this study could be better explored.

CHAPTER IV

RESULTS

The results of this thesis are presented in four parts:

(a) questionnaire giving adolescents' use of their neighbourhood,

(b) map giving adolescents' perception of their neighbourhood,

(c) associations of questionnaire and map, and

(d) additional descriptive results.

Questionnaire on Use of Neighbourhood

Behaviours or Activities

On the assumption that the number of different types of activities in which an adolescent engages can provide an index of the diversity of the individual's activities or behaviours, a behavioural score could be derived from questionnaire responses for each respondent. The total number of different activities across all respondents was 21, of which 6 were out-of-home discretionary, 2 were out-of-home obligatory, 11 were in-home discretionary, and 2 were in-home obligatory. The means and standard deviations for each of these behavioural scores are shown in Table 9.

TABLE 9

BEHAVIOURAL SCORES FOR OUT-OF-HOME AND IN-HOME
DISCRETIONARY AND OBLIGATORY ACTIVITIES

Kind of Activity/Behaviour	Mean	S.D.
Out-of-home discretionary activities	2.18	1.15
Out-of-home obligatory activities	0.72	0.50
In-home discretionary activities	2.11	0.56
In-home obligatory activities	0.10	0.30

N = 131

The specific types of activities that contributed to each of these behavioural subscores are listed in Table 10. Because the distribution of responses were highly scattered, the higher percentages of responses in the four behavioural categories are noted and the remaining categories are listed together. It is of note that the diversity of activity is discretionary with the greater variation in the out-of-home category.

Table 10

QUESTIONNAIRE RESPONSES FOR OUT-OF-HOME AND IN-HOME
DISCRETIONARY AND OBLIGATORY ACTIVITIES

Kind of Activity/Behaviour	% of Responses
Out-of-home discretionary	
Play outdoor sports	35.4%
Shop, go to entertainment	35.1%
Play at school or lessons	14.7%
Group activities	12.3%
Other	2.5%
Out-of-home obligatory	
Go to work	96.8%
Go to lessons or school	3.2%
In-home discretionary	
Watch T.V.	47.5%
Play in-house sports, music, hobbies .	40.2%
Eat	2.9%
Party	2.5%
Listen to radio, stereo	2.2%
Other	4.7%
In-home obligatory	
Homework	53.8%
Household chores	46.2%

Using the behavioural scores of each of the respondents, the
means and standard deviations for discretionary and obligatory activities
for grades and sex of students are shown in Table 11.

Table 11

MEAN BEHAVIOURAL SCORES FOR OUT-OF-HOME AND IN-HOME, DISCRETIONARY AND
OBLIGATORY ACTIVITIES ACCORDING TO GRADE AND SEX OF STUDENT

Variable		Discretionary Activity		Obligatory Activity	
Student Grade	N	Mean	S.D.	Mean	S.D.
Out-of-home					
Grade 7	44	2.636	0.942	0.681	0.518
Grade 8	54	2.092	1.185	0.722	0.452
Grade 9	33	1.696	1.131	0.757	0.435
In-home					
Grade 7	44	2.113	0.442	0.159	0.369
Grade 8	54	2.074	0.639	0.074	0.264
Grade 9	33	2.151	0.565	0.060	0.242
Student Sex					
Out-of-home					
Male	69	2.014	1.077	0.652	0.509
Female	62	2.354	1.202	0.790	0.410
In-home					
Male	69	2.130	0.539	0.028	0.581
Female	62	2.080	0.168	0.177	0.385

N = 131

Because the behavioural subscores for obligatory and discre-
tionary activities are not equivalent and because the scores are not

normally distributed, these behavioural scores were transformed to Z-scores for statistical analysis. Analysis of variance of the Z-scores for age, type of activity (discretionary, obligatory), and location (in-home, out-of-home) indicated no differences in level of diversity of activities between ages and sex. There were also no differences in location nor type of activity. However, the interaction of location, type of activity, and age is highly significant, $F = 5.68$, $df = 3,127$, $p < .001$ (see Figure 7).

Figure 7 shows a sharp decrease in out-of-home discretionary activities between the twelve-year-olds and the fifteen-year-olds. At the same time there is an increase in the in-home discretionary activities between the fourteen and fifteen-year-olds. A possible explanation for this may be that the younger adolescents engage in more out-of-home "play". Conversely, the in-home obligatory activities decrease between the fourteen and fifteen-year-olds while the out-of-home obligatory activities peak for the fourteen-year-olds and drop slightly for the fifteen-year-olds. It may be that as adolescents grow older, their out-of-home obligatory responsibilities such as chores or work replace those spent in the home.

An analysis of variance of Z-scores involving grade, location (in-home, out-of-home), and type of activity (discretionary, obligatory) indicated similar results with only the interaction of grade, location, and type as significant, $F = 5.01$, $df = 2,128$, $p < .008$ (see Figure 8).

Places or Locations

The place or locations of activities produced a place score similar to that of the behavioural score. Considering only out-of-home

places, the place score gave a range of 17 different places mentioned
for specific activities, 15 of which were discretionary places and 2
obligatory places. The means and standard deviations for each of these
place scores are shown in Table 12.

TABLE 12

PLACE SCORES FOR OUT-OF-HOME DISCRETIONARY
AND OBLIGATORY PLACES

Kind of Activity Place	Mean	S.D.
Out-of-home discretionary places	3.44	1.43
Out-of-home obligatory places	0.15	0.35

N = 131

The specific kinds of places that contributed to each of
theplace subscores are listed in Table 13. Again, because the distri-
bution of responses were highly scattered, especially among the discre-
tionary places, the higher percentages of responses are noted and the
remaining categories are listed together. The out-of-home category
shows a wide diversity of places in and out of the neighbourhood of
Waverley Heights.

Using the place scores of each of the respondents, the means
and standard deviations for out-of-home discretionary and obligatory
places according to student age, and the out-of-home places and in-home
as an activity place according to student grade and sex are shown in
Table 14.

TABLE 13

QUESTIONNAIRE RESPONSES FOR OUT-OF-HOME
DISCRETIONARY AND OBLIGATORY PLACES

Kind of Activity Place	% of Responses
Out-of-home discretionary place	
Downtown, movies, shopping center	22.0%
Community club	12.2%
Facilities outside community	10.9%
Outside of home including yard	8.7%
Friends' homes	8.7%
School, gym, playground	8.2%
Adam's Variety Store	7.8%
Saints Roller Rink	5.6%
Other	15.9%
Out-of-home obligatory place	
Work	89.5%
School	10.5%

In a manner similar to the behavioural scores, place scores were transformed to Z-scores for statistical analysis. Of the analyses of Z-scores for place, only the age and type of place (out-of-home discretionary or obligatory) interaction was significant, F = 3.36, df = 3,127, p < .02 (see Figure 9).

Figure 9 shows a sharp decrease with age in out-of-home discretionary activities previously discussed. The out-of-home obligatory places portray a similar pattern as those shown in the behavioural scores with a peak in the number of places mentioned by fourteen-year-olds, followed by a decrease for the fifteen-year-olds.

TABLE 14

MEAN PLACE SCORES FOR IN-HOME AND OUT-OF-HOME DISCRETIONARY AND
OBLIGATORY PLACES ACCORDING TO AGE, GRADE AND SEX OF STUDENT

Variable		Discretionary Place		Obligatory Place	
a) Student Age	N	Mean	S.D.	Mean	S.D.
Out-of-home					
11-12 years	31	4.2	1.17	0.9	0.30
13 years	44	3.4	1.45	0.2	0.37
14 years	39	3.2	1.48	0.2	0.38
15-16 years	17	2.8	1.24	0.1	0.33
b) Student Grade					
Out-of-home					
Grade 7	44	2.6	0.94	0.7	0.52
Grade 8	54	2.1	1.19	0.7	0.45
Grade 9	33	1.7	1.13	0.8	0.44
In-home					
Grade 7	44	2.1	0.44	0.2	0.37
Grade 8	54	2.1	0.64	0.1	0.26
Grade 9	33	2.2	0.57	0.1	0.24
c) Student Sex					
Out-of-home					
Male	69	3.3	1.37	0.2	0.40
Female	62	3.5	1.50	0.1	0.27
Male	69	2.1	0.54	0.0	0.17
Female	62	2.1	0.58	0.2	0.39

N = 131

Z-SCORES OF OUT-OF-HOME DISCRETIONARY, OUT-OF-HOME OBLIGATORY,
IN-HOME DISCRETIONARY, IN-HOME OBLIGATORY ACTIVITIES
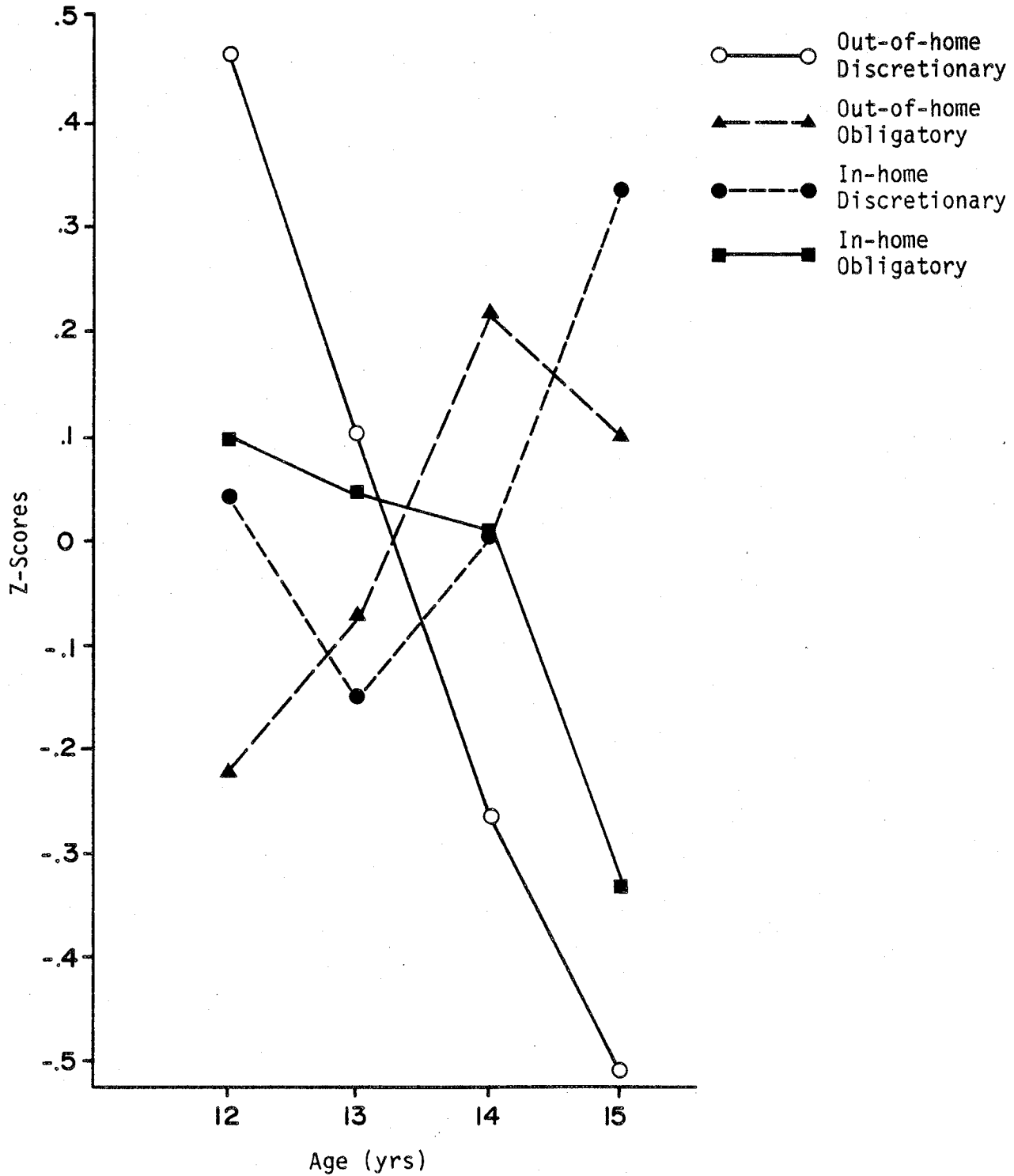ACCORDING TO STUDENT AGE

Fig. 7

Z-SCORES OF OUT-OF-HOME DISCRETIONARY, OUT-OF-HOME OBLIGATORY,
IN-HOME DISCRETIONARY, IN-HOME OBLIGATORY ACTIVITIES
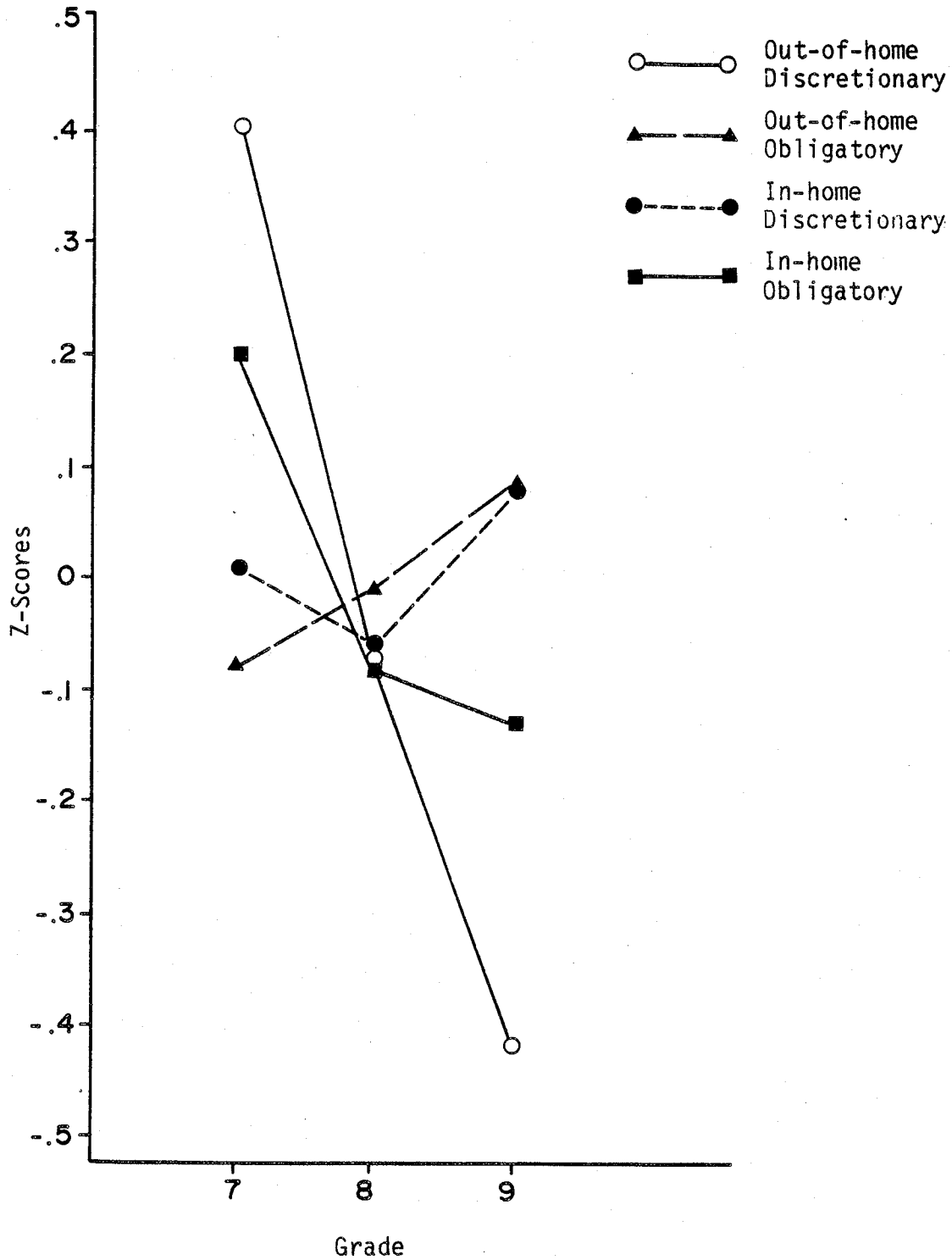ACCORDING TO STUDENT GRADE

Fig. 8

Z-SCORES OF OUT-OF-HOME DISCRETIONARY AND OBLIGATORY
PLACES ACCORDING TO STUDENT AGE
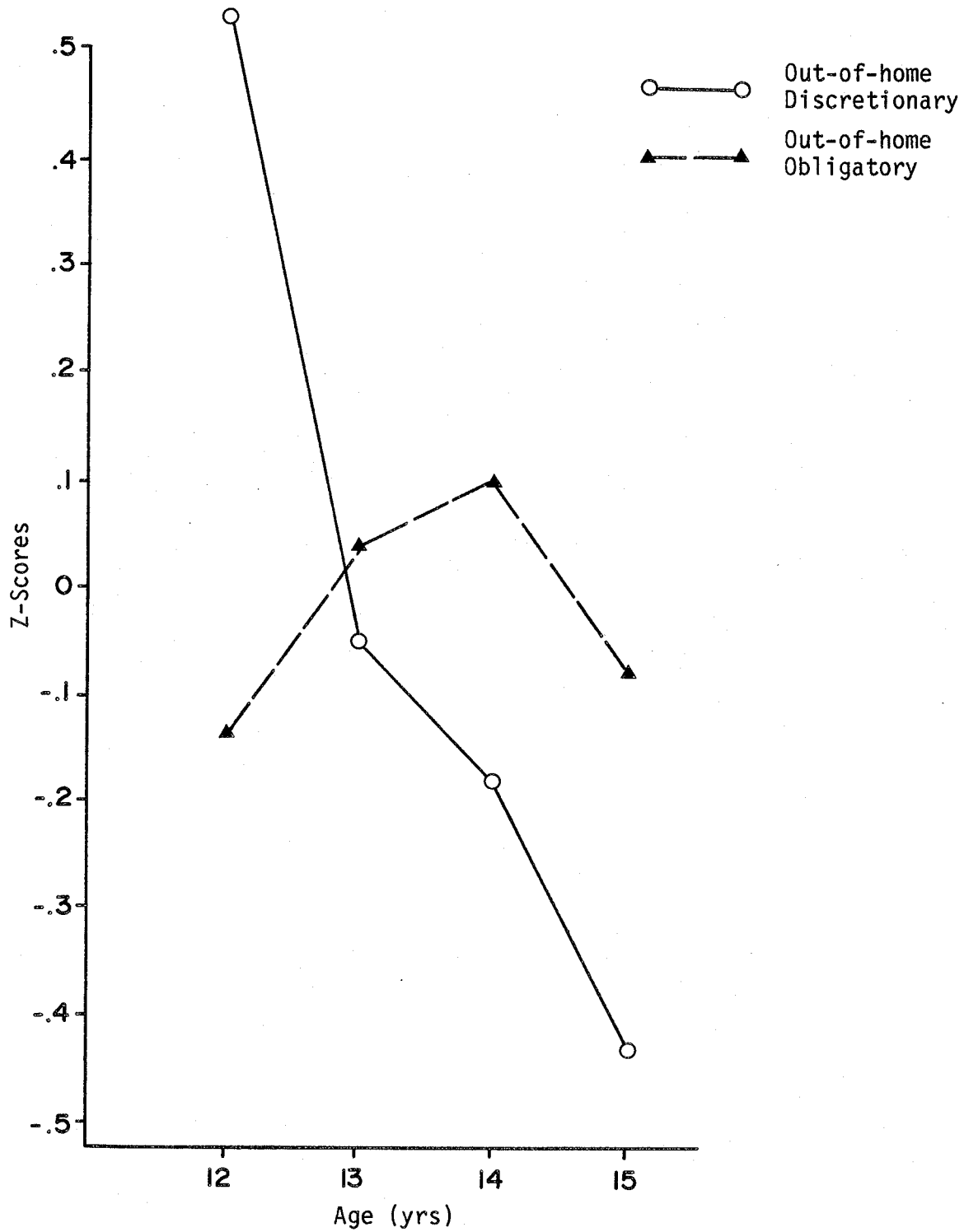
Fig. 9

Map on Adolescents' Perception
of Their Neighbourhood

Descriptive Characteristics

As was discussed in the data analysis plan, Map #1 of each student was reviewed by the Research Methods class and the three research assistants for concensus on the type and sub-style of map.

The major research assistant and the investigator attempted to determine the N, S, E, W distance illustrated on each map and the predominant orientation from which the map was drawn. It proved to be impossible to estimate distance, even measured in street blocks and corners, for many of the students, because of the lack of information given on the maps. Determining the predominant orientation of many of the maps was similarly difficult. Without a specific set of instructions given to the students to place a north arrow and indicate the number of blocks drawn, a self-initiated map did not spontaneously produce this information.

The student maps did, however, generate neutral descriptions or comments and drawings. Neutral descriptions or comments such as "lake", "my house", or "big field" occurred in 95.9% of the students' maps. Drawings of abstract symbols such as arrows were found on 84.6% of the maps, and combinations of drawings such as stick figures or birds were found on 14.6% of the maps.

Type and style of maps. As previously discussed, there was general concensus on the type of map drawn according to the two broad sequential or spatial categories defined by Appleyard. Sequential maps were judged to be ones that were path-oriented and based on roads. Spatial maps were judged to be ones that were space-oriented and based on drawings of landmarks, districts and node elements.

It is important to note that although there were 131 students who were used for this study, there were only 123 students who drew their Map #1 in such a way that it could be categorized. As a result, the coding of the map instrument was carried out on a total of 123 maps and the associations between the Map #1's and the questionnaires were adjusted accordingly. Table 15 shows the frequencies and percentages for the two major map types.

TABLE 15
SEQUENTIAL AND SPATIAL MAP TYPES

Map Type	Frequency	%
Sequential	104	84.6
Spatial	19	15.4
Total	123	100.0

Table 16 shows the absolute frequencies and the percentages of the sub-styles of maps. As previously discussed, the sub-styles were judged roughly on a continuum from the most primitive maps in both types to the most developed.

TABLE 16
STYLES OF MAPS WITHIN SEQUENTIAL
AND SPATIAL MAP TYPES

Sequential Type			Spatial Type		
	Frequency	%		Frequency	%
Fragmented	16	13.1	Scattered	18	14.8
Chain	35	28.7	Mosaic	0	0
Branch & loop	46	37.7	Link	1	0.8
Network	6	4.9	Patterned	0	0

N = 123

Style of maps. Crosstabulations were done on the styles of maps drawn and the independent variables of age, grade and sex of students. The styles were combined by their level of development, taking fragmented and scattered together, chain alone, branch and loop, and linked together, and network alone. Chi-square analyses indicated significance for grade x^2 = 16.14, $\underline{df}$ = 8, $\underline{p}$ < .04, and for sex x^2 = 10.55, $\underline{df}$ = 4, $\underline{p}$ < .03.

Figure No. 10, which illustrates the style of maps drawn according to student grade, shows an interesting result. When the two more developed styles of branch and loop/linked and network are combined, the total percentages are 54.8% for grade 7's, 32.7% for grade 8's and 44.8% for grade 9's. Why the younger grade 7 students show more developed map styles is not known. A possible explanation may be that school work at the lower grade level deals with cartographic maps more than work at the higher grade level. As well, it has already been shown that the younger adolescents carry out more out-of-home discretionary activities and mention more different activity places in their questionnaire responses. This contact with places outside of the home may also contribute to level of map styles produced by the grade 7's.

Figure No. 11 illustrates map styles according to sex. The female students tended to draw more primitive styles with a combined total of 29.3% of their maps falling in the two more developed categories. The male students reversed this result with a combined total of 55.4% of their maps in the two more developed categories. This appears to support Appleyard's findings that sex was a variable in mapping ability. However, because age and cultural differences between the subjects in Appleyard's study and those in this study, any specific comparisons cannot be made.

Detail of maps. The amount of detail drawn on each of the

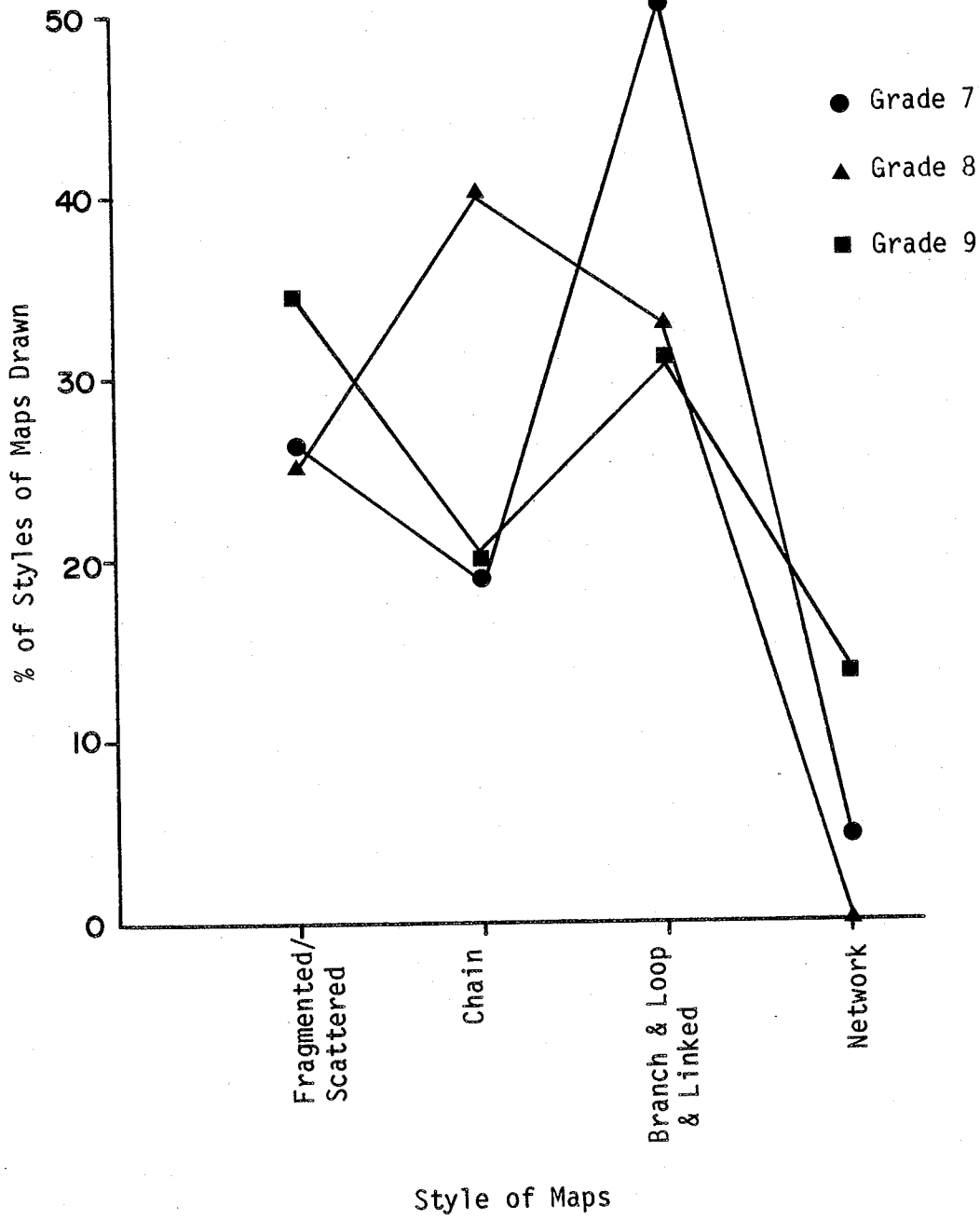PERCENTAGES OF MAP STYLES
BY GRADE OF STUDENTS

● Grade 7

▲ Grade 8

■ Grade 9

% of Styles of Maps Drawn

Style of Maps

Fig. 10

PERCENTAGES OF MAP STYLES
BY SEX OF STUDENTS
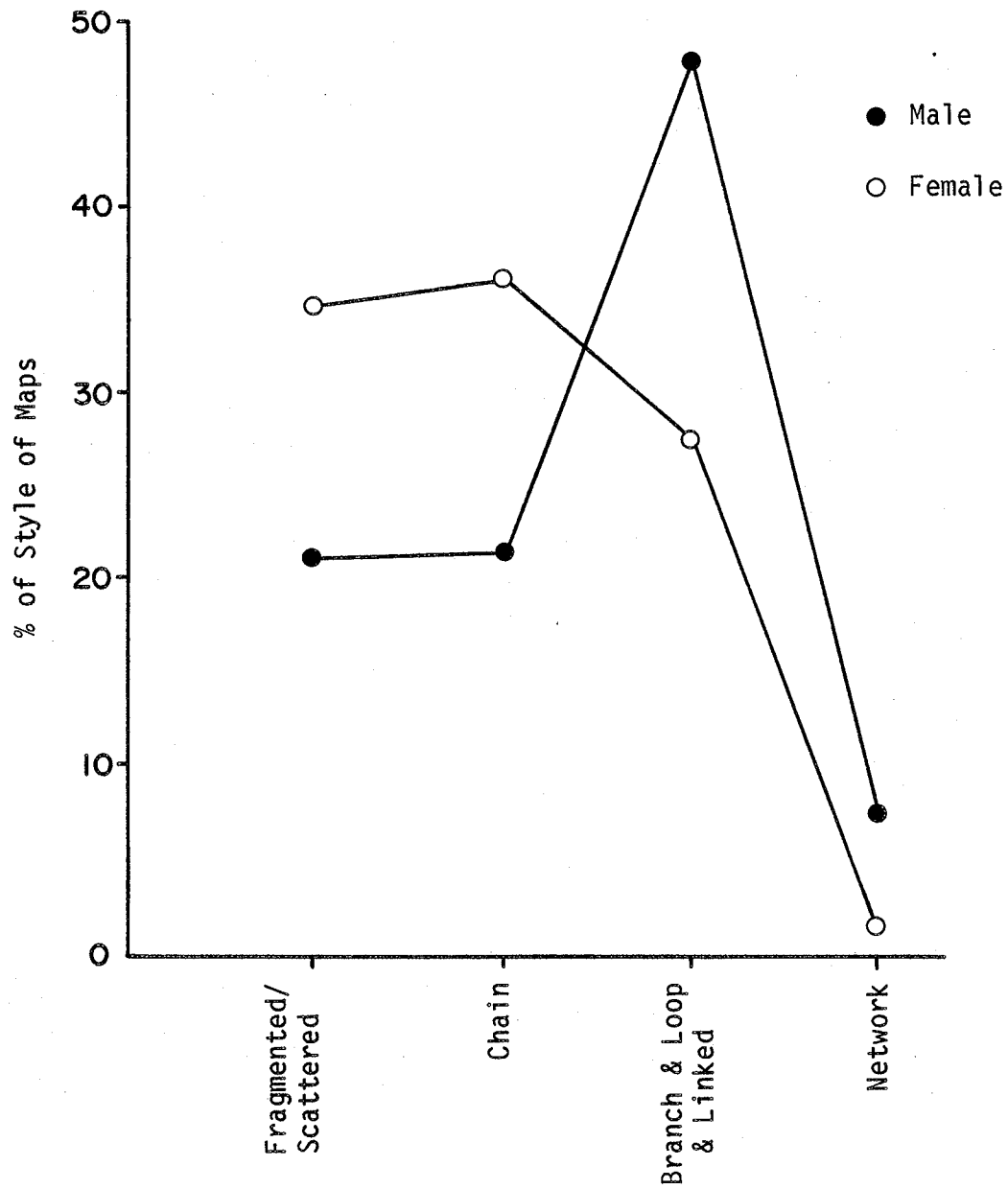
Fig. 11

student's Map #1 was taken to be an indication of the breadth or scope of his perceived neighbourhood. It is important to remember that the students were given the mapping task first, before the use questionnaire, and were given a limited time of ten minutes to produce their "map". The research question being tested was essentially how much does each adolescent student see or perceive of what there is to see, and how much of that information will be spontaneously regenerated in the mapping task. Some students drew roads, buildings and even mailboxes, while other students drew very few features in their environment, which could be counted as detail.

The amount of detail of each map was measured according to the style of level of development of map and then examined using the independent variables of age, grade and sex.

The amount of detail of each map was measured according to the style of the map. As discussed earlier, maps with greater detail, for example, ones with more clearly-defined roads or landmarks, were also judged to be the more developed styles. Chi-square analysis on the amount of detail of student maps and their styles proved to be significant with x^2 = 37.25, df = 12, p < .002.

A summary of the chi-squares obtained from analyses of detail and style of maps relative to age, grade, and sex of students is presented in Table 17. The most significant results are shown for the 13-year-old students and the grade 8's. As the style of map is, in part, determined by the amount of information drawn (i.e. the amount of detail), it has already been shown that the younger students did draw the more developed styles of maps.

TABLE 17

MAP DETAIL AND STYLE BY AGE,
GRADE, AND SEX OF STUDENTS

Variable		Measures		
Student Age	N	Signif.	Chi sq.	DF
11 - 12 years	31	NS	—	—
13 years	44	0.003	24.41	9
14 years	39	NS	—	—
15 - 16 years	17	NS	—	—
Student Grade				
Grade 7	44	NS	—	—
Grade 8	54	0.001	29.50	9
Grade 9	33	0.037	17.84	9
Student Sex				
Male	69	0.024	23.46	12
Female	62	0.039	17.68	9

The students' maps were also examined for the amount of detail and the number of different activity places. Activity places were locations drawn or mentioned on the maps where discretionary or obligatory activities could be carried out. Chi-square analysis indicated map detail and activity places significant with $x^2 = 28.47$, $\underline{df} = 6$, $\underline{p} < .001$.

Table 18 shows the summary of map detail and activity places measured by the independent variables. The most significant result is shown for male students. Because activity places form part of the amount of detail counted, this result is not suprising due to the fact that males tended to draw more detailed maps in general.

TABLE 18

MAP DETAIL AND ACTIVITY PLACES BY AGE,
GRADE AND SEX OF STUDENTS

Variable		Measures		
Student Age	N	Signif.	Chi sq.	DF
11 - 12 years	31	NS	—	—
13 years	44	NS	—	—
14 years	39	0.022	14.75	6
15 - 16 years	17	NS	—	—
Student Grade				
Grade 7	44	NS	—	—
Grade 8	54	0.029	14.03	6
Grade 9	33	0.017	15.38	6
Student Sex				
Male	69	0.001	20.90	6
Female	62	0.022	14.76	6

Activity places of maps. Although activity places were measured in the detail analysis, they were also analysed according to map styles and the independent variables. Results of activity places and style

did not prove significant, however, the one variable of student age did prove to be significant for 15-year-olds with x^2 = 14.14, df = 6, p < .03.

Associations of Questionnaires and Maps

In an attempt to make associations between the questionnaires on adolescents' neighbourhood activities and the maps on adolescents' neighbourhood perceptions, the two groups of results were examined in a number of different ways. Behavioural scores representing the number of different activities from the questinnaires were examined relative to the style, detail and activity places drawn on the respondents' maps. Contingency coefficients indicate significant associations between behavioural scores and map styles, cont. coeff. = .34, df = 8, p < .05; map detail cont. coeff. = .33, df = 4, p < .04. These results suggest that the students who had obtained higher behavioural and place scores from the questionnaire responses were also the ones who generated more developed, detailed maps. It would appear that an increase in use of the neighbourhood outside of the home influences the perception of that neighbourhood when measured by the level and complexity of cognitive map drawn.

Additional Descriptive Results Obtained from the Questionnaires

A number of the questions in the questionnaire were included to give a broader background on the nature of Waverley Heights as a neighbourhood and also information about the respondents which could suggest how they may use the community. These results were not analysed but they were examined to provide a more complete context in which to view data that was analysed.

Neighbourhood Likes and Dislikes

Questions on the students' feelings toward their neighbourhood are shown in Table 19. The four highest percentages of responses are shown as the other responses were highly scattered.

TABLE 19

STUDENT RESPONSES ON NEIGHBOURHOOD
LIKES AND DISLIKES

Neighbourhood Likes and Dislikes	%
Positive attributes	
Neighbourhood in general	21.4
A particular physical feature	14.3
Like nothing	13.4
A particular facility	13.4
Family or friends	12.5
People in general	8.0
Other	17.0
Negative attributes	
A particular physical feature	12.0
People with negative personalities	10.2
Nothing to do	9.3
The characteristic of the neighbourhood . . .	9.3
Authority figures	8.3
Nothing	6.5
Facilities lacking	6.5
Everything	5.6
Other	32.3

Questions were also asked if there were places students chose not to go in general and during the day or night. Thirty-five percent responded that they chose not to go to school, and 26.6% responded that there were places they were afraid to go. During the day, alleys (6.3%), the field behind the school (6.3%) and the woods and bush (6.3%), were their answers. The students felt these places were dangerous (33.3%) or were afraid of violence (33.3%). At night, alleys (22.9%) and across the railway tracks (14.3%), were places feared because the students were afraid of violence (61.3%) or these places were viewed as dangerous (12.9%).

The students were asked if there were places they were prohibited from using; 19.4% responded affirmatively. The places mentioned were Adam's Variety Store (29.4%), pubs and adult places (29.4%), near the lakes (11.8%), shopping centers (11.8%) and the school or gym after hours (11.8%).

A number of questions focused on the students aspirational activities in-home and out-of-home, and the restrictions on these activities and places. In their own homes, 24.5% of the students wanted to have company and parties, and 16.0% wanted some form of indoor sport or music. In 22.7% of the responses, parental disapproval proved to be the restriction and in 16.7% of the responses, absense of a particular object (i.e. a pool table) was the restriction.

Students were asked if there was anything missing in their neighbourhood which they would like. Sixty-nine percent of them replied affirmatively. The four highest percentages of responses were: a recreational facility not available in the community (37.6%), a physical

feature (i.e. more trees) (14.4%), commercial facilities (13.3%) and entertainment places (10.0%).

Transportation Mode

In an attempt to determine how the students moved around in their neighbourhood and out of it, responses regarding sports activities, lessons, group clubs and out-of-community activities were crosstabulated with various modes of travel. Due to the fact that a small percentage of students engaged in any organized activities, the results were not significant. In general, the students walked, jogged or ran to places in the community. Car and bus rides were mentioned for out-of-community activities such as organized hockey games. Travel by bicycle was occasionally mentioned, however, as this study was carried out prior to the spring season, the students' responses seemed to reflect winter travel conditions.

Jobs and Allowance

A section of the questionnaire was concerned with the student's ability to obtain money for discretionary spending. The investigator questioned if the number and kind of activities done and places used would be influenced by monies available to this group of adolescents. According to the questionnaire, frequencies 70.5% of the students had a job which included babysitting (63.0%) or delivering papers (20.7%). An allowance was received by 71.1%; 37.8% received $1.00 - $3.00 per week, 26.7% received $3.50 - $5.00 per week, and 12.2% received as much as they desired. For most students, monies were available to be spent on discretionary activities or to use discretionary places.

Crosstabulations were carried out on the student questionnaires between the positive and negative job responses and the number and kinds of discretionary activities and places mentioned. Similarly, the availability and amount of allowance was calculated. The crosstabulations did not produce significant results at the $p < .05$ level.

Parental Supervision

One of the other questions of concern to the investigator was, "Did students who had a parent normally at home after school hours differ in their number and kind of activities carried out and places used?" Because school officials had forbidden questions on parental employment, one question was used to judge if a student generally had a parent or adult at home after school. Unless the response to this question gave a direct answer such as "my mother", it was difficult to judge if a person named was an adult. As a result, further investigation of this question could not be reliably carried out.

<div align="center">Summary</div>

The results of the questionnaire, map data, and the associations between the two provide information worth noting specifically.

The questionnaire data points out the importance of out-of-home discretionary activities for the respondents. Although the students generally carried out a narrow range of different activities, that range itself dropped off significantly as the age and grade of students increased. With a drop in out-of-home discretionary activities, there was an increase in in-home discretionary activities.

A parallel result occured when out-of-home discretionary places were examined. The range of different places similarly dropped off as

the students grew older. Home replaced community places for activities.

The responses for out-of-home discretionary activities mentioned playing outdoor sports, and shopping or going to entertainment as the two major groups of activities. The places most commonly mentioned were downtown, movies and shopping centers, and the community club. While the neighbourhood does provide the community club, the location of their other discretionary activities, of necessity, takes part outside of Waverley Heights. Even the community club would appear to cater to those who take part in more organized sports activities as it was mentioned in 12.2% of the responses while playing outdoor sports as a general activity was mentioned in 35.4% of the responses.

It is interesting to note the responses when the students were asked what features were missing in the neighbourhood. Their answers pointed to recreational facilities, certain physical features, commercial facilities and entertainment.

When asked what places were prohibited from use and the reason why, Adam's Variety Store (the only commercial facility in the neighbour-hood) and local pubs were disapproved of by parents, and shopping centers and the school after hours were restricted by authority figures.

One of the physical features of the community, "the lake(s)", was mentioned as a prohibited place because it was perceived to be dangerous either by parents and/or the students. It is impossible, however, to move through any major area of the community without circumventing one or more of these lakes.

The map data supported the results of the questionnaires in that the younger students drew more developed maps generally, and gave a larger amount of detail.

The associations of the map and questionnaire data produced significant results for those students who obtained higher behavioural or activity scores. In other words, those students who participated in more different activities produced more developed and detailed maps.

CHAPTER V

IMPLICATIONS AND CONCLUSIONS

This thesis originally stated the objective of exploring two questions: (1) "How does the adolescent use this environment?" and (2) "How does the adolescent of approximately 11 - 15 years of age perceive his neighbourhood or community?" A review of literature and previous research suggested that a combination of testing techniques may provide a model to more fully explore these questions. In addition, it appeared necessary to develop a conceptual framework in which the adolescent period could be examined from a developmental perspective.

The implications to be drawn from this study fall into two major areas: (1) social pychological implications related to the development of the adolescent in his socio-spatial environment, and (2) planning implications related to the effects of the physical environment on the adolescent and the demands made on that environment by him.

Social Psychological Implications

In order to comment on the social pychological implications of this study, it is necessary to recall that in an earlier chapter it was stated that development or growth of a personality was dependent upon (1) needs of an individual at a specific stage or time, and (2) the environment's specific ability to meet those needs. The individual acquires over time a certain history which gives him unique characteristics in addition to certain common qualities shared by others at the
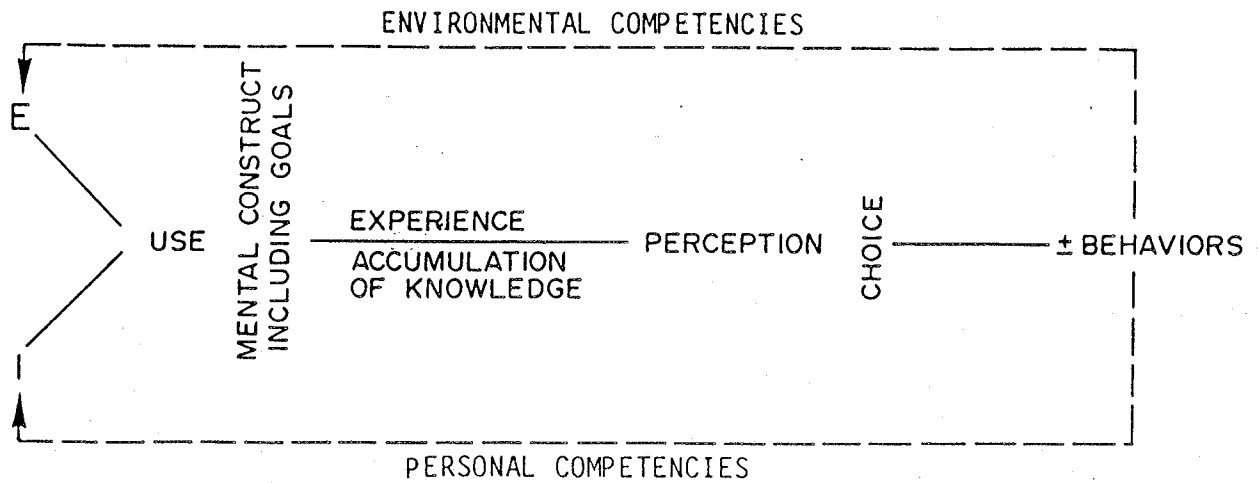
same developmental stage. As well, situational differences and social conditions add to that individual's capabilities and personality.

The environment, on the other hand, contains certain directive conditions, but as was discussed in Chapter I, the physical environment is also a social environment. This study accepts the theory that the two are inextricably bound.

The individual interacts with the environment in carrying out his daily activities. Out of use of the environment, he develops a mental construct which includes relating his concept of self to others and to the environment. This contact with the environment leads to differing images and perceptions of the world which varies at any time with his image of self. This mental construct includes the individual's goals.

Despite individual differences, there are developmentally appropriate goals at any given stage, some of which are more dependent on the physical environment than others. The goals of the adolescent period were discussed in Chapter I.

Through experience and accumulation of knowledge comes learning that in the creation and recognition of self-identity, an individual has the ability to choose. This thesis has shown that the younger adolescents engage in more varied activities and use a wider range of places. The older adolescents, on the other hand, appear to choose or select certain activities and places presumably based on the experiences of previous years and the goals relevant to their age at the present time. This recognition of choice is critical to adolescent development. It affects the individual's behaviours and influences his expectancies -- the symbolic elaborations and transformations of the world of reality. Expectations also influence the individual's feelings of personal and environmental competence.

ENVIRONMENTAL COMPETENCIES

E

USE

MENTAL CONSTRUCT INCLUDING GOALS

$$\frac{\text{EXPERIENCE}}{\text{ACCUMULATION OF KNOWLEDGE}}$$

PERCEPTION

CHOICE

$\pm$ BEHAVIORS

I

PERSONAL COMPETENCIES

THE RELATIONSHIP BETWEEN AN INDIVIDUAL AND HIS ENVIRONMENT

E = environment   I = individual   F = f (I,E), I = f (B,E)

Fig. 6

To illustrate this relationship between the individual and his
environment, Figure 12 was developed.

THE RELATIONSHIP BETWEEN AN INDIVIDUAL AND HIS ENVIRONMENT
ENVIRONMENTAL COMPETENCIES

PERSONAL COMPETENCIES

E = environment I = individual $F = f(I,E)$, $I = f(B,E)$

Fig. 12

Specifically in this study, results indicated that the younger
11 to 13-year-old adolescents carried on more varied discretionary activi-
ties and frequented different activity places. This would be consistent
with the socially-acceptable idea of "hanging around" for this age
group. This range of activities or behaviours are ones which allow the
adolescent to become socially mature, establish heterosexual interests,
gain emancipation from home control, experiment and test values, and
develop self-identity.

As the adolescents increased in age, the number of different
activities and places declined. One reason for this occurence would be
consistent with resolving the goals of maturity by choice of fewer selec-
tive activities, more concentrated interests, and clearer self-identity.
A second explanation may have to do with the process of resolving these
goals. It is possible that as the adolescent ages, the demands to
mature cause him to withdraw for a time from the stimulation of the
physical environment. It is not that the adolescent is "doing nothing",

it is more likely that the developmental tasks now being performed are less observable and not as dependent on the physical community.

Refining The Developmental Model

As the results of this thesis became apparent, the investigator returned to the developmental model presented earlier in the study to seek possible explanations for the findings. The growth model using developmental norms seemed to be useful in depicting the stage of adolescence specifically and the importance of the environment to "wholesome" growth and maturation. Throughout time, the model was refined.

The first stage of refinement was to look at growth of the adolescent in terms of normal or "wholesome" maturational level. This measurement combined the concept of Spivak's "whole action" from his critical confluence theory and the goals of the adolescent period by Cole and Hall.

The next step was to recognize the input of the environment, physical and social, as being an input that could be real or perceived. It was then necessary to introduce some way to identify how, and at what point, the adolescent makes a choice or exerts control as to the amount and nature of the environmental input. This point became a form of a feedback loop.

The feedback loop becomes the interface between the adolescent and his environment. At any given time, he controls this interface by exhibiting a degree of "openness" or receptivity to environmental alternatives and opportunities. On the other hand, he may consciously or unconsciously close out certain environmental inputs. This feedback mechanism is a form of a monitoring system which allows each input to be evaluated according to past experiences, real or perceived. See Figures 13 and 14 which illustrate this interface.

INPUT

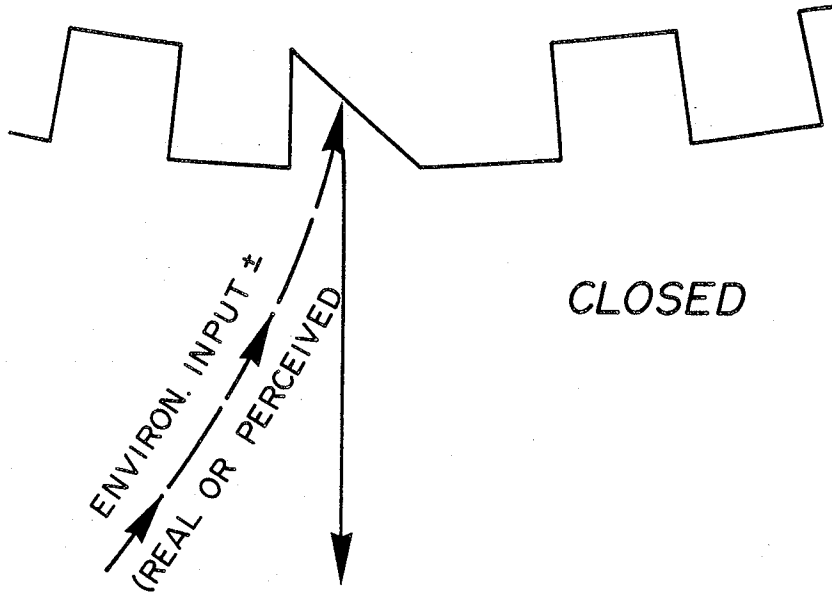FEEDBACK MECHANISM CLOSED TO ENVIRONMENTAL INPUTS

ENVIRON. INPUT ±

(REAL OR PERCEIVED)

CLOSED

Fig. 13

FEEDBACK MECHANISM OPEN TO ENVIRONMENTAL INPUTS
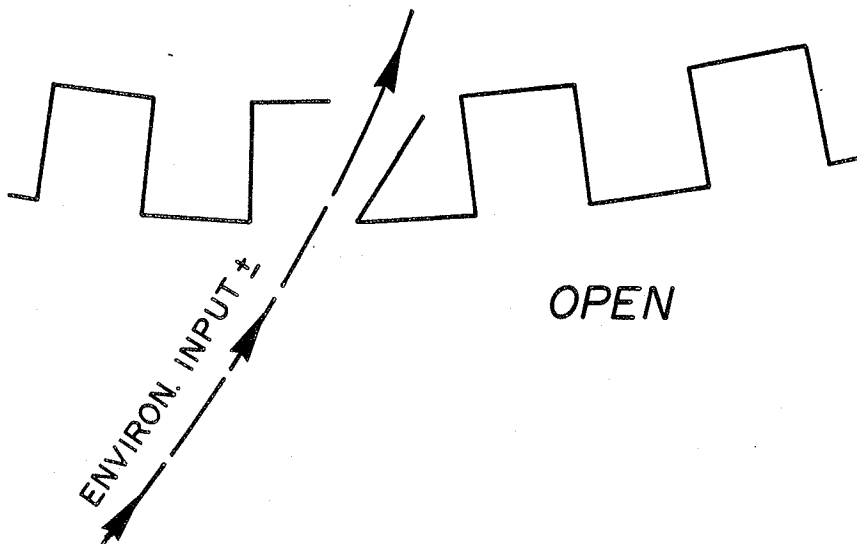
ENVIRON. INPUT ±

OPEN

Fig. 14

If the individual accepts the environmental input, it moves into the realm of environmental cognition going through the steps shown in Figure 15 of (c) consciousness raising to the (d) recognition and sensitivity toward the opportunities and alternatives engendered in the (e) screening of the opportunities and alternatives, and weighing of the "costs", onto (f), the point of actual decision-making involving selection of courses of action and appropriate behaviours. The effectance of these behaviours (g) adds to the growing experience and knowledge of the individual.

Figure 16 illustrates the point at which this experience is put back into the feedback or monitoring loop, whereby the individual evaluates the effectiveness of his choice while simultaneously producing a behavioural response or demand output back into the environment. Some behavioural responses are negative and, while not lost, do not contribute to a "wholesome" experience. Other responses shown in Figure 17 add to the growing body of positive experiences of the individual and contribute to his sense of environmental competence and the next environmental interchange. It is possible that at any given time, an individual, especially an adolescent, may select a course of action or behaviour which is situationally inappropriate and because of his increasing awareness of the context of his actions, may actually carry out a more appropriate positive behaviour.

Planning Implications

One of the tasks of planners is to design environments which fit the needs of future users. Of necessity, the planner must make decisions on the aggregate characteristics of those users and their needs. Waverley

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A REFINEMENT OF THE DEVELOPMENTAL GROWTH MODEL

Fig. 15

115
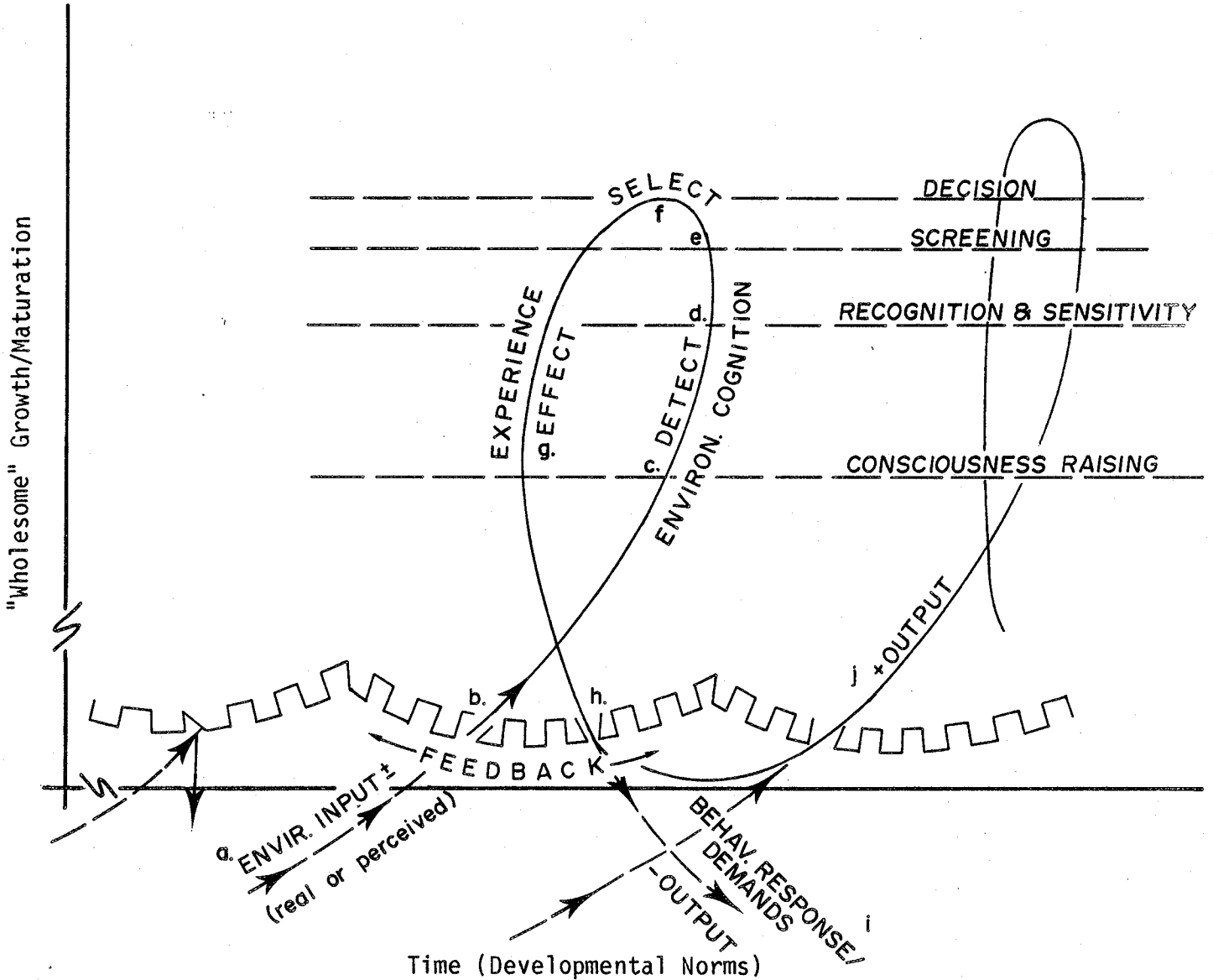
OUTPUT

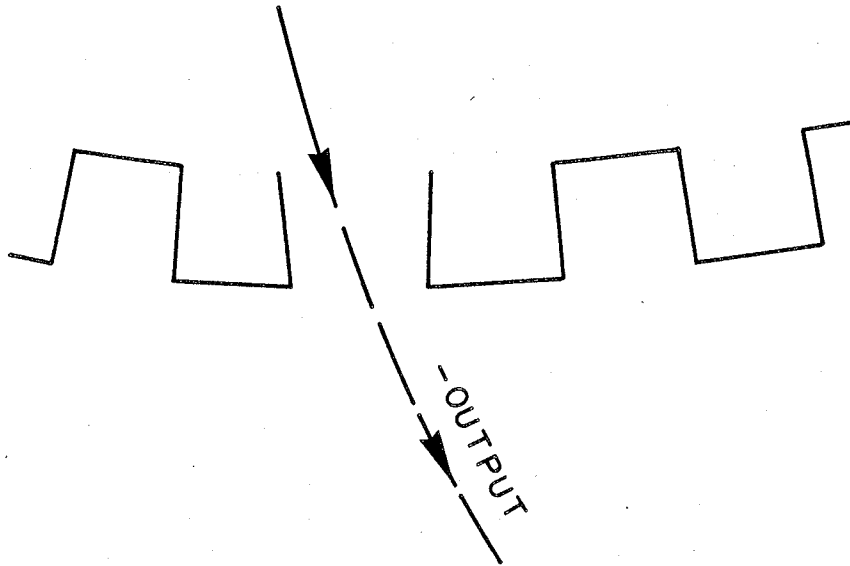FEEDBACK MECHANISM SHOWING NEGATIVE OUTPUT

Fig. 16

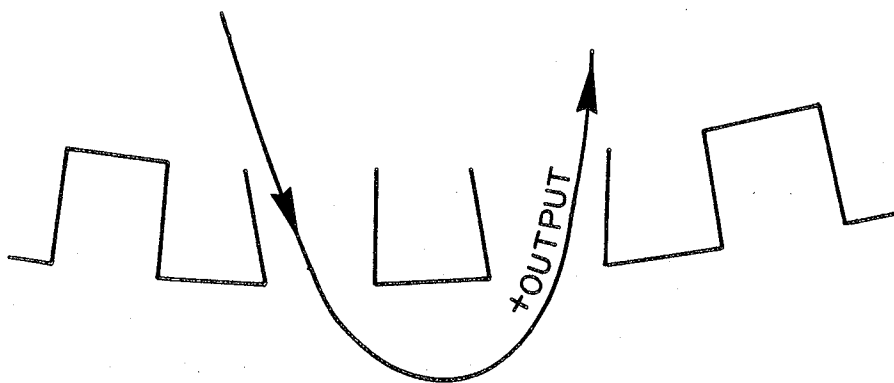FEEDBACK MECHANISM INCORPORATING POSITIVE OUTPUT

Fig. 17

Heights is an example of a suburban community predominantly designed for families in the child-raising stage of the life-cycle. Although this thesis studied the community when it was relatively immature, the physical configuration of the subdivision plan, from the outset, suggested a neighbourhood planned for families with young children.

The fact that the period of adolescence is the "in-between" stage of childhood and adulthood poses a dilemma for anyone designing a community for families. The adolescent has specific needs which are different from those of a child and yet one could question whether the designer/planner even sees the adolescent as a potential user of a community. Essentially, there appears to be a lack of congruence between the needs of this age group and the environment in which they exist.

The question which arises from this study with implications for planners is "How does one design a community that is environmentally congruent for more than one developmental stage?" A second question then occurs "If one actually provides the physical resources, will they be used?".

The answer to the first question must lie in the ability of the designer/planner (1) to recognize and identify the needs of users in various stages of human development, and (2) to have the desire and capability to provide an appropriately designed variety of spatial environments.

This study has shown that a particular group of users -- early adolescents, can make their needs known. When asked, this group responded specifically as to what activities they did or did not carry out, what they would like to do, what places they used, and what they felt was

missing from their community. By focussing on the activities or behaviours
of this age group and the locations mentioned for types of behaviours,
it is possible to determine the nature of the physical resources necessary
to meet these needs. It may also be possible to begin to understand the
quality and meaning given the physical environment in which these activities
are carried out.

Provision of appropriately designed varieties of spatial environ-
ments depends on understanding the demands placed on these environments
by users and the resultant environmental responses given back to them.
A variety of spatial environments is important to individuals in order
to exercise choice and control critical to the adolescent stage of
development.

Specific answers as to what should or could be designed to
provide a more congruent neighbourhood environment for this age group has
to do with the location and placement of resources, how the resources
would be used, and the personnel support behind the resources.

This study suggests that the most relevant observations for
planners lie in the out-of-home discretionary activities carried out by
the adolescents. Recreation, in the form of outdoor sports, and shopping,
movies, and entertainment are especially important to this gruop.

The school and the community club provide the only locations for
organized sports activity in the neighbourhood. While a small number
of students did participate in organized sports, many of the students
played unsupervised, spontaneous sports, presumably on the streets or in
open areas. Because surveillance is a major concern of many adolescents
and given the fact that the community club is run by parent volunteers,
and the school supervised by authority figures, this may contribute to lack

of use of these community resources. Perhaps adolescents need a gathering place with flexible space that could be operated according to their own rules. Although the place should not be supervised by adults, older, trained high school or university students could provide control and allay parents' concern.

Unsupervised areas such as the tennis courts, open fields, and the lakes were drawn on some of the students maps, but not mentioned as being used in the questionnaire. On the contrary, the fields and lakes, when mentioned, were negatively cited as being dangerous. Clearly, the planners' view of the lakes as a potential recreation resource and the adolescents' perception of them are incongruent. It may be that some of the open fields need only goal posts to encourage spontaneous group sports. The largest lake, on the other hand, may need a warming shack and a cleared area of ice during the winter. In the summer, the same building could house a Park and Recreation instructor for such activities as canoeing. Water retention lakes such as the ones in Waverley Heights are used much more extensively in Saskatoon for example, where a portion of the lakeshore is reserved for public recreation activities at all times of the year.

Shopping, movies, and entertainment as discretionary activities for these adolescents poses a similar dilemma with regard to location and use. Convenience shopping is confined to Waverley Plaza and commercial establishments along Pembina Highway. Adam's Variety Store in Waverley Plaza is prohibited for use of many of the students because of parental disapproval, and stores along Pembina Highway discourage this age group from "hanging around". Movies and entertainment facilities are not available within the community, therefore, the ability of students to use these resources are dependent on money and accessibility.

Movies and entertainment such as pinball games could go on in the
gathering place suggested earlier or in some already existing facility.
While this may not be of the scale provided downtown, entertainment with
the community might be popular throughout the week.

Circulation within the community is clearly reliant upon the
car, not unlike many suburban areas. This age group of approximately
11 - 15 years do not have access to car transportation without relying
on someone older. The feeder bus service is limited both in route and
service. Bicycle use is confined to certain times of year. As a result,
walking, running, and jogging are the most usual methods of mobility for
the students. One of the major obstacles using even this form of trans-
portation, is again the lakes. Because of their placement and the
configuration of streets and cul-de-sacs surrounding them, any attempt
to quickly or directly get from one point in the community to the other
becomes difficult. This was very apparent in the map drawings. Students
could illustrate their street or cul-de-sac and specific locations such
as the school or community club, but could not illustrate the routes or
linkages between. Without doing a transportation study, it is not known
if increased feeder bus service would assist in this regard. It is
clear, however, that the subdivision plan itself is complicated and the
provision of more direct routes from certain areas to the major streets
should have be planned for initially.

The second question of "If the resources are provided, will they
actually be used?" is difficult to answer. This study suggests that
some adolescents will use community resources and facilities, organized
or not, but that in general, use of out-of-home discretionary places
decline as the student grows older. What appears to be the challenge to
planners is to provide a range of opportunities and resources available

to the younger adolescent, 11 - 13 year olds in order to provide exper-
ience, knowledge and choice. When and if the older adolescent tends to
cut down his interaction with the community for a time, he will have had
a well of experience to draw upon and a base of environmental knowledge
from which to choose.

Conclusions

This thesis has attempted to answer questions associated with
the perceptions and use of a suburban environment by early adolescents.
The results of this research is, in some cases, rudimentary and incon-
clusive. Other results are definitive and do provide conclusive answers.

The focus of this study relied on the creation of a model forming
two research techniques, a questionnaire and a cognitive map. The ques-
tionnaire did generate useful data and, with the exception of a few
questions, requires very little change. Content analysis of all the
questionnaires was time-consuming, but gave the range of responses such
that the "behavioural" and "place" scores could be calculated. The
decision to administer the question instrument after the Map #1 was
a good one.

The self-initiated mapping technique raises some concerns.
Because of the wide variety of maps produced in content, complexity, and
organization, the investigator now questions if instructions to place at
least a few reference points should have been given. If there were some
method of ensuring that Map #2 would be completed, perhaps details left
out of Map #1 would have occurred. Combining the mapping exercise with
the questionnaire was useful in eliciting more information than could be
obtained by one method alone. An additional technique to be considered

might be a verbal interview asking the respondent to explain features drawn in the map(s).

The creation of the developmental model to help explain the behaviours of the students in this study was a personal intellectual exercise. While the model undoubtably needs further thought and refinement, it helped to provide a perspective from which to view the behaviours and lack of apparent activities of some of the students.

It is apparent that this thesis has raised more questions than the two originally put forth. Some of the areas for future research are:

1. The study should be replicated in a variety of neighbourhoods of differing age and at different seasons of the year.

2. It should be replicated in different cities, especially ones with differing weather conditions.

3. The study should be tested using not only young adolescents, but teenagers and parents to see if activities and perceptions are maitained or changed over developmental time.

4. The study should be carried out in areas with strong racial and cultural traditions to compare and contrast the results of neighbourhood use and perception relative to inherited background characteristics.

In summary, we need to know more information about the way people in general, but adolescents in particular, perceive, represent, and learn to know about their neighbourhood environment. The process and the product of "environmental knowing" should be a major area of study for planners of our future environments.

FOOTNOTES

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APPENDIX   A

Department of Architecture
Department of Interior Design
Department of City Planning
Department of Environmental Studies
Department of Landscape Architecture

University of Manitoba   Winnipeg R3T 2N2   Canada   Faculty of Architecture

204 474-9286

Thank you for taking part in this project.
The answers and drawings you provide will
allow me to describe how students in this
area use their community and will give you
a chance to suggest how the area might be
improved.

The information which you supply is con-
fidential and you will never be identified
in any way. Your name will not be used on
the questionaire or recorded anywhere.

Thank you

On the blank sheet of paper provided, draw me
a map of the area that you think of as your
neighbourhood or community, just as you would
to describe it to a new friend moving into the
area ..... places you go, your school, your
home etc.

Don't worry about your drawing skills. It
doesn't matter how well you draw.

You have about 10 MINUTES.

RAISE YOUR HAND when finished and the assistant
will collect your map.

Now will you please complete this questionaire.

You will have 20 MINUTES.

Any and all answers will be helpful.

RAISE YOUR HAND when you have finished the
questionaire and the assistant will collect
it.

THE THINGS THAT YOU DO

1. What is the ONE thing you like doing most at home?

_____

_____

2. How often do you do this?   (Put an X to either end which describes how often you do it, or if you think it belongs somewhere in between, put an X where you think it belongs)

_____	:	_____	:	_____	:	_____	:	_____
More than once a day		Every day		Twice a week		Once a week		Once every two weeks or less

3. Of things that could be possible for you to do at home, what is the ONE thing you can't do that you'd like to?   Why?

_____

_____

4. Where is the ONE place you like to go to most in the community? Why?

_____

_____

5. About how often do you go there?   (Put an X where you think it belongs)

_____	:	_____	:	_____	:	_____	:	_____
More than once a day		Every day		Twice a week		Once a week		Once every two weeks or less

6. About how often do you and your friends spend time together AT YOUR HOME?   (Put an X where you think it belongs)

_____	:	_____	:	_____	:	_____	:	_____
More than once a day		Every day		Twice a week		Once a week		Once every two weeks or less

7. About how often do you and your friends spend time together AT YOUR FRIENDS' homes?

_____ : _____ : _____ : _____ : _____
More than   Every   Twice   Once   Once every two
once a day   day   a week   a week   weeks or less

8. Outside of regular school hours, where do you spend most of your time?   Why?

_____

_____

9. After school is over, where do you USUALLY go?   Who do you go with?

_____

_____

What do you do there?

_____

_____

10. Is there anyone at your home right after school?

      Always_____   Sometimes_____   Never_____

IF THERE IS:
Who is there with you? _____

_____

_____

11. Where do you usually hang around with friends?

_____

_____

Of these places which ONE place do you hang around the most?

_____

12. About how often do you do this?

___ : ___ : ___ : ___ : ___

| More than once a day | Every day | Twice a week | Once a week | Once every two weeks or less |

13. Not counting lessons, do you take part in any sports activities OUTSIDE of regular physical education classes?

Regularly_____   Sometimes_____   Never_____

IF SO: fill in below

Activity?	Where?	How do you get there?	About how often?

14. OUTSIDE of regular school hours, do you take any lessons? (for example, skating, piano, swimming lessons)

Yes_____   No_____

IF YES: fill in below

Activity?	Where?	How do you get there?	About how often?

15. Do you go to a club, recreation program, youth group activity etc. (For example, Scouts or Guides, a Y program)

Regularly_____   Sometimes_____   Never_____

IF SO: fill in below

Activity?	Where?	How do you get there?	About how often?

16. Are there any other things that you do regularly in your community?

Yes_____   No_____

IF SO: fill in below

Activity?	Where?	How do you get there?	About how often?

17. Do you go out of your community for special shopping and entertainment? (For example, clothes shopping, movies)

Regularly_____   Sometimes_____   Never_____

IF SO: fill in below

Activity?	Where?	How do you get there?	About how often?

18. Do you have hobbies such as crafts, collecting or making things etc. that you SPEND TIME AT.

    Regularly_____   Sometimes_____   Never_____

    IF SO: how often do you do them?

    _____ : _____ : _____ : _____ : _____
    More than   Every   Twice   Once   Once every two
    once a day day   a week   a week   weeks or less

19. Do you watch television?

    Regularly_____   Sometimes_____   Never_____

    IF SO: how often do you watch TV?

    _____ : _____ : _____ : _____ : _____
    More than   Every   Twice   Once   Once every two
    once a day day   a week   a week   weeks or less

    Who usually watches TV with you?_____

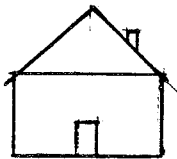## PERSONAL BACKGROUND

20. How old are you?   _____years

21. Sex: Male_____   Female_____

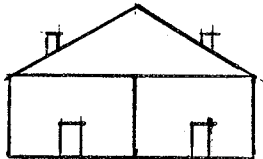22. What grade are you in at school?   Grade_____

23. Where were you born?   Name of City_____

                           Name of Country_____

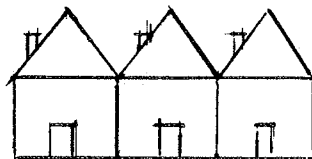## YOUR HOME AND NEIGHBOURHOOD

24. What kind of home do you live in now?

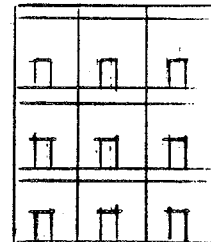( )   ( )   ( )   ( )

25. Does your family own a car?

Yes_____   No_____

IF YES: how many cars does your family own? _____

: how many drivers are there in your family? _____

26. Describe the ONE thing you LIKE best about your neighbour-
hood or community.

_____

_____

_____

27. Describe the ONE thing you DISLIKE most about your neigh-
bourhood or community.

_____

_____

_____

28. Do you feel there is anything missing in your neighbourhood?

           Yes_____   No_____

    IF YES: describe what you'd like to see added.

_____

_____

_____

29. Are there places in your neighbourhood where you choose NOT to go?

           Yes_____   No_____

    IF YES: where?_____

       : why do you not go there?_____

       _____

30. Are there places in your neighbourhood where you're AFRAID to go either during the day or at night?

           YES_____   No_____

    IF YES: where are you afraid to go during the DAY?_____

_____

      : why are you afraid to go there during the DAY?_____

_____

      : where are you afraid to go at NIGHT?_____

_____

      : why are you afraid to go there at NIGHT?_____

_____

31. Are there places you are NOT allowed to use or be at with your friends in the neighbourhood or community?

Yes_____   No_____

IF YES: what places are you not allowed to use or be at?_____

_____

: why are you not allowed there?_____

_____

YOU AND YOUR FAMILY

32. Do you have a job AWAY from home for which you earn money? (For example, babysitting, paper route, working in a restaurant)

Yes_____   No_____

IF YES: what jobs do you do to earn money?_____

_____

_____

: how often do you do these jobs in the week?_____

_____

_____

33. Do you get spending money or an allowance from anyone in your family?

Yes_____   No_____

IF YES: how much do you receive a week?_____

34. What language do you speak most often at home with your family?

_____

35. Other than you, how many people live in the same house with you?

(^{1}) (^{2}) (^{3}) (^{4}) (^{5}) (^{6}) (^{7}) (^{8}) (^{9}) (^{10})

36. How many younger brothers do you have?_____

How many older brothers do you have?_____

How many younger sisters do you have?_____

How many older sisters do you have?_____

37. How long have you lived at the same address?_____

38. How long have you lived in this neighbourhood?_____

39. Where did you live before moving into this neighbourhood?____

_____

Now that you have completed this questionaire, PUT UP YOUR HAND and the assistant will collect it.

Now that you have had time to think about
what you do, places you go and don't go,
draw me another map of your neighbourhood
or community.

You have about 10 MINUTES.

RAISE YOUR HAND when you have finished and
the assistant will collect your map.

Thank you for helping us with our research
study. Please make sure the assistant has
collected ALL YOUR MATERIAL. You are wel-
come to keep the pencil.

THE THINGS THAT YOU DO

1. What is the ONE thing you like doing most at home?

   Watch T.V.

2. How often do you do this? (Put an X to either end which
   describes how often you do it, or if you think it belongs
   somewhere in between, put an X where you think it belongs)

   _____ : __X__ : _____ : _____ : _____

   More than   Every   Twice   Once   Once every two
   once a day   day   a week   a week   weeks or less

3. Of things that could be possible for you to do at home, what
   is the ONE thing you can't do that you'd like to? Why?

   Listen to the record player because the
   needle is ruined

4. Where is the ONE place you like to go to most in the community?
   Why?

   the skating rink

5. About how often do you go there?   (Put an X where you think
   it belongs)

   _____ : _____ : _____ : __X__ : _____

   More than   Every   Twice   Once   Once every two
   once a day   day   a week   a week   weeks or less

6. About how often do you and your friends spend time together
   AT YOUR HOME? (Put an X where you think it belongs)

   _____ : _____ : __X__ : _____ : _____

   More than   Every   Twice   Once   Once every two
   once a day   day   a week   a week   weeks or less

-2-

7. About how often do you and your friends spend time together
AT YOUR FRIENDS' homes?

More than once a day	Every day	Twice a week	Once a week	Once every two weeks or less
____	____	____	X	____

8. Outside of regular school hours, where do you spend most of
your time?   Why?

At my house because there is nothing
else to do

9. After school is over, where do you USUALLY go?   Who do you
go with?

I go do the papers with my friends,

What do you do there?

I help them do the papers.

10. Is there anyone at your home right after school?

   Always X   Sometimes____   Never____

IF THERE IS:
Who is there with you?   My sisters

11. Where do you usually hang around with friends?

Comic World, Seven Eleven, Adams variety

Of these places which ONE place do you hang around the most?

Comic World

12. About how often do you do this?

___ : ___ : ✕ : ___ : ___

More than   Every   Twice   Once   Once every two
once a day   day   a week   a week   weeks or less

13. Not counting lessons, do you take part in any sports act-
ivities OUTSIDE of regular physical education classes?

Regularly_____   Sometimes_____   Never ✕

IF SO: fill in below

Activity?	Where?	How do you get there?	About how often?

14. OUTSIDE of regular school hours, do you take any lessons? (for
example, skating, piano, swimming lessons)

Yes_____   No ✕

IF YES: fill in below

Activity?	Where?	How do you get there?	About how often?

15. Do you go to a club, recreation program, youth group activity etc. (For example, Scouts or Guides, a Y program)

Regularly_____ Sometimes_____ Never___X___

IF SO: fill in below

Activity?	Where?	How do you get there?	About how often?

16. Are there any other things that you do regularly in your community?

Yes_____ No___X___

IF SO: fill in below

Activity?	Where?	How do you get there?	About how often?

17. Do you go out of your community for special shopping and entertainment? (For example, clothes shopping, movies)

Regularly___X___ Sometimes_____ Never_____

IF SO: fill in below

Activity?	Where?	How do you get there?	About how often?
Shopping	shopping centre	by car	once a week
Movies	downtown	by bus	once a month

18. Do you have hobbies such as crafts, collecting or making things etc. that you SPEND TIME AT.

/   Regularly X   Sometimes_____   Never_____

IF SO: how often do you do them?

2   ____ : X : ____ : ____ : ____
More than   Every   Twice   Once   Once every two
once a day   day   a week   a week   weeks or less

19. Do you watch television?

Regularly X   Sometimes_____   Never_____

IF SO: how often do you watch TV?

____ : X : ____ : ____ : ____
More than   Every   Twice   Once   Once every two
once a day   day   a week   a week   weeks or less

Who usually watches TV with you? My sister

PERSONAL BACKGROUND

20. How old are you? ___ years

21. Sex: Male X   Female_____

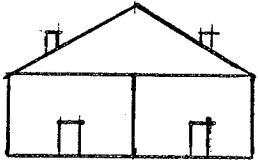22. What grade are you in at school? Grade 7

23. Where were you born? Name of City Los Cruces

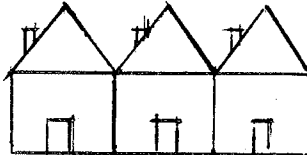   Name of Country New Mexico

YOUR HOME AND NEIGHBOURHOOD

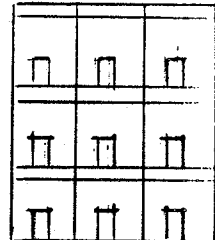24. What kind of home do you live in now?

( )   (X)   ( )   ( )

25. Does your family own a car?

Yes ___X___   No_____

IF YES: how many cars does your family own?   2

: how many drivers are there in your family?   _____

26. Describe the ONE thing you LIKE best about your neighbour-
hood or community.

_____It's clean_____

_____

_____

27. Describe the ONE thing you DISLIKE most about your neigh-
bourhood or community.

_____The dogs barking at night_____

_____

_____

28. Do you feel there is anything missing in your neighbourhood?

               Yes_____   No___X___

IF YES: describe what you'd like to see added.

_____

_____

_____

29. Are there places in your neighbourhood where you choose NOT to go?

               Yes_____   No__X____

IF YES: where?_____

      : why do you not go there?_____

_____

30. Are there places in your neighbourhood where you're AFRAID to go either during the day or at night?

               YES_____   No___X____

IF YES: where are you afraid to go during the DAY?_____

_____

      : why are you afraid to go there during the DAY?_____

_____

      : where are you afraid to go at NIGHT?_____

_____

      : why are you afraid to go there at NIGHT?_____

_____

31. Are there places you are NOT allowed to use or be at with your friends in the neighbourhood or community?

Yes_____   No__X___

IF YES: what places are you not allowed to use or be at?_____

_____

: why are you not allowed there?_____

_____

YOU AND YOUR FAMILY

32. Do you have a job AWAY from home for which you earn money? (For example, babysitting, paper route, working in a restaurant)

Yes__X___   No_____

IF YES: what jobs do you do to earn money?_help do

papers_____

_____

: how often do you do these jobs in the week?__4__

times a week_____

_____

33. Do you get spending money or an allowance from anyone in your family?

Yes__X___   No_____

IF YES: how much do you receive a week?__2.00____

34. What language do you speak most often at home with your family?

English

35. Other than you, how many people live in the same house with you?

<div>
1 ( )   2 ( )   3 ( )   4 (X)   5 ( )   6 ( )   7 ( )   8 ( )   9 ( )   10 ( )
</div>

36. How many younger brothers do you have? _0_

How many older brothers do you have? _0_

How many younger sisters do you have? _1_

How many older sisters do you have? _0_

37. How long have you lived at the same address? _2 years_

38. How long have you lived in this neighbourhood? _2 years_

39. Where did you live before moving into this neighbourhood? _at fort georgy_

Now that you have completed this questionaire, <u>PUT UP YOUR HAND</u> and the assistant will collect it.

APPENDIX B

CODING FROM CONTENT ANALYSIS OF QUESTIONNAIRES

I. Coding for closed-ended questions other than straight numerical responses

Always/ Sometimes/Never	Regularly/ Sometimes/Never	Yes/No
0 No answer	0 No answer	0 No answer
1 Always	1 Regularly	1 yes
2 Sometimes	2 Sometimes	2 No
3 Never	3 Never	3 Used to/not anymore

Frequency: How often?

0 No answer
1 More than once a day
2 Everyday
3 Twice a week
4 Once a week
5 Once every two weeks or less
6 Once a month
7 Once every one to three months
8 Seasonally
9 Sometimes (occasionally, unspecified)

Sex

0 No answer
1 Male
2 Female

House Type

0 No answer
1 Single family detached
2 Duplex
3 Multi-family attached
   (Row House)
4 Apartment

II Coding for open-ended questions:
The things that you do/activities

A. Activity: Do what?

00 No answer
01 Watch T.V.
02 Sleep
03 Eat
04 Listen to radio, stereo
05 Reflect, think, relax

A. Activities - Continued

　　06 Play indoor sports, music, hobbies, art
　　07 Do indoor chores, cooking, cleaning
　　08 Interact with family
　　09 Indoor skill development, reading, drawing, practising
　　10 Do homework
　　11 Socialize, have company, party, dance/drink, fool around
　　12 Courting, sexual activities
　　13 Play outdoor sports
　　14 Play with pet(s)
　　15 Go to lessons, school
　　16 Go to work, work
　　17 Shop, go to movies, entertainment
　　18 Play
　　19 Unspecified activity
　　20 Other
　　21 Combination of discretionary activities
　　22 Unclear or irrelevant activities

B. Location/Place: Where?

　　00 No answer
　　01 Home
　　02 Outside of home including yard and street
　　03 Friend's' home(s)
　　04 Girlfriend's, boyfriend's home
　　05 Relative's house
　　06 School, including yard and gym
　　07 Community Club
　　08 Adam's Variety Store
　　09 Roller rink (Saints)
　　10 Stores, shopping center, plaza, inside community
　　11 Downtown, movies, shopping centers outside community
　　12 Work
　　13 Nowhere in particular
　　14 Facilities outside the community (Pan Am Pool, Sargent Park)
　　15 Teacher's house
　　16 Music school or studio (Yamaha)
　　17 Organization places outside community (Y.M.C.A./H.A., HMS
　　　　 Chippewa
　　18 Church

C. Reason for doing activity or for going to location/place: Why?

　　00 No answer
　　01 To be alone, by myself, reflect, relax
　　02 To be with family
　　03 To be with friends, socialize
　　04 To engage in courting, sexual activities
　　05 To watch T.V., sleep, eat, listen to stereo/radio
　　06 To play indoor sports, music, hobbies, arts
　　07 To do chores or babysitting
　　08 To do indoor skill development, reading, drawing, practising
　　09 To do homework
　　10 To play with pet

C. Reason for doing activity or for going to location/place - Continued

    11 To hack around
    12 To use facility or equipment
    13 To be entertained
    14 To do a specific outdoor sport
    15 Enjoys activity or place generally (like it)
    16 To work
    17 Have to
    18 To have something to do

D. Level of interaction: Who with?

    0 No answer
    1 Alone, by myself, nobody
    2 Anyone, no one in particular
    3 Friends
    4 Girlfriend, boyfriend
    5 Family, all or part of but including an adult
    6 Parent(s)
    7 Siblings
    8 Extended family
    9 Pets

E. Desired activity: Like to do what?

    00 No answer
    01 Watch T.V.
    02 Sleep, more, all day, undisturbed
    03 Eat, as much as desired
    04 Listen to radio or stereo loudly
    05 Reflect, think, relax undisturbed
    06 Play indoor sports, music, hobbies/arts
    07 Do indoor chores, cooking, cleaning, or responsibilities
    08 Interact with family
    09 Do indoor skill development, read, draw practise
    10 Homework
    11 Have company, party, dance/drink, fool around
    12 Engage in sexual activities, have opposite sex in house
    13 Play outdoor sports
    14 Have pets or more pets
    15 Skip school
    16 Work, have a job
    17 Shop, go to movies, entertainments, pubs, (more)
    18 Unspecified activities (don't know)
    19 Combination of in-home discretionary activities
    20 Unclear or irrelevant activities
    21 Smoke

F. Restrictions on activities: Why can't you do it?

    0 No answer
    1 Parents do not approve or permit it
    2 Authorities (school) do not approve or permit it
    3 Society, mores, convention (under age) do not permit it
    4 Self-chosen restriction, doesn't choose to
    5 Physical features of the house do not allow it
    6 Fixtures or objects in the house are unavailable (no pool)
    7 Physical features of the community do not allow it
    8 Facilities unavailable in the community
    9 Unclear or irrelevant answer

G. Sport Activities

    0 No answer
    1 Running, jogging outdoors, biking
    2 Hockey, skating generally
    3 Organized hockey, ringette
    4 Organized team sports indoor, basketball, volleyball,
      floor hockey
    5 Organized team sports outdoors, soccer, football, baseball
    6 Individual indoor sports, swimming, skateboarding, weight
      lifting
    7 Individual outdoor sports, horseback riding, golfing
    8 Home games/sports, pool, table tennis
    9 Roller skating

H. Lessons

    0 No answer
    1 Music lessons, drums, piano, guitar
    2 Sport lessons, swimming, skating, riding
    3 Fine art lessons
    4 Dance lessons
    5 Other

I. Clubs, recreation, youth group activities

    0 No answer
    1 Community Club activities
    2 Church group (Teens)
    3 YMCA/YWCA
    4 Sea Cadets
    5 Scouts/Guides
    6 Other (Canadian Youth Association)

J. Additional activities

    0 No answer
    1 Church activities
    2 Sports activities
    3 Individual activities (dringing)
    4 Group activities (getting together)

K. Out-of-community activities and entertainment

    0 No answer
    1 Roller skating
    2 Clothes shopping
    3 Unspecified shopping
    4 Movies
    4 Courting, sexual activities (picking up boys)
    6 Individual sports entertainment (horseback riding)
    7 Group sports entertainment (Jets)
    8 Unclear or irrelevant answer

L. Transportation mode: How do you get there?

    0 No answer
    1 Walk, jog, run
    2 Car (ride)
    3 Bus
    4 Bike

III Coding for open-ended questions: Your home and neighbourhood

A. Neighbourhood likes

    00 No answer
    01 Nothing, not too much I like
    02 Family/friends
    03 People (nice, no mean peaple hardly, everyone gets along)
    04 Location (near roler rink, shops, schools)
    05 Neighbourhood characteristics (quiet,clean, not a lot of traffic)
    06 Facilities (club, rink)
    07 Physical features (lake, places to bike, play football)
    08 Han around places (Adam's Variety Store, commercial places)
    09 Other (it's away from the Maples)
    10 Unclear or irrelevant answer

B. Neighbourhood dislikes

    00 No answer
    01 Nothing
    02 Family/friends
    03 Dislike people (hate) in general
    04 Everything
    05 Authority figures and rules (principal, teachers, janitor)
    06 People with negative personality characteristics (smoke, brag,
       are dumb)
    07 Physical features lacking (no trees)
    08 Negative physical features (mud, garbage, weeds, smell, dirty
       unpaved streets)
    09 Facilities lacking (recreation center, skate board track)
    10 Home conditions unsatisfactory (apartment noisy, houses close
       together)
    11 Dogs and/or owners
    12 Nothing to do
    13 No friends nearby or no friends
    14 Neighbourhood characteristics (it's too big)
    15 Answer based on personal bias (racial bias)
    16 Unclear or irrelevant answer

C. What you would like to see added

00 No answer
01 Nothing
02 Friends, more kids my age, old friends (cute girls/guys)
03 Physical features in the community (trees, parks, grass)
04 Recreation facilities in community (swimming pool, skateboard/
     basketball court)
05 Commercial facilities (stores, shopping centers, mall)
06 Hang around places (some places for kids, pinball palces)
07 Entertainment places (movie theatre, arcades)
08 Change in present emphasis of recreation (more sports for
     girls in Community Club, less hockey, less ringette)
09 Senior High School
10 Unclear or irrelevant answer
11 Everything
13 Other

D. Places you choose not to go:
Places Afraid to go during day/night

00 No answer
01 Home
02 School
03 Side streets
04 Alleys
05 Major roads
06 Field behind school
07 Woods or bush
08 In less developed areas
09 Across the railway tracks
10 By the townhouses/apartments
11 Near new construction sites
12 Near the lakes
13 Adam's Variety Store
14 Roller rink
15 Unclear or irrelevant answer
16 Other
17 Nowhere

E. Why do you choose not to go there?

0 No answer
1 Dislike parent(s)
2 Parents do not approve or permit it
3 Hates school
4 Hates authority figures (principal, teachers, janitor)
5 Hates people or kids
6 Dangerous (lakes)
7 Afraid of violent people (might get raped or mugged)
8 Unclear or irrelevant answer
9 Other

F. Places not allowed to use or be with friends

    0 No answer
    1 Home
    2 School or gym after hours
    3 Construction site or newly-developed areas
    4 Shopping centers
    5 Pubs, adult places
    6 Lakes
    7 Adam's Variety Store

IV Coding for open-ended questions: You and Your Family

A. Jobs to earn money

    0 No answer
    1 Babysitting
    2 Paper route
    3 Work in commercial places (restaurant)
    4 Work outdoors (cut grass, shovel snow)
    5 Unspecified chores
    6 Occasional jobs (collecting bottles)

B Allowance

    0 No answer
    1 As much as I want or need
    2 $1.00 - $3.00 per week
    3 $3.50 - $5.00 per week
    4 $5.50 - $9.00 per week
    5 Approximately $10.00 per week
    6 Approximately $15.00 per week
    7 Approximately $20.00 per week
    8 Unclear or irrelevant answer (none of your business)

C. Birth place - city of birth

    0 No answer
    1 Wininpeg
    2 City of Manitoba (Brandon, Churchill)
    3 Town or rural area in Manitoba
    4 City, town or rural area in Canada
    5 City, town, or rural area in U.S.A.
    6 City, town or rural area outside of Canada or the U.S.A.
    7 Personal or crossed out

D. Birth place - country of birth

    0 No answer
    1 Canada
    2 U.S.A.
    3 Carribean (Jamaica, St. Kitts)
    4 Phillipines
    5 Great Britain (England, Scotland)
    6 Western Europe (Poland)
    7 Other (Malaysia, Africa)

E. Language spoken at home

    0 No answer
    1 English
    2 French
    3 German, Dutch, Polish, Ukranian, Italian
    4 Iloxana, Phillipine language

F. Lived at the same address (present), Lived in the neighbourhood, Lived before moving into the neighbourhood

    0 No answer
    1 Less than 6 months
    2 6 months
    3 7 months to 1 year approximately
    4 1 to 2 years
    5 2 to 4 years approximately
    6 5 to 6 years approximately

APPENDIX   C

CODING FROM CONTENT ANALYSIS OF MAP #1

I Map Characteristics Using Appleyard's Typology

   A. Type
      0 Not able to distinguish
      1 Sequential
      2 Spatial

   B. Style
      0 Not able to distinguish
      1 Fragmented
      2 Chain
      3 Branch and Loop
      4 Netted
      5 Scattered
      6 Mosaic
      7 Linked
      8 Patterned

II Locational Information

   A. Area
      0 Not able to distinguish
      1 Quandrant #1
      2 Quandrant #2
      3 Quandrant #3
      4 Quandrant #4

   B. Distance in number of blocks
      0 Not able to distinguish
      2 Actual number of blocks
      3 Actual number of blocks
      4 Actual number of blocks
      5 Actual number of blocks
      6 Actual number of blocks
      7 Actual number of blocks
      8 Large jumps between blocks
      9 Infinite scale

C. Orientation of map drawn

    0 Not able to distinguish
    1 Predominantly North
    2 Predominantly South
    3 Predominantly East
    4 Predominantly West

II Attributive Information Using Ladd's Typology

A. Neutral descriptive comments

    0 No
    1 Yes

B. Evaluative comments

    0 No
    1 Yes

C. Drawings

    0 No
    1 People
    2 Animals
    3 Abstract symbols
    4 Landscape drawings

III Vehicular/Pedestrian Networks

A. Main arteries

    0-3 Drawn and named
    0-3 Drawn, not named
    0-1 Waverley
    0-1 Bison
    0-1 Pembina
    0-1 Relative position correct

B. Collector streets

    0-2 Drawn and named
    0-2 Drawn, not named
    0-1 Chancellor
    0-1 Markham
    0-1 Relative position correct

C. Secondary streets

    0-3 Drawn and named
    0-3 Drawn, not named
    0-1 Chancellor S-1
    0-1 Chancellor S-2
    0-1 Chancellor S-3
    0-1 Relative position correct

D. Tertiary street

    0-22 Drawn and named
    0-22 Drawn, not named
    0-1   Relative position correct

E. Other routes

    0-9 Number of pedestrian corridors drawn
    0-9 Number of "places" drawn and named
    0-9 Number of "places" drawn, not named
    0-9 Number of alleys drawn
    0-4 Number of exit/entrance nodes drawn

IV Location of Houses, Apartments, Townhouses, Duplexes

A. Houses

    0-1 "Houses" deliniated
    0-2 Lot line or yard symbol drawn
    0-1 Own house identified
    0-1 Location of own house on a street

B. Apartments

    0-1 "Apartments" deliniated
    0-2 Drawing or symbol of apartment
    0-1 Relative position correct

C. Townhouses

    0-1 "Townhouses" deliniated
    0-2 Drawing or symbol of townhouse
    0-1 Relative position correct

D. Duplexes

    0-1 "Duplexes" deliniated
    0-2 Drawing or symbol of duplexes
    0-1 Relative position correct

V Schools

    0-3 Number of schools drawn
    0-3 Number of schools described or named
    0-1 Relative position correct

VI Community Club and Rink

    0-1 Community Club drawn
    0-3 Community described or named
    0-1 Relative position correct
    0-1 Skating rink drawn
    0-3 Skating described or named
    0-1 Relative position correct

VII Commercial establishments

        0-1 Waverley Plaza drawn or named
        0-4 Stecifio Store delineated
        0-1 Montcalm Hotel dawn or named
        0-1 "Pubs" outside community drawn or named
        0-3 Number of banks drawn or named
        0-1 Liquor commission delineated
        0-1 "7-Eleven) store drawn or named
        0-1 "Canadian Tire" drawn or named
        0-1 "Consumers" drawn or named
        0-4 Number of fast-food outlets drawn or named
        0-4 Number of shopping centers drawn or named
        0-4 Number of businesses outside community drawn or named

VIII Churches or Religious Places

        0-4 Number of churches or religious places drawn or named

IX Recreation Places

        0-1 Tennis courts drawn or named
        0-1 Roller rink (Saints) drawn or named
        0-4 Other recreational places drawn or named

X   Major Landmarks

        0-1 Victoria Hospital drawn or named
        0-1 Hydro station drawn or named
        0-1 Doug pound drawn or named
        0-1 University of Manitoba drawn or named
        0-1 City of Winnipeg Works & Operations drawn or named
        0-1 Cash Auto Salvage drawn or named
        0-1 Sugar Beet factory drawn or named
        0-1 Other landmarks drawn or named

XI Boundaries Other Than Roads

        0-1 Railway tracks drawn or named
        0-1 Manitoba Power Corridor
        0-1 Field Boundaries

XII Hard Landscape Elements

        0-1 Sidewalks drawn or named
        0-1 Mailboxes drawn or named
        0-1 Bridge drawn or named
        0-1 Driveways drawn or named
        0-1 Tunnel drawn or named
        0-1 Power Service Boxes drawn or named
        0-1 Hydrants drawn or named
        0-1 Bus stops drawn or named
        0-1 Railway signals drawn or named
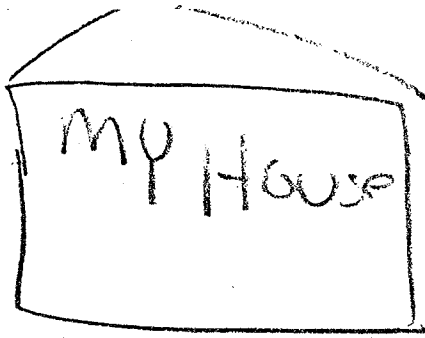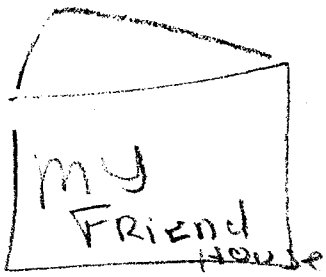   0-1 Other drawn or named

XIII Soft Landscape Elements

    0-4 Number of lakes drawn or described "lakes"
    0-4 Number of lakes named
    0-4 Number of lakes in relative correct position
    0-1 One-half landscaped area east of President's Lake delineated
    0-1 Tot lot delineated
    0-1 One-half landscaped area west of A. A. Leach School delineated
    0-6 Number of non-lanscaped areas delineated
    0-4 Number of vacant lands delineated
    0-1 Private lawns/grass delineated
    0-1 "Bush" or "forest" delineated

XIV Symbols

    0-3 Additional symbols used

APPENDIX D

My Friend House

My House

School

Roller Rink

store

town houses

Green bror Bay

Syracuse

Lake Dale

acres

Lakeland gro

Chancellor

Chancellor

Lakeside

m a 5 K 93

m

School

sorting ccc
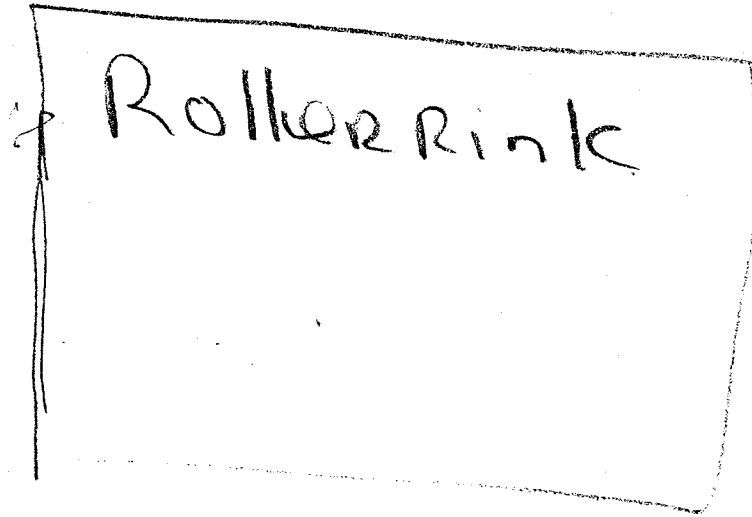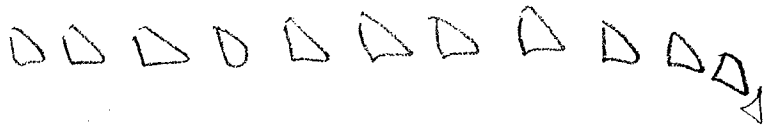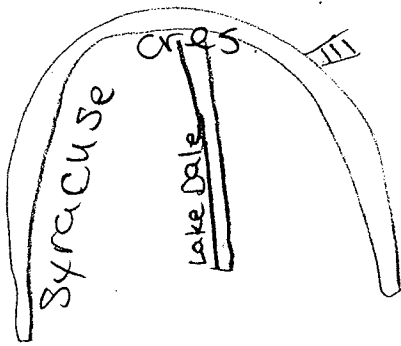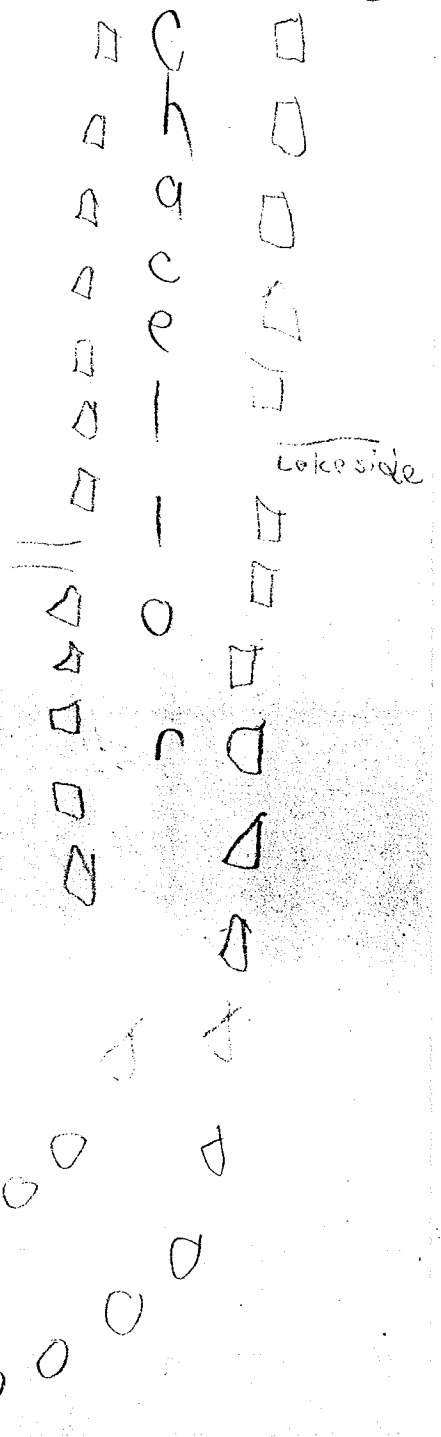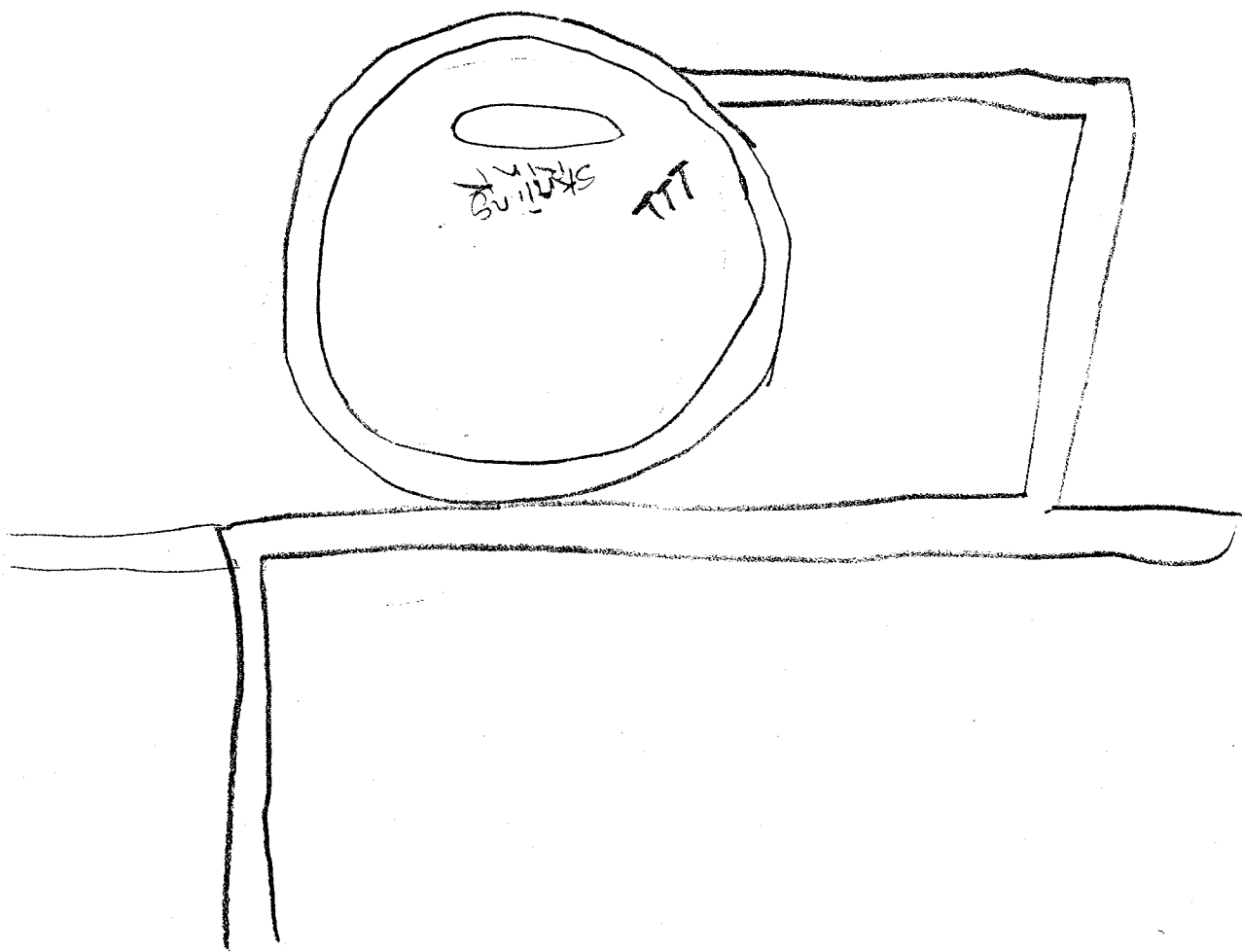
Field

all little
roads in here
(with houses)
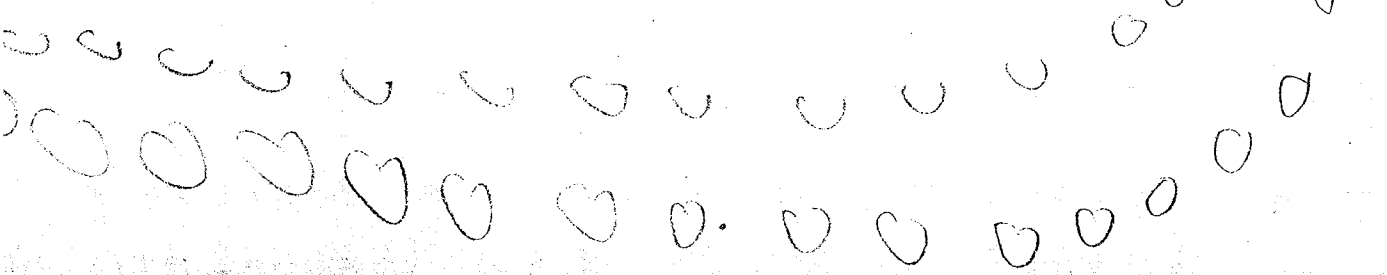
Plaza

Mark

chane ellar

Drive

School

Community club

ham ROAD

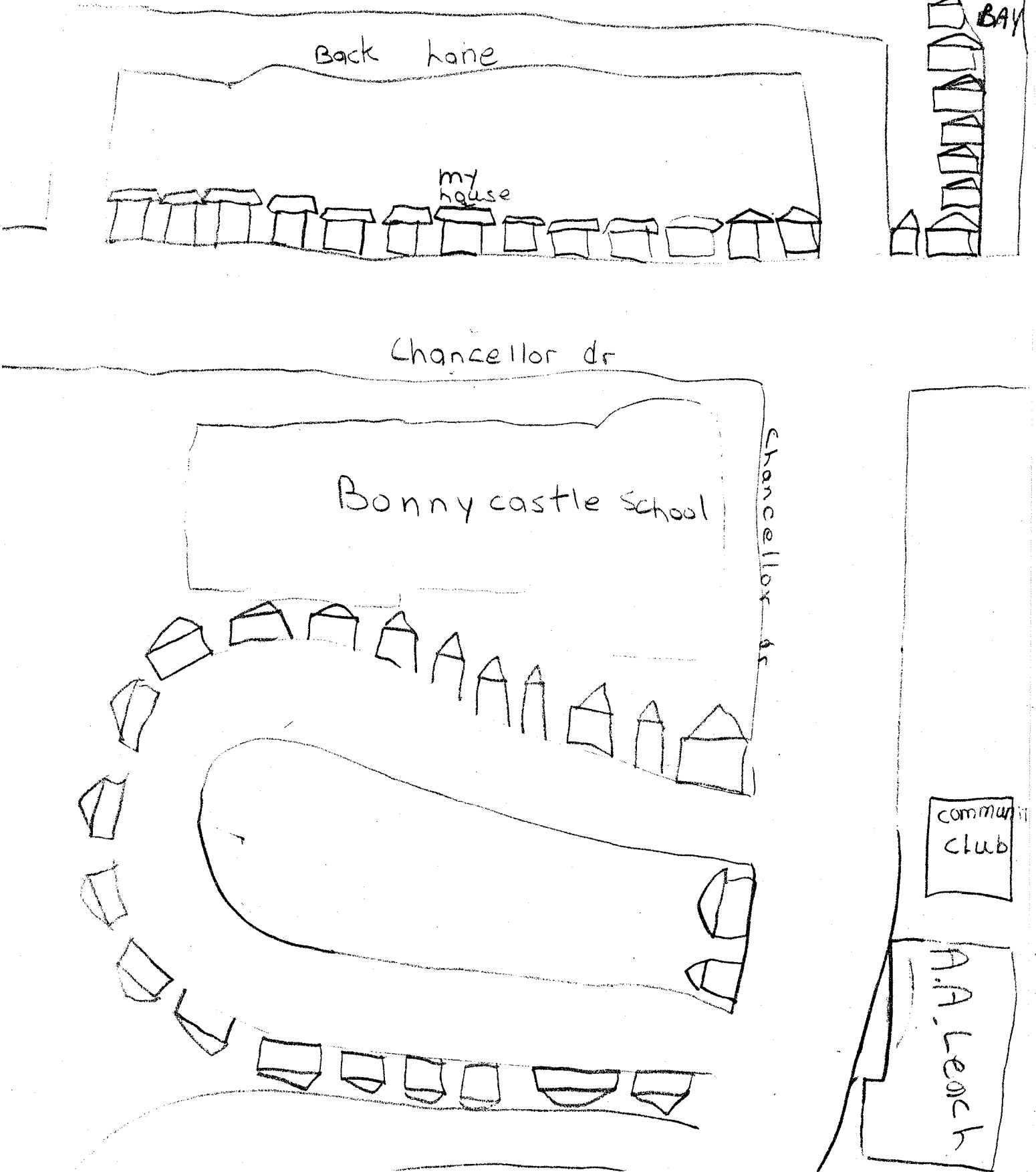Dag Club my Friend lives there

Lake
Villige
BAY

Back Lane

my house

Chancellor dr

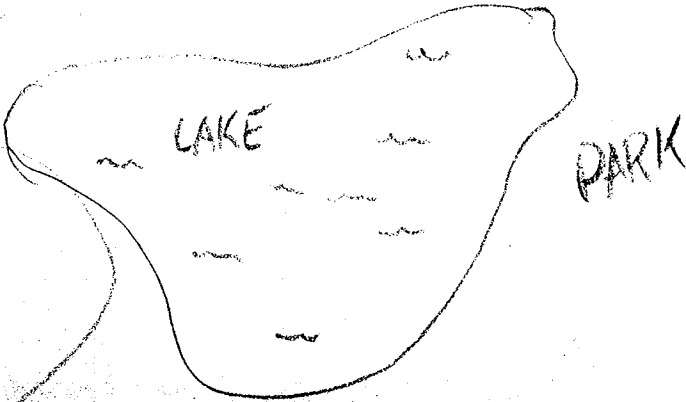Bonny castle School

Chancellor dr

communit
Club

A.A.Leach

JOHNNY'S HOUSE

SCHOOL

MARKHAM R.D.

CHANCELLOR DR.

MARKHAM RD.

LAKE

PARK

OSGOODE

RAILROAD TRACK

LAKESHORE RD.

MONTCLAIR BAY

MY HOUSE

CHANCELLOR DR.

JUNK YARD